Economics of Integrated Broiler Farming

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Dr.V.Balamurugan

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ECONOMICS OF INTEGRATED BROILER FARMING

V.BALAMURUGAN

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CHAPTER I

INTRODUCTION AND RESEARCH DESIGN

INTRODUCTION

India is an agricultural country where around 65 per cent of the population is engaged in agriculture and related activities contributed GDP of 7.31 billion crores during 2010[1]. Agriculture and allied sectors like forestry, logging and fishing accounted for 17% of the GDP in 2012[2]. Agriculture, one of the potential sources of rural economy, forms the backbone of the country's economy. It has been providing employment to a large section of the people of India. Indian agriculture has been the source of supply of raw materials to the leading industries like cotton, textiles, jute, sugar and oil. There are many other industries which depend on agriculture in an indirect way also.

In spite of the fact that agriculture contributes a major share of the national income, it has been in a deplorable condition in India right from the beginning. On the eve of the First Plan, Indian farmers were in heavy debts owing to the village moneylenders[3]. They had small and scattered holdings. They had very little knowledge of proper tools and equipments, high yielding hybrid seeds, improved methods of cultivation practices and effective use of manure.

To bring about increase in agriculture production, the Indian Planning Commission introduced various programmes such as modern irrigation, soil conservation, dry farming and land reclamation, supply of fertilizers and manure, better ploughs and improved agricultural implements, adoption of scientific practices and the like. The overall objective of the Eleventh Five Year Plan (2007-2012) is thus 'to ensure that future growth especially in agriculture that is more efficient, sustainable and inclusive'. 'For growth to be at all-inclusive, the agricultural strategy must focus on the 85 percent of farmers who are

[1] **Economic Outlook Survey**, 2011.
[2] **Economy of India**, http://en.wikipedia.org/wiki/Economy_of_India#Agriculture, 2013.

marginal, increasingly female and who find it difficult to access inputs, credit and extension or to market their output'.

Despite the progress under various Plans, Indian agriculture is still a gamble for monsoons. While failure of rainfall is witnessed in some parts of the country, excessive rains and consequent floods damage standing crops in certain other parts of the country. Also, the failure of land reforms, fluctuation in prices of agricultural produces, deterioration of soil health, imbalances in supply of water for irrigation, multiplication of pests and diseases and the like challenge Indian agriculture. Many Indian farmers were unable to earn sufficient income to meet out the expense for their domestic requirements. There have been reports about farmers committing suicides due to debts, poverty and misery in the country. Consequently, the farmers began to seek diversification of agriculture looking out for more profitable and remunerative enterprises such as horticulture, sericulture, dairying and broiler farming. The Government also has been encouraging such allied activities by allocating more and more funds in the successive Five – Year Plans. Activities allied to agriculture provide subsidiary occupation, offer self-employment opportunities, improve nutritional standards and also fetch more profit than what is accrued from agriculture. Of the various allied activities, broiler farming has become one of the prospective economic activities among the rural folks.

India ranks first in having the largest livestock population in the world. Livestock plays an important role in the national economy as well as in the socio economic development by augmenting family incomes and generating gainful employment in the rural areas, particularly for the landless, small and marginal farmers and women. With its 1.2 billion population and eight percent GDP growth rate, India is rapidly emerging as one of the biggest markets in the world. Livestock sector contributes approximately four percent to GDP and 27 percent to agriculture GDP[4]. Poultry and dairy sectors are the major sectors contributing to economic development.

[4] GoI, Economy of India, 2012.

The poultry sector has undergone a paradigm shift in structure and operation during the last two decades. It has transformed itself from a mere backyard activity into a major commercial activity with participation by big players leading to successful implementation of contract poultry farming on a large scale. India is emerging as the world`s second largest poultry market with an annual growth of more than 14 percent, producing 61 million tonnes or 3.6 percent of global egg production. Apart from this, India ranks sixth in broiler production (125 billion Rupees) with an annual output of 2.39 million tonnes of broiler meat[5]. The total poultry industry is valued at about 350 billion rupees. The per capita consumption per year is approximately 2.4 kg, which is much lower than the recommendation of 11 kgs per head by National Institute of Nutrition.

Domestic poultry meat production (broiler - meat weight) is estimated to have increased from less than 1.0 million tons in 2000 to 3.4 million tons in 2012 with per capita consumption increasing from 0.8 kg to 2.8 kilo gram per annum during same period[6]. Several breakthroughs in poultry science and technology have led to the development of genetically superior breeds capable of higher production, even under adverse climatic conditions. This industry has a large scope with great potential for export of poultry products.

Besides the Ministry of Agriculture and the Ministry of Food Processing Industries, the list of organizations playing a major role in the development of poultry and livestock industry is quite lengthy. Prominent among them are: APEDA, National Meat & Poultry Processing Board (NMPPB), Poultry Federation of India (PFD), All India Poultry Breeders Association (AIPMA), India Poultry Equipment Manufacturers Association (IPEMA), Karnal Poultry Farmers Associations, Central Institute of Fisheries Technology, National Egg Coordination Committee (NECC), Compound Livestock Feed Manufacturers Association (CLFMA), National Institute of Nutrition (NIN) India Poultry Journalists` Association

[5] GoI, Ministry of Agriculture Estimate, 2012.
[6] Indian Poultry Industry – Broiler Meat and Table Egg, 2012.

(IPJA), Andhra Pradesh Poultry Federation (APPF) and Poultry Breeders Association (A.P.) etc.

The poultry's another segment 'Broiler farming' is of great importance in today's context in terms of employment generation, economy and nutritional values. Malnutrition is a matter of serious concern among the people of our country with low score in the average Human Development Index (HDI) 0.547 compared with world index of 0.682 in 2011[7]. The growing economy of our country has not been able to satisfy this requirement due to factors like population explosion, illiteracy, poverty and the like. In such a context, it is imperative to develop broiler farming in almost all parts of the country which not only provides employment to the teeming millions in the country but also caters to their nutritional requirements.

Though Broiler farming started its debut as a backyard venture, it has today transformed itself into the fastest growing sector due to introduction of Integration of support activities. Easy adaptability of broiler to different agro climatic conditions and substantial employment oppournity coupled with high profit encouraged people to involve themselves in Integration. Normally in broiler farming the farmers have to invest more money for infrastructure and inputs. They grow the chicks into birds under conventional method and market the birds locally at their own risk. Individual own farming does not give an opportunity to expand it by adopting new technology, using modern equipments and following modern management techniques needed for farming that requires huge investment in terms of feed, medicines, marketing facilities and the like. Broiler birds are susceptible for diseases of many kinds and to combat them biological research facilities are required. In the absence of which mortality of birds and large scale loss becomes inevitable. An individual farmer cannot have such facilities of his own but this is possible for an integrator who has large number of broiler farms under their care and control. In such context, integrating system helps the farmers in a great way. The Integrator usually provides all inputs and

[7] International Human Development Indicators – UNDP website, Countries Section.

markets the birds at their own risk. Integrators pay a sum as 'growing charge' based on the weight gained per bird to the farmers. The introduction of hybrid birds and application of improved technology also have contributed much to the development of broiler farming.

The broiler meat has proved to be an affordable and widely accepted meat to the non-vegetarians. Vitamin B-12 is available in Non-vegetarian food. If a child takes 25 grams of chicken meat, it can give 45 per cent of protein and 50 percent of Vitamin B-12 requirements of a day[8]. Broiler meat is an ideal food for young as well as old people. It is easily digestible and contains all essential amino acids required in human diet. Broiler meat being low in calories is an ideal food for weight control. Physician suggests chicken instead of mutton to the people who have symptoms of various health problems like blood pressure, cholesterol, diabetic disorders and the like. Recently fast food stalls and value added chicken products have become more popular. From the economic point of view, non-vegetarians prefer chicken to mutton as the former is available at a highly lesser price than the later.

In such a context a conducive and encouraging situation arose where the system of integration in broiler farming became appropriate. Today in India, 69.02 per cent are under integration whereas 30.98 per cent of farms are individual still running as own farming[9]. Such an increase in integration systems in broiler farming is a positive and an encouraging sign today.

Poultry generates self-employment opportunities directly to a large number of rural masses and also provides job oppourtunities to lakhs of skilled workers and labourers directly and indirectly through various ancillary industries such as poultry feed manufacturing units, broiler processing units, marketing personnel, pharmaceuticals, equipment

[8] SIVAKUMAR.K AND APPA RAO.V, "Meat and Body Health," **Kozhi Nanban** (Tamil Magazine), SKM Publishers, Vol. XVIII, No.12 Erode, July 2000, PP. 9-11.

[9] P.V.K. SASIDHAR, "Integrated Contract Broiler Farming: An Evaluation Case Study in India", India Gandhi National Open University (IGNOU), School of Extension and Development Studies, New Delhi, 2010. http://www.meas-extension.org/meas-offers/case-studies/contract-farming

manufacturing units, poultry vaccine and medicine manufacturers, hatchery people and the like. Thus, the development of broiler farms not only helps in improving the socio-economic conditions of the rural but also the urban and sub-urban people through various ancillary industries.

After the introduction of 'Integrated System' of broiler farming, large number of integrity firms has come up enthusiastically to start broiler farming across length and breadth of the country. Broiler framing under integration today is a lucrative venture not only to integrators but also to the farmers. Besides other parts of the country, Poultry integrators have been expanding most rapidly in southern India, particularly in the Coimbatore district of Tamil Nadu reportedly has a large integration, which now accounts for about 75 per cent of production and consumption[10].

The major integrators and contract growers operating in the southern and western region of the country include Venkateshwara, Suguna, Pioneer, Diamond Riverdale, Star chick, Gold chick, Godrej real gold and Godrej agro vet, Shanthi, Peninsula, Skylark and Komarla. Some of these integrators are also selling their processed chicken products in brand names Venky, Godrej-Realgold, Lifeline-Tenderchicken, Nutri-Freshchicken and Skylark-Nutririch.

Under a production contract, the integrators supply major inputs like day-old chicks, feed, veterinary care, pharmaceuticals and biological and technical services. They are also responsible for the lifting up of live broilers for disposal. Integrators bear all the input and output price risk and share the production risk with the broiler producer to a certain extent. However, the grower does not share any benefits from the increasing output prices, although they supply the labour, infrastructure and management skills needed for production. They receive a growing fee per bird based on performance such as Feed Conversion Ratio (FCR), harvest recovery and average live weight. They get additional

[10] RAJENDRAN et al, "A Study on Cost of Production of Broiler at Market Age at Palladam Area", Tamil Nadu **J. Veterinary & Animal Science**s 4 (2) 69-70, March - April 2008.

remuneration on superior performance standards set in the contract. If the performance is below standard, a corresponding amount per bird is subtracted from the contract fee[11].

The sudden spurt in broiler farming on integration basis was the effect of decline of agricultural sector to a great extent in India, because the major source of feed for the billions of broiler birds is only agro-composition of broiler feed in maize; so large quantity of maize have to be produced. This way the system of integration helps in the agricultural sector also becoming mutually reciprocal to each other.

Integrated broiler producers in Tamil Nadu have associated themselves and have formed an association known as Broiler Co-ordination Committee (BCC). It is the formal body representing the Broiler industry. BCC was formed in September 1994 with registered office at Palladam in Coimbatore district. All the integrators are members of BCC. The committee has a President, Vice President, Secretary and Treasurer. The main objectives of BCC as per its bye-law are to maintain stable and firm meat price, to create unity and goodwill among the members, to educate the members about their legal rights related to broiler farming and the like. Price of broiler per kilogram is fixed by BCC based on prices offered by the majority of its members. It is the formal price of broilers for both Tamil Nadu and Kerala.

Even integrators are confined to local markets; one reason is the high cost of moving live birds to distant places (above 200 km), poor road conditions, lack of refrigerated transport / cold storage infrastructure and weak distribution networks in rural areas. Furthermore, most consumers prefer meat from live birds and lack interest in processed or chilled meat[12].

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[11] FAIROZE MOHAMED NADEEM, ACHOTH LALITH, K.K. PRASANNA RASHMI, TIONGEO MARITES M, DELGADO CHRISTOPHER L., NARROD CLARE and CHENGAPPA PADINJARANDA G. (2006). "Contract Farming of Milk and Poultry in India Project, Equitable Intensification of Market Oriented Smallholder Poultry Production in India through Contract Farming.

12 The Compound Feed Manufacturers Association (CFMA) of India, Livestock Industry Report 2005, pp.15-16.

Broiler production in India is growing rapidly. Tamil Nadu, Andhra Pradesh, Maharashtra, Karnataka and Kerala contribute more than 60 per cent of broiler production of the country. According to the BCC, the process of integration has resulted in tremendous growth of broiler industry in Tamil Nadu. As a result, Tamil Nadu ranks first in broiler production.

The process of broiler integration helps in reducing the cost of broiler production costs by increasing technical efficiency and eliminating the margins on feed. The concept of integration has helped significantly in faster and uniform broiler production at farms.

STATEMENT OF PROBLEM

Poultry farming which was a traditional backyard activity in Indian society in the past has transformed into a large scale commercial farming. Today it has grown into a technology driven broiler industry helping in economic growth, employment generation and supplementing nutrition to the malnourished teeming millions of the people in India. Many industries like feed industry, pharmaceutical industry, logistics, wholesalers and retailers also flourish with the poultry industry.

With the decline of prospects in agriculture, the possibilities for developing agriculture related vocations have been explored over a few decades. Thus, poultry sector also has become an agro based activity and a suitable substitute to agriculture. As a result, both skilled and unskilled labourers and farmers started opting this poultry sector.

With the introduction of the concept of integration in the poultry sector, broiler industry has grown by leaps and bounds in a few decades in India. This concept is both beneficial and profitable to both the integrator and the broiler farmers. Under integration scheme, the farmer has to invest very less and can expect an assured income at the end of each batch. He spends only on shed, labour, water and electricity whereas the integrator provides all the essential requirements like chicks, feed, medicine and the like. This sector has developed into a well

structured net work of production and marketing of broiler throughout the country.

Theni District, the study area, is basically an agriculture oriented district where a large number of people are engaged in broiler farming. New capital formation, higher amount of direct and indirect employment oppourtunity and the like from this business activity plays a vital role in furthering economic development of this region. Many broiler farms have been functioning in this district generating employment and contributing to the economic status of the farmers.

However, even in integrated broiler farming there are inherent problems like fluctuations in price, frequent changes in demand and supply, disease and mortality and the like which need to be addressed for the sustenance of this industry.

Under the aforesaid contexts a micro level study about the economics of integrated broiler farming and the problems faced by the farmers, integrators and other functionaries is felt socially relevant and hence the present study.

OBJECTIVES

1. To study the broiler-farming scenario in terms of trend, growth and magnitude of variability in broiler production all over the world in general and broiler farming in India, Tamil Nadu and the study area in particular.
2. To study the vertical integration in broiler farming and to analyze the socio-economic conditions of the respondent broiler farmers.
3. To find out the factors motivated the respondents to start broiler farming in the study area.
4. To ascertain the cost, returns and profit and to analyze the resource use efficiency in integrated broiler farming in the study area.
5. To assess capital productivity of the investment made in integrated broiler farming.
6. To evaluate marketing cost, marketing margin, price-spread and marketing efficiency of different channels and to examine the temporal variations in prices of broiler chicken.

7. To study the problems encountered by the farmers in integrated vertical broiler farming.
8. To offer suitable suggestions based on findings.

CONCEPTS AND REVIEW

This section briefly reviews some of the concepts used in the earlier studies on broiler farming as well as other livestock grown under the similar situation. It also presents the concepts relevant to the present study.

For better exposition and clarity, the review has been organised under the following headings:

i) Cost Structure

The right decision on investment in farming activities can be taken only when valuable information on cost and returns are available. Such information will be very useful to improve cropping pattern as well as efficiency through least cost combination resources.

According to **Bhende (2006)**[13] fixed cost consists of investment on purchase of land, cost of construction of sheds, purchase of equipment and long-term investment for poultry sheds, variable cost that includes cost of chicks, feed, medicine, expenditure on electricity, coal and gas, cost of husk, disinfectants, transport and communication.

In the present study, total cost of production is classified into fixed cost and variable cost. Fixed cost includes land revenue, rental value of land, annual share of net establishment cost, depreciation on fixed assets, repairs and maintenance and interest on fixed capital.

The variable cost includes annual operation and maintenance cost, which included cost incurred on floor dust, labour, coal and gas, electricity, disinfectants and interest on working capital.

[13] BHENDE, M.J. "Production and Cost of Broiler Meat: A Case Study of Karnataka", Research Report: XL/ADRT/118. Institute of Socio-Economic Change, Bangalore, March, 2006.

ii) Returns

According to **Kalaivanan (2002)**[14], 'gross income' is the actual amount realised on the sale of the produce and he arrived at the net income by deducting cost of production from the gross income.

In the present study, gross return on broiler production is the growing charge received and the value realised from sale of manure and gunny bags. The net profit is arrived at by deducting the total cost of production from gross return.

iii) Resource use efficiency and Returns to Scale

Ferguson (1981)[15] defined 'Production Function' as a schedule showing the maximum amount of output that could be produced from any specified set of inputs, given the existing technology or state of art.

Sulthan Ibrahim (2003)[16] fitted a multiple regression type production function in broiler production. The output of broiler was taken as dependent variable. the price of broiler bird per kilogram, the age of birds, cost of all inputs, the establishment cost of broiler and labour cost were treated as independent variables.

In the present study, Cobb-Douglas type Production Function is fitted to estimate the resource returns, returns to scale and resource use efficiency. The weight of broiler chicken per bird has been taken as dependent variable. Feed cost, cost of chick, medicine cost, labour, litter cost, brooding expenses have been taken as independent variables. The efficiency of resource use is studied with the help of MVP/MIC ratio using Cobb-Douglas Production Function.

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[14] KALAIVANAN, G., "The study on Production, Marketing and Financial Aspects of Poultry Farming in Tamil Nadu – with specific reference to Namakkal and Erode Districts," unpublished Thesis, submitted to Madurai Kamaraj University, Madurai. 2002.

[15] FERGUSON, C.E. **Micro Economic Theory,** Homeland, Illinois, U.S.A, 1981, pp.203.

[16] SULTHAN IBRAHIM, "A Study on Broiler Farming in Tamil Nadu," Unpublished Ph.D Thesis, submitted to Madurai Kamaraj University, Madurai, 2003.

iv) Capital Productivity

Varinder Singh et al (2010)[17]**,** in their study on cost benefit analysis of investment in broiler farming, evaluated financial feasibility of investment in broiler farming in Punjab state, using Pay-back period method, the Net Present Value method, the Benefit-Cost ratio and the Internal Rate of Return.

In the present study, economic viability of investment in broiler production has been determined by using the Pay-back period method, the Net present value technique and the Internal Rate of Return.

v) Market and Marketing

Clark and **Clark (1990)**[18] defined the term 'market' as a centre or an area about which forces leading to an exchange of title to particular product operated and towards which and from which the actual goods tended to travel.

Market is some place where forces of demand and supply operate to determine or alter price as the quality goods or services is transferred and certain physical and institutional arrangements are in evidence.

vi) Marketing

According to **Stanton (1975)**[19], marketing is a total system of interacting business activities designed to plan, price, promote and distribute want – satisfying products and services to the present and potential customers.

In the present study, marketing refers to all business activities that direct the flow of goods and services from the primary producer to the ultimate consumer.

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[17] VIRENDRA SINGH, SHARMA, V.K SIDHU M.S and KINGRA, H.S "Broiler Production in Punjab – An Economic Analysis", **Agricultural Economics Research Review**, Vol.23 Jul-Dec 2010, pp.315-324.

[18] TOUSLY CLARK AND E.CLARK, **Principles of Marketing,** The Macmillan Company Limited, London, 1990, pp.10.

[19] WILLIAM J.STANTON, **Fundamentals of Marketing,** McGraw Hill Kogakusha Ltd., New Delhi, 1975, pp.7

vii) Marketing Structure

According to **Wells (1954)**[20], market structure includes the various market channels, intermediaries and traders involved in moving the produce from the producers to the consumers or users.

In the present study, market structure includes Commission agents, Wholesaler, Retailer who are engaged in the trade channel.

viii) Marketing Channel

Bilgrani (1974)[21] defines 'market channel' as distributors who are engaged direct or indirect transfer of title to the product as it moves from producer to consumer or industrial users.

Khols and **Vhl (1980)**[22] are of the view that middlemen are those individuals who specialize in performing various marketing functions involved in purchase and sale of goods as they are moved from producer to consumer.

In the present study, marketing channel refers to the collection and movement agencies associated with the exchange of goods and services from the producers to the ultimate consumers or users. A description of functionaries involved in the marketing of broiler is given below.

Middlemen

According to **Cundiff** and **Still (1968)**[23], middlemen are business concerns that are situated in the channel of distribution at some points between the producers and consumers. Different types of middlemen identified in case of broiler marketing are listed below.

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[20] WELLS, O.V. **Marketing Year Book of Agriculture,** V.S.D.A., 1954, pp.3

[21] BILGRANI, S.M. "The Role of Distribution in Marketing", **Indian Journal of Marketing,** Vol.IV, (5), 1974, pp.25-27.

[22] RICHARD KHOLS L. AND JOSEPH N.VHL, **Marketing of Agricultural Products,** Macmillan Publishing Co., Inc., New York, 1980, pp.8.

[23] CUNDIFF, E.W. AND R.R.STILL, **Basic Marketing,** Prentice Hall of India Private Limited, New Delhi, 1968, pp.21

Commission Agents

Commission agents act on behalf of wholesaler. Sometime they make an advance and never take title to the birds and as such do not bear any risk associated with it. They charge commission for the services rendered by them.

Wholesalers

The wholesalers buy broiler from the integrator at farm gate and sell it to retailer or institutional buyer. They are large-scale operators, take risks and also enjoy the advantages of large-scale operation.

Retailers

The retailers buy broiler from the wholesaler and sell it to consumer. They are more in numbers and reach the end user. They take risks and also enjoy benefits.

ix) Marketing Cost

According to **Jain (1971)**[24], marketing costs are the actual expenses incurred in brining the goods and services from the producer to the consumer. The expenses are incurred by all those who are engaged in the process of marketing from producers to retailers.

Dhull and **Gangwar (1973)**[25] describe marketing costs as sum of actual costs incurred by each agency involved in the marketing channel for performing their functions. These include transportation cost, loading and un-loading charge, weighing charge, weight loss and mortality, dressing wastage and sanitation, commission, establishment cost and labour.

In the present study marketing cost is the sum of actual costs incurred by each agency involved in the marketing channel for performing its function.

[24] JAIN, S.C. **Principles and Practice of Agricultural Marketing and Price Polices,** Vora & Co Publishers Private Limited, Bombay, 1971, pp3.

[25] DHULL D.N. AND GANGWAR, A.C. "Markets of Rape Seed and Mustard in Hariyana", **Agricultural Marketing,** 16 (1) 1973, pp16.

x) Marketing Margin

Ramamoorthy (1981)[26] defined marketing margin as the income to the marketing agencies who might themselves have paid out most of the cost to cover their own expenses, the price they paid for labour, equipment and the like in carrying out the marketing functions, bearing a portion as a reward for management of enterprise and risk.

In the present study, marketing margin is the profit received by the different marketing agencies in carrying out their marketing functions.

xi) Price-Spread

Singh and **George (1970)**[27] defined price-spread as the marketing cost incurred and marketing margin earned on the costs in the movement of the produce from the primary source to the ultimate consumer.

Sidhu and **Ranji (1979)**[28] defined price-spread as the difference between the price paid by the consumer and the price received by the producer for an equivalent quantity of farm product.

In the present study, price-spread is the difference between the price paid by the ultimate consumer and price received by the grower and it includes the costs and margins of different agencies.

xii) Marketing Efficiency

According to **Ramamoorthy (1981)**[29], efficiency is measured by the marketing margin received by each intermediary and its proportion to the consumer's price.

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[26] RAMAMOORTHY, K. "An Economic Analysis of Production, Marketing and Consumption of Tomato in Coimbatore Taluk", Unpublished Ph.D. thesis submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1981, pp18.

[27] SINGH R and GEORGE, M.V. "Price-Spread and Marketing Margin of Rice in Punjab", **Agricultural Situation in India,** 25(3), 1970, pp.249-253.

[28] SIDHU D.S.and RANJI, P.S. "Price-Spread in Egg Industry in Punjab", **Indian Journal of Agricultural Economics,** Vol.XXXI (4), 1979, pp168.

[29] RAMAMOORTHY.K, **Op.cit.,** pp28**.**

Dahl and **Hamond (1977)**[30] referred marketing efficiency to the achievement of minimum cost in accomplishment of the basic marketing functions of assembling, processing, transportation storage, distribution and related physical and facilitative activities.

According to **Sidhu** and **Ranji (1979)**[31], marketing efficiency can be improved through operational efficiency and pricing efficiency. The operational efficiency here refers to the cost effectiveness. The later refers to the structural characteristics of the marketing system where the sellers are able to get the true value of the produce and the consumers receive the true worth of their money.

xiii) Temporal Variation

Temporal variation refers to changes in the price of a product at a particular market over a period of time. A study on past temporal price movements of a commodity would assist in forecasting the future behaviour of prices. The four elements for analysis of the temporal variation in prices were identified as trend, cyclical, seasonal and irregular elements.

Thomson and **Foote (1952)**[32] define secular trend as a persistent upward or downward movement extending over a relatively longer period of time or it is agreed to be the value which most nearly represents the normal condition for the data at each unit of time throughout the series.

In the present study, the trend variation represents the general tendency of the price variation over a long period of time.

Bober (1971)[33] defines the cyclical variation as the recurrent fluctuations that occurs at about the same time in many economic time

[30] DOLE C.DAHL and HAMOND, Market and Price Analysis**:** The Agricultural Industries**,** McGraw Hill Publications Pvt.Ltd., New York, 1977, p.15.
[31] SIDHU AND RANJI **Op.cit.,** pp168.
[32] THOMSON F.L and FOOTE, R.J. **Agricultural Prices,** The McGraw Hill Company, Inc., New York, 1952, pp.316.
[33] STANLEY BOBER, **Op.cit.** pp.21

series and has a periodicity that varies from a minimum of one year to a maximum of twelve years.

In the present study, cyclical variation refers to recurrent up-and-down movement around secular trend levels, which are different from seasonal fluctuations and have duration anywhere from 2 to 12 years.

He also stated that on examining a series of fluctuations that had duration of less than one year and if these fluctuations recurred from year to year in a periodic fashion, it would be inferred that the data were undergoing seasonal variation.

According to **Gupta** and **Gupta (1983)**[34], the irregular or random variations refer to such variations which would not repeat in a definite pattern and they include all types of variations other than those accounting for the trend, seasonal and cyclical movements.

In the present study, the variations in the prices which are irregular and un-predictable are called irregular variations.

xiv) Vertical Integration

The term 'Vertical Integration' refers to the organisational design of a firm in which it owns two or more stages in the value chain and control over decision-making on product attributes and the logistics.

Freivalds (1989)[35] analyzed and discussed the market experiences of best-dressed chicken in Jamaica while studying the growth and integration of broiler production in Jamaica. He opined that the integration has increased the bargaining position of farmers. The researcher also studied the grower's equity and structure of poultry industry before recommending the concepts of integration.

[34] GUPTA S.P and M.P.GUPTA, **Business Statistics,** Sultan Chand and Sons, New Delhi, 1983, pp.350.

[35] FREIVALDS, J. The Best Dressed Chicken: The Growth and Integration of Jamaica Broilers. **Agribusiness Worldwide**, 2(6): 1989, pp.14-18.

Boehlje and Ray (2000)[36] studied the financial feasibility of contract versus independent pork production in Washington DC and found out that the contract pig production yielded two folds as compared to independent farming in production as well as profits.

Mackel (1979)[37] studied different aspects of desirability and feasibility for contracting in case of fat cattle in Scotland. The researcher opined that the pig fattening enterprise holds economic significance as against other contracts.

Gnanakumar P Baba (2007)[38] studied the financial feasibility of investments in contract poultry farming in Tamil Nadu region. Fifty integrated poultries were selected randomly in Coimbatore district and a study undertaken. He concluded that on an average, farmers received a growing cost Rs 2.36 per Kg of bird. The study also calculated the profitability per chick, which was found to be Rs 1 .50 in the beginning. The study also estimated the returns on investment that was found to be 11.5 per cent in the beginning and increased up to 20 per cent.

Ramaswami, et al. (2005)[39] opined that although a major proportion of poultry eggs and meat is still produced on independent farms, vertical integration and contract growing have become very popular in the southern and western regions of the country for broiler production.

Biswas et al. (2003)[40] studied the sustainability of broiler farming in coastal districts of West Bengal. Their study parameters were stock

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[36] BOEHLJE, M. AND RAY, S., Contract Vs Independent Pork Production: Does financing matter? **Agricultural Finance Review**, 59: 2000, pp.31-42.

[37] MACKEL, C., Contract of fat cattle. **Economic Report**, *NOAN* MACKEL, C. 1990, Contract of Fat Cattle. **Economic Report**, *NOAN,* 1979.

[38] GNANAKUMAR, P.BABA. "Financial Feasibility of Investments in Contract Poultry Farming". **Indian Journal of Marketing**, **XXXVII** (2): 2007, pp.12.

[39] RAMASWAMI BHARAT, PRATAP SINGH BIRTHAL and P. K. JOSHI, "Efficiency and Distribution in Contract Farming: The Case of Indian Poultry Growers", Discussion Paper 05-01, Feb.2005.

[40] BISWAS, S., GOSWAMI, A., JANA, C. AND DAS, A.K., A Study on Broiler Chicken Production and Marketing Situation in Coastal Belt of West Bengal. **Indian Journal of Animal Health** 42(1): 2003, pp.51-57.

procurement, market sales, profit, monthly income and sale of meat, utilization of dead stock, rearing systems and marketing. They concluded that congenial and improved conditions of the state have prioritized the broiler production. The findings indicate the sustainability of broiler farming in the locality. Areas for further improvement are identified and discussed.

Verma and Chandra Deo (1994)[41] are of the view that successful poultry production called for a proper understanding of the various aspects such as feeding, housing, prevention of aliments and diseases and more so the management practices. Ensuring adequate sanitary conditions promoted sound health to birds.

Mitra (1994)[42] presented his observation that as a routine disease – preventive measure, most of the people compromise with vaccination, but it is not a substitute for sanitation or bio-security. An effective vaccination may protect the flock against a specific disease, but lack of bio-security, poor sanitation or faulty management can expose the birds to numerous health problems. In addition, he recommended a few management practices for sanitation and disinfection.

Venkanagouda, et al. (1996)[43] stated that early chick mortality was one of the most important problems infections causes, bacterial diseases were considered very important. They analysed the bacteria etiology of early chick mortality in poultry upto four weeks of age in and around Bangalore area.

Bhende (2006)[44] Identified the cause of death of chicks and birds during different weeks: majority of the deaths during first three weeks of installation of chicks are attributed to gout, weakness and Chronic

[41] VERMA S.V.S and CHANDRA DEO, Proper Litter Management. The key to Better Poultry House Sanitation **Poultry Guide**, April 1994, pp. 13-15.

[42] MITRA.A, Managing Disease Control, **Indian Poultry Industry Year Book** 1994, pp. 281-282.

[43] VENKANAGOUDA, KRISHNAPPA G. AND UPADHYE, A.S. 1996, Bacterial Etiology of Early Chick Mortality, **Indian Veterinary Journal**, (73) March 1996, pp. 253 – 256.

[44] BHENDE, M.J.**Op.cit.,** pp.84

Respiratory Disorder (CRD). The mortality of birds after the fifth week is reported due to overweight and other causes. Death of birds between three and five weeks is attributed to weakness and infections.

Minot (1986)[45] studied the effect of contract faring exclusively on small farmers in less developed countries. He reported that majority of the small farmers' face the problems of infrastructure and reported the financial ways of improvement and policies undertaken by Michigan State.

Vershinin (1986)[46] conducted a survey on various aspects of organizational and economic problems of contract farming based on family groups. The researcher reported that the performance and other problems related to contract farming are sparsely occurring with regard to family groups.

Glover (1987)[47] studied various aspects relating to the benefits to small holders from contract farming in Wales. He concluded that majority of the problems were concentrated around the maintenance and production aspects. The researcher also identified the major bottlenecks in contract farming in case of small holders.

Heim (1988)[48] reported the main problems in drawing up the contract, especially under the sponsorship and under an agricultural co-operative land ownership and input qualities were the discriminate factors under the outcome of his study in Bonn (Germany).

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[45] MINOT, Contract Farming and its effect on Small Farmers in Less Developed Countries. *MSU International Development Working Papers,* Department of Agricultural Economics, Michigan State University, 1986, pp.31-86.

[46] VERSHININ, Organizational and Economic probes of Contract Farming based on family groups organization. **Ekonomic heslic**, 1: 1986, pp.23-29.

[47] GLOVER, Increasing the benefits to Small Holders from Contract Farming; Problems for Farmers Organization and Policy Maker. **World Development**, 15(4): 1987, pp. 441-448.

[48] HEIM, N., Contract Farming – Problems of drawing up the contract, **Informations dienstkartei**, 1988, pp. 1081-1086.

Cordes (1988)[49] in his study of contract agriculture in German and Dutch laying hen farming revealed that the low productivity was due to unspecified standards prevailing in the study area and opined that majority of production problems occurred due to the socio economic differences among the layer farms. Further, the study also revealed that market for eggs in the study area was un-uniform.

Schrader (1989)[50] in his study on egg and broiler markets in Madison (USA) came out with various pricing problems in case of contract agriculture especially with emphasis on thin markets.

Gillespie and Eidman (1998)[51] studied the effect of risk and autonomy on the decisions of independent hog producers who wished to go for contracting. He found out that about 86 per cent of the producers decided against independent rearing due to hovering risk and also many producers (68 %) wanted a subtle type of contract hog production in Indiana State.

Wereschnitzky (1984)[52] presented a detailed structure on development, forms and problems in contract farming. The study conducted in Hamburg, Germany, concluded that the contract farming is a multi-functional paradigm in agriculture and a reasonable step for rural development.

Eroshenko (1984)[53] reported the benefits of contract rearing of young animals in private part time farms in Podso (Russia). Further, various aspects regarding the contractual arrangements such as procurement and rolling back of animals was discussed and opined that

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[49] CORDES, B.,Contract Agriculture on German and Dutch laying hen farming. Agromarket Studies, **Universitat-keil**, 1988, pp.27: 219.

[50] SCHRADER, L. F., The Egg & Broiler Markets, Pricing Problems in Food Industry, University of Wisconsin, Madison, USA, 1989, pp. 41-56.

[51] GILLESPIE, J.M. AND EIDMAN, C., "The Effect of Risk and Autonomy on Independent Hog Producers' Contracting Decisions". **Journal of Agriculture and Applied Economics**, 30(1): 1998, pp.175-188.

[52] WERESCHNITZKY, Contract Farming: Developer, Forms and Problems. *Berichte-Uber Landwirtschaft,* 52(3): 1984, pp.393-413.

[53] EROSHENKO, Contract Rearing of Young Animals in Private Part Time Farms. *Soretskoe- Garuelarstvo,* 1**:** pp. 1984, 117-122.

the contract animal rearing brought in the economics of scale in case of large farms.

Stoyanov (1987)[54] addressed various issues regarding contractual systems in Bulgaria and recommended improvement in the aspects of production and sale of livestock the researches defined contract farming as a systematic co – operative system for small farmers.

Freivalds (1989)[55] analyzed and discussed the market experiences of best-dressed chicken while studying the growth and integration of broiler production in Jamaica. He opined that the integration increased the bargaining position of farmers. The researcher also studied the grower's equity and structure of poultry industry before recommending the concepts of integration.

Glover (1990)[56] highlighted the experience of contract farming and out grower's scheme of seven countries in the Eastern and the Southern Africa. In those schemes, farmers sold their crops under contract to private or public enterprises for processing or export in return for various inputs, services and price guarantee. The researcher identified some of the key determinants of success and evaluated the performance and also examined the constraints to replication. In most cases , performance in delivering services and providing income to farmers have been quite good although high management costs were widely applied. According to author, lesser control, more reliance on price incentives and farmers participation might have increased overhead costs while developing management capability among growers.

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[54] STOYANOV, Improvement in the Contract System for Production and Sale of Agricultural Produce. *Mezhdounarodno-Sdskostopansko-Spisanie,* 1 **:** 1987, pp.39-41.

[55] FREIVALDS, J., "The Best Dressed Chicken: The Growth and Integration of Jamaica Broilers". **Agribusiness Worldwide**, 2(6): 1989, pp. 14-18.

[56] GLOVER, **Op.cit.** pp.423-427

Porter and Kevin (1997)[57] analyzed and recorded the travails of farmers in Africa. Examining their own experience of contract farming in Nigeria and South Africa, they have drawn attention to important issues which have reviewed little attention in the literature, notably staffing of schemes, farmers previous experience with Multinational Companies (MNC's) water and labour issues.

Rehber (1998)[58] presented a brief history along with explanation of contract farming concepts. Further, the reasons behind contract farming were analyzed based on several research works and articles. Finally, a simplified model was presented for the success of private contractual arrangements in the light of evidence taken from the experience.

Singh Sukhpal (2000)[59] reviewed the logic, practice and implications of contract farming for contract farmers and the local economy with evidence of contract farming experiences from African, Latin America and Asian countries in different sectors of agriculture. He found that agri-business firms tend to deal with large producers only. Contracting lead to environmental, equity, food security and sustainability problems, though it lead to better incomes for farmers and more employment for labour initially through the introduction of new crop technologies and by providing markets and inputs. In fact, contract farming as a system affected producers positively or negatively was dependent on the context of the economy.

The researcher further studied the role of contract farming in agricultural diversification and development in terms of its practices and implications for the producers and local economy in the Punjab in India.

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[57] PORTER GINA AND KEVIN PHILLIPS HOWARD, Comparing Contracts: An Evaluation of Contract Farming Schemes in Africa. **World Development**, 25(2): 1997, 227-238.

[58] REHBER, Vertical Integration in Agriculture and Contract Farming. *Working Paper No. 46:* A joint USDA Land Grant University Research Project, Uludag University Bursa, Turkey, 1998.

[59] SINGH SUKHPAL, Theory and Practice of Contract farming: A review. **Journal of Social and Economic Development**, 2(1): 2000, pp.228-246.

Hindustan Lever Limited (HLL), Pepsi and Jijer were engaged in contract farming of tomato, potato and chili respectively. The main benefits of contracting as perceived by contract farmers were better and reliable income, new and better farming skills, better soil management and outlet for bulk sales.

Abhiram (2001)[60] examined the supply chain management and role of contract faming of tomato production in Maharashtra. He opined that the services of contract farming system were advantageous to both the farmers and company. The impact was clearly brought out by contract farming. Tomato yields increased three fold (from 16 to 52 Mt/ha), chilly yields increased from 6 tonnes to 18 tonnes/ha, farm incomes increased by more than 2.5 times, processing season linked to fruit availability increased from 28 to more than 55 days and there was an improvement in the quality of produce.

Rausser and Simon (2001)[61] examined the incentives and processor placements regarding the broiler chicken production contracts in California. While analyzing the contractual setup, the researchers found that the environmental management of processor placements and production incentives to main factors that contribute to the success of contracts and contract renewal.

Shalander and Deoghare (2001)[62] reported various aspects of contractual arrangements of goat rearing in north India. They found that 69 per cent of the farmers were in favour of arrangement and renewal of contracts whereas 62 per cent of the farmers were without any land holdings.

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[60] ABHIRAM SINGH, "Supply Chain Management – Role of Contract farming". **Indian Food Packer**, 51(2) : 2001, pp.81-85.

[61] RAUSSER, G. C. AND SIMON, L. K., Processor Placements and Producer Incentives: Anslysing Broiler Chicken Production Contract. *Working Paper* – Department of Agricultural Resource Economy, University of California, No. 858, 2001, pp 25.

[62] SHALANDER KUNAL AND DEOGHARE, "Contractual Arrangements in Goat Rearing: A case study". **Indian Journal of Animal Ruminants**, 7(1): 2001, pp.45-47.

Maung and Foster (2002)[63] emphasized the need of vertical integration to facilitate the alternate marketing options in hog industry of Canada. The researcher opined that the vertical integration would have direct impact on capital investment and other real option approaches.

Dellal and Tan (2003)[64] studied the socio-economic behaviour of contract Turkey farmers in Fukeoka, Japan as compared to the case of Turkey. The study recommended the system for the large-scale production as against the small-scale production of Turkey.

Merry et al. (2004)[65] studied the systems of informal contracts in food plains of lower Amazon. The study highlighted positive integral role by informal contracts in the growth of small cattle heads, which directly contribute for farm stabilization.

Tatlidil and Aktruk (2004)[66] examined the viability of contract farming model in Faisalabad (Pakistan). They revealed that the price fluctuation and market glut can be avoided through adopting the models of contract farming over the traditional production systems.

Begum (2005)[67] undertook a study in Bangladesh to identify incentives for poultry farmers to participate in contract farming in Bangladesh. She explored why farmers enter into contract farming and evaluated the impact of a vertically integrated contract poultry farming

[63] MAUNG, A AND FOSTER, K., "Capital Investment under Alternative Marketing Scenarios in the Hog Industry: A Real Option Approach". **Canadian Journal of Agricultural Economics**, 50(3): 2002, pp. 223-235.

[64] DELLAL, I. KAI, S. TAN, S. and TAN, S., the Socioeconomic Analysis of Contract Turkey Farms: the Turkish case. **Journal of the Faculty of Agriculture, Kyushu University**, 49(2): 2003, pp.51 3-524.

[65] MERRY, F. D., SHEIKH, P. A. and MCGRATH, D. G. "The Role of Informal Contracts in the Growth of Small Cattle Herds on the Flood Plains of the Lower Amazon". **Agriculture and Human Values**, 21(4): 2004, pp 377-386.

[66] TATLIDIL, F. F. and AKTURK, D., "Comparative Analysis of Contract and Non-Contract Farming Model in Tomato Production". **Journal of Agronomy**, 3(4): 2004, pp.305-310.

[67] BEGUM, I. A., "An Assessment of Vertically Integrated Contract Poultry Farming - A case study in Bangladesh"**. International Journal of Poultry Sciences**, 4(3) : 2005, pp.167-176

system on farmers income by analysing the costs and returns and labour utilization,. It was revealed in the study that contract farmers get several incentives from the vertically integrated firm, which includes credit, production and price risk reduction, marketing assistance, technical expertise and the like. She also concluded that contract farmers were better off in terms of net income by getting a high net return from the poultry farm.

Reimer (2005)[68] reported that the only solution for the pork industry in Boston to survive the risks of shortage was the adoption towards vertical integration. The researcher was of the opinion that the pork industry trading autonomy will be at stake if needed measures are not applied immediate.

Hoffler (2006)[69] advocated the promotion of contract farming in potato to sustain the investments and to reduce the transaction risks involved in potato value chain business in Germany.

Jiqin and YingChun (2006)[70] highlighted the need of vertical co-ordination of innovative pork supply chain in Nanjing (China). According to them the vertical co-ordination in production is the only answer to cater the ever increasing demands of pork in China.

Mathur and Reddy (1970)[71] reported that the contribution of chick cost was 27.00 per cent towards the total cost. Labour charges accounted for 1.69 per cent. The depreciation on buildings and equipment was 3.7 per cent of the total costs. They also reported that 45.9 per cent of the total costs comprised of feed charges. The average

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[68] REIMER, J. J., "Vertical Integration in the Pork Industry". **American Journal of Agricultural Economics**, 88(1): 2005, pp. 234-248.

[69] HOFFLER, H., 2006, "Promoting The Kenyan Potato Value Chain: Can Contract Farming Help Build Trust And Reduce Transaction Risks?" Trust and Risk in Business Networks: *Proc. of the 99th Sem. of the European Association of Agricultural Economists EAAE,* Bonn, Germany, 8 10 February, 2006, pp. 51 7-528.

[70] HAN JIQIN, DAI YINGCHUN and YING RUIYAO, "An Exploratory Research on Vertical Coordination of Innovative Pork Supply Chain". **Journal Nanjing Agricultural University**, 2006, 29(3): pp.122-126.

[71] MATHUR C. S. AND REDDY, C. V. "Economics of Broiler Raising in India". **Poultry Guide**, 1970 76:pp. 45-48.

return per broiler was Rs. 6.68 while the net profit over total cost amounted to 20.8 per cent.

Maurice (1970)[72] reported that the chick cost contributed to 27.67 per cent while the feed charges accounted for 61.55 per cent of the total costs. Labour charges accounted to 1.69 per cent while the miscellaneous expenses contributed to 3.5 per cent of the total costs. The depreciation on buildings and equipments was 3.3 per cent. The average returns per broiler were Rs. 6.89 while the net profit was Rs. 1.27 (22.67% over total cost).

Majood Ahmed (1977)[73] in his study on economics of broiler production in Akola concluded that the total cost per broiler worked out to Rs. 8.41. The recurring (variable) and non-recurring (fixed) expenditure per broiler was Rs 7.27 and Rs. 1.14 respectively. This worked out to 86.44 and 13.65 per cent of the total cost. The cost of chicks and feed accounted for 90 per cent of the recurring expenditure. The monetary return per broiler was Rs. 10.10 at the selling rate of Rs. 8.00 per kg of the live weight. Margin of profit per broiler housed, over variable costs, was Rs. 2.82 and over total cost was Rs. 1.69 (20.10%).

Azad (1980)[74] conducted a study in Kanpur and estimated that on an average per bird, variable and fixed costs were Rs. 50.21 and Rs11.67, respectively .the cost of production per 100 eggs was worked out to be Rs. 29.98. Further, they estimated gross and net returns per month per bird at Rs. 6.57 and Rs. 1.12, respectively. The net profit per bird over one production cycle varied from Rs. 10.79 to Rs. 15.69 with an overall average of Rs. 13.15.

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[72] MAURICE, D.V., "Financial Results and Appraisal of an Efficient Speculative Broiler Unit Supplying the X'mas Market with 10-week-old table birds". **Poultry Guide**, 76: 1970, pp. 61-63.

[73] MAJOOD AHMED, "The Cost of Broiler Production". **Poultry Guide**, 14(4): 1977, pp.27.

[74] AZAD, **Indian Poultry Industry Year Book**, New Delhi, 1980, pp. 16-17.

Basu (1986)[75] estimated the total cost in production of eggs at Rs. 7,420 per 100 layers in Haldia district of West Bengal. He found that the total cost of rearing 100 layers during pre – laying period was Rs. 1,215 and during laying period, it was Rs. 6, 205, which formed 16.37 and 83.63 per cent of the total cost.

Kulkarni (1982)[76] studied the economics of poultry farming in and around Hyderabad. He found that the rearing costs per layer ranged from Rs. 75.42 on large farms to Rs. 76.38on medium farms and Rs. 78.22 on small farms with an average of Rs. 76.67. This study also revealed an inverse relationship between costs in egg production and farm size. The variable cost per 100 birds amounted to Rs. 66.80, Rs. 67.31 and Rs. 67.26 on large, medium and small farms respectively, with an average cost at Rs. 67.12. The proportion of the fixed cost to the total cost varied from 12.50 per cent on large farms and 14.01 per cent on small farms.

Kothandaraman and Narahari (1982)[77] in their project for a broiler farm of 500 bird (weekly replacement) concluded that feed cost was the major item of expenditure (53% of the total costs) followed by the costs on chicks (29% of total costs), 98 per cent of the total returns were from the sale of broilers. About 16 per cent of the total returns formed the net profit in the project.

Sewak and Dhillon (1983)[78] opined that the costs and returns of poultry business in Punjab have undergone a big change due to severe inflationary trend in the Indian economy. As for as costs were concerned, the major expenditure was on feed (74.65%), followed by cost of day old chicks (7.04%), cost of human labour (4.54%) and miscellaneous charges

[75] BASU, S.K., "A Need to develop Poultry Farming in the District of Haldia". **Indian Poultry Reviews**, 11(18), 1986, pp.26-28.

[76] KULKARNI, A., "Economics of Poultry Farming around Hyderabad, India". *Unpublished M. Sc. (Agri.) Thesis and*hra Pradesh Agriculture University, Hyderabad, India. 1982.

[77] KOTHANDARAMAN, P and NARAHARI, D., "Economics of Broiler Production in India". **Poultry Guide**, 19(4), 1982, pp.45-49.

[78] SEWAK, H.L. and B.S. DHILLON, "Costs and Returns Structure in Poultry Enterprise in the Punjab State". **Poultry Guide**, 20(5), 1983, pp.35-42.

(4.08%). The total cost per bird per year ranged from Rs. 60.67 on small farms to Rs. 53.78 on large farms.

Vliger (1983)[79] studied the economics of contract production in pig farming in Holland. He reported that majority of the costs inured by the farmers pertained to the maintenance of animals at rational stage of production where in consumption starts doubling every week.

Sundaresan and Kothandaraman (1984)[80] were the opinion that summer and North East Monsoon were less favourable than winter and South West Monsoon for better broiler productivity performance. Litter material used did not differ very much between seasons. High stocking density group tended to exhibit better feed efficiency. The profit margin for the commercial broilers was quite high as compared to very low margin for New Hampshire's. In South West Monsoon seasons, commercial lot gave higher profit than the summer season lot.

Ashok (1987)[81] conducted a study in and around Hyderabad city and estimated that proportion of costs per layer in the total cost was 25.10, 24.90, 24.58 and 24.68 per cent in small, medium large and pooled farms respectively. In the laying period, the proportion of costs to total cost per 100 layers was 74.90, 75.10, 75.42 and 75.32 per cent for small, medium, large and pooled farms respectively. Feed cost accounted for 73.94 per cent of total cost of production.

Raghuram et al. (1987)[82] in their study on economic analysis of poultry production in Nellore district of Andhra Pradesh found that the total production costs ranged from Rs. 55,194 in small units to Rs. 2,09,

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[79] VLIGER, *Contract Production in Pig Farming in 1973*. Landbouw Economisch Institute, 2: 1983, pp.96-120.

[80] SUNDARESAN.K and KOTHANDARAMAN.P, "Influence of season, Stocking Density and Litter Material on Broiler Performance," unpublished Thesis submitted to Tamil Nadu Veterinary University, 1984.

[81] ASHOK, "Economic Analysis of Poultry Production". **Indian Journal Poultry of Sciences**, 22(3), 1987, pp.267-271.

[82] RAGHURAM, P.,MD HASAN, APPARAO, T., BHAVANIDEVI, T. and ANKAMMA, N., "Economic Analysis of Poultry Production". **Indian Journal Poultry Sciences**, 22(3), 1989, pp.276-279.

276 in large units with an average Rs. 1,20,51 9. The total production costs per 100 layers ranged from Rs. 11,387 on small units to Rs. 10,185 on large units with an average of Rs. 10,284. The proportion of variable costs to the total costs was 91.99, 91.78 and 92.38 per cent on small, medium and large units respectively with 92.16 per cent for the average farm.

Lance (1987)[83] discussed the economic aspects of contracts turkey growers in Georgia. He came out with the effective production costs and returns for independent and contract turkey growers. The researchers found that independent turkey growing is less beneficial compared to that of contract growing mainly because of high cost of production in case of independent growers.

Singh and Bhullar (1987)[84] in their comparative study of poultry farming in Punjab and Andhra Pradesh with the total cost of maintenance of Rs. 125.96 indicated that the cost of feed (72.14%) , the interest on working capital (7.82%), the value of bird (5.3%) and the labour expenses (3.98%) were the major items of maintenance cost per bird.

Chhikara and Chidha (1989)[85] in their study on cost structure of poultry farming in Gurgaon district of Haryana showed that the major item in the total cost was feed (70.12%) followed by interest on working capital (10.72%) . The other components of costs were 6.82 per cent, 5.42 per cent and 2.24 per cent, respectively towards cost of day old chick, fixed cost and labour cost. The total cost per bird per year was at Rs. 104.38, Rs. 92.41 and Rs. 88.52 for small, medium and large farms respectively. The gross income per bird was Rs. 113.77, Rs. 114.37 and Rs. 115.23 for small, medium and large farms there by giving a net return of Rs. 9.39, Rs. 21.96 and Rs. 26.71 per bird per year respectively.

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[83] LANCE, "Production Cost and Returns for Independent and Contract Turkey Growers in Feorgis". **Research Bulletin**, University of Georgia, 1987, pp.301: 29.

[84] SINGH, A.J. and BHULLAR, A. S., "Declining Profitability in Poultry Farming". **Indian Journal Poultry Sciences**, 22(4): 1987, pp368-372.

[85] CHHIKARA, O.P. and SINGH, S. S., "Cost Structure of Poultry Farming in Haryana". **Poultry Guide**, 24(6): 1989, pp.45-51.

Shanmugam (1991)[86] conducted a study on production and marketing of broilers in Salem district of Tamil Nadu. He concluded that feed cost accounted for the highest share (52.64%) followed by chicks (24.68%). The labour charges accounted for 2.94 per cent while medicinal and electricity charges accounted for 6.15 per cent and 2.51 per cent. The net returns over total cost were worked out at Rs. 4.50 per bird.

Shiva Prasad (1991)[87] in his study on production and marketing of eggs and broilers in Bellary district of Karnataka concluded that total variable costs formed about 7.2 per cent of the total costs. The variable costs comprised of the chicks (29.5%), feed (45.48%) and interest on working capital (10.37%) , medicine and veterinary charges accounted for 8.17 percent and electricity charges account for 1 .3 per cent of the total costs . He also concluded that 98 per cent of the returns from broiler farming were through sale of broilers.

Singh (1995)[88] in his study on broiler marketing in Ambala and Gurgaon districts of Haryana state concluded that the most important channel is producer-wholesaler-retailer consumer and price spread was found to decrease with the elimination of intermediaries. Two indices (concentration ratio and the Hirschman, Herfindahl index) were used to analyse market structure. The indices revealed an absence of monopoly in broiler marketing.

Ashutosh and Shrivastava (1999)[89] studied the economics of poultry production and marketing in Jabalpur district Results reveal that commercial layer and broiler units, particularly the larger farms, were well managed and cost effective as compared to the small and medium

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[86] SHANMUGAM, T. R., "Production and Marketing Aspects of Broilers in Salem District, Tamil Nadu". **Agricultural Banker**, 14(1): 1991, pp.43-44.

[87] SHIV PRASAD, C., "Production and Marketing of Eggs and Broilers in Bellary District, Karnataka – An Economic Analysis". *Unpublished M. Sc. (Agri.) Thesis,* University of Agricultural Sciences, Dharwad, Karnataka, Indi, 1991.

[88] SINGH, S., "Marketing of Poultry Products of Broiler", **Indian Journal Agricultural Marketing**, 9 (1), 1995, pp.51-61.

[89] ASHUTOSH and SRIVASTAVA, "Economics of Poultry Production and Marketing in Jabalpur district". **Article Review** (Agro Economic Research Centre Madhya Pradesh), 1999. pp. 46-48.

farms. Among the four main marketing channels, two account for a 75 per cent share of egg marketing and one account for a 90 per cent share of broiler marketing. Poultry farming is considered to have good prospects in the district due to relatively cheaper land and labour input originating from tribal areas. It was recommended that efforts should be made to exploit this potential.

Ranga Reddy et al. (1997)[90] made an economic analysis of broiler production in Kamarajar district of Tamil Nadu, which revealed that Rs. 27.10 per broiler was invested to start a broiler farm. The total cost of broiler production per bird was Rs. 22.18 of which variable and fixed costs constituted 93.24 per cent and 6.76 per cent respectively. Cost of feed alone accounted for more than 50% of the total cost followed by cost of chicks (25%). There is a wide scope to reduce the total cost by substituting the least cost farm mixed rations. Amount realized by sale of broilers formed the major source of return (96.21%) in broiler enterprise. The net return per broiler and per kg of live-weight of broiler produced were Rs. 5.51 and Rs. 3.01, respectively.

Deepak Sharma and Shukla (1995)[91] found in their study that the broiler chickens reared in thatched houses either deep litter or on slat floor performed similarly as those in "Pucca" sheds. Therefore, thatch bamboo house can be utilized as an effective of the costly regular "Pucca" Sheds.

Bhattu and Sharma (1999)[92] attempted to study region-wise constraints encountered by broiler farmers in Haryana. The major constraints observed were high cost and poor quality of inputs, oligopoly marketing structure, high electricity charges, incidence of diseases, non-

[90] RANGA REDDY,P., SHANMUGAM,T.R. and MOHAN,B., "Economic and Financial Analysis of Broiler Production in Kamarajar District of Tamil Nadu". **International Journal Animal Sciences**, 12(1), 1997. 119-122

[91] DEEPAK SHARMA and SHUKLA, R.P. "Performance of Broiler Systems", **Indian Journal of Animal Sciences** 65 (70, July 1995, pp. 790-792

[92] BHATTU, B.S., SHARMA, R.K. and GUPTA, S.C., "A Study on Region wise Constraints encountered by Broiler Farmers in Haryana", **Indian Journal of Animal Research**, 33(2), 1999, pp.131-133.

remunerative prices of broilers and existence of rigid procedure for government grant or bank loans and lack of broiler insurance schemes.

Singh (1995)[93] identified the faults of contracting system both at company and at farmers' level. About two thirds of Hindustan lever Limited growers and more than 50 per cent of the Niger growers did not face any major problem in contacting. The other reported problems were poor coordination of activities, poor technical assistance, delayed payments, outright cheating in dealings and manipulation of norms by the firm. Some of the Pepsi potato farmers had a few problems with the company system, but a large number of them (60%) were happy. The study also highlighted the implications of contract farming on cropping pattern, land lease market, sustainability, farm income and employment. Despite, various problems and conflicts between companies and growers, 62 per cent of Hindustan lever limited farmers, 80 per cent of Niger farmers and 68 to 73 per cent of Pespsi (potato and chilli, respectively) farmers wanted to continue contract farming.

Bridges et al. (2002)[94] reported that the poultry farmers in china are prone to poultry associated diseases but no extensive infections by the avian flu were seen. They also studied various potential problems of poultry farmers' with regard to occupational hazards

Sukhpal and Singhe (2002)[95] reviewed the status of contracting and present political economy of contract farming in Punjab. They opined that the small scale farmers faced the chunk of problems as compared to that of large farmers, the majority of problems being related to policy and input decisions.

[93] SINGH SUKHPAL, 2000, **Op.cit** 228-246.

[94] BRIDGES, C.B., LIM, W., FUKUDA, K. and COX, N.J., "Risk of Influenza A (H5N1) Infection among Poultry Workers". **Hong Kong Journal Infectious Diseases**, 185(8), 2002, pp.1005-1010.

[95] SUKHPAL SINGH, "Contracting out Solutions: Political Economy of Contract Farming in the Indian Punjab". **World Development**, Oxford, 30(9), 2002, pp. 1621-1638.

Prasad et al. (2005)[96] studied problems in contract broiler farming as perceived by the farmers in Andhra Pradesh. The problems cited by non-contract farmers included high feed cost (90.6% of the respondents), unremunerated price (87%), high electricity charges (77%), high chick cost (69%), poor quality feed ingredients (69%), delay in lifting of birds by wholesalers (53%), mortality and disease (43%), delay in chick supply (40%) and insufficient attention of hatchery men (39%). Contract farms cited delay in chick supply (87% of the respondents), high electricity charges (69%), mortality and diseases (40%), delay in payment (27%), lesser payment of hatchery to contract farmers (13%) and problems in the daily supervision of the broiler unit by the supervisor (9%) as their problems. Based on these they concluded that non-contract farms have more difficulties in broiler farming.

Yeshodha Devi and Kanchan (2006)[97] studied the chicken consumption pattern and consumer preference for processed chicken in Coimbatore. The study also discussed the problems of live bird market as compared to that of the frozen products in poultry. It was opined that the live bird market should be supplemented by the processed poultry products to reduce the costs and other seasonal vows of the poultry farmers in that region,

Peter.K.Ferket (2010)[98] Poultry nutrition has had a rich and fruitful history utilizing available feed ingredients and state of art feed manufacturing technology to supply nutrition for optimum productivity as poultry genetic potential progresses. The future of poultry nutrition will continue to progress to improve production efficiency, but also to address food safety environmental stewardship and animal welfare concerns.

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[96] PRASAD, K.V.V., REDDY, P.V.V.S., RAO, K.S. and RAGHU RAM, "Problems in Contract Broiler Farming as Perceived by the Farmers". **Indian Veterinary Journal**, 82(4), 2005, pp.407-409.

[97] YESHODA DEVI and KANCHAN, V. S, "Study of Chicken Consumption Pattern and Consumer Preference for Processed Chicken in Coimbatore". **Indian Journal of Marketing,** February, 2006.

[98] PETER.K.FERKET, "Poultry Nutrition moves towards High Standards?" **Poultry Talk**, July 2010.

Aho Paul (1988)[99], in his study entitled "A Convergence of Competing Value systems with respect to Broiler Chicken Supply organisation" disclosed that family farms were more efficient than non-family farms and contract farms were more efficient than corporate farms.

Singh (1992)[100] identified the effects of high temperature and humidity on broiler breeders' body behaviour and effects on their nutritional requirements. The study determined that reproductive performance could be improved through feed restriction programme.

Vanmiddlekoop (1997)[101] identified that timing feed consumption combined with intermittent light technique instead of full feeding and continuous light in Broiler farming. Mortality percentage and feed conversion ratio were 3.7 per cent and 1.62 under the new technique compared to 6.8 per cent and 1.69 per cent under traditional condition. Another development in Broiler Management identified was feeding whole cereal along with a compound feed. The study suggested lowering the nutrient waste burden on the environment due to the limitations imposed by government regulations.

Ganesh Hedge (1998)[102] obtained range of farm size from 4000 to 30600 birds per batch. The system of broiler rearing was disclosed as a deep litter system with a floor space of 930 cm^2 per bird. Mean marketing age was determined as 48 days. Average body weight, feed efficiency and livability percentage obtained were 1.92 kg, 2.13 kg and 94 per cent respectively. It was suggested to rear 4000 birds with "all in all out" system with own feed mixing and direct marketing.

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[99] AHO PAUL, "A Convergence of Competing Value systems with respect to Broiler Chicken Supply organisation," Rural Sociological Society, 1988, **Sociological Abstracts,** 1986-1999/09.

[100] SINGH, "Management of Broiler Flock", **Poultry Guide**, vol. XXIX, No.4, April 1992, pp.31-37.

[101] VANMIDDLEKOOP, " New Technique for Broiler Management", **Poultry International**, 1997, PP.60-64.

[102] GANESH HEDGE, "A Study on Management and Production Performance of Broilers in Palladam Area," Unpublished M.V.Sc Thesis, Tamil Nadu Veterinary University, Chennai, 1998.

Borah et al. (2001)[103] revealed that multiple linear regression function for seven variables namely farm size, cost of poultry shed and equipment expenses, labour and maintenance, cost led to 98 per cent variation in broiler meat production.

Banday et al. (2000)[104] concluded that the overall mortality was 16.66 per cent due to various diseases among than mortality due to viral diseases like infections; bursal diseases and raniket disease were as high as 33.84 per cent followed by bacterial and managerial diseases. Seasonal prevalence of mortality pattern revealed higher incidence during summer and winter than spring and autumn.

Mathialagam (2001)[105] identified lack of awareness in decision making, housing disinfection, medical purchase, feed processing, chick medication and culling technologies as the main problems.

Nakkeeran (1997)[106] determined that 40.66 per cent of farmers used their own funds and 23 per cent of farmers borrowed from commercial banks for their investment of fixed assets. The ratio of fixed assets to owned capital was 1.235 (more than unity). The net worth of the farm was in the positive direction.

Ramesh Kumar et al. (1995)[107] concluded that variation in labour and electricity did not affect the product cost markedly, profit increased

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[103] BORAH.R.S, CHOUDARI.H and BARUAH.H, "Impact of Different resources on Broiler production", **Indian Journal of Poultry Science** 2000 (35) (1) 99 – 101, Assam Agri University India poultry abstracts, 2001, Volume, 27, No.1, pp 19.

[104] BANDAY.M.T, PANPORI. N.A, BHAT.M.R and ANAND.G.S "Epidemiological Profile of the Common Diseases in Commercial Broiler Chicken in Kashmir", **Poultry Punch**, Volume XVI, No.7, May 2000 pp.56-62.

[105] MATHIALAGAN, "Problems of Poultry Farmers as perceived by Farmers, Extension Personnel and Technology Development in Tamil Nadu," **Indian Journal of Animal Research** 2000 (34) (1) 52, 55, Veterinary college and Research Institute. Namakkal, India, Poultry Abstracts, 2001 Vol.27, No.4 pp.160.

[106] NAKKEERAN, "An Economic and Managerial Analysis of Broiler Farms in Coimbatore District", Unpublished M.B.M Thesis, Tamil Nadu Agricultural University, Coimbatore, 1997.

[107] RAMESHKUMAR.L.S, SAHUG.L.S AND KHARUB.R.K, "Economics of Broiler Farms in Jind District", **Poultry Guide**, Vol. XXXII, March, April, 1995, pp 27-28.

if the farm size was increased and vice versa. A farm size of 5000 was suggested.

Usha (1997)[108] found that the supply of broilers were higher during the months of September to February and lower during the months of April, May and June. It was concluded that broiler business was a profitable one and there existed the economies of scale.

Chickara and Chidha (1989)[109] disclosed that cost and returns structure of poultry establishments had undergone a change due to the severe inflationary trend in Indian Economy. Their study also disclosed the economics of the scale in poultry could be increased through purchasing of superior stock of day old chicks, adequate knowledge of feed mixing and efficient use of labour.

Jebarani (1994)[110] concluded that fixed assets and equipment were 70.82 per cent, 78.93 per cent and 70.07 per cent out of total investment in the case of small (1000 – 4000 birds), medium (4000 – 8000 birds) and large (above 8000 birds) farms. Family labour was 3.2, 4.0, 7.6 more days for 100 birds in case of small medium and large farms respectively. Feed costs and chick cost were determined to be 55 per cent and 27 per cent respectively. Breakeven quantity of birds were found at 802 birds, 1130 birds and 1913 birds in case of small, medium and large farms respectively.

Sulthan Ibrahim (2003)[111] concluded that the commission (growing charges) received was 89.44 per cent during summer and 90.43 per cent during monsoon in overall. The income earned per broiler by small, medium and large farmers during summer amounted to Rs.4.07, Rs.403 and Rs.4.01 respectively whereas it was Rs.4.68, Rs.4.56 and

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[108] USHA "A Study of Broiler Farms in Coimbatore Taluk – An Economic Analysis", unpublished M.Phil Thesis, Madurai Kamaraj University, Madurai, 1997

[109] CHICKARA AND CHIDHA, "Cost Structure of Poultry Farming in Haryana", **Poultry Guide**, June 1989, Vol.XXVI, No.6, pp 23-30.

[110] JEBARANI, "Determinants of Operational Efficiency in Broiler Farming in and around Madras City – An Economic Analysis," unpublished PhD thesis submitted to Tamil Nadu Agricultural University, Coimbatore, 1994.

[111] SULTHAN IBRAHIM, "A Study Broiler Farming in Tamil Nadu", unpublished Ph.D Thesis, submitted to Madurai Kamaraj University, Madurai, 2003.

Rs.4.54 during the monsoon. It has been observed that income earned by the small farmers was more than that of medium and large farmers in both the seasons.

Rental Value of Land

The Directorate of Economics and Statistics defined imputed rental value for owned land at the existing rate of rent prevailing for similar land in the village. In the case of leased land, the actual rent paid was taken[112]. In the present study, all the sample broiler farms were owner-operated. Therefore the rental value prevailing in the adjoining areas was taken as the rental value of broiler farms under study.

Broiler

A young bird of either sex, up to seven weeks of age and weighing about 2 – 2.4 Kg usually of the meat type breeds.

Broiler Farming

The term 'broiler farming' has been used to refer to the venture of rearing broilers and all the activities involved therein.

Farmer and Farming

The terms 'farmer' and 'farming' have been used to refer to broiler farmer and broiler farming respectively.

Integrator

The term 'integrator' refers to one who provides the growing stock (day–old-chicks; fatteners), feeds, veterinary supplies and services and implements the final marketing of the output.

The Grower

The term 'grower' refers to the contract grower, say, Broiler Farmer, typically provides the space and facilities (land and housing), equipment, utilities, labour (family and / or hired), day – to – day farm management.

Small Size Farm

A farm with flock strength of less than 5000 birds has been referred to as small size farm.

[112] "Studies on the Economics of Farm Management in Tanjore, Report for the Year 1969-70", Directorate of Economics and Statistics, Ministry of Agricultural and Irrigation, Government of India, New Delhi, 1974, pp.23.

Medium Size Farm

A farm with flock strength between 5000 and 8000 birds has been referred to as medium size farm.

Large Size Farm

A farm with flock strength of greater than 8000 birds has been referred to as large size farm.

BCC Rate

Broiler Co-ordination Committee is an association of broiler integrators which fixes the price of live Broiler bird for sale at farm gate.

Fixed Capital

The term 'fixed capital' has been used to refer to the cost involved in the construction of sheds, installation of fittings and equipment. It is non-recurring in nature.

Working Capital

The term 'Working Capital' has been used to refer to the cost of rearing chicks from a day old to the point of sale. The money spent in connection with shed cleaning materials, wages to labourer, litter material, brooding expenses, electricity charges and other maintenance expanses up to seven weeks are clubbed under this head.

Depreciation

Depreciation was charged to meet the loss due to wear and tear on fixed assets. Here depreciation was calculated under straight-line method[113]. It was done separately for Broiler Shed, Tools and Equipment and Material. Depreciation was charged at the rate specified below:

Broiler Shed	:	20	per cent
Tools and Equipment	:	25	per cent
Material	:	50	per cent

[113] Studies on Economics of Management in Coimbatore District, Tamil Nadu, **Directorate of Economics and Statistics**, 1971 – 72, New Delhi, P.240.

Live Bird

Adult broiler bird is jut out rearing.

Batch

Group of birds reared together for a particular period of six week.

Broiler Shed

It refers to shed used for growing chicks into birds.

Tools and Equipment

This refers to Feeder, Drinker, Brooder, Pipe line, lighting and heating and pump set owned by the broiler farmer.

Material

This includes curtain, cage, partitions purchased by a broiler farmer for his farm.

SCOPE OF THE STUDY

The researcher has undertaken this study only from the viewpoint of farmers. The farming practices and importance of vertical integration and the practical difficulties expressed by the farmers related to the conditions prevailing in the study area are the major focus of the study. The scope of the study has been also limited to broiler chicken only which are reared for the commercial production of meat for human consumption.

METHODOLOGY

Survey method was adopted for the present study. Both Primary and Secondary data were extensively used.

Sampling Design

According to the unpublished records available in the office of NABARD, Theni and major integrators, there were 301 poultry farms functioning in Theni district at the time of conducting survey. There are eight blocks in Theni District out of which five blocks were selected based on the number of broiler farms functioning in each of these blocks. From each selected blocks, 50 percent of the existing farms were selected using proportionate random sampling method. They constitute 38 from Aundipatti, 34 from Uthamapalayam, 32 from Bodi, 30 from Periyakulam

and 16 from Theni. The ultimate sample farms were selected using simple random sampling with lottery method. The selected sample constitutes 45 from small size farms, 60 from medium size farms and 45 from large size farms. Thus the total sample size worked out to be 150. The details of which are present in Table 1.1.

Table 1.1

SAMPLE SIZE

S.No.	Block	Total Farms	Sample Farms
1.	Aundipatti	76	38
2.	Uthamapalayam	68	34
3.	Bodi	65	32
4.	Periyakulam	60	30
5.	Theni	32	16
Total		**301**	**150**

Source: Unpublished records, NABARD, Theni

COLLECTION OF DATA

The primary data were collected from the broiler farmers through personal interview method. The researcher undertook a pilot study in order to gather first hand information and based on such information he designed an interview schedule consisting of questions covering farmers profile, integration, production, financial aspects and problems of Broiler Farming and Marketing. The interview schedule so prepared was pre-tested and finalized after making necessary changes. As most of the farmers do not have English knowledge, the interview schedule was translated into "Tamil" the regional language.

For the purpose of collecting secondary data, the researcher visited libraries of different universities, colleges and other educational institutions located in Madurai, Chennai and Coimbatore. Books, Journals, magazines, reports, theses and dissertation have also been referred to.

The researcher also collected data from the Statistics and Animal Husbandry Departments of Government of Tamil Nadu, Broiler Co-ordination Committee and the private concerns like Integration Company

in Theni District namely Suguna Poultry Farm Pvt. Ltd, Shanthi Poultry Farms (India) Ltd., VKS Broilers, Mani Hatcheries and Broiler Farmers.

TOOLS OF ANALYSIS

Cob-Douglas type of production function was used to analyse the determinants of broiler chicken production.

To assess capital productivity involved in the investment in integrated broiler production, Pay-back period, Net Present value and Internal Rate of Return were calculated.

To study the trend in broiler production in World, India, Tamil Nadu and the study area, simple regression equation were used.

To find out the growth rate in broiler production, compound growth rate was calculated using semi-log of exponential function.

In order to analyse the magnitude of variability in broiler production, co-efficient of variation was computed.

Time series analysis was carried out to study temporal variations in price of broiler chicken meat using multiplicative model.

To measure the marketing efficiency of the various channels in the marketing of broiler chicken meat, Sheperd's formula method was used

To analyse the problems faced by the integrator, wholesaler and retailers in marketing of broilers, Garrett's Ranking Technique was used.

To analyse the socio-economic profile of the sample respondents' simple percentage analysis was used.

To analyse the factors motivating farmers to venture into broiler farming, Factor analysis was used.

PERIOD OF STUDY

The researcher has taken into consideration the total life cycle of the broilers – a period of seven weeks for his study, the information relating to production of broiler meat, revenue realized and expenditure incurred have been collected from the respondents during November 2011 and September 2012. In addition, the researcher collected information relating to broiler meat price from Broiler Coordination Committee (BCC), Palladam for the period commencing from 2000-01 fiscal to 2011-12. Secondary data

relating to broiler production were collected for a period of 10 years from 2001 to 2010.

LIMITATIONS OF THE STUDY

The present study is based on the views, opinion and information provided by the farmers. They furnished most of the information from their memory and therefore the accuracy is subject to the recall bias. However, efforts were taken to minimize the errors through checks and cross checks at the time of interview.

To ascertain cost, revenue and profit, the averages of the value furnished by the respondents were taken into account. As the results were arrived at based on average values, the results may not have so much accuracy as in the case of experimental studies. Since the present study is confined to a micro level, generalization of the findings must be considered with due caution.

CHAPTER SCHEME

The present study is classified into in six chapters.

1. The first chapter entitled, "Introduction and Research Design" introduces the topic and points out the importance of Broiler Farming. This chapter includes statement of problem, review of literature, objectives, concepts and review of the literature, sampling design, collection of data, tools of analysis and chapter scheme.

2. The second chapter entitled, "Vertical Integration in Broiler Farming and Socio-Economic Characteristics of the Sample Farmers" presents the socio and economic characteristics of the respondent farmers and the production practices of Integration followed in Broiler Farming.

3. The third chapter entitled "Broiler Farming – A Perspective" presents the status of broiler farming in World, India, Tamil Nadu and the Study Area. Factors influenced the respondents to start broiler farming in the study area are also incorporated in this chapter.

4. The fourth chapter entitled "Cost and Return Analysis in Integrated Broiler Farming" analyses the cost of production, revenue and profitability from the view points of both farmers and integrators.

5. The fifth chapter entitled, "Marketing of Broiler Birds" discusses the practices in marketing of broiler and analyses the marketing cost, marketing margin and channel efficiency.

6. The sixth chapter entitled, "Problems faced by the Farmers in Integrated Broiler Farming" analyses the problems and suggestions to improve the broiler farming.

7. The seventh chapter entitled, "Summary of Findings, Suggestions and Conclusion" presents a summary of findings of the study and offers suitable suggestions based on the investigation.

CHAPTER II
VERTICAL INTEGRATION IN BROILER FARMING AND SOCIO-ECONOMIC CHARACTERISTICS OF SAMPLE FARMERS

INTRODUCTION

The wake of the 21st century witnessed globalization, liberalization and expansion of agribusiness paving the way for contract farming as an effective way to co-ordinate and promote production and marketing in agriculture and agro-based industries like broiler farming. "Contract farming can be defined as an agreement between farmers and processing or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices."

From this concept Integration in broiler farming emerged. There are three kinds of integrations namely Vertical, Horizontal and Circular. In Vertical Integration the entire process of production and marketing are administered and controlled by a single owner firm. In full vertical integration, the firm owns two or more different stages in the value chain and exercises control over decision making on product attributes and the logistics. It can be illustrated by meatpacker who decides to reach both backward towards the producer and operate his own livestock-buying points in the countryside and forward toward the consumer and operate his own meat wholesaling firm. Horizontal integration occurs when a firm gains control over the firms performing similar activities at the same level in production and marketing sequence. When both these systems of integration are combined together in an operation, then it is called Circular Integration. Vertical integration is best reserved for ownership integration where two or more stages in the process of production and marketing are effectively controlled by a single management. This term is related to a technological rather than an institutional development.

Contract Farmers

There are about 12,000 broiler farmers in Tamil Nadu. In the study area there are about 303 contract farmers. These contract farmers act as agents of integrators in rearing chicks. They get chicks, feed, medicine and other supervisory service from the integrators and rear the chicks up to the marketing age. At the time of rearing, contract farmers incur expenses like

labour, electricity charges. Litter material, lighting and heating. Contract farmers get commission for rearing the chicks. It is fixed according to the weight of total birds sold and feed consumed (FCR). Income from sale of manure and empty gunny bags are other incomes of contract farmers. Thus contract farmers do not spend money on purchase of chicks, feed and medicine and they are protected from marketing risks under the process of integration.

Integrators

Integrators are the real owners of commercial broilers produced. They produce broilers through their own or contract farms and market them. Integrators in the study area have parent stocks. Broiler eggs are raised from these stocks. Hatcheries are also owned by them. The eggs raised are hatched and day-old chicks are supplied to various contract farmers. Further integrators have their own feed mixing units. Feed ingredients are purchased in lump and feeds are prepared at low cost compared with the market prices. Feeds and medicines are supplied to contract farmers and chicks are reared through them. The leading integrators in the study area are Suguna Poultry Farm Ltd, Shanthi Poultry Farm Ltd, Mani Broilers, SKM Hatcheries and the like.

The concept of vertical integration with contract farming as an intermediary chain of governance strategy is a commonly adapted venture by various integrators in the poultry industry. The system provides for several advantages in terms of efficiency in harnessing sophisticated technologies and achieving economies of scale even in geographically distributed and traditional small scale farming systems[114]. The provision of better inputs, finance assured marketing and the like is found to provide a sense of security among the farmers and higher expected returns when compared to independent producers. In general, contract farming system was widely accepted and adapted which acted as a major impetus for broiler industry. The trend also gained momentous as a sequel to the diminishing returns from crop based agriculture. The private players in a short span of time expanded their network, improved production efficiency, reduced number of middle-men and forced the wholesalers and

[114] B.SOUNDARARAJAN, Suguna Poultry Farm, Poulvet.com, 2007.

retailers to reduce their margins. Thus these players gained control over markets and established their price leaderships. The resultant fall in real prices of the poultry meat made it affordable across different consumer segments and thus the demand was imminent. Factors like growth in per capita income and urban population also played a key role in the present per capita consumption level[115].

Integrated Broiler Farming in India

Integrated broiler farming was first introduced by Suguna Poultry Farm in Tamil Nadu during late 1990s. Later it spread mainly to Karnataka, Andhra Pradesh, Maharashtra and other states of India promoted by various integrating firms. The major private integrators operating in the southern and western region of the country include Venkateswara, Suguna, Pioneer, Diamond Riverdale, Star Chick, Gold Chick, Godrej Real Gold, Godrej Agro Vet, Shanthi, Peninsula, Skylark and Komarla. In general, integrated farming has contributed for the rapid growth of Indian broiler industry.

Poultry Integrators have been expanding most rapidly in southern India, particularly in Coimbatore area of Tamil Nadu. Integrators have recently become more prevalent in western India, including Pune, Nasik and Mumbai, where they now account for about 35 percent of production and consumption. In northern and eastern India, integration has moved more slowly accounting for about 10 percent of the market. In the North, integrators have found it difficult to enlist and manage contract growers and, despite the presence of the large and affluent Delhi market, there are no major, fully integrated contract growers in the region. In the East, lower per capita incomes and low demand for poultry meat are likely contributors to the slow rate of growth.

In southern India, the process of integration began in the mid-1990s and grew rapidly as independent growers found guaranteed returns in contract farming. As integration expanded, some formerly independent hatcheries and feed millers found it necessary to become integrators themselves or risk going out of business. Integration has brought two important changes to the poultry industry in southern India: lower

[115] GAIN, Indian Poultry and Products - Global Agriculture Information Network Report No.IN6083 – USDA Foreign Agricultural Services, 2006.

average costs of production through improved technology and management lower retail prices for poultry meat, which has been a key demand stimulus in the southern and western regions.

In the last 2 - 3 years, several integrators have begun to operate around the Mumbai market in western India, primarily in the Pune and Nasik areas. They include poultry integrators who are expanding from southern India, ventures by national or regional hatchery and feed businesses and local poultry wholesaling firms, all competing to enlist contract growers and expand market share in the region. This competition, combined with seasonally weak demand due to religious observances, led at times to severely depressed producer and retail prices in the Mumbai market.

For integrators to succeed in the Mumbai market as they have in southern India, they must overcome the dominant role of the traditional Mumbai wholesale trade. Traditional trading relationships, together with the high cost of establishing an effective retail presence, may prevent integrators from competing down marketing margins and expanding their share of the market. The firms that are entering this market, however, all have significant financial resources and plan to address this issue through strategic links with existing food retailing operations.

Integrators are also expanding in the areas of Bangalore and Hyderabad in the South and Calcutta in the East. The only major region where large integrators have not yet made significant inroads is in North India, including the large Delhi market. In this region, some individual producers have expanded into feed mixing and direct retail marketing. No producers, however, are involved in rearing parent or grandparent flocks and very few are contracting out production. The lack of poultry integration in the North may be due to difficulties in enforcing contract-farming agreements[116]. Also, climatic extremes of hot and cold make poultry production more management- and capital intensive in the North, compared with the other regions. Lastly, unlike other regions where the

[116] At present, India does not have a law covering contract farming and the contracts between farmers and contractors cannot technically be enforced. Integrators and growers in other regions appear to be working together smoothly despite this problem, but this is not the case in North India.

integrators have flourished, the Punjab-Haryana-Western Uttar Pradesh area near Delhi is heavily irrigated and highly productive for crop farming. As a result, allocating management and labor to contract farming for the margins fixed in standard broiler contracts may be less appealing. Contract models that call for farmers to serve only as the owner of the houses, with the integrator providing all labor and management, may be more successful in this region.

Constraints in Integrated Broiler Farming

The primary constraint in expanding integrated poultry operations is marketing. Most integrators sell the bulk of their output as live birds in the wholesale markets, with a small share sold in retail markets as either live or dressed birds or products. With limited demand or capacity for frozen products and the high cost of moving live birds to distant markets, integrators are mostly confined to their local regional market and its seasonal demand patterns. In general, the availability of feed grain or oil meal was not considered to be a significant problem, although seasonal shortages of corn and have resulted in higher prices. Only in northern India did integrators regard enlistment, organization, or management of contract farmers as a significant problem So far, foreign direct investment (FDI) has been a minor factor in the expansion of integrated poultry operations in India. A large integrator in both the southern and western regions operates a processing facility built recently with the assistance of private Saudi Arabian investment. Two large Asian integrators, Japfa from Indonesia and CP from Thailand, have been in the feed business in India for several years but have, so far, not expanded into poultry integration.

Although India's backyard poultry dates back to pre-historic period, the modern commercial poultry production[117] came into focus only in late 1980s. The poultry sector's contribution to total value of outputs from livestock sector has gone up from 2.1 per cent in 1951 to about 12.8 per cent in 2009-10, with an annual production of 55 billion eggs and 3.0 MMT of broiler meat (Economic Survey of India, 2009-10). The expansion in

[117] SASIDHAR, P.V.K. *Professor, (IGNOU), School of Extension and Development Studies, New Delhi - 110068 (India),* "Integrated Contract Broiler Farming: An Evaluation Case Study in India," June 2012.

supply has been spurred by rising incomes and has resulted in lower poultry prices in south India where much of the growth has occurred[118].

Challenges before the Broiler Industry

The impressive growth in the poultry sector in general and broiler industry in particular is the result of technological breakthroughs in breeding, feeding and health and sizeable investments from the private sector. However, these efforts have concentrated on productivity and production by neglecting several front-end activities such as wholesaling, processing, retailing and equitable inclusive development. In addition, per capita consumption of eggs and chicken in rural India is less than half of that in urban areas. Therefore, the very big challenge before the broiler industry and policy makers is enhancing the poultry production, processing on one side and taking the benefits of poultry revolution to small rural farmers in terms of raising income and providing food security on the other side.

Even though commercialization can yield substantial gains, the transition from subsistence farming to market driven broiler production is burdened with risk[119]. The important issues connected with commercial broiler production are: i) Market volatility which makes the broiler rearing a risky enterprise, ii) Taste shifts of consumer in favour of processed chicken and small farmers are too distant from consumers to track their preferences and iii) Lack of capital and technical expertise among small broiler farmers. These problems are serious enough that they could effectively choke off participation in markets except the large farmers. One of the value chain development arrangements that enable market access by small broiler farmers in South India now is extension and advisory services (EAS) provision by large private poultry companies through integrated contract broiler farming.

Advantages to the Small Broiler Farmers

The nature of contracting has been instrumental in removing small broiler farmer's risk through buyback guarantee and provision of coping

[118] USDA, (2004), *India's Poultry Sector, Development and Prospects,* Agriculture and Trade Reports, **Economics Research Service**, WRS-04-03.

119 VON BRAUN, JOACHIM AND EILEEN KENNEDY, (1994), Ed., "Agricultural Commercialization, Economic Development and Nutrition", Johns Hopkins University Press.

against production failure. Provision of quality inputs such as chicks, feed and medicine has helped the farmers raise quality chickens. Apparently, balanced contracts that benefit both parties in terms of assured markets, competitive price and guarantee against risk have resulted in successful value chain development through contract broiler farming.

Integration of Broiler Production in Tamil Nadu

Broiler integration was started in Tamil Nadu during the sixties. Farmers got chicks from commercial hatcheries, reared and marketed them at the grown up stage. This practice was followed by the farmers of Tamil Nadu up to the middle of eighties. The process of integration of broiler industry in Tamil Nadu was started during the later eighties and it started gaining momentum during the early nineties. By the year 1998 the entire industry was integrated. Hatchery owners and large broiler farmers converted themselves into integrators. Small broiler farmers who could not afford money for chicks and feed were not only ready to take marketing risks but became contract farmers also under this process.

PROFILE OF THENI DISTRICT

A comprehensive account of the profile of the study area in research is a basic requirement. It helps us to understand the advantageous and negative factors that contribute to the sustenance or failure of any vocation. The topic of research undertaken by the researcher is broiler farming and the study is confined to Theni district of Tamil Nadu.

Theni district is located at the foot hills of Western Ghats which bifurcate Tamil Nadu form Kerala and is situated between 9^0-30^0-00 and 10^0-30^0 of Northern Latitude and between 77^0 – 00^0 and 78^0 – 30^0 of Eastern Longitude. It is located at a distance of 78 kilometer on the west of Madurai. It is the fourth largest district in Tamil Nadu. The district was composite territory of the erstwhile Madurai district and the district was carved out of Madurai district in 1996. It is bounded by Madurai district in East, Kerala state in West and South and by Dindigul district in North.

It has a geographical area of 2889.23 square kilometers with a population of 10,93,950 people. It has a forest cover of 1,03,718 hectares.

Agriculture is a prominent vocation in the district with nearly 51.9% agricultural labourers depending on it. The literacy rate in the district is

63.32%. The people of this district have access to education from primary to college level education. The district has large number of schools, Arts and Science Colleges, Polytechnics, Engineering Colleges, Medical Colleges, Para-medical institutions, B.Ed. Colleges, etc., which have been catering to the academic needs of the people of this district. Theni is an important trade centre in South India. It trades in almost all the agricultural products and many industrial goods. It abounds in many textile mills with Ginning, Spinning, Weaving and Dying units and Handloom and Power looms. The trade and industrial sector of the district provides employment oppourtunities to a large number of skilled and unskilled workers.

The commission mundies in Theni, besides the regulated markets have been doing an appreciable service to the agriculturists of this district by extending financial support to them and in marketing the agricultural products. The public distribution system in the district is functioning effectively catering to the basic needs of the people.

The district is accessible by well-laid roads and the NH47 connecting Rameshwaram and Cochin in Kerala passes through Theni. All villages in the district are connected by road transport and by communication networks.

Places and Tourist Interest

The Cumbum valley in the district is a fertile region where three crops a year are raised. Mullai-Periyar is a boon to this district which satisfies the water requirements not only of Theni district but also Sivagangai, Ramnad and part of Dindigul districts through Vaigai River. The district abounds in many places of tourist attraction. Some of the important tourist places in the district are Vaigai Dam, Cloud Lands alias Patchai Malai, Suruli falls, Manjalar Dam, Kumbakarai falls and Chinna Suruli falls. Vaigai Dam a beautifully developed tourist centre attracts a large number of tourists round the year.

Many archaeological evidences are there Chinnamanur and Uthamapalayam in the form of Copper Plates, inscriptions, statutes, etc, which help to trace the chronological sequence of events in the history of South India. In Uthamapalayam, there is a small rock cluster where, the legend has that Jain Saints had resided;

The temple for the God Saneeswarar is a famous temple which attracts large number of pilgrims and devotees from many parts of the country. Worshipping of this God, it is believed, will bring relief to devotees from the malefic influence of the planets and bless them with longevity and prosperity.

Climate and Weather

Theni district has tropical climate and the weather is pleasant for the most part of year except during summer. The district receives rain during the South-west and North East monsoons. The rain water is reserved in Ponds, Dams, etc. The rainfall in Theni district during Southwest monsoon is 178.4 mm and during North East Monsoon it is 384 mm.

Agriculture

Agriculture in the district is taken up enthusiastically by the farmers. In as much as 85,672 hectares of land food crops are cultivated in the district. The non-food crops are cultivated in about 37590 hectares. The district is in the world map of spices and condiments. Some of the spices are Cardamom, Pepper, Clove, Nut-meg and the like. These spices are grown in hill tracts of the district. Horticultural crops are grown in about 7723 hectares. Farming on the plains in the districts is carried on with the help of irrigation facilities like open-wells, bore-wells and river water. There is a large extent of land in the district where rain-fed crops are cultivated. These crops also contribute to the economy of the district. The rain pattern in this district, of late has become speculative and erratic causing unprecedented loss to the farmers and the industrialists.

Grape is one of the cash crops grown in the Cumbum region the quality of which is considered to be matching with the best anywhere. Efforts are on foot to start an industry to produce wine from grapes grown in large extent in this region.

Coconut is another important crop that is grown in all parts of the district. The by-products of coconut like coir are used as raw materials for many tiny industries. Mango, Silk cotton, cardamom, coffee, Tea, Cashew-nut are some of the important crops cultivated in the district with a major share in the national level production of these crops. There are processing and trading units for silk cotton and cashew nut in the district. Shrimp

farming with varieties of fish is taken in the district. Sugarcane is another cash crop which is grown in irrigated lands. There is a sugarcane factory named Rajashree Sugars near Andipatti which serves the sugarcane farmers of the district. Other crops cultivated in the district are food grain, ground nut, flowers, vegetables, fruits, mulberry, etc.

The Government coconut nursery near Vaigai Dam is supplying high yielding varieties of coconut plants to farmers. The Horticultural College and Research Centre does the same service developing the improved breeds of plants for various crops.

Bodinayakanur of this district is an important international market centre for cardamom. Cardamom business is a flourishing one and traders from Bodinayakanur, Cumbum, etc, export cardamom to different countries which brings a sizeable amount of foreign exchange to the exchequer. Auction centres for Cardamom function only in Bodinayakanur in this district besides a few in the adjoining centres in the Kerala State and the price for this product is fixed only in these markets.

The details about various crops cultivated in the district are presented in the table given below.

Table 2.1

AREA UNDER CULTIVATION OF FOOD CROP IN THE THENI DISTRICT

S.No.	Crops	Theni Area in Hectares	% to Total	% to State	Tamil Nadu Area in Hec.
1.	Total Food Grain	48455	56.60	1.4	3500788
2.	Condiments & Spices	4202	5.0	2.4	171776
3.	Sugar Crops	10713	12.5	3.2	330086
4.	Fresh & Dry Fruits	16760	19.6	5.3	315558
5.	Vegetables	5542	6.5	2.6	217317
Total Food Crops		**85672**	**100**	**2.0**	**4535522**

Source: Annual Statistics Report, Theni District.

Table 2.2

AREA UNDER CULTIVATIO OF NON-FOOD CROPS IN THENI DISTRICT

S.No.	Crops	Theni Area in Hectares	% to Total	% to State	Tamil Nadu Area in Hec.
1.	Fibers	7735	20.6	4.5	173820
2.	Edible Oil Seeds	22157	59.0	2.0	1137517
3.	Tobacco	118	0.3	2.7	4408
4.	Coffee	3793	10.1	11.2	33740
5.	Tea	1591	4.2	2.3	67853
6.	Flowers	375	1.0	2.0	18718
7.	Teak	738	2.0	16.5	4467
8.	Mulberry	86	0.2	1.4	6089
9.	Others	997	2.7	0.3	355975
Total Non-Food Crops		**37590**	**100**	**2.1**	**1802587**

Source: Annual Statistics Report, Theni District.

Table 2.3

HORTICULTURAL RESOURCES

S.No.	Crops	Area in Hect.	% to State	Production in MT	Productivity in Kg / Hect.
1.	Cardamom	1288	26.6	123	95
2.	Pepper	11	0.3	3	262
3.	Tea	1591	11.2	12728	8000
4.	Coffee	3793	2.3	2276	600
5.	Cashew nut	2613	3.0	883	338
6.	Beet root	239	20.8	5497	23000
7.	Drumstick	399	8.6	1995	5000
8.	Beans	449	17.3	3592	8000
9.	Tomato	2866	9.3	27702	9665
10.	Mango	7723	7.2	45544	5897

Source: Annual Statistics Report, Theni District.

Some of the agro based industries and activities other than broiler farming in the district are Straw board, Handmade paper, Groundnut oil extraction, Cotton seed oil extraction, Coconut oil extraction, Coir twisting, Mat weaving, Bags, caps, etc from Banana Fibers, Cut flowers for export, Instant food mixes, Cereal flour, Bakery products, Fruit juices, jams and jelly, Mango pickle, Dehydration of Vegetables and fruits, Sugar candy, Detergent Soaps, Liquid soap, Cleaning powder, Bleach powder and the like.

Live stock is an essential component of agriculture in any society. The district abounds in cattle population and poultry population. Cow-rearing is a common vocation in the entire district. The district has a prominent place in milk production. There are number of milk co-operatives, chilling units, marketing networks and industries for value addition are functioning in the district.

In Power generation sector, Hydel projects, Wind mill projects and power plants in private industries generate power in the district.

The district has tiny, small, medium and large scale industries involved in the production and marketing of various goods. Both state and central governments have introduced many schemes to help these industries. Some of them are TIIC, DIC, SIDCO and industrial estates. These institutions help the industries in the district by providing assistances like financial assistance through banks project preparations, market survey, etc. Most of the important nationalized and scheduled banks with ATM facilities are functioning extending loan facilities of all kinds to the people of the district. The district has judicial courts from Judicial Magistrate court to Principal District's Court and Consumer Courts.

Self Help Group as a movement has been functioning throughout the district and with the help of this, many entrepreneurs have emerged leading to income generation and self employment. The government is providing funds generously to these groups. The self help groups are engaged in different production oriented projects and the government has been helping these groups to market their products. Uzhavar Santhais', a farmers' friendly market centre, have been helping the farmers to sell their farm produces themselves directly to the consumers where all the financial benefits go to the farmers.

People of different religious and communities live together in peace and harmony. There are many places of worship like temples for the Hindus, Churches for Christians and Mosques for Muslims etc. These religious sects celebrate their festivals in gusto and gaiety. Festivals like Veerapandi Gowmariamman festival conducted for a week draw lacks of people from around Tamil Nadu and other states also.

Nutrino, a scientific project, is in the process of installation at the foothills of the Western Ghats near Thevaram. This is the first of its kind in the country which will enlighten the humanity with facts about particles without mass and the benefits to the mankind. This project will find a place for the district in the world map of scientific research.

But, however the agricultural sector in the district, of late has been facing many challenges for its sustenance and survival. The erratic rain pattern, shortage of labour, high cost of inputs, fluctuations in the

markets, interrupted power supply are some of the problems that pose challenges to agricultural sector. Many cultivable lands due to some of these problems have been transformed into either residential plots or left as barren lands. The people traditionally dependent on agriculture for income and employment have been deprived of them. They languish in poverty and misery. Reports are there about the farmers having committed suicide. In such a critical situation, the agro-based vocations among the people can be encouraged.

Some of the farm based vocations are cattle rearing, milk production, vermi culture, mushroom cultivation, mulberry and silkworm production, organic manure and pesticide production, coir industry and poultry farming. All these activities have been there in Indian society but they have not been developed as industrial units. To sustain and safeguard the agriculture sector, it is imperative to encourage and support these farm activities. Broiler farming has come up as industrial units helping a section of the society in employment and income generation. The importance of broiler farming is also felt for its supplement to the nutritional needs of the people in the form of animal protein.

Integration in broiler farming is a novel concept which attracts large number of people to venture in broiler farming, because the broiler farming needs only minimum investment to start. Major share of investment is provided by integrators in the form of chicks, feed, medicines, transport, etc. some of the major integrators operating in the study area are Suguna Poultry Farm Ltd, Shanthi Poultry Farm Ltd, VKS Hatcheries, Mani Broilers, SKM Hatcheries, etc., Many broiler farms with the help of these integrators have been started on small, medium and large scale in Theni district the study area.

In general the district has good scope for developing poultry farming as agro based industry with suitable conditions of geographical and climatic factors. In the context of agriculturalists and dependent labourers gradually losing hope in this sector, Broiler farming will be a lucrative substitute with potential for income generation and employment oppourtunities for them.

SOCIO-ECONOMIC CHARACTERSTICS OF SAMPLE RESPONDENTS

In this section, an attempt has been made to analyse the socio-economic characteristics of sample Broiler Farmers in Theni district of Tamil Nadu. The profile of the broiler farmers is important to analyse the socio and economic characteristics which may have its own impact on the growth of the Broiler farming in the study area. The farmers with high profile may be sound in application of all managerial and technical aspects in their farming activities with inherent ability to manage any technical and financial problems. However, the farmers with lesser profile may be lacking in their awareness on the management practices as well as its applications. Hence, the present study includes the profile of the farmers and integrated farming activities to provide basic information to the study.

Even though the number of variables related to the profile of the respondents are too many, the present study confines to the following variables such as sex, age, literacy, community, religion, marital status, family income, family type, household size, earning members in family and occupation of the respondents. Besides these, farming and technical variables like residential area of the farmer, experience, motivation, maintenance of accounts, the choice of integrator and distribution of farms by integrators have been studied.

GENDER OF THE RESPONDENTS

Sex of the farmers is one of the important social factors which contribute to the efficient performance and successful management of any venture. Broiler farming involves more manual and supervisory work. Therefore it is imperative to see the distribution of male and female gender among the sample respondents. The details are presented in Table 2.4.

Table 2.4

CLASSIFICATION OF SAMPLE RESPONDENTS BY SEX

Sex	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Male	41 (91.1)	57 (95.0)	43 (95.6)	141 (94.0)
Female	4 (8.9)	3 (5.0)	2 (4.4)	9 (6.0)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Table 2.4 presents details about the distribution of respondents based on their sex and it is found that male constitutes 94.0 per cent and their female counterparts constitute only a very mean of 6.0 per cent of the total. In all the three categories of broiler farming namely small medium and large, only the male predominates with 91.1 per cent, 95.0 per cent and 95.6 per cent respectively.

This trend reveals the fact that vocation like broiler farming is an exclusive domain of the male in our society and because of the nature of the works involved in such ventures. Female is with less representation in all the three categories of the farming with 8.9 per cent, 5.0 per cent and 4.4 per cent respectively.

AGE COMPOSITION

The age of the Broiler farmers is considered to be one of the important social factors as it impacts on their level of awareness and execution of the works in broiler farming. The performance and success of the broiler farming are expected to largely depend upon the age of respondent entrepreneurs. In general, the aged farmers will have more practical experience than youngsters do while the youngsters have more idea on scientific orientation, more energetic, change prone, progressive and innovative than elders do. In the present study, the respondents who run integrated broiler farming were classified into less than 30 years, 30 – 50 years and above 50 years. The distribution of sample farmers based on their age is given in Table 2.5.

Table 2.5

AGE COMPOSITION OF SAMPLE RESPONDEDNTS

Age (in years)	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Below 30	5 (11.1)	2 (3.3)	4 (8.9)	11 (7.3)
Between 30 - 50	33 (73.3)	50 (83.4)	40 (88.9)	123 (82.0)
Above 50	7 (15.6)	8 (13.3)	1 (2.2)	16 (10.7)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Table 2.5 shows that of the 150 respondents, a majority of 123 who constitute 82.0 per cent belong to "30-50' years category whereas 16

farmers (10.7%) were in the 'above 50' years category. Only 11 farmers who constitute 7.3 per cent of the total were in 'below 30' years category. The analysis also shows that the respondents who were in the '30-50' years category form part of majority in all the three categories. In the case of large farmers category, the respondents belonging to 'below 30' years category stood second and in all others categories their position was next to the respondents belonging to 'above 50' years category. On the whole a substantial number of respondents in all the three categories were in the age category of 'between 30 – 50' years with sufficient experience and efficiency to perform well in the broiler farming.

LITERACY LEVEL OF THE BROILER FARMERS

Education is a process of knowledge, virtue, piety and moral training. And also it has the greatest tendency to civilize and humanize them in relation to one another. Since the level of education influences the personality traits of the respondents, the level of awareness and implementation of any scientific management principles also will increase in their unit. Therefore this is included as one of the profile variables. The level of literacy of the respondents is classified as post graduate, graduate, secondary, primary and illiterate for the present study. The distribution of respondents based on their literacy level is presented in Table 2.6.

Table 2.6

LITERACY LEVEL OF SAMPLE BROILER FARMERS

Literacy Level	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Post Graduate	3 (6.7)	4 (6.7)	1 (2.2)	8 (5.3)
Graduate	3 (6.6)	9 (15.0)	6 (13.3)	18 (11.9)
Secondary	18 (40.0)	22 (36.7)	24 (53.4)	64 (42.8)
Primary	13 (28.9)	18 (30.0)	4 (8.9)	35 (23.3)
Illiterate	8 (17.8)	7 (11.6)	10 (22.2)	25 (16.7)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Table 2.6 reveals that majority of the respondents had education up to secondary level constituting 42.8 per cent followed by 23.3 per cent up to primary level and 16.7 per cent respondents are illiterates. The Graduates and the Post graduates constitute 11.9 per cent and 5.3 per cent respectively of the total. It indicates that the educated graduates and

post graduates did not volunteer to take up broiler farming, an agro-based venture. The farmers who completed the Secondary education is more in all size of the farms than others, in small it constitutes 40.0 per cent, whereas in medium farms it constitutes 36.7 per cent and in case of large farms it constitutes 53.3 per cent to the respective total. On the whole, the substantial numbers of respondents in all the three categories have acquired education up to secondary education level followed by Primary Education.

RELIGION-WISE CLASSIFICATION OF THE RESPONDENTS

Religion of the respondents is one of the social factors which have an impact on the choice of vocation. The farmers may have religious taboos in rearing chicks. Religion is one of the socio economic profile variables and it is confined to Hindu, Christian and Muslim religions. Table 2.7 presents the distribution of respondents under religion.

Table 2.7

RELIGION WISE CLASSIFICATION OF THE RESPONDENTS

Religion	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Hindu	33 (73.3)	49 (81.7)	36 (80.0)	118 (78.7)
Christian	5 (11.1)	3 (5.0)	4 (8.9)	12 (8.0)
Muslim	7 (15.6)	8 (13.3)	5 (11.1)	20 (13.3)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Table 2.7 illustrates the distribution of respondents based on their religious sects. It reveals that of the total, the majority of the respondents undertaking broiler farming are Hindus constituting 78.7 per cent followed by Muslims with 13.3 per cent and the Christians with 8.0 per cent. In all the three categories namely small, medium and large, Hindus constitute the majority with 73.3 per cent, 81.7 per cent and 80.0 per cent respectively. Among the Christians and Muslim respondents the Muslim respondents outnumber the Christian counterparts in undertaking broiler farming in all the three categories of units of the total, the Muslims constitute 13.3 per cent while the Christians constitute only 8.0 per cent.

DISTRIBUTION OF SAMPLE RESPONDENTS BY COMMUNITY

The community of the respondents is yet another social factor which determines the choice of vocation. Most of the community people take non-vegetarian food and such people do not have reservation about rearing chicks as commercial venture. People of the same community may not like to deal with thousands of living birds and may not like to take high risk associated with chick rearing. The variable community is confined to FC, BC, MBC and SC / ST. Table 2.8 shows the distribution respondents by community.

Table 2.8

DISTRIBUTION OF SAMPLE RESPONDENTS BY COMMUNITY

Community	Number of Broiler Farmers in			
	Small	Medium	Large	Total
FC	2 (4.4)	1 (1.7)	1 (2.2)	4 (2.7)
BC	25 (55.6)	47 (78.3)	36 (80.0)	108 (72.0)
MBC	15 (33.3)	10 (16.7)	7 (15.6)	32 (21.3)
SC / ST	3 (6.7)	2 (3.3)	1 (2.2)	6 (4.0)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

In total, the maximum of 72.0 per cent to the total respondents belong to BC followed by 21.3 per cent belonging to MBC, 2.7 per cent to FC and 4.0 per cent to SC/ST. In all the three sizes of farms, the respondents from large farms in BC constitute 80.0 per cent, 78.3 per cent from medium farms and 55.6 per cent from small farms.

MARITAL STATUS

Indian culture increases the responsibility of a married person. Normally a married man is more responsible in all activities than a bachelor. A Family man is believed to do any of kind work with commitment to earn his livelihood. So it was included as one of the family domain variables. The distribution of respondents based on marital status is presented in Table 2.9.

Table 2.9

CLASSIFICATION OF SAMPLE RESPONDENTS BY MARITAL STATUS

Status	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Married	39 (86.7)	55 (91.7)	43 (95.6)	137 (91.3)
Unmarried	6 (13.3)	5 (8.3)	2 (4.4)	13 (8.7)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Table 2.9 reveals that of the total, 137 respondents constituting 91.3 per cent are married. The married respondents in small, medium and large size farms are 86.7 per cent, 91.7 per cent and 95.6 per cent in its respective total. The unmarried respondents have very less participation in broiler farming. They constitute only 8.7 per cent of the total of which 13.3 per cent in small, 8.3 per cent in medium and 4.4 per cent in large categories of farms.

ANNUAL INCOME

There is a direct relationship between income of the owner and the running of broiler farms. Income is an important factor in fulfilling one's needs. Income is the most important economic variable that influences the easy functioning of broiler farming. Everyone intends to earn money out of any activity. The personal income of the respondents indicates one's financial strength. An analysis is made to know the income that the broiler farmers earn from their respective farms. In the present study, the personal income among the respondents are classified into below Rs.50,000, Rs.50,000 to Rs.100,000, Rs.100,000 to Rs.150,000 and above Rs.150,000 income. The distribution of respondents based on their personal income is shown in Table 2.10.

Table 2.10

INCOME WISE CLASSIFICATION OF SAMPLE RESPONDENTS

Income (Rs.)	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Below 50000	23 (51.1)	5 (8.3)	2 (4.4)	31 (20.7)
50000 – 100000	17 (37.8)	27 (45.0)	18 (40.0)	63 (42.0)
100000 - 150000	3 (6.7)	21 (35.0)	16 (35.6)	40 (26.7)
Above 150000	2 (4.4)	7 (11.7)	9 (20.0)	16 (10.6)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data
Figures in brackets show percentages to total

It is inferred from Table 2.10 that the annual income ranges among a majority of the respondents is from Rs.50,000 to Rs.100,000 per annum. It constitutes 37.8 per cent, 45.0 per cent and 40.0 per cent in small, medium and large farms respectively. The number of respondents who have income of Rs.100,000 to Rs.150,000 constitutes 26.7 per cent of the total. In small size farms, the most important personal income of the respondent is below Rs.50,000 that constitutes 51.1 per cent whereas in medium size farms it is 45.0 per cent under Rs.50,000 to Rs.100,000 category. In case of large size farms, the number of respondents having a personal income of Rs.50,000 to 100,000 constitutes 40.0 percentage to the total. The analysis infers that the annual income of the respondents in large farm category is higher than the personal income of the respondents in medium as well as small size farms.

FAMILY TYPE

In India both the nuclear and joint family systems prevail. The husband, the wife and the children constitute a nuclear family. The nuclear family together with at least one grandparent is called joint or extended family. Joint family is more commonly found in rural India than in other countries. The family type of the respondents is included as one of the personal profiles. The experience and guidance can be had from elders in case of joint family and however the freedom is restricted. In nuclear families, youngsters have more freedom to decisions. The size of the family has impact upon the process of making decisions, performance of work, pattern of expenditure and the like. It is, therefore, imperative to analyse as to which type of family the majority of the farm owners belong. The distribution of the family type among respondents is shown in Table 2.11.

Table 2.11

DISTRIBUTION OF SAMPLE RESPONDENTS BY FAMILY TYPE

Type	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Nuclear Family	43 (95.6)	59 (98.3)	44 (97.8)	146 (97.3)
Joint Family	2 (4.4)	1 (1.7)	1 (2.2)	4 (2.7)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

The most prominent family type among respondents is found to be a nuclear one that constitutes 97.3 per cent of the total. Joint family system prevails among only small size farm owners that too constitute only 4.4 per cent, 1.7 per cent in medium size farms and the rest large size farms having 2.2 per cent. The respondents of the nuclear type of family dominate in all the three categories of farms with 95.6 per cent in small, 98.3 per cent in medium and 97.8 per cent in large categories of farms. The disintegration of Joint family system is the main cause for such a trend in broiler farming.

HOUSEHOLD SIZE

Depending upon the number of children the size of the family may vary. Indian rural families are, in general, large in size. The household size indicates the number of family members living along with the respondents. Since the family size indicates the family commitment of the respondents, it is included as one of the profile variables. In general, the respondents with higher family size will have more family commitments compared to the respondents with lesser family size. The family size among the respondents in the present study is confined to two, three, four and above four members. The household size among the respondents is shown in Table 2.12.

Table 2.12

CLASSIFICATION OF SAMPLE RESPONDENTS BY HOUSEHOLD SIZE

Household Size	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Two	2 (4.4)	0 (0.0)	0 (0.0)	2 (1.3)
Three	6 (13.3)	7 (11.7)	3 (6.7)	16 (10.7)
Four	35 (77.9)	48 (80.0)	41 (91.1)	124 (82.7)
Above four	2 (4.4)	5 (8.3)	1 (2.2)	8 (5.3)

Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Table 2.12 reveals that out of the total respondents, the most prominent category is the four member household that constitutes 82.7 per cent to the total. In case of small farms, the most important category is four that constitutes 77.9 per cent whereas in medium farms it constitutes 80.0 per cent and in large farms the four member category constitutes 91.1 per cent. The lowest category is two that constitutes only 2 per cent to its total.

EARNING MEMBERS IN THE FAMILY

The number of earning members in the family of the respondents has been considered since it has its impact on the family commitment and status. In the present study, the number of members earning from various vocations other than broiler farming in respondents' family is confined to one, two and three. The distribution of respondents based on earning members in the family is given in Table 2.13.

Table 2.13

CLASSIFICATION OF SAMPLE RESPONDENTS BY EARNING MEMBERS IN THE FAMILY

Earning Members	Number of Broiler Farmers in			
	Small	**Medium**	**Large**	**Total**
One	39 (86.7)	56 (93.3)	44 (97.8)	139 (92.7)
Two	4 (8.9)	4 (6.7)	1 (2.2)	9 (6.0)
Three	2 (4.4)	0 (0.0)	0 (0.0)	2 (1.3)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total.

Table 2.13 shows that a substantial number of 139 respondents had only one earning member in family which constitutes 92.7 per cent of the total. It is followed by nine that constitutes 6.0 per cent in total. In small farms, one member earning category constitutes 86.7 per cent of the total whereas in the medium size farms, it constitutes 93.3 per cent of the total. In case of large size farms, it constitutes 92.7 per cent to the total. Therefore it may be inferred that in majority of the households of almost all the categories of the respondents, there was only one member earning from different works other than the family's broiler farms.

OCCUPATIONAL BACKGROUND

Occupation means the work that a person does to earn for the livelihood. The economic position of one's life is very often determined by one's occupation. The occupation provides status and income. The occupational background of the respondents is included as a profile variable since it may have more impact on the business idea. By occupational background, the respondents are confined to agriculture, business and employee. The distribution of respondents according to their occupational background are presented in Table 2.14

Table 2.14

DISTRIBUTION OF SAMPLE RESPONDENTS BY OCCUPATION

Occupation	Number of Broiler Farmers in			
	Small	Medium	Large	Total
BF Only	11 (24.4)	4 (6.7)	0 (0.0)	15 (10.0)
BF & Agriculture	29 (64.5)	45 (75.0)	39 (86.7)	113 (75.3)
BF & Business	4 (8.9)	7 (11.7)	5 (11.1)	16 (10.7)
BF & Employee	1 (2.2)	4 (6.7)	1 (2.2)	6 (4.0)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data; BF - Broiler Farming

Figures in brackets show percentages to total

Table 2.14 shows that a majority of the respondents constituting 75.3 per cent of this total had broiler farming as an allied activity where agriculture was their primary occupation. 10.7 per cent of the respondents had business as their main occupation whereas only four per cent of them were employees working elsewhere. Fifteen respondents constituting 10 per cent of the total were engaged only in broiler farming.

RESIDENTIAL AREA OF THE FARMER

The location of the respondents is one of the important socio economic variables which have a bearing on the success of the broiler farms. If the location of farmer is close to the broiler farm, he can do the works and monitor the farm round the clock. He can involve the members of the family also in the farm works without hiring labourers. If the hired labourers are employed, the performance of the labourer will get

enhanced because of the direct supervision of the farmer. Therefore, the location of the broiler farms of the respondents is included as one of the variables. Table 2.15 shows the distribution of the respondents by location.

Table 2.15

DISTRIBUTION OF SAMPLE RESPONDENTS BY LOCATION OF THE FARMER

Farmer Location	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Rural	41 (91.1)	57 (95.0)	39 (86.7)	137 (91.3)
Semi Urban	3 (6.7)	0 (0.0)	4 (8.9)	7 (4.7)
Urban	1 (2.2)	3 (5.0)	2 (4.4)	6 (4.0)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

The majority 91.3 percent of the respondents were from rural areas followed by 4.7 per cent from semi urban and 4.0 per cent from urban. The small farms category also rural location contributes substantially about 91.1 per cent of its total. In case of medium and large farms, rural location constitutes 95.0 per cent and 86.7 percent respectively. Most of the farmers are residing in villages where farming is environmentally good.

EXPERIENCE IN BROILER FARMING

The years of experience indicate the number of years the farmers had in the related field. Since the years of experience may have effect on the technical, managerial and costing aspects in broiler farming, it is included as one of the profile variables. The years of experience of the respondents in the present study is confined to 1 – 3 years, 3 – 5 years, 5 – 8 years and above 8 years. The distribution of farmers based on their years of experience is given in Table 2.16.

Table 2.16

EXPERIENCE-WISE CLASSIFICATION OF SAMPLE RESPONDENTS

Experience (in years)	Number of Broiler Farmers in			
	Small	Medium	Large	Total
1 – 3 Years	8 (17.8)	4 (6.7)	2 (4.4)	14 (9.3)
3 – 5 Years	13 (28.9)	27 (45.0)	6 (13.3)	46 (30.7)

5 – 8 Years	19 (42.2)	23 (38.3)	29 (64.5)	71 (47.3)
Above 8 Years	5 (11.1)	6 (10.0)	8 (17.8)	19 (12.7)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

It is clear from Table 2.16 that the 47.3 per cent of the farmers have five to eight years followed by 3 - 5 years that constitutes 30.7 per cent. The analysis infers that most the farmers had more than three to five years of experience in broiler farming.

SOURCES OF MOTIVATION

Motivation is an important factor to start a business venture. The broiler farmers would have started their farms only with some sort of motivation from some source. The distribution of respondents on the basis of source of motivation to start the broiler farming is shown in Table 2.17.

Table 2.17

SOURCES OF MOTIVATION FOR THE SAMPLE RESPONDENTS

Source of Motivation	Number of Broiler Farmers in			
	Small	**Medium**	**Large**	**Total**
Neighbour	5 (11.1)	14 (23.3)	27 (60.0)	46 (30.7)
Integrator	23 (51.1)	24 (40.0)	5 (11.1)	52 (34.7)
Parents	4 (8.9)	15 (25.0)	4 (8.9)	23 (15.3)
Friends	13 (28.9)	7 (11.7)	9 (20.0)	29 (19.3)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Table 2.17 reveals that most of the farmers had motivation to start the broiler farming from integrator and this factor constitutes 34.7 per cent of the total followed by neighbour that constitutes 30.7 per cent. 19.3 per cent of farmers were motivated by friends and parent motivation constitutes 15.3 per cent. The integrator and Neighbour normally give an idea about broiler farming taken as venture. In small and medium farms category, most of farmers were motivated by integrator that constitutes 51.1 per cent and 40.0 per cent of the farmers respectively were motivated by integrator while 60 per cent of the farmers were motivated by neighbours in case of large integrators.

MAINTENANCE OF ACCOUNTS

Record keeping is an important aspect to ascertain profit and loss of any firm that is involved in financial activity. The maintenance of records is the most important activity to find out cost of production and returns in broiler farming. Though the Integrator maintains the farmers' records for batch closing, the farmers also keep the books of accounts till the batch is over and after one or two batches the records are not necessary. Therefore, it is included as one of the business profile variable. Table 2.18 shows the distribution of farmers based on the habit of maintaining detailed accounts in broiler farms.

Table 2.18

MAINTENANCE OF ACCOUNTS BY SAMPLE BROILER FARMERS

Accounts	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Yes	3 (6.7)	2 (3.3)	4 (8.9)	9 (6.0)
No	42 (93.3)	58 (96.7)	41 (91.1)	141 (94.0)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

Out of the total respondents, only the negligible percentage of 6.0 per cent of farmers were in the habit of keeping records for one or two years which clearly shows the farmers' ignorance in detailed record keeping in the study area.

THE CHOICE OF INTEGRATOR IN BROILER INDUSTRY

Though Integration in Broiler industry is a new concept many integrators contract with farmers with different technical, managerial and economical criteria. Every Integrator has his own breed, feed mills, hatchery and own style of farm management that is scientifically proven. Here the farmers' responsibility is to choose particular integrators who support them in technical, managerial and economical aspects. The farmers' choices for preferring integrators in broiler farming were studied through an opinion survey in the study area.

The farmers were asked to rank some of the identified reasons. The order of merit assigned by the respondents was converted into scores by

using Garret's Ranking Technique.[120] This method was suggested by Garret for converting the ranks into scores when number of items ranked differed from respondent to respondent. The per cent position for each rank was found using the following formula.

Per cent Position = 100(Rij-0.5) / Nj

Where,

Rij = Rank given to i^{th} factor by j^{th} individual.

Nj = Number of factors ranked by j^{th} individual.

By referring the table given by Garrett, the per cent position estimated were converted into scores. Then for each factor, the scores of various respondents were added and divided by the number of respondents to arrive at the mean score. The mean score thus obtained for each factor were arranged in a descending order. The factor with highest mean score was given the first rank followed by second, third and so on.

The factors in preferring integrators by farmers in broiler farming in the study area were analysed and the results are presented in Table 2.19.

Table 2.19

THE FARMERS' PREFERENCE IN SELECTING INTEGRATOR

S. No.	Variable	Garret Rank Mean Score	Rank
1.	Prompt and Timely Payment	96.20	I
2.	More Number of Batches	95.97	II
3.	Supply of Good Quality Chicks	74.07	III
4.	Quality Feed	71.40	IV
5.	Proper Medical Care	69.48	V
6.	Lifting in Time	68.91	VI
7.	Intensive Supervision	65.32	VII
8.	Low Mortality	64.65	VIII

Source: Primary data

It is observed form Table 2.19 that the analysis of the factors responsible for the choice of the integrators by the farmers reveals that Prompt and Timely Payment is ranked first in importance with mean score of 96.20. Prompt and Timely Payment by the integrator will help the farmers to meet out their expenses and carry on the required works for the successive batches. This is followed by more number of Batches with

[120] Henry E. Garret and Woodworth, P.S. **Statistics in Psychology and Education**, Vikas Fetter and Sciences Private Ltd., Bombay, 1969, p.329

mean score of 95.97. This indicates that the farmers prefer the integrator who provides more number of batches which will be more profitable to the farmers. The inputs like chicks and feed were given third and fourth rank with mean scores of 74.07 and 71.40 respectively to the fact that quality of chicks and feed supplied by the integrator is of great importance. Proper medical care is assigned the fifth rank in importance with mean score 69.48. It implies that proper medical care is very much essential throughout the batch to take care of the health of the birds and protect them from infections and seasonal diseases like Avian Influenza. This is followed by lifting in time with mean score 68.91. The broiler birds must be lifted at appropriate time from the farm, the feed consumption will increase and the meat may become fibrous. The last factors were intensive supervision and low mortality with mean score of 65.32 and 64.65 respectively.

DISTRIBUTION OF FARMS BY INTEGRATORS

There are innumerable integrators operating in Theni district each having its own breed, feed mills, hatchery and own style of farm management that is scientifically proven. Four of these integrators namely Suguna Poultry Farm Ltd., Shanthi Poultry Farm (India) Ltd., SKM Broilers and VKS Hatcheries have been prominent with an established network of broiler farming in this area. The farmers also have been cooperating with these integrators in such a way that both the integrators and the farmers are greatly benefitted. The details of these integrators and the distribution of their farms in various categories of broiler farms are presented in Table 2.20.

Table 2.20

DISTRIBUTION OF FARMS BY INTEGRATORS

Name of the Integrator	Number of Broiler Farmers in			
	Small	Medium	Large	Total
Suguna Poultry Farm Ltd	26 (57.8)	34 (56.7)	29 (64.4)	89 (59.3)
Shanthi Poultry Farm India Ltd	12 (26.6)	23 (38.3)	15 (33.4)	50 (33.4)
SKM Broilers	3 (6.7)	1 (1.7)	1 (2.2)	5 (3.3)
V K S Hatcheries	4 (8.9)	2 (3.3)	0 (0.0)	6 (4.0)
Total	45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Figures in brackets show percentages to total

It is understood that out of the total sample farms, Suguna Poultry Pvt. Ltd had 59.3 per cent of farms followed by Shanthi Poultry Farm India Ltd with 33.3 per cent farms, SKM Broilers with 3.3 per cent of farms and VKS Hatcheries with 4.0 per cent of poultry farms. In case of Shanthi Poultry Farm India Ltd, second highest number for farms next to Suguna Poultry Farm Ltd., have in small, medium and large size farms constituting 26.7 percent, 38.3 percent and 33.3 percent respectively and they are operating in the study area more than a decade with goodwill. SKM Broilers and VKS Hatcheries had very least number of farms in the study area since they started their operation recently. The table shows that Suguna Poultry Farm has Ltd, the majority share in the all the categories of farms followed by Shanthi Poultry Farm India Ltd, SKM Broilers and VKS Hatcheris in the order of the number of farms each integrator has in all the sizes of the farms.

Summary

In this chapter the origin and history of contract broiler farming in India was traced. The general growth of integrated farming across the length and breadth of the country by introducing systematic infrastructure and procedures were also highlighted. The basic socio-economic characteristics of the respondents of the study area reveals that majority of the respondents were in the age group of 30-50 years, had secondary education only, belong to Hindu backward class, had 5 – 8 years of experience in poultry rearing, were married and having the annual income of Rs.50,000 to 1,00,000 and with at least four members in their respective families. In the choice of integrator by the farmer 'Prompt and Timely Payment' was ranked first by the farmers and the other criteria in the order of importance are "More number of batches" and quality inputs like chicks, feed and medicine.

CHAPTER III
BROILER FARMING – A PERSPECTIVE

INTRODUCTION

In this chapter, the researcher made an attempt to highlight the significant economic criteria of broiler farming. Birds were discovered and domesticated over 7000 years ago. The chicken belongs to the *Galliformes* order and is believed to have originated from the red jungle fowl (*Gallus gallus*). The term poultry refers to chicks, ducks, quail and the like. The study is confined to the birds reared for meat production.

The trend in growth as well as the magnitude of variability for Broiler Production during the period taken for the study were computed for different countries at world level, for different states at all India level and for different districts including the study area in Tamil Nadu. A brief analysis was also made about institutional finance for poultry farming in Theni District.

The Framework of Analysis

Trend Analysis: Trend in production of broiler was estimated using the simple regression equation of the following form.

$$Y = a + bt$$

Where,

Y = Production in year 't'
a = Constant
b = Regression co-efficient
t = Time in years

Growth Performance and Magnitude of Variability

Nilakantha Rath in his study recommended that in a biological production process like agriculture, Compound growth rate was more appropriate for analysing the growth rate over a period of time[121]. Considering his view, the compound growth rate with regard to production of broiler meat has been estimated on the basis of the semi-log or exponential function.

$$y = a + bt$$

[121] NILAKANTHA RATH, "A Note on Agricultural Production in India during 1955-78", Study of Growth Rates in Series XIV **Indian Society of Agricultural Economics**, Bombay.

Where,

y = Production

t = Time Periods

'a' and 'b' are the parameters to be estimated.

Compound growth rate = (antilog b – 1) x 100

To measure the magnitude of variability in the production, co-efficient of variation (C.V.) was used.[122]

Co-efficient of Variation (C.V.) = (Standard Deviation / Mean) x 100

BROILER INDUSTRY - A WORLD SCENARIO

Global production of broiler meat has been growing since the 1960s, faster than that of any other meat. In recent years, this trend could be noticed in developing countries. Broiler meat is popular because it is cheaper, more versatile and is perceived to give more health benefits than red meat. In spite of these advantages, the world broiler industry increasingly faces pressure to improve its production methods, with consumers and government citing health, environment and animal welfare as the areas for improvement. The production of commercial broilers was started in 1950's in different parts of the world. There are a few factors behind the quick development of broiler industry namely relatively quick returns on the money invested in the enterprise, increased consumer demand for broilers, increasing in purchasing power of consumers and greater efficiency of operation. World poultry industry is expanding, as the population is increasing. Per capita consumption is also increasing. The structure of broiler industry is highly influenced by agro-climatic conditions and the availability and cost of major inputs such as land, capital, labour, feed and technology, consumer preferences and government policy. The broilers are sensitive to changes in temperature and humidity and the matter of ensuring maximum productivity would require that these conditions be inherently favourable to lower the cost of controlling diseases and the environment. In addition, access to advanced technology, which is also necessary to achieve a high level of efficiency is another factor that strongly influences industry performance. Modern technologies and a high level of vertical integration characterize broiler

[122] LATHA BASTINE, C. and K.PALANICAMY, "An Analysis of Growth Trends of Principal Crops in Kerala", **Agricultural Situation in India**, March 1994.

industries in major exporting countries. The major broiler-producing countries in the world, in terms of volume, are the United States, China, Brazil, European Union, Mexico, India, Indonesia, Iran and Canada.

COUNTRY-WISE BROILER PRODUCTION

Since the 1960s, the global production of poultry meat has been growing faster than that of any other meat in both developed and developing countries. This growth pattern can be expected to continue because of the inherent efficiency in feed conversion and the lower production costs associated with intensive poultry production. Such production efficiency is particularly beneficial to developing countries, which tend to have limited agricultural resources but burgeoning and often poor, populations. Declining poultry prices and increasing income have been attributed to increase in per capita poultry consumption, which is sensitive to both price and income changes[123] (Taha 2003). The significant growth in poultry (especially broiler chicken) production and consumption in the developing countries have important implications for the global trading of all meat products, as well as feeds and related inputs[124]. The production of broiler chicken in its trend is highly commendable. It is all due to research and technology, agro climatic condition, purchasing capacity, the change in pattern of consumers' meat preference and the like. The world broiler production is rapidly increasing than any other livestock production since it has been highly technical, integrated and has more consumer demand. The US broiler industry has, no doubt, been a technological and marketing leader. One of its major contributions is the development of contract farming and vertically integrated production systems that prevail in the world broiler industry today[125]. China is no doubt a key player in the world broiler market, being a significant producer, as well as a key importer and exporter of broiler meat.

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[123] TAHA, F.A. 2003. "The Poultry Sector in Middle-income Countries and its Feed Requirements: The Case of Egypt". Outlook Report No.WRS03-02. Economic Research Service, USDA. Http://www.ers.usda.gov/publications/WRS03/dec03/ wrs0302.

[124] LANDES, M, S. PERSAUD, and J. DYCK. 2004. "India's Poultry Sector: Development and Prospects". ERS, USDA, Agricultural and Trade Report WRS-04-03

[125] OLLINGER, M., J. MACDONALD, and M. MADISON. 2000. "Structural Change in the U.S. Chicken and Turkey Slaughter". USDA, AER No. 787

The Brazilian poultry sector has experienced a significant growth in the past three decades. Under the former Soviet Union, the Russian broiler industry, like all its other industries, was designed, built and operated entirely by the government by itself. After the collapse of the Soviet Union in 1991, the industry has gone through significant structural changes. Table 3.1 picturises the leading broiler producing countries and their production.

TABLE 3.1

COUNTRY-WISE BROILER PRODUCTION FROM 2001 TO 2010 (in tonnes)

Year	USA	China	Brazil	Mexico	Russian Federation	India	Indonesia	Iran	Others	Total
2001	14267000	88508869	62080000	19280200	86184300	92300000	90040000	88530000	26030303	60854735
2002	14467000	91733955	70900000	20757600	93756000	10880000	10830000	94200000	26772076	63588801
2003	14696000	94481844	77600000	21155580	10304200	93600000	11171070	11040000	26866646	65074540
2004	15450700	94835055	86680000	22794040	11522220	11720000	11909100	11520000	27348640	67897715
2005	16041300	99653900	78657800	24365300	13457300	14030000	11257100	12370000	28787555	70207995

2006	1621 6800	1016 4829	8164 000	2463 800	1580 160	1512 000	1260 150	1360 000	2959 7969	7231 9708
2007	1662 7600	1072 7950	8988 040	2542 490	1868 890	1713 000	1295 840	1468 000	3144 5108	7667 6918
2008	1699 4100	1130 3665	1021 5500	2580 780	2000 680	1815 000	1349 550	1566 000	3296 0435	8078 5710
2009	1633 4000	1144 2552	9940 350	2636 490	2313 380	2026 000	1408 770	1610 000	3479 9917	8251 1459
2010	1697 1000	1184 0603	1069 2600	2681 120	2533 400	2300 000	1650 000	1650 000	3588 6291	8620 5014
Average	1580 6550	1024 0094	8555 227	2374 0311	1562 4288	1488 000	1238 205	1297 430	3004 9494	7261 2260
P	21	14	11	3.	2.	2.	1.	1.	41	10

er ce nt	.7 7	.1 0	.7 8	2 7	1 5	0 5	7 1	7 9	.3 8	0. 00
R a n k	1	2	3	4						

Source: http://faostat3.fao.org/home/index.html#DOWNLOAD

Table 3.1 reveals that Broiler production in the world continued to show an upward trend. Food and Agriculture Organisation of United Nations has assessed the production of broiler meat worldwide at 86205 thousand metric tonnes in 2010.

Among the major broiler producing countries in the world, USA stands first with 15806550 tonnes per annum, followed by China in second position with 10240094 tonnes, Brazil third with 8555227 tonnes, Mexico in fourth position with 2374031 tonnes, Russian Federation in fifth position with 1562428 tonnes, India in sixth position with 1488800 tonnes, Indonesia in seventh position with 1238205 tonnes and Iran in ninth position with 1297430 tones of broiler meat production per annum.

The USA contributed 21.77 percent of share in the total volume of broiler production in the world, followed by China 14.10 percent, Brazil 11.78 percent, Mexico 3.27 percent, Russian Federation 2.15 percent, India 2.05 percent, Iran 1.79 percent and Indonesia 1.71 percent during the period under study.

India and Russian Federation are almost equal in the percentage of volume of broiler production in the world.

Trend, Growth and Magnitude of Variability of World Broiler Production

To analyse the trend, growth and magnitude of variability of broiler production among the major broiler producing countries in the world, Compound growth rate and co-efficient of variation were calculated and the results are given in Table 3.2.

Table 3.2

COUNTRY WISE TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF BROILER PRODUCTION

Country	*Semi – log*		R^2	*CGR Percent per annum)*	*C.V (%)*
	Constant	*Regression Co-efficient*			
USA	7.149 (0.007)	0.009** (0.001)	0.883	2.09	6.49
China	6.929 (0.004)	0.014** (0.001)	0.983	3.28	10.15
Brazil	6.789 (0.018)	0.023** (0.003)	0.894	5.44	16.75
Mexico	6.287 (0.009)	0.016** (0.001)	0.937	3.75	10.96
Russian Federation	5.862 (0.010)	0.055** (0.002)	0.993	13.51	38.00
India	5.906 (0.021)	0.045** (0.003)	0.957	10.92	31.65
Indonesia	5.995 (0.015)	0.018** (0.002)	0.882	4.23	14.26
Iran	5.931 (0.012)	0.031** (0.002)	0.971	7.40	21.27
World Total	7.765 (0.003)	0.017** (0.00)	0.994	3.99	11.89

Source: Computed from Table 3.1

NS – Non-significant

CGR – Compound Growth Rate

** Significant at one percent level

It is observed from Table 3.2 that the trend in broiler production in all countries is positive and statistically significant at one percent level. It implies that broiler production in these countries showed an increasing trend during the period under study.

The growth rate is high in Russian Federation with 13.51 percent followed by India with 10.92 percent since the consumption had increased in Russian Federation and India during the period under study. USA had very low growth rate but it had consistency in production during the period under study.

It is further inferred from Table 3.2 that the production of broiler in Russian Federation showed a sizeable variation of 38.00 percent followed by India with 31.65 per cent. The variation in USA is low which indicates that the country had consistency in broiler production during the period under study.

BROILER PRODUCTION IN INDIA

The Indian Poultry Industry plays a prominent role in the agriculture sector contributing 2.5 percent to the country's GDP. In just a few decades, the industry has got transformed from a backyard activity to a highly technology-driven industry. It has grown rapidly at the rate of 6-8 percent in layers and 10-12 percent in broilers in the past two decades. With an annual output of 57 million of eggs and 1250 million broilers, which yield 7.63 lakh tons of poultry meat, India is the fourth highest producer of eggs and sixth highest producer of broilers in the world. The percentage share of agriculture GDP was 18.5 per cent[126].

Poultry Industry in India is constantly on the rise with modern techniques and changing from live bird to fresh chilled and frozen product market. A new chapter began with integrated poultry operations throughout the country and there was an overwhelming response from all segments to integration concept with poultry.

Analysts estimate that the poultry sector in India has been growing at a fast rate along with other industries. Over the past decade, the poultry industry contributed approximately US 437 million to GNP. Several breakthroughs in poultry science and technology have led to the development of genetically superior breeds capable of higher production; even under adverse climatic conditions that facilitate opportunities to expand the export of poultry products on a large scale. The average per capita poultry meat consumption was also estimated to increase from 0.69 to 2.92 kilogram, during 2000 – 2010. Overall, the total egg consumption was estimated to increase to 34 billion in 2000 and to 106 billion in 2020, while poultry meat consumption is expected to increase from 687 million kilogram to 2137 million kilogram[127].

India stands sixth in Broiler meat production and fifth in egg production in the world. As the population increases, the per capita consumption also increases. The growth of poultry industry has a

[126] Industry : Financial Aggregated & Ratios, Centre for Monitoring Indian Economy, June 2012

[127] Poultry Vision – 2020, Breeders Association, Coimbatore, 2006.

vital role in Indian Economy. Thousands of farmers are involved in it. It generates a substantial employment oppourtunity of 6 million people such as farmers, integrators, hatchery men, feed manufacturers, medicine / vaccine manufacturers, traders, processers, slaughters, logistics and the like.

Drivers of change in poultry sector include, demographic changes – increasing population and increased urbanization; income growth both in urban and rural areas developments in transportation, the processing industry and retailing; rising per capita consumption; and the identification of the export markets, creating conducive environment for broiler farming in rural areas for promoting sustainable economic development. Requirements to promote these objectives include improved disease control and prevention measures; land – use policies that do not unnecessarily inhibit the establishment of poultry farms; favourable investment policy and provision of loans and improved research and extension.

Poultry is one of the fastest growing segments of the agricultural sector in India today. While the production of agricultural crops has been rising at the rate of 4 – 5 percent per annum, the production of eggs and broilers has been rising at the rate of 10 – 12 percent per annum[128]. The growth of the poultry sector in India has also been marked by an increase in the size of the poultry farm. India produced around 23,00,000 tonnes[129].

India with a population of more than a billion has vast scope for the production of broilers. Genetically superior birds, manufacture of quality feeds, high tech poultry equipments, pharmaceuticals and health care products including vaccines are some of the main factors contributing to the higher production of broiler meat. The habit of non-vegetarian food consumption is increasing in recent years even in rural areas. Chicken meat has emerged as an important part of diet in the urban area of Indian sub-

[128] MEHTA **et al.,** (2003), Livestock Industrialisation Project: Phase II – Policy, Technical and Environmental Determinants and Implications of the Scaling-Up of Broiler and Egg Production in India.

[129] FAOSTAT, 2011.

continent. It leads to more production of broiler meat every year. The states of Tamil Nadu, Andhra Pradesh, Maharastra, Karnataka and Kerala contributed more than 40 per cent of the total production in the country[130].

Broiler production in India and the absolute as well as percentage increase or decrease of broiler production over the previous years and the trend values are presented in Table 3.3.

Table 3.3

BROILER PRODUCTION IN INDIA DURING 2001 TO 2010

Year	Broiler Production (Tonnes)	Increase / Decrease	Percentage Increase / Decrease	Trend Value
2001	923000	-	-	804636
2002	1088000	165000	17,88	956673
2003	936000	-152000	-13,97	1108709
2004	1172000	236000	25,21	1260745
2005	1403000	231000	19,71	1412782
2006	1512000	109000	7,77	1564818
2007	1713000	201000	13,29	1716855
2008	1815000	102000	5,95	1868891
2009	2026000	211000	11,63	2020927
2010	2300000	274000	13,52	2172964

Source: FAOSTAT

It could be seen from Table 3.3 that broiler production in India rose from 9,23,000 tonnes in 2001 to 23,00,000 tonnes in 2010. The broiler production which stood at 9,36,000 tonnes in 2003, increased to 11,72,000 tonnes in 2004 making 25.21 percent annual growth when compared to the previous year 20003. The year 2010 witnessed a remarkable increase in production by 2,74,000 tonnes over the previous year making an annual growth of 13.52 percent when compared to 2009. The data also reveal that broiler production decreased from 10,88,000 tonnes in 2002 to 9,36,000 tonnes in 2003, registering a negative annual growth rate of 13.97 percent due to Avian influenza. Except this all other periods under review witnessed an increase. This is in spite of large scale break out of Avian influenza

[130] Vision for Poultry Industry: Current scenario future prospects (2005), Access at http://www.chinaccm.com/4S/4S06/4S0601/news/20070815/115714.asp

throughout the country during 2005 and 2009, which indicates that the farmers and the integrators undertook strenuous efforts to improve the Broiler Production in India. The trend value for broiler production in India increased from 8,04,636 tonnes in 2001 to 21,72,964 tonnes in 2010.

Trend, Growth and Magnitude of Variability of Broiler Production in India

To understand the growth rate of broiler production, compound growth rate has been calculated using semi-log method and to analyse the magnitude of variability in production, co-efficient of variation is used. The results are presented in Table 3.4.

Table 3.4

TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF BROILER PRODUCTION IN INDIA DURING 2001 TO 2010

Particulars	Semi – log		R^2	*CGR Percent per annum)*	*C.V Percentage*
	Constant	Regression Co-efficient			
Broiler Production in India	5.906 (0.021)	0.045** (0.003)	0.957	10.92	31.65

Source: Computed from Table 3.3

** Significant at 5 percent level

CGR – Compound Growth Rate

The results of the analysis in Table 3.4 reveal that the trend in broiler production in India is positive and statistically significant at one percent level. It implies that there is a significant increase in the broiler production in India during the period under study.

The decadal analysis in India shows a spectacular performance in growth rate. The analysis reveals that broiler production in India had increased at the rate of 10.92 percent per annum during 2001 and 2010.

It is also inferred from Table 3.4 that broiler production in India showed a sizeable variation of 31.65 percent during the period under study. This may be due to Bird flu in 2003 and broiler production recovered in 2007.

STATE-WISE BROILER FOWLS POPULATION IN INDIA

The state wise fowls population in India according to 17th Census 2003 and 18th Census 2007, absolute as well as percentage and increase or decrease while comparing with previous census, are exhibited in Table 3.5.

Table 3.5

STATE-WISE FOWLS POPULATION IN INDIA FOR THE YEAR 2003 & 2007

S.No.	Name of the State	17th Census, 2003 (No.of Fowls '000)	18th Census, 2007 (No.of Fowls '000)	Increase / Decrease	Increase / Decrease (%)
1	Tamil Nadu	86120	126879	40759	32.12
2	Andhra Pradesh	101985	123036	21051	17.11
3	West Bengal	43700	73626	29926	40.65
4	Maharashtra	37892	64431	26539	41.19
5	Karnataka	25576	41845	16269	38.88
6	Haryana	13610	28619	15009	52.44
7	Assam	14658	20609	5951	28.88
8	Orissa	16886	19489	2603	13.36
9	Kerala	10992	14219	3227	22.69
10	Chhattisgarh	8005	13838	5833	42.15
11	Gujarat	8100	13327	5227	39.22
12	Bihar	12820	10755	-2065	-19.20
13	Punjab	10773	10536	-237	-2.25
14	Jharkhand	13465	10448	-3017	-28.88
15	Uttar Pradesh	11262	8460	-2802	-33.12
16	Madhya Pradesh	11676	7311	-4365	-59.70
17	J & K	5325	6487	1162	17.91
18	Rajasthan	6185	4914	-1271	-25.86
19	Meghalaya	2762	3026	264	8.72
20	Nagaland	2673	2991	318	10.63
21	Tripura	2271	2895	624	21.55
22	Uttaranchal	1967	2563	596	23.25
23	Manipur	2383	1830	-553	-30.22
24	Arunachala Pradesh	1610	1259	-351	-27.88
25	Mizoram	1114	1232	118	9.58
26	Andaman Nicobar	857	916	59	6.44
27	Himachal Pradesh	767	725	-42	-5.79
28	Goa	565	504	-61	-12.10
29	Pondicherry	207	345	138	40.00
30	Dadar Nagar Haveli	106	169	63	37.28
31	Sikkim	321	157	-164	-104.46
32	Laksha Deep	129	137	8	5.84
	Total	**456762**	**617578**	**160816**	**26.04**

Source: 17th & 18th Livestock Census, Dept. of Animal Husbandry, http://dahd.nic.in/dahd/WriteReadData/7.Par IV Livestock Census BAHS 2012.pdf

Tamil Nadu remains first in broiler production followed by Andhra Pradesh, West Bengal and Maharashtra. According to 18th Census 2007, Tamil Nadu occupies the first place with 1,26,879 thousand broiler fowls population, among all the States in India, followed by Andhra Pradesh with 1,23,036 thousand broiler fowls population. The broiler population in Haryana which stood at 13610 thousand in 2003, increased to 28,619 thousand, in 2007 making a spectacular increase of 52.44 percent when compared to 2003. Maharashtra State witnessed a remarkable increase in fowls population in the year 2007 by 26,539 thousands over the previous Census 2003, registering an increase of 41.19 percent when compared to 2003. The states Chhattisgarh and West Bengal also witnessed significant increase in broiler population while compared with previous Census with 42.15 percent and 40.65 percent respectively. This may be due to geographical and demographic factors, food culture and level of awareness.

The fowls population in Madhya Pradesh decreased from 11,676 thousand in 2003 to 7311 thousand in 2007, registering a decrease at the rate of 59.70 percent over the previous year 2003. Uttar Pradesh also experienced a significant decrease in fowls population by 33.12 percent when compared to previous census 2003. The decrease in broiler population is mainly due to hot climate in the State compared with others.

BROILER PRODUCTION IN TAMIL NADU

Tamil Nadu was the pioneer State in introducing integrated broiler farming. The favourable climate and conducive entrepreneurial climate in the State are the basic factors for the consistent growth of Broiler farming in the state. The spectacular growth in number of poultry birds in Tamil Nadu was due to the fact that organized arrangements for poultry development gained momentum only after 1970 when farms were established with high-yielding improved varieties of birds. Until such time the poultry sector was depending on "Desi" birds. However, the productivity of this variety was very low. The state Animal Husbandry Department looked after the poultry development by providing technical know-

how and chicks. In order to offer specialized services an autonomous body called Tamil Nadu Poultry Development Corporation was formed. Both the department and corporation played a significant role in promoting poultry development in the state. Poultry Disease Diagnostic Laboratory located at Erode played a crucial role in monitoring the incidence of diseases affecting poultry, undertaking preventive measures and providing technical guidance to the farmers for the effective disease management and control. The Tamil Nadu University of Veterinary and Animal Sciences, Chennai also plays a significant role in the field of poultry education.

The broiler production in Tamil Nadu, absolute as well as percentage and increase or decrease while comparing with previous census, are exhibited in Table 3.6.

Table 3.6

BROILER PRODUCTION IN TAMIL NADU DURING 2001 – 2010

Year	Broiler Production (Tonnes)	Increase / Decrease	Percentage Increase / Decrease	Trend Value
2001	119145	-	-	128267
2002	142974	23829	20.00	141349
2003	157271	14297	10.00	154432
2004	188726	31455	20.00	167514
2005	165834	22892	-12.13	180597
2006	197865	32031	19.32	193679
2007	201654	3789	1.91	206762
2008	215648	13994	6.94	219844
2009	235684	20000	9.27	232927
2010	246583	10935	4.64	246009

Source: Unpublished records of BCC, Palladam.

From Table 3.6 it is observed that there is a substantial increase in quantity of broiler production in Tamil Nadu over the period under study except during the year 2005. The production of broiler chicken was the highest during 2010. It increased remarkably from 1,19,145 tonnes in 2001 to 1,42,974 tonnes in 2002, thereby making an annual growth rate of 20 percent when compared to the previous year 2001. The years 2004 and 2006 also had witnessed a substantial increase in production with annual growth rate of 20 percent and 19.32 percent respectively when compared to the previous years. The introduction and popularity of integration

concept in broiler production, favourable climatic conditions and the like are the major reasons for such consistent growth in broiler production during the period under study.

The year 2005 experienced a substantial decrease in annual growth rate by 12.13 percent over the previous year, owing to the Avian Influenza during the period. It is found that the trend value for broiler production in Tamil Nadu had increased from 1,28,267 tonnes in 2001 to 2,46,009 tonnes in 2010.

Trend, Growth and Magnitude of Variability of Broiler Production in Tamil Nadu

In order to ascertain the growth rate in broiler production in Tamil Nadu, Compound growth rate has been calculated using exponential method and to analyse the consistency of production, co-efficient of variation is used. The results are presented in Table 3.7.

Table 3.7

TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF BROILER PRODUCTION IN TAMIL NADU DURING 2001 TO 2010

Particulars	*Semi – log*		R^2	*CGR Percent per annum)*	*C.V Percentage*
	Constant	*Regression Co-efficient*			
Broiler Production in Tamil Nadu	5.089** (0.032)	0.032** (0.150)	0.920	7.65	21.78

Source: Computed from Table 3.6

** Significant at 5 percent level

CGR – Compound Growth Rate

It is observed from Table 3.8 that broiler production in Tamil Nadu was positive and statistically significant at one percent level. It implies that broiler production in Tamil Nadu witnessed a significant growth during the period under study. The analysis reveals that quantum of broiler production in Tamil Nadu had increased at the rate of 7.65 percent. It is also inferred from Table 3.7 that the magnitude of variability of broiler production in Tamil Nadu is 21.78 percent. It is lesser than country's variation of 31.65 percent. It implies that broiler production in Tamil Nadu is more consistent than country's level of variation.

DISTRICT-WISE POULTRY POPULATION IN TAMIL NADU

District wise population of broiler farming in Tamil Nadu as per the latest Animal husbandry Livestock Census in 2007 is presented in Table 3.8.

Table 3.8

DISTRICT-WISE POULTRY POPULATION IN TAMIL NADU IN 2007

S.No.	District	No. of Fowls	Percentage	Rank
1	Salem	3825195	14.70	I
2	Dharmapuri	3424917	13.16	II
3	Dindigul	2166354	8.32	III
4	Sivaganga	1277722	4.91	IV
5	Virudhunagar	1150939	4.42	V
6	Kancheepuram	1122748	4.31	VI
7	Pudukkottai	1071874	4.12	VII
8	Theni	1057250	4.06	VIII
9	Vilupuram	1056035	4.06	IX
10	Madurai	1045316	4.02	X
11	Thanjavur	1019016	3.92	XI
12	Vellore	867817	3.33	XII
13	Thiruvalluvar	673902	2.59	XIII
14	Nagapattinum	665119	2.56	XIV
15	Kanniyakumari	648106	2.49	XV
16	Namakkal	637887	2.45	XVI
17	Tiruchirapalli	611808	2.35	XVII
18	Ariyalur	586561	2.35	XVIII
19	Karur	573192	2.20	XIX
20	Cuddalore	501188	1.93	XX
21	Erode	476541	1.83	XXI
22	Ramnathapuram	412584	1.59	XXII
23	Coimbatore	362136	1.39	XXIII
24	Thiruvalluvar	309339	1.29	XXIV
25	Perambalur	223993	0.86	XXV
26	Tiruvannamalai	182093	0.79	XXVI
	Total	**25949632**	**100.00**	

Source: Department of Animal Husbandry (updated in August, 2010)

It is observed from Table 3.8 that Salem Districts stood in first place with 3825195 fowls followed by Dharmapuri District with 3424917 fowls, Dindigul district with 2166354 fowls in the second and third places respectively. This may be due to favorable climate

and better vocation of the farmers compared with other vocations in the districts. Sivagana District occupies fourth position with 12,77,722 fowls, Virudhunagar district in fifth position with 11,50,939 fowls and Theni district occupies eighth place with 10,57,250 fowls population in 2007.

Salem district contributed 14.70 percent share in the total number of fowls population in Tamil Nadu followed by Namakkal district 13.16 percent, Dindigul 8.32 percent, Sivagana 4.91 percent and Theni district 4.06 percent share during the year.

It could be inferred from analysis that Salem and Namakkal districts alone contributed nearly one fourth share in the total broiler production in Tamil Nadu.

Perambalur and Tiruvannamalai districts contributed only less than one percent in the total production due to unfavorable climate prevailing in the districts.

BROILER FARMING IN THE STUDY AREA

Theni district offers good scope for poultry development. The district is climatically and locationally suitable for poultry rearing and can take advantage of the infrastructure and expertise developed in the adjoining districts. As regards Broiler units, due to the uneconomic rate of poultry meat, wide fluctuation in their prices and increase in the feed cost, broiler farmers have been opting for contract farming wherein they have to invest only on shed space, equipment and management of the batches, while the chicks, feed, medicine and marketing and the like are taken care of by the integrators.

Theni District stands in the eighth place in production of broilers in Tamil Nadu (vide Table 3.6). In Theni District, the broiler farming was started in 1985; chicks were purchased from Palladam which is a hub of hatcheries in Tamil Nadu. Then a minimum number of farmers were involved in Broiler farming. Though the technical support from veterinarians and the financial support from government were available, the farmers were not able to earn out of it throughout the year due to great variation in market price and seasonal demand. The private companies supplied chicks and feeds

to farmers on credit during 1985 – 90's. After 1998, Suguna Poultry Farm Pvt.Ltd in Theni district introduced the concept of Integration since its weather condition is always conducive for livestock rearing especially broilers. Venkateshwara, Shanthi Poultry Farm started Integration in Theni District. Since then the number of farmers have increased and the modern technology has been adopted to improve the efficiency of the production. Even those farmers, who were reluctant to increase the farm capacity, became ready to modernize the farm automation in watering, feeding and the like. At present there are 303 broiler farms in Theni District. The status of broiler farmers is ever increasing in all aspects like economic, continuous employment generation, quick return and reduction of poverty in the study area. Since Theni District is hilly demarked and agriculture dependent, environmentally conducive for broiler rearing, the broiler production in Theni district is considerably increasing. Broiler production in Theni District and the absolute as well as percentage increase or decrease over the previous years and the trend values are presented in Table 3.9.

Table 3.9

BROILER PRODUCTION IN THENI DISTRICT DURING 2001 TO 2010

Year	Broiler Production (Tones)	Increase / Decrease	Percentage Increase / Decrease	Trend Value
2001	595700	-	-	562900
2002	659800	61100	10.21	643700
2003	745000	85200	12.91	724500
2004	830700	85700	11.50	805200
2005	815000	-15700	-1.89	886000
2006	894300	79300	9.73	966700
2007	1008300	114000	12.75	1047500
2008	1124800	116500	11.55	1128200
2009	1230500	105700	9.40	1209000
2010	1356400	125900	10.23	1289800

Source: Unpublished records of BCC Palladam, Coimbatore.

It could be seen from Table 3.9 that broiler production in Theni district increased from 5,95,700 tonnes in 2001 to 7,45,5000 tonnes in 2003, making a 12.91 percent increase over the previous year. It is also observed from the table that there was a gradual increase in broiler production from 2004, except during 2005 when

there was a 1.89 percent decrease over the previous year which is due to large scale break out of Avian Influenza in this region.

The production of broiler chicken, which stood at 8,94,300 tonnes in 2006, increased to 10,08,300 tonnes in 2007 and again increased to 11,24,800 tonnes in 2008, registering an annual growth rate of 12.75 percent and 11.55 percent respectively over the previous years. It is seen from Table 3.9 that the trend value for broiler production showed an increasing trend. The trend value had increased from 5,62,900 tonnes in 2001 to 12,89,800 tonnes in 2010.

Trend, Growth and Magnitude of Variability of Broiler Production

The annual growth rate of broiler production in Theni District and the magnitude of variability during the period under review are presented in Table 3.10.

Table 3.10

TREND, GROWTH AND MAGNITUDE OF VARIABILITY OF BROILER PRODUCTION IN THENI DISTRICT DURING 2001 TO 2010

Particulars	*Semi – log*		R^2	*CGR (Percent per annum)*	*C.V Percentage*
	Constant	*Regression Co-efficient*			
Broiler Production in Tamil Nadu	3.742** (0.010)	0.038** (0.002)	0.985	9.14	26.92

Source: Computed from Table 3.9.

** Significant at 5 percent level

CGR – Compound Growth Rate

It is observed from Table 3.10 that the trend in broiler production was positive and statistically significant at one percent level. It reveals that broiler production in Theni District witnessed a significant increase during the period under study. The analysis indicates that the broiler production in Theni District is increasing at the rate of 9.14 percent per annum during the period under study. It is also inferred from Table 3.10 that the production of broiler in India had sizeable variation during the period under study with 26.92 per cent.

BROILER FINANCE

Finance is as important in poultry farming as in the case of any other business activity. Any decision taken on production, marketing and all other activities of poultry farming has financial implications. All the decisions are finalized only based on the availability of finance.

Though the broiler farmers use their own lands, they generally need money to finance their farming activities like construction of sheds, purchase of equipments and fittings, payment of electricity, labour, water, cleaning and maintenance. The broiler farmer also requires money for expansion of broiler shed.

Source of Finance

The broiler farmers arrange money from various sources to meet out all the expenses involved in starting the broiler farm. The source of finance is one of important variables to analyse that is confined to Own Capital, Bank Loan, Money Lenders, Friends and Relatives. The percentage of various sources contributed to total capital structure is presented in Table 3.11.

Table 3.11

SOURCES OF CAPITAL

Source	Percentage of Capital Structure in Broiler Farms			
	Small	Medium	Large	Total
Own Capital	59.78	39.57	25.61	41.65
Bank Loan	27.67	54.08	62.94	48.23
Money Lenders	3.32	2.32	4.74	3.46
Friends and Relatives	9.23	4.03	6.71	6.66
Total	100.0	100.0	100.0	100.0

Source: Primary data

Figures in parentheses are percentages to total

It could be observed from Table 3.11 that out of total capital structure, 59.78 percent was contributed through own capital by small farmers, 39.57 percent by medium farmers and 25.61 percent by large farmers. It implies that large and medium farmers found other sources like bank loan, money lenders, relatives and friends.

Out of borrowed capital, bank loan had highest of 62.94 percent in case of large farmers followed by 54.08 percent by

medium farmers. It implies that the large farmers availed more bank loan than other size of farmers.

Money lenders constituted comparatively less in all size farms. Small farmers borrowed money from friends and relatives which constituted 9.23 per cent and this less in medium and large farms.

Out of borrowed capital in overall, bank loan itself contributed 48.23 percent to the total capital. It implies that bank sector contributed more in the growth of broiler farming in Theni District.

Institutional Finance for Poultry Farming in Theni District

National Bank for Agriculture and Rural Development (NABARD) offered required re-finance to propagate the Broiler farming throughout Theni District through service banks. The extent of financial assistance given by NABARD over the years is presented in Table 3.12.

Table 3.12

INSTITUTIONAL CREDIT TO BROILER FARMERS IN THENI DISTRICT

S.No.	Year	Amount (in lakh)	Increase / Decrease	Percentage Increase / Decrease	Trend Value
1	2000-01	67.86	-	-	14.05
2	2001-02	35.47	-32.39	-47.73	60.35
3	2002-03	99.93	64.46	181.73	106.65
4	2003-04	143.63	43.7	43.73	152.95
5	2004-05	111.26	-32.37	-22.54	199.25
6	2005-06	359.04	247.78	222.70	245.55
7	2006-07	356.82	-2.22	-0.62	291.85
8	2007-08	328.16	-28.66	-8.03	338.15
9	2008-09	553.88	225.72	68.78	384.45
10	2009-10	697.44	143.56	25.92	430.75

Source: NABARD Year Book -Theni District. (2000-01 to 2009-10)

From Table 3.12 it is observed that there is a substantial increase in bank loan to broiler farmers in Theni District by NABARD Bank over the period under study except during the years 2001-01. 2004-05. 2006-07 and 2007-08. It increased remarkably from Rs.111.26 lakhs in 2004-05 to Rs.359.04 lakhs 2005-06 thereby making an annual growth rate of 222.70 percent as compared to previous year. It may be due to the banker realised the worthiness of broiler farming and ready for lending freely. So that number of broiler farmers increased considerably during the period under study.

The year 2001-02 experienced a substantial decrease in annual growth rate by 47.73 percent over the previous year, owing to change in lending policy of banking sector.

Table 3.13

TREND, GROWTH AND MAGNITUDE OF THE VARIABILITY OF INSTITUTIONAL FINANCE TO POULTRY FARMING IN THENI DISTRICT FROM 2001 TO 2010

In order to ascertain the growth rate of financial assistance provided by NABARD Bank to the broiler farmers in Theni District has been calculated using exponential method and to analyse the consistency in lending, co-efficient of variation is used. The results are presented in Table 3.13.

Particular	*Semi – log*		R^2	*CGR Percent per annum)*	*C.V Percentage*
	Constant	*Regression Co-efficient*			
NABARD Finance to Poultry Farming	1.555 (0.105)	0.132** (0.017)	0.884	35.519	81.01

Source: Computed from Table 3.12

** Significant at 5 percent level

CGR – Compound Growth Rate

It is observed from Table 3.13 that trend in institutional financial to poultry farming in Theni District is positive and statistically significant indicating that the finance assistance provided by NABARD Bank in Theni District showed an increasing trend during the period under study. The analysis reveals that Growth rate of financial assistance increased at the rate of 35.519 percent per annum due to an increase in number of broiler farms. The co–efficient of variation is 81.01 per annum during the period under study.

FACTORS MOTIVATING TO START BROILER FARMING

Motivation is the action that impels or urges an individual to assume an attitude generally favourable towards his work leading him to perform satisfactorily. A motive is a driving force that causes a person to take action to satisfy the specific needs. Understanding motivation is an important key to managing things, labour, inputs

and the like. By studying motivation, the researcher can analyse the major forces influencing the farmers to involve themselves in agro-based activities. There are various factors that motivate the sample respondents in the study area to undertake the broiler farming. An attempt is made in this chapter to bring out the dominant factor that inspired the respondents to enter into this venture.

Factor analysis is bodies of techniques used for the study of inter relationship among variable[131]. In the words of Thurstone, it is necessary to rotate factor matrices, if one want to interpret them adequately[132].

Though there are several methods available for factor analysis, the Principal factor method with orthogonal Varimax rotation is the widely used one. It minimizes the number of variables with high loadings on a factor, thereby enhancing the interpretability of the factors[133]. Further orthogonal rotations maintain the independence of the factors as the right angles are maintained between the axes.

For the purpose of obtaining a simple statement, factor matrix is rotated. The number of factors retained for rotation is restricted to those principal components that have Eigen values greater than unity[134].

An attempt has been made to extract specific factors and define variables, which constitute each factor, based on the strength and direction of factor loadings in motivation. In total, 14 variables have been included to analyse the motivation for starting broiler farming that are factorised into 5 factors.

FACTOR ANALYSIS

Mathematically, factor analysis is somewhat similar to multiple regression analysis. Each variable is expressed as a linear

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131 GILBERT, A.C. Marketing Research, The Dryden Press, Illinios, 1979, p-557.

132 THURSTONE, L. Multiple Factor Analysis, University of Chicago Press, Chicago, 1959, p-508 to 509.

133 NARESH K.MALHOTRA, Marketing Research and Applied Orientation, Prentice Hall India Private Limited, 4th edition, 2005, p-568.

134 Indian Institute of Management, Financial Analysis of Public Enterprises in India, Bangalore, 1978, p .31.

combination of underlying factors. The amount of variance a variable shares with all other variables included in the analysis is referred to communality. The Co-variation among the variables is described in terms of a small number of common factors plus a unique factor for each variable. These factors are not over observed. If the variables are standardized, the factor model may be represented as

$X_i = A_{ij} F + A_{i\,2}F_2 + A_{i\,3}F_3 + \ldots\ldots\ldots\ldots A_{im} F_{in} - V_i - U_i$

Where,

$X_i =$ i^{th} standaradised variable

$A_{ij} =$ standardized multiple regression coefficient of variable $_i$ on common factor $_j$

$F =$ Common factor $_j$

V_i=Standardised regression coefficient of variable $_i$ on unique factor $_i$

$U_i =$ the unique factor for variable $_i$

$m =$ Number of common factors

The unique factors are uncorrelated with each other and with the common factors. The common factors themselves can be expressed as linear combinations of the observed variables.

$F_i = W_{i1} X_i + W_{i2} X_2 + W_{i3} X_{i3} + \ldots\ldots\ldots + W_{ik} X_k$

Where,

$F_i =$ Estimate of i^{th} Factor

$W_i =$ Weight or factor score coefficient

$k =$ Number of variables

It is possible to select weights or factor score coefficient, so that the first factor explains the largest portion of the total variance. Then a second set of weight can be selected, so that the second factor accounts for most of the residual variance, subject to being uncorrelated with the first factor. This same principle could be applied for selecting additional weights for the additional factors. Thus the factors can be estimated so that their factor scores, unlike the value of the original variables are not correlated. Furthermore, the first factor accounts for the highest variance in the data, the second factor the second highest and so on.

The rotated factor matrix for the factors motivating the broiler farmers to venture in broiler farming is analysed and the details are presented in Table 3.14.

Table 3.14

ROTATED FACTOR MATRIX FOR FACTOR MOTIVATING TO START BROILER FARMING

S.No.	Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1	Risk related to Quality of Input	0.799	0.119	0.022	0.223	0.048
2	Price Risk	0.773	0.152	0.171	0.020	0.002
3	Monetary loss borne by Integrator	0.675	0.142	0.161	0.178	0.021
4	Market Instability	0.648	0.180	0.079	0.048	0.192
5	Assured Growing Charge	0.031	0.870	0.085	0.081	0.022
6	Return on Manure Sale	0.028	0.855	0.033	0.010	0.043
7	Quick Return	0.096	0.683	0.018	0.263	0.069
8	Technology and Modern Management	0.013	0.039	0.825	0.071	0.126
9	R & D for controlling Diseases	0.489	0.025	0.618	0.134	0.024
10	Skill transfer	0.267	0.228	0.500	0.300	0.261
11	Agri-related activity	0.058	0.033	0.254	0.775	0.097
12	Easy Maintenance	0.009	0.303	0.229	0.586	0.127
13	Pride of Self-Employment	0.028	0.099	0.091	0.344	0.798
14	Credit Facility	0.109	0.026	0.016	0.348	0.740

Source: Primary data

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 6 iterations

Table 3.14 exhibits the rotated factor loadings for the fourteen statements (attributes) of broiler farming. It is clear that all these fourteen statements have been extracted into five factors.

These variables defining Factor 1 with their factor loading and community for the motivation in starting broiler farming in the study area are given in Table 3.15.

Table 3.15

FACTOR 1: LESS RISK

S.No.	Variable	Factor Loading	Communality (H2)	Cronbach's Alpha
1.	Risk related to Quality of Input	0.799	0.705	0.789
2.	Price Risk	0.773	0.650	

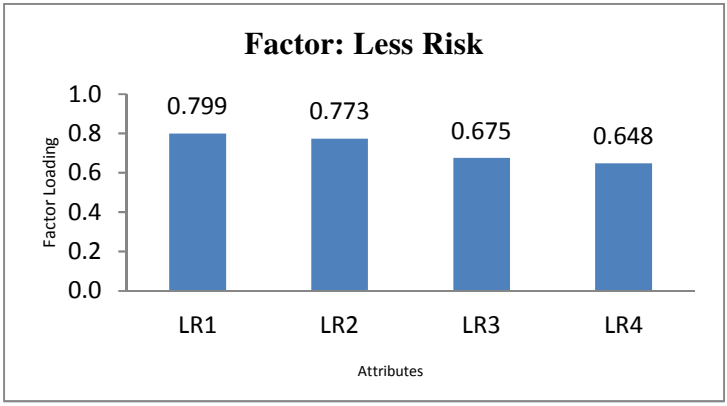
3.	Monetary loss borne by Integrator	0.675	0.533	
4.	Market Instability	0.648	0.497	

Source: Primary data

It is observed from Table 3.15 that the variables of motivation such as risk related to quality of input, price, monetary loss and market instability constituted Factor 1 with higher factor loading. The higher value of communality for the four variables indicates that higher amount of variance is explained by the extracted factors. The included four variables explain this factor to the extent of 78.90 per cent.

The degree of motivation of the factor 'Less Risks' in motivating the farmer to start broiler farming is presented in Figure 3.3.

Figure 3.3



The variables defining Factor 2 with their factor loading and communality for the motivation in starting broiler farming under integration in Theni District is given in Table 3.16.

Table 3.16

FACTOR 2: PROFITABLE VENTURE

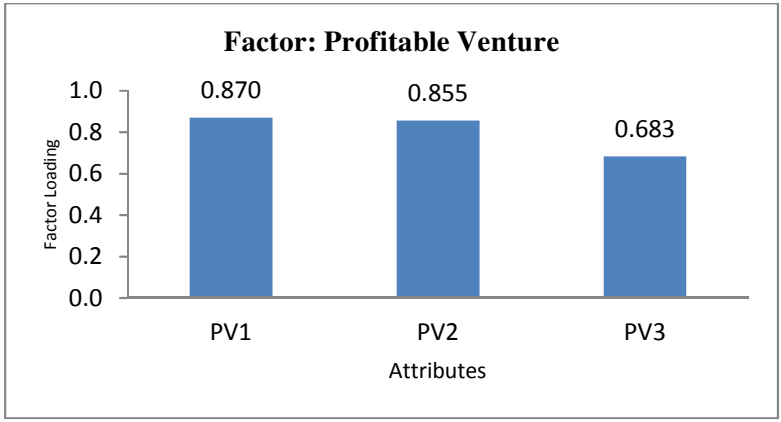
S.No.	Variable	Factor Loading	Communality (H2)	Cronbach's Alpha
1.	Assured Growing Charge	0.870	0.772	0.715
2.	Return on manure Sale	0.855	0.736	
3.	Quick return	0.683	0.550	

Source: Primary data

Among the variables of motivation to start broiler farming, the variables such as return from Growing charge, manure sales and gunny bag sales constituted Factor 2 with higher factor loading. The higher value of communality for the three attributes indicates that the variables within the Factor 2 have very high association among them. The included three variables explain this factor to the extent of 71.50 per cent.

The degree of motivation of the factor 'Profitable Venture' in motivating the farmer to start broiler farming is presented in Figure 3.4.

Figure 3.4



The variables defining Factor 3 with their factor loadings and communalities for motivation in starting broiler farming under integration in the study area is given in Table 3.17.

Table 3.17

FACTOR 3: TECHNICAL KNOWLEDGE

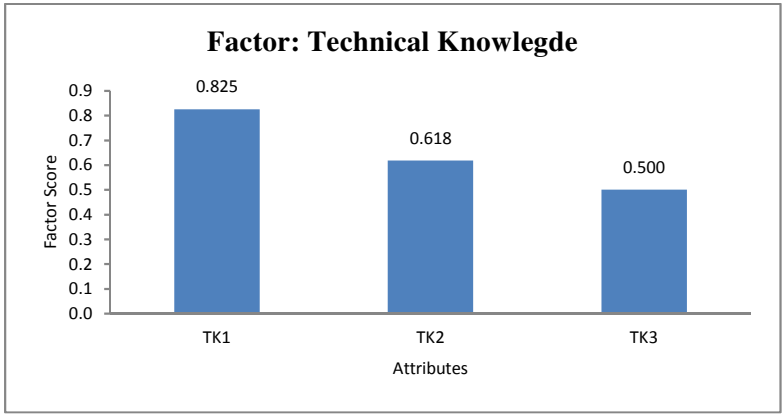
S.No.	Variable	Factor Loading	Communality (H2)	Cronbach's Alpha
1.	Technology and Managerial Practices	0.825	0.703	0.734
2.	R & D for Controlling Diseases	0.618	0.640	
3.	Skill Training	0.500	0.532	

Source: Primary data

Among the variables of motivation, the variables Technology and Managerial Practices, Research and Development for controlling Diseases and Skill Training constituted Factor 3 with higher factor loading. The higher factor loadings of the variables indicate that the factor 3 underlies the above two variables. The high communality value of the variables indicates that the variables within the factor 3 have very high association among them. All three variables in this factor explain it to the extent of 73.40 per cent.

The degree of motivation of the factor 'Technical Knowledge' in motivating the farmer to start broiler farming is presented in Figure 3.5.

Figure 3.5



The variables defining Factor 4 with their factor loadings and communalities for motivation in starting broiler farming under integration in the study area is given in Table 3.18.

Table 3.18

FACTOR 4 : ALTERNATIVE TO AGRICULTURE

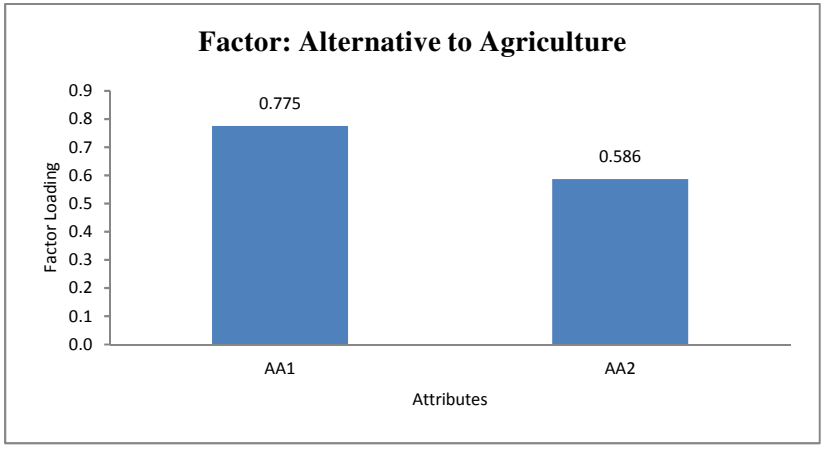
S.No.	Variable	Factor Loading	Communality (H2)	Cronbach's Alpha
1.	Agri-related activity	0.775	0.679	0.693
2.	Easy Maintenance	0.586	0.504	

Source: Primary data

Among the variables of motivation, the variables 'Agri-related activity' and 'easy maintenance' constituted Factor 3 with higher factor loading. The higher factor loadings of the variables indicate that the Factor 4 underlies the above two variables. The high communality value of the variables indicates that the variables within the Factor 4 have very high association among them. The two variables in this factor explain it to the extent of 69.30 per cent.

The degree of motivation of the factor 'Alternative to Agriculture' in motivating the farmer to start broiler farming is presented in Figure 3.4.

Figure 3.6



The variables defining Factor 5 with their factor loadings and communalities for motivation in starting broiler farming under integration in the study area is presented in Table 3.19.

Table 3.19

FACTOR 5: MINIMUM CAPTIAL

S.No.	Variable	Factor Loading	Communality (H2)	Cronbach's Alpha
1.	Pride of Self-employment	0.798	0.775	0.767
2.	Credit Facility	0.740	0.682	

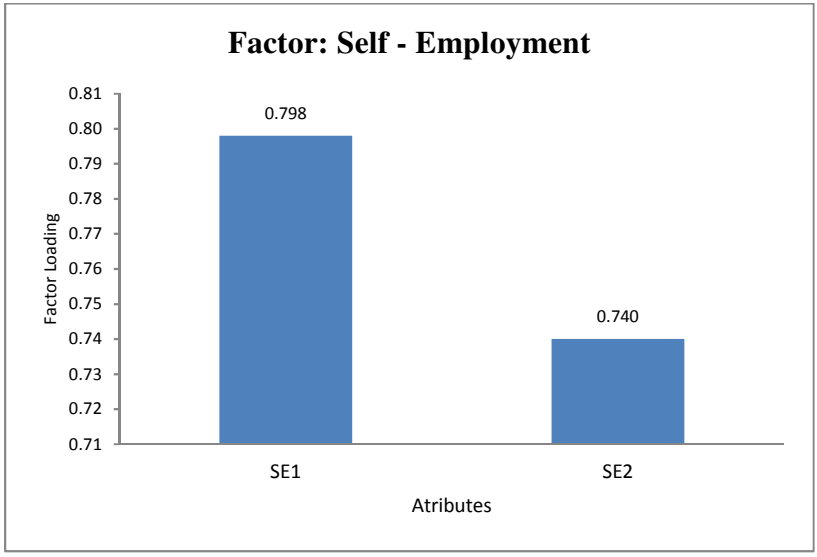
Source: Primary Data

Among the variables of motivation, the variables pride of self-employment and Credit Facility constituted Factor 5 with higher factor loadings.

The higher factor loadings of the variables indicate that the Factor 5 underlies the above two variables. The high communality value of these variables indicates that the variables within the Factor 5 have very high association among them. The two variables in this factor explain it to the extent of 76.70 per cent.

The degree of motivation of the factor 'Self - Employment' in motivating the farmer to start broiler farming is presented in Figure 3.5.

Figure 3.7



FACTORS MOTIVATING TO START BROILER FARMING

Factor analysis of fourteen attributes relating to the motivation to start broiler farming identified five factors and the results are presented in Table 3.20.

Table 3.20

FACTORS MOTIVATING TO START BROILER FARMING

S.No.	Factor	Eigen Value	Percentage of Variance	Cum. Percentage of Variance
1.	Less Risks	2.634	18.811	18.811
2.	Profitable Venture	2.268	16.201	35.012
3.	Technical Knowledge	1.466	10.472	45.484
4.	Alternative to Agriculture	1.305	9.324	54.808
5.	Pride of Self-Employment	1.284	9.170	63.978

Source: Primary data

Kaiser-Meyer-Olkin measures of Sampling Adequacy : 0.689

Bartlett's Test of Sphericity

Chi-Square : 380.757

Degrees of Freedom : 91

Significance : 0.0001

It is observed from Table 3.20 that five factors were extracted out of fourteen variables. These factors account for 63.98 percentage variance in the data. Eigen value for the first factor is 2.63 which indicated that the factor contains very high information than other factors. In individually owned broiler farms, there are many risks which may cause huge loss and problems to the individual owner. But in integrated farming such risks are very less to the broiler farmer, because most of the input costs are borne by the integrator.

The second factor 'Profitable Venture' accounts for 16.20 per cent of variance. Eigen value is 2.27. Broiler farming is one of the profitable ventures as compared with other allied agricultural activities. It is an important factor that motivates the farmer starting it.

The third factor 'Technical Knowledge' accounts for 10.472 per cent of variance. Its Eigen value is 1.466. A small farmer cannot have research and development wing to find a better solution needed in technical and managerial part. So the farmers find

technologically proven methods are used in integrated broiler farming.

The fourth factor 'Alternative to Agriculture' accounts for 9.32 per cent of variance. Its Eigen value is 1.305. In the context of the decline of the prospects of agriculture, broiler farming has become one of the prospective alternatives to agriculture. Therefore this factor is an important motivating factor for the farmers to start broiler farms under integration.

The fifth factor 'Self Employment' accounts for 9.17 per cent of variance. Its Eigen value is 1.284. It is always a matter of pride to any individual to be an entrepreneur and a sole proprietor of an enterprise. Owning a broiler farm is also a matter of pride to an individual. Therefore this also is one of the motivating factors for the farmers to start the broiler farm.

High value of Kaiser – Mayer – Olkin (KMO) test of sampling adequacy (0.689) indicates the correlation between the pairs of variables explained by other variables and thus factor analysis is considered to be appropriate in this model.

The Bartlett's test of sphericity chi-square indicates the population correlation matrix. It is an identity matrix. The identity test of statistics for sphericity is based on x^2 test which is significant. The value is 380.757.

RELATIONSHIP BETWEEN MOTIVATIONAL FACTORS AND OVERAL DECISION BEHAVIOUR OF THE BROILER FARMERS TO START BROILER FARMING

After finding out the factors involved in motivating to start broiler farming, the next step is to find out the factors influencing the broiler farmers to start broiler farming. 'Multiple Regressions Analysis' has been done to identify the relationship between factors and the overall decision behavior of the broiler farmers. The function in log form is as follows:

$$\text{Log } Y = \log b_0 + b_1 \log x_1 + b_2 \log x_2 + \ldots\ldots + b_5 \log_5 + e$$

Where,

Y = Overall Score on Decision Behaviour

x_1 = Score on Less Risk

x_2 = Score on Profitable Venture

x_3 = Score on Technical Knowledge

x_4 = Score on Alternative to Agriculture

x_5 = Score on Pride of Self-employment

b_o. b_1.b_2. ….. b_5 are the parameters of independent variable to be estimated.

b_0 = Regression Constant.

e = Error term.

In order to test the significance of the estimated parameters, b1. b2..…. b5

t-test of the following formula has been used.

$$t = \frac{b_1}{SEb_1}$$

Where,

SEb_1 = Standard error of b_1

The regression co-efficient of the independent variables has been estimated and the results for small farmers are shown in Table 3.21.

Table 3.21

FACTORS INFLUENCING TO START BROILER FARMING – SMALL SIZE

S.No.	Factor	Notation	Elasticity Co-efficient	Standard Error	t- value
1.	Constant	b_0	3.371**	0.955	3.529
2.	Less Risks	x_1	0.136**	0.021	6.476
3.	Profitable Venture	x_2	-0.001^{NS}	0.151	-0.008
4.	Technical Knowledge	x_3	0.045^{NS}	0.078	-0.058
5.	Alternative to Agriculture	x_4	0.329**	0.108	3.043
6.	Pride of Self-employment	x_5	0.521**	0.129	4.039

Source: Computed data

R^2 : 0.736

F-test : 21.758

**Significant at one per cent level

*Significant at five per cent level

NS – Not Significant

It is seen from Table 3.21 that co-efficient of determination (R^2) was 0.736 indicating 73.60 per cent of the variation in the decision behaviour to start broiler farming be explained by all the five independent variables included in the model. The F-value indicates that the fitted log Linear Multiple Regression was significant at one per cent level and it is valid to draw inference.

Among the five independent variables, Less Risk, Pride of Self-employment and Alternative to agriculture were found to be statistically significant.

It could be inferred that decision behaviour of the small broiler farmers of starting broiler farming was significantly influenced by the level of risk reduction. One per cent increase in the less risk keeping all other factors constant will increase the decision behaviour of the broiler farmers by 0.136 per cent from its mean level.

Motivation level to start broiler farming in the study area was also significantly influenced by the level of Alternative to agriculture. One per cent increase in the level of perception toward Alternative to agriculture keeping all other factors constant will increase the decision making behaviour by 0.329 per cent from its mean level.

The motivation level to start the broiler farming was also significantly influenced by the factor Pride of Self-employment. One per cent increase in the level of perception towards pride of self-employment keeping all others constant would increase the level of motivation to start broiler farming by 0.521 per cent from the mean level.

The regression co-efficient of the independent variables has been estimated and the results for the medium farmers are presented in Table 3.22.

Table 3.22

FACTORS INFLUENCING TO START BROILER FARMING – MEDIUM SIZE

S.No.	Factor	Notation	Elasticity Co-efficient	Standard Error	t- value

1	Constant	b_0			
2	Less Risks	x_1	0.142**	0.034	4.176
3	Profitable Venture	x_2	0.152**	0.046	3.04
4	Technical Knowledge	x_3	0.067^{NS}	0.068	0.983
5	Alternative to Agriculture	x_4	0.072^{NS}	0.096	0.748
6	Pride of Self Employment	x_5	0.689**	0.080	8.575

Source: Computed data

R^2 : 0.754

F-test : 33.092

**Significant at one per cent level

*Significant at five per cent level

NS – Not Significant

It is seen from Table 3.22 that co-efficient of determination (R^2) was 0.754 indicating 75.40 per cent of the variation in motivational factors to start broiler farming by medium size farmers are be explained by all the five independent variables included in the model. The F-value indicates that the fitted log Linear Multiple Regression was significant at one per cent level and it is valid to draw inference.

Among the five independent variables, Pride of Self Employment, Profitable venture and Less Risk were found to be statistically significant.

It could be inferred from Table 3.22 that motivation for starting broiler farming was significantly influenced by the level of perception on 'Pride of Self Employment'. One per cent increase in the level of efficiency in perception on Pride of Self Employment keeping all other factors constant will increase the motivational factor by 0.689 per cent from its mean level.

The elasticity co-efficient for the variable 'Less Risk' was 0.142 which indicates that by increasing Less Risk by one per cent keeping all other factors constant the motivation level would increase by 0.142 per cent from its mean level.

The elasticity co efficient for the variable 'Profitable venture' was 0.152 which indicates one per cent increase in the level of perception towards profitable venture keeping all other factors

constant would increase the level of motivation to start broiler farming in the study area by 0.152 per cent from its mean level.

The regression coefficient of the independent variables has been estimated and the results for the large farmers are presented in Table 3.23.

Table 3.23

FACTORS INFLUENCING TO START BROILER FARMING – LARGE SIZE

S.No.	Factor	Notation	Elasticity Co-efficient	Standard Error	t – value
1	Constant	b_0	3.332**	0.925	3.603
2	Less Risks	x_1	0.163**	0.038	4.289
3	Profitable Venture	x_2	0.196**	0.057	3.438
4	Technical Knowledge	x_3	0.020^{NS}	0.072	0.279
5	Alternative to Agriculture	x_4	0.351**	0.106	3.301
6	Pride of Self Employment	x_5	0.762**	0.161	4.732

Source: Computed data

R^2 : 0.746

F-test : 22.858

**Significant at one per cent level

*Significant at five per cent level

NS – Not Significant

It is seen from Table 3.23 that co-efficient of determination (R^2) was 0.746 indicating 74.60 per cent of the variation in the decision behaviour to start broiler farming be explained by all the five independent variables included in the model. The F-value indicates that the fitted log Linear Multiple Regression was significant at one per cent level and it is valid to draw inference. Among the five independent variables, Less Risk, Pride of Self Employment, Profitable Venture and Alternative to Agriculture were found to be statistically significant.

It could be inferred that motivation of starting broiler farming was significantly influenced by the level of the above said four variables. One per cent increase in the perception on Pride of Self Employment. Alternative to agriculture, profitable venture and less risk keeping all other factors constant will increase the decision behaviour by 0.762 per cent, 0.351 per cent, 0.196 per cent and 0.163 per cent respectively from their mean level.

The regression coefficient of the independent variables has been estimated and the results for overall farmers are presented Table 3.24.

Table 3.24

FACTORS INFLUENCING TO START BROILER FARMING – OVERALL

S.No.	Factor	Notation	Elasticity Co-efficient	Standard Error	t- value
1	Constant	b_0	2.043**	0.435	4.696
2	Less Risks	x_1	0.144**	0.033	4.363
3	Profitable Venture	x_2	0.199**	0.038	3.131
4	Technical Knowledge	x_3	-0.003^{NS}	0.041	-0.062
5	Alternative to Agriculture	x_4	0.267**	0.058	4.642
6	Pride of Self Employment	x_5	0.653**	0.064	10.203

Source: Computed data

R^2 : 0.707

F-test : 73.030

**Significant at one per cent level

*Significant at five per cent level

NS – Not Significant

It is seen from Table 3.24 that co-efficient of determination (R^2) was 0.707 indicating 70.70 per cent of the variation in decision behaviour to start broiler farming in Theni District be explained by all the five independent variables included in the model. The F-value indicates that the fitted log Linear Multiple Regression was significant at one per cent level and it is valid to draw inference.

Among the five independent variables, Less Risk, Pride of Self Employment, Profitable Venture and Alternative to agriculture were found to be statistically significant.

It could be inferred that motivation of starting broiler farming was significantly influenced by all the above four independent variables. One per cent increase in the perception on Pride of Self Employment. Alternative to agriculture, profitable venture and less risk keeping all other factors constant will increase the decision behaviour by 0.653. 0.267. 0.199 and 0.144 percent respectively from its mean level.

ASSOCIATION BETWEEN PERSONAL PROFILE VARIABLES AND MOTIVATIONAL FACTOR TO START BROILER FARM

Personal Profile of the broiler farmers may have its own influence on the motivation to starting broiler farming in Theni District. The present study has made an attempt to analyse such association with the help of one way analysis of variance. The result of one way analysis of variance is given in Table 3.25.

Table 3.25

ASSOCIATION OF PERSONAL PROFILE VARIABLES AND MOTIVATIONAL FACTOR TO START BROILER FARM

S.No.	Variable	Less Risk	Profitable Venture	Technical Knowledge	Alternative to Agriculture	Pride of Self Employment
1	Sex	6.385**	2.895**	2.730*	2.663**	2.158 NS
2	Age	7.492**	3.009**	9.751**	2.460*	7.399**
3	Education	3.177**	3.556**	6.049**	5.903**	9.389**
4	Religion	1.509 NS	5.029**	0.731 NS	2.643**	1.929 NS
5	Community	2.952**	1.014 NS	0.576 NS	2.934**	6.768**
6	Income	9.114 **	7.455**	3.190 **	10.385**	6.221**
7	Occupation	3.031**	4.873 **	3.485**	3.101**	9.432**
8	Marital Status	4.097**	1.606 NS	2.907*	1.788 NS	19.026**
9	Family Type	5.455**	3.128**	5.299**	2.078*	97.369**
10	Household size	5.999**	3.120 **	3.256**	1.717 NS	19.020**
11	Earning Members	5.829**	3.291**	1.914 NS	5.838**	0.730 NS
12	Experience	10.712**	8.986**	2.899*	6.808**	9.832**

Source: Computed data

*Significant at five per cent level

**Significant at one per cent level

NS – not significant

Regarding the motivational factor on less risk, the significantly associating personal profile variables are Sex, Age, Education, Community, Income, Occupation, Marital Status, family Type, House hold size, Earning members, Ownership of farm and Experience in motivation in starting broiler farms. In case of motivational factors on profitable venture, significantly associating variables are Sex, Age, Education, Religion, Income, Occupation, family Type, House hold size, Earning members and Experience. As far as technical knowledge is concerned, all the selected profile variables except religion, community and earning members have

significant association. In case of motivational factors on 'Alternative to Agriculture', the significantly associating personal variables are sex, age, Education, religion, community, income, occupation, family type, earning members and experience. In case of 'Pride of Self Employment', the significantly associating variables are age, education, community, income, occupation, marital status, family type, household size and experience.

Summary

In the world broiler production, the production of broiler in Russian Federation showed a sizeable variation of 38.00 per cent followed by India with 31.65 per cent. The variation in USA is low which indicates that the country had consistency in broiler production during the period under study. The broiler production in Tamil Nadu continues to show an upward trend except in the year 2005 due to Avian influenza during the period under study. There was sudden increase of 12.75 per cent in 2007. 11.55 per cent in 2008 and 10.23 per cent in 2010. There are five motivating factors to start broiler farming namely Less Risks, Profitable Venture, Alternative to Agriculture, Technical Knowledge and Pride of Self-Employment.

CHAPTER IV
COST AND RETURN ANALYSIS IN INTEGRATED BROILER FARMING

INTRODUCTION

An analysis of cost components and their returns are very essential to evaluate the profitability of any enterprise. Broiler farming is an agriculture allied activity that requires infrastructure cost and maintenance cost. Hence an attempt is made in this chapter to estimate the cost of production and the return in broiler rearing in order to find whether broiler farming is profitable and viable.

BREED REARED IN THE STUDY AREA

A breed may be defined as a group of fowls related by descent. India primarily imports its grandparent stock, as Pure-line breeding is an expensive affair with sizeable R&D involved[135]. Major Purelines used in India are "ROSS", "Shaver", "Lohman" and the like with domestic breeders importing Grand Parent (GP) stock of these Purelines. Within a breed, varieties may be recognised by difference in comb, plumage, colour, beard and other features[136]. These are known as different strains of breed and worldwide the breeds of fowl number more than three hundred. There are different breeds reared in the study area, like Ross, Cobb 400 and Cobb 100. Ross has softness of flesh, less bone weight and soft in nature, good for rearing in moderate climate but not suitable for hot weather and it requires more care. Cobb breed is basically cross from country bird and hybrid strains, easy to rear in any weather condition. It tastes good and its texture is like the country bird. Table 4.1 illustrates the breed-wise number of farms selected for the study.

[135] ANJAN GOSH, L.SHIVAKUMAR, **Poultry Industry**: 'AN ICRA Perspective – Broiler Meat and Table Egg', June, 2011

[136] **Encyclopedia Americana**, Garlier International Inc., Vol.6, 1984, pp.438.

Table 4.1

BREED REARED BY THE SAMPLE RESPONDENTS IN THE STUDY AREA

S.No.	Breed Variety	Size of the Broiler Farm			
		Small	Medium	Large	Total
1.	Cobb	19 (42.22)	13 (21.67)	14 (31.11)	46 (30.67)
2.	Ross	26 (57.78)	47 (78.33)	31 (68.89)	104 (69.33)
Total		45 (100.0)	60 (100.0)	45 (100.0)	150 (100.0)

Source: Primary data

Table 4.1 shows that out of 150 sample farmers 104 (69.33%) of them had reared Ross breed chicks, whereas 46 (30.67%) of them had reared Cobb breed chicks. Hence, it may be inferred that rearing of Ross breed chicks was very popular in the study area for their inherent tendency for gaining weight in starter period, softness, taste and less wastage.

AVERAGE WEIGHT OF BROILER BIRD

A Day Old broiler Chick (DOC) takes six weeks to grow into live bird with average body weight of 1.8 to 2.3 kilograms with timeline and weight variation based on feed quality, weather conditions and general farm management for a given Pureline[137]. Weight of broiler bird is one of the production criteria to determine the cost of production. All measures are taken to increase the weight in proportion to the feed intake. Greater the weight, the more the gain would be to the farmer as well as the integrator. Size wise Average weigh of broiler birds in Theni District is presented in Table 4.2.

Table 4.2

AVERAGE WEIGHT OF BROILER BIRDS REARED BY SAMPLE RESPONDENTS

S.No.	Particulars	Size of the Broiler Farm			
		Small	Medium	Large	Overall
1.	Average Weight (in kg)	2.17	2.19	2.11	2.16

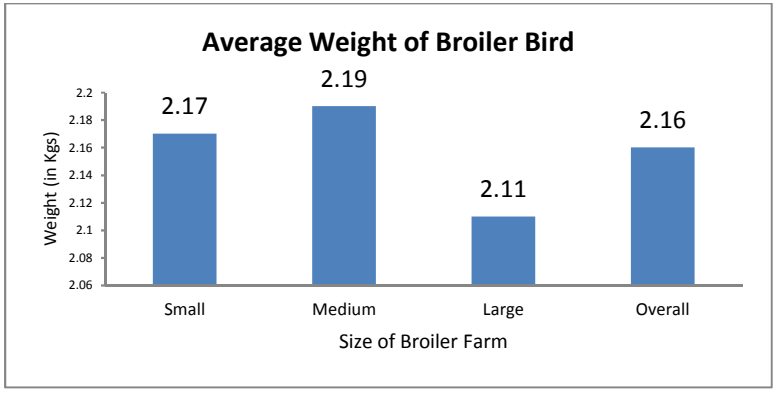
Source: Primary data

[137] ANJAN GOSH, L.SHIVAKUMAR, **Op.cit.**

The average weight was overall 2.16 kilogram per bird. In small farms it was 2.17 whereas in medium farms it was 2.19 kilogram and in large farms it was 2.11 kilograms.

The average weight gain of the broiler birds for different categories of broiler farmers are presented in Figure 4.1.

Figure 4.1



MORTALITY RATE IN INTEGRATED BROILER FARMING

Mortality rate denotes the number of mortalities that have occurred out of hundred chicks during the process of rearing. It is used as a measure of efficiency of broiler farming. Typical mortality rate in Indian farm is 8 – 10 per cent whereas in developed countries it is less than 5 per cent[138]. Early mortality has less economic effect than later mortality since birds died later would have taken more feed and consumed medicine that are necessary. Mortality rates in broiler farms throughout one year are shown in Table 4.3.

Table 4.3

ANNUAL AVERAGE MORTALITY IN BROILER FARMING

S.No.	Particulars	Size of the Broiler Farm			
		Small	Medium	Large	Overall
1	Number of Birds reared per batch	4922	7083	13886	8475.6
2	Number of Batches reared per annum	5.5	5	5	5

[138] ANJAN GOSH, L.SHIVAKUMAR, **Op.cit.**

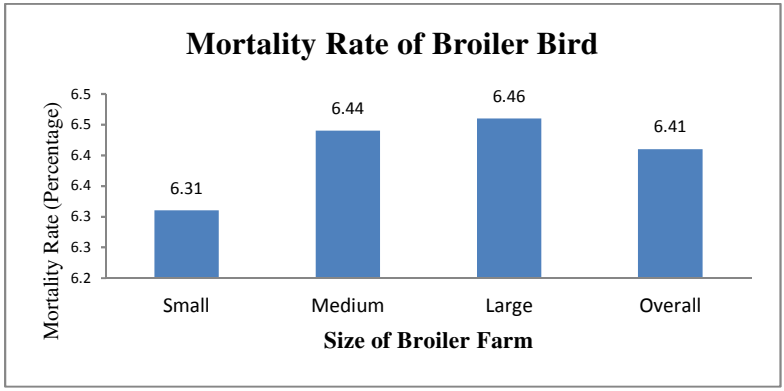
3	Total number of birds reared per annum	24610	35415	69430	42378
4	Total number of mortality per annum	1553	2281	4485	2274
5	Total number of birds alive per annum	23057	33134	64945	39654.2
	Mortality Rate	**6.31**	**6.44**	**6.46**	**6.41**

Source : Primary data

Mortality of birds is not easily controllable. It is due to disease, uneven growth and viral infection and the like. On an average out of 42378 birds reared per annum, the number of birds died was 2274 accounting for 6.41 per cent mortality rate during the period under study which is less than the rate of national average mortality. This may be due to the favourable climate, proper medical care and supervision. The mortality rate is lower among small broiler farms than medium and large scale farms. This may be due to personal attention given by the small farmers and involvement of own labour. Family labour takes better care of birds than the hired one.

The details of rate of mortality in broiler farming of different sizes of broiler farms in the study area are presented in Figure 2.2.

Figure 4.2



FEED CONVERSION RATIO

Feed Conversion Ratio (FCR) is one of technical criteria to determine the cost of production to the integrator and rearing

charge payable to the farmer. Feed conversion ratio is the relationship between the feed consumed and weight gained. Existing FCR in India is around 1.8 to 2.00 though companies strive to reduce the same through advances in Veterinary service and improved feed mix[139]. When the feed intake is more the weight gain also would proportionately increase. The feed consumption pattern varies from breed to breed, season to season and farm to farm depending upon the management of farmer and control of feed. Feed intake is converted into weight of the birds. The proportion principle sometimes may not apply due to feed wastage, other health factors and the like.

Total feed intake of the broiler birds of the sample respondents, weight gained in proportion and the rate of feed conversion are exhibited in Table 4.4.

Table 4.4

FEED CONVERSION RATIO OF INTEGRATED BROILER FARMING

S.No.	Particulars	Size of the Broiler Farm			
		Small	Medium	Large	Overall
1.	Total Weight of Chicken	50029,35	72569,26	143528,45	87095,04
2.	Total Feed Consumed in (Kg)	26193.19	38396.30	76752.94	46242.36
3.	**Feed Conversion Rate**	**1.91**	**1.89**	**1.87**	**1.89**

Source: Primary data

It is observed from Table 4.4 that the overall feed conversion ratio (FCR) in the study area is1.89. The analysis reveals that FCR is lesser in large farms constituting 1.87 than the FCR among the medium and small farms. The FCR of small farms was 1.91 which was higher than medium and large farms due to the reasons like control of feed, less feed wastage and the like.

MARKETABLE AGE

The birds are ready for commercial sale when they attain the appropriate age. The age may vary from farm to farm, breed to breed and season to season. Ideally the marketable age is the end of the sixth week. But the period varies due to differences in kinds of

[139] ANJAN GOSH, L.SHIVAKUMAR, **Op.cit.**

breeds, weight of birds, market conditions, management of the farm and the like. The marketable age is also one of the cost determining factors in broiler farming. Normally the entire lot of birds may not be lifted from the farm within a single day. Sometimes it takes more than five days to complete the farm. It depends on the size of farm and demand in the market. As age of a bird increases its feed consumption will also increase and consequently the rate of FCR will also increase which has impact on cost of production. So mean (marketable age) age may be considered as one of the important factors to determine cost of production of broiler birds. Marketable age of birds for the study period is given in Table 4.5.

Table 4.5

MARKETABLE AGE OF BROILERS UNDER INTEGRATED FARMING

S.No.	Particulars	Size of the Broiler Farm			
		Small	Medium	Large	Overall
1.	Marketable Age in days	41	42	44	42

Source: Primary data

Marketable age of birds in Small farms, medium farms and large farms are 41, 42 and 44 days respectively. Marketable age in large farms is more than small and medium farms since the large farms have more capacity and it is liquidated with demand and availability of buyer. As age of a bird increases its feed consumption will also increase and consequently the rate of feed consumption will also increase which has impact on cost of production. The overall marketable mean age of a bird in the study area is worked out to 42 days.

COST INCURRED BY THE FARMER IN BROILER FARMING

Under integration system of broiler farming, cost of production of broiler includes the cost incurred by both the broiler farmer and the integrator. The broiler farmer under integration incurs cost under various heads in rearing broiler chicken in the farms. The cost incurred by the farmer includes both fixed and variable cost. The fixed cost includes construction of shed, water and pipe line fittings, equipments and the like and the variable cost includes shed

cleaning, brooding cost, litter purchase, labour and miscellaneous cost. The detailed cost incurred by the farmer is worked out and presented in Table.4.6.

Table 4.6

ANNUAL AVERAGE COST INCURRED BY THE FARMER UNDER INTEGRATED BROILER FARMING

S.No.	Particulars	Size of the Broiler Farm			
		Small	Medium	Large	Overall
I	**Variable Cost**				
1	Shed Cleaning Cost	8722.22 (4.50)	11508.35 (4.27)	18677.80 (4.19)	12823.35 (4.28)
2	Litter Cost	18055.53 (9.32)	25058.35 (9.30)	40688.90 (9.12)	27646.67 (9.22)
3	Labour Cost	35333.37 (18.24)	46428.58 (17.23)	78569.69 (17.62)	52742.35 (17.60)
4	Brooding & Heating	12466.65 (6.43)	16841.65 (6.25)	27455.55 (6.16)	18713.32 (6.24)
5	Electricity Charges	8427.75 (4.35)	11758.29 (4.36)	18955.87 (4.25)	12918.40 (4.31)
6	Miscellaneous Expenses	15114.29 (7.80)	20371.43 (7.56)	35666.67 (8.00)	23382.86 (7.80
7	Int. on working capital	5887.19 (3.04)	7918.00 (2.94	13200.87 (2.96)	8893.62 (2.97)
8	**Total Variable Cost (1 to 7)**	**104007 (53.68)**	**139884.65 (51.92)**	**233215.35 (52.29)**	**157120.57 (52.43)**
	Fixed Cost				
9	Rental Value of land	24000 (12.39)	36000 (13.36)	60000 (13.45)	39600 (13.21)
10	Depreciation on fixed assets	22234.16 (11.47)	31213.38 (11.58)	44835.9 (10.05)	32606.37 (10.88)
11	Repairs and Maintenance	6209.56 (3.20)	8337.35 (3.09)	14608.63 (3.28)	9580.40 (3.20)
12	Interest on fixed capital	37311.1 (19.26)	53998.5 (20.04)	93322.5 (20.93)	60789.48 (20.28)
13	**Total Fixed Cost (9 to 12)**	**89754.82 (46.32)**	**129549.23 (48.08)**	**212767.03 (47.71)**	**142576.25 (47.57)**
14	**Total Cost (8 + 13)**	**193761.82 (100.00)**	**269433.88 (100.00)**	**445982.38 (100.00)**	**299696.81 (100.00)**

Source: Primary data

Figures in the parentheses are percentage to total

It could be inferred from Table 4.6 that the total cost of production of broiler chicken on an average, works out to be overall Rs.2,99,696.81 of which fixed cost is Rs.47.57 per cent and variable cost Rs.52.43 percent. However these cost are found varied among small, medium and large size farms.

Variable Cost

The overall total variable cost amounted to Rs.1,57,120.57 per annum which constituted 52.29 per cent of the total cost incurred by the farmer. In case of small farms it was Rs.1,04,007 constituting 53.68 percent whereas in medium farm it was Rs.1,39,884.65 constituting 51.92 percent and in large farms Rs.2,33,215.35 constituting 52.29 percent to the total cost. The percentage of variable cost to the total cost in integrated broiler farms was higher in small farms than medium and large farms with the cost in medium and large farms being evenly distributed.

Shed Cleaning Expense

Shed Cleaning expense is one of the important costs incurred by the farmers. The shed must be cleaned and washed with disinfectants periodically in order to ensure a healthy environment. The average cost of shed cleaning was Rs.8,722.22 per annum which constituted 4.50 per cent of the total cost incurred by the small farmer. The shed cleaning cost incurred by the large farmer was Rs.18,677.80 accounting for 4.19 per cent which is lower than small and medium farms. The reduction in cost incurred by the large farmers may be due to the economy of large scale operation.

Litter Cost

To rear chicks carefully, the floor should be soft for which litter materials like rice husk, coconut waste, coir and the like are used. The average cost of litter material amounted to Rs.27,646.67 that constituted 9.22 per cent of the total production cost. It was more in small farms with 9.32 percent than medium and large farms with 9.30 percent and 9.12 percent to the percentage of total cost respectively.

Labour Cost

Integrated broiler farmers employ two types of labour in broiler farming namely family labour and hired labour. Type of labour influences broiler production. Effective involvement and spirit of family labour result in low mortality and high weight gain of broiler birds.

Among various means of expenditure in broiler farming, the investment of human labour took the major share followed by interest on fixed capital. Cost of labour included the expenditure on cleaning of sheds, application of vaccines, catching of birds, daily tracking, watering, feeding and the like.

Cost of labour, on average was Rs.52,742.35 that constituted 17.60 per cent of the total production cost. It was lower in medium farms with 17.23 percent than small and large farms with 18.24 percent and 17.62 percent respectively and this trend is due to proper labour utilization.

Brooding and Heating

During brooding appropriate temperature should be maintained to rear chicks as healthy ones and with the optimum weight. The average cost incurred for brooding and heating amounted to Rs.18,713.32 (6.24 %). The cost was worked out for small, medium and large farms which were Rs.12,466.65 (6.43 %), Rs.16,841.65 (6.25 %) and Rs.27,455.55 (6.16 %) respectively. The percentage of brooding and heating cost to the total in small farms was higher than medium and large farms.

Electricity Charges

Electricity is being consumed in broiler farms throughout the batch. The overall cost of electricity amounted to Rs.12,918.40 that constituted 4.31 per cent to the total cost. It amounted to Rs.8,427.75 (4.35 %), Rs.11,758.29 (4.36 %) and Rs.18,955.87 (4.25%) in small, medium and large farms respectively. In medium farm, its percentage to total was higher than small and medium farm.

Miscellaneous Expenses

Apart from the regular expenses, there are some junk expenses that amounted to Rs.23,382.86 constituting 7.80 per cent of the total cost. It was worked out and the costs were Rs.35,666.67 (8.00 %), 20,371.43 (7.56 %) and 15,114.29 (7.80 %) for large, medium and small farms respectively. The percentage of miscellaneous expenses to total in large farms was higher than medium and small farms due to the mass production in large farms.

Interest on Working Capital

The interest on working capital worked out to Rs.8,893.62 that constituted 2.97 per cent of the total cost incurred by the broiler farmer. In case of small farmers, interest on working capital contributed the highest share of Rs.5,887.19 (3.04 %), followed by large farms with Rs.13,200.87 (2.96 %). It was higher in small farms than medium and large farms.

Fixed Cost

Fixed cost consisted of Rental value of land, depreciation on fixed assets, repairs and maintenance and interest accrued thereupon. Among the components of fixed cost the interest on fixed capital had highest share in all size of farms. The average fixed cost amounted to Rs. 1,42,576.25 that constituted 47.57 per cent of the total cost.

Fixed cost was Rs.89,754.82 (46.32 %) in small farms, Rs.1,29,549.23 (48.08 %) in medium farms and Rs.2,12,767.03 (47.71 %) in large farms. In medium farms, it was higher than other size of farms.

Rental Value of Land

Land should be located with easy approach roads and market centers. The average rental value of land worked out to Rs.39,600.00 that constituted 13.21 per cent to the total cost of broiler. It was Rs.24,000 (12.39 %) in small farms, Rs.36,000 (13.36 %) in medium farms and Rs.60,000 (13.45 %) in large farms. It was lower in small farms followed by medium and large farms.

Depreciation on Fixed Assets

The average depreciation on fixed assets namely broiler shed at 20 percent, equipment and pump set at 25 percent amounted to Rs.32,606.37 and the total depreciation on fixed cost constituted 10.88 per cent to the total cost. In case of medium farms it was Rs.31,213.38 (11.58 %), followed by small farms with Rs.22,234.16 (11.47 %) and large farms the depreciation cost was 44,835.9 (10.05 %). Its percentage to total was lower in large farms than medium and small farms.

Repairs and Maintenance

The average cost incurred for repairs and maintenance of fixed assets amounted to Rs.9580.40 and the percentage share of the total cost was 3.20 per cent. It was higher in large farms with Rs.14,608.63 (3.28 %), followed by small farms with Rs.6,209.56 (3.20 %) and for the medium farms the repairs and maintenance cost was Rs.8,337.35 (3.09 %).

Interest on Fixed Capital

Average Interest on fixed capital amounted to Rs.60789.48 that constituted 20.28 per cent to the total cost. Among the different sizes of the farms, large farms had highest percentage of 20.93 with Rs.93,322.50, followed by 20.04 per cent in medium farms with Rs.53,998.50 and 19.26 percent in small farms with Rs.37,311.10. It was lower in small farms due to low investment compared to the other sizes of farms.

RETURNS OF THE FARMERS IN INTEGRATED BROILER FARMING IN THENI DISTRICT

Any financial activity is undertaken with the aim of earning returns out of it. To study the feasibility of an enterprise, cost and return should be worked out. To estimate the cost incurred by the farmer under integrated broiler farming system, it is essential to analyze the return possible to the farmers under Integrated Broiler Farming System. Generally the return to the farmers may be in the form of growing charge given by the integrator, return on sale of manure and gunny bags. The integrator and farmers keenly look for the proportionate weight gain to the quantum of feed consumed by the broiler birds based on these parameters only, the growing charge to the farmers is determined. When the rate of feed consumption and gain in weight of the birds are as per standard as agreed upon by the integrator and the farmer, the growing charge will be paid. If the weight gain is not in proportion to the quantum of feed consumed, the growing charge also will be reduced based on the extent of reduction in weight of the broiler birds.

The annual average weight of chicken grown, growing charge received, income from sale of manure and gunny bags are analyzed and the results are given in Table 4.7.

Table 4.7

ANNUAL AVERAGE RETURNS OF THE FARMERS UNDER INTEGRATED BROILER FARMING

S.No	Particulars	Size of the Broiler Farm			
		Small	Medium	Large	Overall
1	Weight of Chicken grown (Kg)	50029.35	72569.26	143528.45	87095.04
2	Growing Charge per kg	**4.06**	**4.19**	**4.27**	**4.17**
3	Total Growing Charge (Rs)	203119.16	304065.20	612866.48	366421.77
4	Sale of Manure (Rs)	10357.14	15285.71	28800.00	17861.42
5	Sale of Gunny bags (Rs)	8642.86	12971.43	23100.00	14711.43
6	**Gross Return (3 + 4 + 5)**	**222119.16**	**332322.34**	**664766.48**	**398994.62**
7	Total Cost	193761.82	269433.88	445982.38	299696.81
	Net Return (6 – 7)	**28357.34**	**62888.46**	**218784.10**	**99297.82**
	Net Profit Ratio	**12.77**	**18.92**	**32.91**	**24.89**
	Return On Investment	**7.60**	**11.65**	**23.44**	**13.97**

Source: Primary data

The rate of growing charge paid by the integrator was Rs.4.17 per kilogram. It was high in large farms and was less in medium and small farms. When feed consumption and weight of the bird are up to the standard as agreed by the integrator and the farmer, the farmer will be paid as a growing charge to the maximum level. When the weight of the chicken is not proportionate to the feed consumption level, the farmer will be paid only lesser amount as growing charge. The growing charge paid by the integrator to the large farmer was computed as Rs.4.27 per kg whereas it was Rs.4.19 per kg and Rs.4.06 per kg in case of medium and small farms respectively. It implies that large farmers are more efficient than medium and small farmers in the optimum weight gain of the broiler birds.

The growing charge paid by the integrator to the farmer amounted to Rs.6,12,866.48, Rs.3,04,065.20 and Rs.2,03,119.16 in small, medium

and large farms respectively. It was higher in large farms since production cost was lower and rate of growing charge is higher. Sale of manure and gunny bags is residual income in broiler farming. They were Rs.10,357.14 and Rs.8,642.86 in small farms, Rs.15,285.71 and Rs.12,971.43 in medium farms and Rs.28800.00 and Rs,23,100 in large farms respectively.

Gross return was computed to Rs.2,22,119.16 in small farms, Rs.3,32,322.34 in medium farms and Rs.6,64,766.48 in large farms respectively. Net return was Rs.28,357.34, Rs.62,888.46 and Rs.2,18,718.10 in small, medium and large farms respectively.

In large farms, net profit ratio is highest (32.91 %), followed by medium farms (18.92 %) and small farms (12.77 %). Return on investment is highest in large farms with 23.44 percent followed by medium farms with 11.65 percent and in small farms with 7.60 percent. It ensures the existence of economies of large scale operation.

COST OF PRODUCTION OF CHICKEN UNDER INTEGRATED BROILER FARMING

The concept of integration in broiler farming is a real boon to the farmers and the integrators too. They are mutually benefited under integration scheme. Under Integrated Broiler Farming System, the farmer and the Integrator contribute something in the process of Broiler Chicken production. While the farmer incurs expenses towards shed cleaning, labour, litter cost, brooding and heating expenses and investment in Fixed Assets, the integrator incurs expenses towards Chicks, Feed, Medicine and Administrative cost. The cost incurred and the returns earned by the farmers under Integrated Broiler Farming System have already been discussed. The next step is to find out the cost of production of chicken.

The annual average cost of production of broiler chicken under Integrated Broiler Farming System is presented in Table 4.8.

TABLE 4.8
ANNUAL AVERAGE COST OF PRODUCTION OF BROILER UNDER INTEGRATED FARMING

S.No.	Particulars	Size of the Farm			
		Small	Medium	Large	Overall
I	**Variable Cost**				
1.	Chick Cost	393760.00 (14.99)	558140.40 (15.13)	1065056.20 (15.05)	660901.02 (15.06)
2.	Feed Cost	1673480.00 (63.71)	2331015.30 (63.17)	4530307.50 (64.0)	2793542.37 (63.67)
3.	Medicine Cost	28301.50 (1.08)	38640 (1.05)	59693.25 (0.81)	41854.43 (0.95)
1.	Shed Cleaning Cost	8722.22 (0.33)	11508.35 (0.31)	18677.80 (0.26)	12823.35 (0.29)
2.	Litter Cost	18055.53 (0.69)	25058.35 (0.68)	40688.90 (0.57)	27646.67 (0.63)
3.	Labour Cost	35333.37 (1.35)	46428.58 (1.26)	78569.69 (1.11)	52742.35 (1.20)
4.	Brooding & Heating	12466.65 (0.47)	16841.65 (0.46)	27455.55 (0.39)	18713.32 (0.43)
5.	Electricity Charges	8427.75 (0.32)	11758.29 (0.32)	18955.87 (0.27)	12918.40 (0.86)
6.	Miscellaneous Expenses	23160.79 (0.88)	32543.03 (0.88)	59418.30 (0.84)	37790.94 (0.86)
7.	Interest on Working Capital	132102.47 (5.03)	184316.04 (5.00)	353929.38 (5.00)	219535.97 (5.00)
8.	**Total Variable Cost**	**2333810.28 (88.85)**	**3256249.99 (88.25)**	**6252752.44 (88.34)**	**3878468.81 (88.40)**
II	**Fixed Cost**				
9.	Rental Value of land	24000 (0.91)	36000 (0.98)	60000 (0.85)	39600 (0.90)
10.	Depreciation on fixed assets	22234.16 (0.85)	31213.38 (0.85)	44835.9 (0.63)	32606.37 (0.74)
11.	Repairs and Maintenance	6209.56 (0.24)	8337.35 (0.23)	14608.63 (0.21)	9580.40 (0.22)
12.	Interest on fixed capital	37311.1 (1.42)	53998.5 (1.46)	93322.5 (1.32)	60789.48 (1.39)
13.	**Total Fixed Cost (9 to 12)**	**89754.82 (3.42)**	**129549.23 (3.51)**	**212767.03 (3.01)**	**142576.25 (3.25)**
14.	Rearing Cost	203117.74 (7.73)	304064.11 (8.24)	612864.56 (8.66)	366420.33 (8.35)
III	**Total Cost of Production**	**2626682.84 (100.00)**	**3689863.33 (100.00)**	**7078384.03 (100.00)**	**4387465.39 (100.00)**
15.	Weight of Chicken Grown	50029.00	72569.00	143528.00	87094.70
IV	**Cost per Kilograms**	**52.50**	**50.85**	**49.32**	**50.88**

Source: Primary data

Figures in parentheses indicate percentages

Variable Cost

The total variable cost amounted to Rs.3878468.81 for 150 farms. The total variable cost constituted 88.40 per cent of the total cost. It is the maximum in small size farms that constituted 88.85 per cent amounting to Rs. 2333810.28 whereas in medium and large farms it is comparatively a lesser cost.

Chick Cost

Among various components of variable costs, expenditure on chicks was the major item followed by the feed. The chick cost is prime cost in production of broiler birds that amounted to Rs.660901.02 overall constituting 15.06 per cent of the total production cost of broiler in Theni District. In small farms, it constitutes 14.99 per cent amounting to Rs.393760.00.

Feed Cost

Feed is yet another important element for the growth of chicks into birds. The rate of feed consumed is proportionately equal to the rate of weight gained. The overall feed cost is Rs.2793542.37 constituting 63.67 per cent. Feed cost is higher in large size farms constituting 64.00 than average feed cost of sample farms. The cost of feed contributed major part of the total cost of production of broiler birds.

Medicine Cost

The cost incurred for promoting growth and prevention from diseases is normally inevitable in broiler farms. The medicine cost on an average is Rs.41,854.43 constituting 0.95 per cent of the total production cost of broiler birds in Theni District. Medicine cost in small (1.08 %) and medium (1.05 %) size farms were higher than average cost. That is due to cost spread in large farms, say, any infection in any part of the farm that is treated with medicine costs much but shared to all birds so the cost would be less.

Miscellaneous Cost

Apart from the actual input cost, the integrator incurs expenses on supervisor salary. Technical supervisor visits farms daily and suggests managerial tips to the farmer. The weighment

supervisor weighs the birds on the sale. These are considered as Administrative or Miscellaneous Cost in integrated broiler farming.

Interest on Working Capital

The interest on Working Capital was Rs.2,19,535.97 in an average that constituted 5.00 per cent of the total production cost of broiler from 150 sample farms. It is higher in small farms (5.03 %) than medium and large size farms.

Fixed Cost

Fixed cost of production was highest in medium size farms with Rs.1,29,549.23 (3.51 %), followed by small farms with Rs.89,754.82 (3.42 %) and large farms with Rs.2,12,767.03 (3.01 %). Overall fixed was Rs.1,42,576.25 (11.60 %). It was more in medium and large farms than overall fixed cost.

Rental Value of Land

Rental value of land was the highest in medium size farms of Rs.36,000 (0.98 %) followed by small farms of Rs.24,000 (0.91 %) and large farms of Rs.60,000 (0.85 %). Its percentage was more in small and medium farms than overall percentage of 0.90.

Depreciation

In small and medium farms the depreciation on fixed cost constituted 0.85 percent whereas it was only 0.63 percent in large farms to the total cost of production.

Repairs and Maintenance

Repairs and maintenance was the lowest in large farms which constituted 0.21 percent followed by medium farms with 0.23 percent and small farms with 0.24 percent. Its percentage to total in small and medium farms was higher than large farms.

Interest on Fixed Capital

Interest on fixed capital was the highest in medium farms with Rs. 53,998.50 (1.46 %), followed by small farms with Rs.37,311.10 (1.42 %) and large farms with Rs.93,322.50 (1.32 %). It was higher than small and medium farms.

Rearing Cost

The integrator holds ownership of the chicks placed in the farms but the farmers are responsible for rearing it from chick stage

to bird stage. In integrated broiler farming system, the farmers are paid a charge for rearing chicks into birds by the integrator. Rearing cost is the income to the farmer and the expenditure to the integrator. To calculate the overall production cost of the broiler farms, the rearing cost is also taken into account. The overall rearing cost is 366420.33 that constituted 8.35 per cent. The rearing cost in small farms (7.73 %) is less than medium (8.24 %) and large size farms (8.66 %). Large farmers get more rearing cost.

Total Production Cost

The average overall cost of production of broiler for the sample farms in Theni District was Rs.4387465.39 for 150 sample farms that amounted to Rs.50.88 per kilo gram of broiler live bird with average weight of 87094.70 kilograms. The annual average total cost of production in case of large farms worked out to Rs.70,78,384.03 whereas it was Rs.36,89,863.33 and Rs.26,26,682.84 in case of medium and small farmers respectively. The cost of production per kilograms was Rs.49.32 in case of large farms and it was Rs.50.85 per kilograms in medium farms and Rs.52.50 in case of small size farms. The cost per kilogram is less in large size farms (Rs.49.32) due to the economy of large scale operation than small size farms (Rs.52.50) and medium size farms (Rs.50.85).

COST OF PRODUCTION PER BIRD IN BROILER FARMING

The annual average cost of production, weight of chicken grown and cost per kilogram under integrated broiler farming system have already been discussed. To have a more realistic picture on cost of production, an attempt is made to find out the cost of production per bird, weight of chicken per bird and cost per kilogram.

The variable and fixed components of total cost of production per bird are presented in Table 4.9.

Table 4.9
COST PER UNIT UNDER INTEGRATED BROILER FARMING IN THENI DISTRICT

S.No	Particulars	Size of the Broiler Farm							
		Small		Medium		Large		Overall	
		Rs.	%	Rs.	%	Rs.	%	Rs.	%
I	**Variable Cost**								
1	Chick Cost	17.08	14.99	16.84	15.12	16.4	15.05	16.78	15.06
2	Feed Cost	72.59	63.71	70.35	63.17	69.76	64.01	70.85	63.59
3	Medicine Cost	1.23	1.08	1.17	1.05	0.92	0.84	1.11	1.00
1	Shed Cleaning Cost	0.38	0.33	0.35	0.31	0.29	0.27	0.34	0.31
2	Litter Cost	0.78	0.68	0.76	0.68	0.63	0.58	0.73	0.66
3	Labour Cost	1.53	1.34	1.4	1.26	1.21	1.11	1.38	1.24
4	Brooding & Heating Cost	0.54	0.47	0.51	0.46	0.42	0.39	0.49	0.44
5	Electricity Charges	0.37	0.32	0.35	0.31	0.29	0.27	0.34	0.31
6	Miscellaneous Expenses	1.00	0.88	0.98	0.88	0.91	0.83	0.97	0.87
7	Interest on Working Capital	5.73	5.03	5.56	4.99	5.45	5.00	5.58	5.01
8	**Total Variable Cost**	**101.23**	**88.85**	**98.27**	**88.25**	**96.28**	**88.34**	**98.56**	**88.46**
II	**Fixed Cost**								
9	Rental Value of land	1.04	0.91	1.09	0.98	0.92	0.84	1.02	0.92
10	Depreciation on fixed assets	0.96	0.84	0.94	0.84	0.69	0.63	0.87	0.78
11	Repairs and Maintenance	0.27	0.24	0.25	0.22	0.22	0.20	0.25	0.22
12	Interest on fixed capital	1.62	1.42	1.63	1.46	1.44	1.32	1.57	1.41
13	**Total Fixed Cost**	**3.89**	**3.41**	**3.91**	**3.51**	**3.27**	**3.00**	**3.71**	**3.33**
14	**Total Cost before Growing Cost**	**105.12**	**92.27**	**102.18**	**91.76**	**99.55**	**91.34**	**102.27**	**91.79**
15	Growing Cost per bird	8.81	7.73	9.18	8.24	9.44	8.66	9.15	8.21
16	**Cost of Production per Bird**	**113.93**	**100.0**	**111.36**	**100.0**	**108.99**	**100.0**	**111.42**	**100.0**
17	Average Weight of Chicken grown	2.17		2.19		2.21		2.19	
18	**Cost of Production per Kg**	**52.5**		**50.85**		**49.32**		**50.89**	

Source: Primary data

It could be observed from Table 4.9 that the cost of production per bird worked out was Rs.113.93 in the case of small farms, Rs.111.36 in the case of medium farms and it was Rs.108.99 in the case of large farms.

The total variable costs were worked out which were Rs.101.23, Rs.98.27 and Rs.96.28 respectively for small, medium and large farms respectively. The overall variable cost in the study region was Rs.98.56.

The contribution of fixed cost to the total cost of production per bird was Rs.3.89 (3.41 %) for small farms, Rs.3.91 (3.51 %) for medium farms and Rs.3.27 (3.0 %) for large farms.

In the case of small farms, among the variable costs, feed cost constituted the maximum share of Rs.72.59 (63.71 %), followed by chick cost Rs.17.08 (14.99 %).

The interest on working capital, the labour cost and medicine cost were estimated to be about Rs.5.73 (5.03 %), Rs.1.53 (1.34 %) and Rs.1.23 (1.08 %) respectively.

In the case of medium farms also the maximum share of Rs.70.35 (63.17 %) was contributed by feed cost followed by chick cost Rs.16.84 (15.12 %).

The interest on working capital, the labour cost and medicine cost were estimated to be about Rs.5.56 (4.99 %), Rs.1.40 (1.26 %) and Rs.1.17 (1.05 %) respectively.

In the case of large farms, feed cost accounted the highest share of Rs.69.76 (64.01 %), followed by chick cost Rs.16.4 (15.05 %).

The expenditure on interest on working capital, labour cost and medicine cost accounted for Rs.5.45 (5.00 %), Rs.1.21 (1.11 %) and Re.0.92 (0.84 %) per bird respectively.

Among the fixed cost components, interest on capital constituted the major share of Rs.1.62 per bird in case of small farms, Rs.1.63 per bird in case of medium farms and Rs.1.44 per bird in the case of large farms.

The rental value of land accounted for the second major share on integrated broiler farms which was Rs.1.04 per bird in the case of small farms, Rs.1.09 in case of medium farms and Re.0.92 in case of large farms.

From the above analysis, it could be inferred that variable cost was more than fixed cost in all the cases. In the case of large farms the variable cost and the total cost per bird was lower than medium and large farms. It might be due to the economies of large scale operation and efficient use of resources.

FUNCTIONAL ANALYSIS

The cost and returns analysis showed that broiler farming was profitable. The question of whether there was any scope to increase the net returns per bird could be answered by analyisng the resource use efficiency. To assess the resource productivity and returns to scale in broiler farming, Cobb-Douglas type of production function has been used.

Determinants of Gross Returns and Resource-use Efficiency

The determinants of gross returns, returns to scale and resource-use efficiency were analysed using Cobb-Douglas type production function. The function in log form is as follows:

$\text{Log } y = \log b_0 + b_1 \log x_1 + b_2 \log x_2 + \ldots\ldots\ldots\ldots\ldots b_6 \log x_6 + eu$

Where,

y	:	Weight of broiler chicken in Kilograms
x_1	:	Feed Cost
x_2	:	Medicine Cost
x_3	:	Labour Cost
x_4	:	Shed Cleaning Expense
x_5	:	Litter Cost
x_6	:	Brooding and heating cost
eu	:	Error term

$b_0, b_1, \ldots,\ldots\ldots\ldots b_6$ are the parameters to be estimated

b_0	=	Regression constant
$b_1, b_2, . , b_6$	=	partial elasticity of the estimated parameters $X_1, X_2, \ldots, X_6$ respectively

In order to test the significance of the estimated parameters $b_1, b_2, \ldots., b_6,$

t-test of the following formula has been used.

$$t = \frac{b_i}{SEb_i}$$

SEb_i = Standard error of b_i

The sum of all production elasticities of factor inputs indicates returns to scale, i.e. $\sum b_i, \quad i = 1, 2 \ldots\ldots, 6$

If $\sum b_i > 1$ increasing returns to scale

If $\sum b_i < 1$ decreasing returns to scale

If $\sum b_i = 1$ constant returns to scale

Determinants of Broiler Chicken Production

The estimated results of Cobb-Douglas type production function for broiler in the case of small size farmers are presented in Table 4.10.

Table 4.10

ESTIMATED COBB-DOUGLAS TYPE PRODUCTION FUNCTION FOR SMALL SIZE FARM

S.No.	Variable	Notation	Elasticity Co-efficient	Standard Error	t- value
1	Weight of Chicken (in Kgs)	Y	---	---	---
2	Constant	b_0	2.982 **	0.548	5.44
3	Feed Cost	x_1	0.413 *	0195	2.122
4	Medicine Cost	x_2	0.233 **	0.071	3.28
5	Labour Cost	x_3	0.544 **	0.99	4.573
6	Shed Cleaning Expense	x_4	-0.028 NS	0.166	-1.689
7	Litter Cost	x_5	-0.097 NS	0.165	-0.591
8	Brooding and heating	x_6	0.168 *	0.064	2.625

Source: Primary data

Sum of elasticity co-efficient : 1.233

R^2 : 0.980

F-test : 221.861 **

**Significant at one percent level

*Significant at five percent level

NS – Not Significant

It is observed from Table 4.10 that the co-efficient of determination (R^2) of the function was 0.980 which indicates that 98.00 per cent of variation in output of broiler is explained by all the six independent variables. F-test shows that the estimated Cobb-Douglas type production function is statistically significant at one per cent level and it is valid to draw inference.

Among the independent variables, feed cost, medicine cost, labour cost and brooding and heating were found to be statistically significant.

It could be inferred that the production of broiler was significantly influenced by the level of labour utilised. One per cent increase in the level of labour cost, keeping all other factors constant, would increase the production of broiler in small size farms by 0.544 per cent from its mean level. Thus it is inferred that efficient utilization of labour contribute to the growth of weight of chicken. So the farmers may make use of more number of labourers in an efficient way to boost the weight of the chicken.

The variable medicine cost of broiler production is one of the important input costs contributing to the production of broiler. Its co-efficient was 0.233 and it was significant at one percent level, indicating that one per cent increase in medicine cost, would increase the output of broiler production in small size farms by 0.233 per cent **ceteris paribus**.

The broiler production was influenced by the value of feed utilized. The co-efficient of feed cost was 0.413 which was significant at five per cent level. This shows that one per cent increase in the cost of feed would increase in broiler production by 0.413 per cent from its mean level.

The elasticity co-efficient of the variable brooding and heating was 0.168 which indicates that by increasing the expenditure on brooding and heating by one per cent, there would be an increase in broiler production by 0.168 per cent **ceteris paribus**.

The relationship between shed cleaning expenses and litter cost to weight of chicken was negative but not statistically significant.

The estimated results of Cobb-Douglas type production function for Broiler in case of medium size farms are furnished in Table 4.11.

Table 4.11

ESTIMATED COBB-DOUGLAS TYPE PRODUCTION FUNCTION FOR MEDIUM SIZE FARM

S.No.	Variable	Notation	Elasticity Co-efficient	Standard Error	t-value
1	Weight of Chicken (in Kgs)	Y	---	---	---
1	Constant	b_0	3.736 **	0.728	5.129
2	Feed Cost	x_1	0.218 **	0.072	3.027
3	Medicine Cost	x_2	0.231 **	0.063	3.667
4	Labour Cost	x_3	0.357 **	0.073	4.890
5	Shed Cleaning Expense	x_4	0.219 NS	0.149	1.470
6	Litter Cost	x_5	-0.031 NS	0.108	0.284
7	Brooding and heating	x_6	0.216 **	0.067	3.223

Source: Primary data

Sum of Elasticity co-efficient : 1.210

R^2 : 0.980

F-test : 316.997**

**Significant at one percent level

*Significant at five percent level
NS – Not Significant

It is seen from Table 4.11 that co-efficient of determination (R^2) was 0.980 indicating that 98.0 per cent of the variation in the output of broiler could be explained by all the six variables included in the production function. The F-value indicates that the fitted Cobb-Douglas type production function was significant at one per cent level and it is valid to draw inference.

Regarding production elasticities, out of six independent variables, four measures of variables namely feed cost, medicine cost, labour cost and brooding and heating were found to be significant at one per cent level. The elasticity co-efficient for the cost of feed was 0.218 which indicates that an increase in the expenditure on feed cost by one per cent, would increase the production of broilers in medium farms by 0.218 per cent **ceteris paribus**. This implies that there was a better scope for increased use of feed to increase the production of broiler in medium size farms.

Broiler production was also significantly influenced by the level of disease protection medicine applied. The analysis indicated that every one per cent increase in the cost of medicine could increase the production of broiler in medium size farms by 0.231 per cent from its mean level.

The variable labour cost is one of the important costs contributing to the production of broiler in medium size farms. Its co-efficient was 0.357 and it was significant at one per cent level indicating that one per cent increase in the labour cost would increase the output of broiler by 0.357 per cent from mean level.

It could also be inferred that the cost of brooding and heating was significantly influenced in output of broilers. One per cent increase in the cost of brooding and heating in medium size broiler farms, would increase the output of broiler by 0.216 per cent from its mean level.

The estimated results of Cobb-Douglas type production function for broiler production in large size farms in Theni District is presented in Table 4.12.

Table 4.12

ESTIMATED COBB-DOUGLAS TYPE PRODUCTION FUNCTION FOR LARGE SIZE FARM

S.No.	Variable	Notation	Elasticity Co-efficient	Standard Error	t- value
1	Weight of Chicken (in Kgs)	Y	---	---	---
1	Constant	b_0	3.415**	0.504	6.772
2	Feed Cost	x_1	0.358*	0.125	2.864
3	Medicine Cost	x_2	0.273**	0.041	6.658
4	Labour Cost	x_3	0.414**	0.078	5.3076
5	Shed Cleaning Expense	x_4	0.073NS	0.153	1.1307
6	Litter Cost	x_5	-0.101NS	0.368	0.274
7	Brooding and heating	x_6	0.208 NS	0.192	1.083

Source: Primary data

Sum of elasticity co-efficient : 1.325

R^2 : 0.992

F-test : 547.933**

**Significant at one percent level

*Significant at five percent level

NS – Not Significant

It is observed from Table 4.12 that the co-efficient of determination (R^2) of the function was 0.992 which indicated that 99.20 per cent of variation in output of broiler in large size farms was detailed by all the six independent variables. F-test shows that the estimated Cobb-Douglas type production function was statistically significant at one per cent level.

Among the variables, feed cost, medicine cost, labour cost and brooding and heating cost of broiler production in large farms were found to be statistically significant.

It could be inferred that the production of broiler in large farms was significantly influenced by the kilograms of feed utilised. One per cent level increase in the expenditure on feed cost, keeping all other factors constant, would increase the output of broiler production by 0.358 per cent from its mean level.

The elasticity of co-efficient for the variable medicine cost was 0.273 which indicates that by increasing the expenditure on medicine by one per cent, there would be an increase in output of broiler production by 0.273 per cent, **ceteris paribus.**

The variable labour cost is one of the important costs contributing to the production of broiler in large farms. Its co-efficient was 0.414 and it was significant at one per cent level, indicating that one per cent increase in labour cost would increase broiler production by 0.414 per cent from its mean level. The variables shed cleaning expenses and litter cost is not found to be statistically significant.

In overall, the Cobb-Douglas type production function was fitted for overall sample farms and the estimates are presented in Table 4.13.

Table 4.13

ESTIMATED COBB-DOUGLAS TYPE PRODUCTION FUNCTION - OVERALL

S.No.	Variable	Notation	Elasticity Co-efficient	Standard Error	t- value
1	Weight of Chicken (in Kgs)	Y	---	---	---
1	Constant	b_0	3.451**	0.287	12.012
2	Feed Cost	x_1	0.256**	0.055	4.654
3	Medicine Cost	x_2	0.239**	0.074	3.229
4	Labour Cost	x_3	0.131**	0.044	2.981
5	Shed Cleaning Expense	x_4	-0.145^{NS}	0.079	-1.845
6	Litter Cost	x_5	-0.097^{NS}	0.060	1.623
7	Brooding and heating cost	x_6	0.204*	0.080	2.542

Source: Primary data

Sum of elasticity co-efficient : 1.251

R^2 : 0.987

F-test : 1407.952**

**Significant at one percent level

*Significant at five percent level

NS – Not Significant

It is illustrated in Table 4.13 that the co-efficient of multiple determination (R^2) of the function was 0.987 which indicated that 98.7 per cent of variation in output of broilers in Theni District was explained by all the six independent variables. F-test shows that the estimated Cobb-Douglas type production function was statistically significant at one per cent level.

The feed cost, medicine cost, labour cost and brooding and heating cost were the important factors that influence the weight gain of the broiler birds in the study area in broiler production.

It could be inferred that the production of broiler in over all farms was significantly influenced by the quantity of feed utilised. One per cent level increase in the expenditure on feed cost, keeping all other factors constant, would increase the output of broiler production by 0.256 per cent from its mean level.

The elasticity of co-efficient for the variable medicine cost was 0.239 which indicates that by increasing the expenditure on medicine by one per cent, there would be an increase in output of broiler production by 0.239 per cent, **ceteris paribus.**

The variable labour cost is one of the important costs contributing to the production of broiler. Its co-efficient was 0.131 and it was significant at one per cent level, indicating that one per cent increase in labour cost would increase broiler production by 0.131 per cent from its base level.

The broiler production was influenced by the cost of brooding and heating and one percent increase in the level of brooding and heating, **ceteris paribus**, would increase the weight of chicken by 0.204 per cent from its mean level.

The co-efficient of shed cleaning expenses and litter cost were negative but statistically not significant indicating that these two variables had no influence on broiler production.

RETURN TO SCALE

The sum of elasticities of the resources is an indicator of the return to scale. The analyses of the returns to scale for different sizes of farms were worked out and the results are presented in Table 4.14.

Table 4.14

RETURN TO SCAL OF INTEGRATED BROILER FARMING

S.No	Particulars	Sum of Elasticity of Co-efficient	Remarks
1.	Small size Farm	1.233	Increasing
2.	Medium size Farm	1.210	Increasing
3.	Large size Farm	1.325	Increasing
4.	Overall	1.251	Increasing

Source: Primary data

It is observed from Table 4.14 that the sum of the elasticities were 1.233 for small farms, 1.210 for medium farms, 1.325 for large farms and 1.251 for overall size broiler farms in the study region. The analysis reveals that the sum of elasticities was greater than unity in all categories. It implies that integrated broiler production in the study area is a viable project.

CAPITAL PRODUCTIVITY ANANLYSIS

The cost involved in integrated broiler farming is borne by both integrator and the farmer. While the integrator bears the cost of chick, medicine and feed, the farmer bears the cost of shed, cost of equipments like auto-drinker, auto-feeder, brooder, pump set, water tank and the like. So, considerable investments were made over the period of rearing. Moreover, the benefits are realized as a stream over a long period of time. Therefore, it is necessary to know the present value of the expected future income to justify the investments made. A sound appraisal technique should be used to measure the economic worth of the investment in integrated broiler farming.

In the present study the following capital budgeting techniques[140] are used to measure the economic worth of the investments in integrated broiler production.

National Bank for Agriculture and Rural Development (NABARD) considers an agricultural project which yields a return of 15 percent on its investment and above as an economically viable project[141]. Hence in this study the required rate of return is taken as 15 per cent.

Pay-Back Period

It measures the number of years required to recover the original cash outlay invested in the project. The maximum acceptable pay-back period is fixed by taking into account the reciprocal of the cost of capital. This can be termed as the cut-off

[140] MAHESWARI, S.N. **Principles of Management Accounting,** Sultan Chand & Sons, New Delhi, 1997, pp.C251-260.

[141] SHANMUGIAH, S. "An Economic Analysis of Production and Marketing of Lime in Tirunelvel District", M.Sc.,(Agri.) Dissertation submitted to Agricultural College and Research Institute, Tamil Nadu Agricultural University, Madurai, 2000.

point. Generally a project having a pay-back period of more than the cut-off point is not entertained.

Table 4.15

PAY - BACK PERIOD OF BROILER FARMING IN THENI DISTRICT

S.No.	Particulars	Pay – back Period	Cut – off Year	Remarks
1.	Small Farming	3.72 Yrs	6.67 Yrs	Viable
2.	Medium Farming	3.18 Yrs	6.67 Yrs	Viable
3.	Large Farming	2.81 Yrs	6.67 Yrs	Viable

Source: Primary data

The pay-back period computed on the basis of undiscounted cumulative value for the investment made in small farming was 3.72 years whereas in medium farming it was 3.18 years. Comparatively large farming took 2.81 years for recovering the initial investment made in broiler farming. The difference in these three broiler farms was due to more return in large and medium farming than small farming. The cut-off year at 15 per cent cost of capital is 6.67 years. The calculated pay-back period is less than the cut-off year. Hence it may be concluded that the investment in integrated broiler farming is a viable one.

Net Present Value

Net present value is found by subtracting present value of costs from the present value of returns. A project whose net present value is greater or equal to zero is considered as a worthy investment. It is the most valid technique of evaluating an investment project. It is generally consistent with the objective of maximizing wealth.

Net Present Value = Present Value of Returns – Present Value of Costs

Symbolically,

$$NPV = \sum_{t=1}^{n} \frac{B_t - C_t}{(1+i)^t}$$

Where,

n = Period of the project in years

B_t = Returns in the year 't'

C_t = Costs in the year 't'

i = Discount rate

The net present value of broiler production in the study region was computed and the results are presented in Table 4.16.

Table 4.16

NET PRESENT VALUE OF BROILER FARMING IN THENI DISTRICT

S.No.	Particulars	Net Present Value (Rupees)	Nature of NPV	Remarks
1.	Small Farming	196210.33	Positive	Acceptable
2.	Medium Farming	413132.52	Positive	Acceptable
3.	Large Farming	1033091.10	Positive	Acceptable

Source: Primary data

It is found from Table 4.16 that the net present value was positive in all size of broiler farming and it is inferred that the capacity to generate more wealth is large in broiler farming. Therefore, investment in broiler farming is economically viable and beneficial.

Internal Rate of Return

Internal Rate of Return is the rate that a project earns. It is the rate of return which equates the present value of net cash flow with initial cash outflow. Internal Rate of Return is the rate of return at which NPV is zero. It is the maximum rate of interest which an organisation can afford to pay on the capital invested in a project. If the IRR exceeds the cut-off rate (oppourtunity cost of capital) the investment is economically viable.

Symbolically,

$$IRR = \frac{\sum_{t=1}^{n} (B_t - C_t)}{(1+i)^t} = 0$$

The internal rate of return was computed for all sizes of integrated broiler farming and the results are presented in Table 4.17

TABLE 4.17

INTERNAL RATE OF RETURN OF BROILER FARMING IN THENI DISTRICT

S.No.	Particulars	Internal Rate of Return	Opportunity Cost of Capital	Remarks
1.	Small Farm	33%	15%	Viable
2.	Medium Farm	43%	15%	Viable
3.	Large Farm	53%	15%	Viable

Source: Primary data

It is seen from Table 4.17 that internal rate of return is the highest in large farm (53%), followed by Medium farm (43%) and small farm (33%) respectively. As compared to oppourtunity cost of capital (cut-off rate) which was taken as 15 percent, the rate of return on investment made in integrated broiler farming is very high. Hence, Broiler Farming in Theni District under Integrated Farming is viable in all size of farms.

Summary

The cost of production of broiler was the maximum in the category of small farmers and the minimum in the case of large farmers. The output of broiler was the maximum in the case of large farmers and whereas it is minimum in the case of small farmers. Net income was the maximum to large farmers. Production functional analysis revealed that reallocation of significant input is possible to optimize the return of income from integrated broiler farming. The analysis of capital productivity reveals that investment in broiler farming is a viable and a profitable venture.

CHAPTER V
MARKETING OF BROILERS

INTRODUCTION

Marketing of goods and services is a very essential feature in any business which transfers them from the hands of the producer to the ultimate consumers with various kinds of intermediaries operating in the process. The success of marketing of any product or service depends upon the existence of a well-developed marketing network. Broiler Farming also is not an exception to it. Marketing of broilers requires special efforts because of the peculiar characteristics of broilers. If the broilers are not disposed off as soon as they attain the stage with marketable weight, the integrators have to incur additional costs in terms of feed.

An attempt is made in this chapter to study the marketing practices, alternative channels used for broiler marketing, price-spread, marketing efficiency and problems of Integrator and price analysis. Marketing problems are analysed from the point of view of the integrators since the contract farmers have no role to play in any activity of broiler marketing.

MARKETING OF BROILERS – SYSTEMS AND PRACTICES

Marketing of broiler birds is a peculiar operation because it deals with the live-birds. Utmost care is to be taken in rearing the birds with feed, medicine, supervision and the like. In marketing of these birds, they have to be lifted in time and dispose through the easily possible Channels. Any delay or fault in the process of marketing will play havoc in terms of loss in profit, mortality, excess feed consumption and result in the broiler becoming fibrous which is usually not preferred.

Wholesalers and Commission agents are mainly involved in purchase of broiler chicken from integrators. A commission agent generally acts as an agent between integrator and wholesalers. The wholesalers purchase broilers in huge quantity from the integrators and sell it to retailers. The Broiler Co-ordination Committee (BCC), situated in Palladam, is an Association of Broiler Integrators. They

regulate the functions of the integrators and it is empowered to fix the price of the live broiler bird. All integrators are expected to follow the price declared by BCC.

5.1.1 Marketing Practices

In this section the marketing practices followed in the marketing of broilers in the study area have been discussed.

Catching of Birds

The catching of broilers is mainly undertaken by the wholesalers and at times by the integrators also. When the broilers are sold to the wholesalers, the collection work is done by the wholesalers themselves. The broilers are collected from the sheds and put them into iron meshed cages. While loading in vehicles the broiler cages are arranged row-wise by leaving sufficient space between the rows for ventilation.

Transporting

The caged broilers are transported from the farms to the stock points of the wholesalers or to the spots of retailers either by the wholesalers or by the integrators through open vans and open Lorries. The wholesalers and retailers have to take delivery of broilers from the farms at their own cost and risk. Generally broilers are not transported during the day time as there are chances for high mortality due to crowding and the heat of the sun. Hence, night time is preferred for safe transportation of birds.

Stocking

Generally the wholesaler sends the birds immediately to the retailer shops without holding them as stock for a long period.

Grading

Grading of birds at the specified stage is impossible and hence no such activity is done at the marketing level. However weak bird, generally which are few in number will be separated and sold at a lesser cost.

Price Fixation

Broiler Coordination Committee (BCC) is empowered to fix the price of the broiler. The price is fixed by the BCC every Monday and Thursday by 11.00 am according to the stock position and demand

and that price will prevail for the whole week. The members of BCC quote such prices for their broilers. The price so fixed by BCC is the farm price. The price fixed by BCC is considered as a guideline price.

Price – Cutting

Many a time such price fixed by the BCC is not strictly taken as such by all the integrators. A few integrators charge lesser price than the price declared by the BCC with a view to attract wholesalers and the retailers particularly during the period of falling prices. This practice is known as price cutting in broiler marketing.

Price Premium

Sometimes the integrator charges higher price than the one fixed by BCC particularly during the period of rising prices to avail themselves of the benefit of the high demand for broilers. This practice of charging extra price is called premium.

Dressing

Broiler industry predominantly operates as a live bird market (wet market). Converting the live broilers into the consumable chicken is called dressing. Dressing is performed in two ways namely dressing with skin and without skin depending upon the preference of the consumer.

Dressing with Skin

This type of dressing is done either by a specially designed machine or manually. It is noted that the small retailers adopt manual dressing method and only the big retailer use machines for this purposes.

Dressing without Skin

This type of dressing is performed purely on manual basis. Head, lungs and corner of the wings are cut from the slaughtered broiler and the skin with feather is removed.

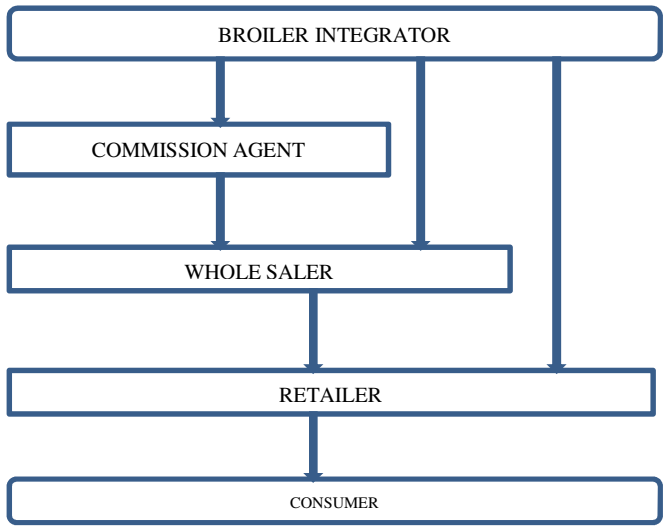
Dressing Loss

In case of with-skin dressing, the dressing loss will be 20 to 25 per cent excluding chicken liver and gizzard while in the case of without skin, the dressing loss will be one third of live weight of broilers excluding chicken liver and gizzard.

MARKETING CHANNELS

Marketing channels are sets of interdependent organisations involved in the process of making a product or service available for use or consumption[142]. Thus Marketing Channels refer to the path through which the broiler travels from the integrator to the ultimate consumer. The survey reveals that the integrator of the study area use three alternative channels for marketing their broilers.

Figure 5.1
MARKETING CHANNELS FOR BROILER CHICKEN MARKETING



The flow chart presented in figure 4.1 shows the presence of different participants in the process of marketing of broiler birds. The different marketing channels identified in the marketing of broiler chicken in the study area are presented below.

[142] LOUIS W.STERN and ADEL, I.EI.ANSARY, **Marketing Channels,** 5th Edition, Opper Saddle River, NJ Prentice Hall, UK. 1996, p.530

Channel I – Broiler Integrator – Commission Agent – Wholesaler – Retailer – Consumer.

Channel II – Broiler Integrator – Wholesaler – Retailer – Consumer.

Channel III - Broiler Integrator – Retailer – Consumer.

MARKETABLE SURPLUS

Marketable surplus is that quantity of the produce which can be made available to the non-farming population of the country. In other words marketable surplus is the estimated quantity to be marketed by the integrator after making some provisions for meeting his own family requirement, farm requirements and social and religious requirements.

All the quantity produced by the farmer will be handed over to the integrator, who in turn will sell them to the middlemen. Since there is no quantity of broiler retained in the study area the quantity produced will normally be equivalent to marketable surplus and marketed surplus.

COST OF MARKETING OF BROILERS

Marketing functions add value to the produce to be sold but they also involve costs which have ultimate impact on the profitability of the sellers. The cost involved in moving the broilers from the point of production to the point of consumption otherwise known as the cost of performing marketing functions is discussed in this section.

Marketing Cost of Integrator

In integrated broiler farming the integrators are the real owners of the birds and the farmers are mere growers. The entire responsibility of marketing of the birds lies only with the integrator. The integrators in the study area sold their broilers through different channels. While marketing the birds the integrator has to meet some expenses on heads like weighment charges, lifting of birds and supervisor salary.

The cost incurred by the integrators in marketing of 100 kilograms of broiler chicken under different channels was worked out and the results are presented in Table 5.1.

Table 5.1

MARKETING COST OF INTEGRATOR

S.No.	Particulars	Channel I		Channel II		Channel III	
		Rs / quintal	%	Rs / quintal	%	Rs / quintal	%
1.	Weighment Charges	23.54	11.78	51.23	17.16	43.56	13.83
2.	Charges for Lifting of Birds	83.29	41.69	111.12	37.22	130.16	41.32
3.	Supervisor Salary	92.95	46.53	136.21	45.62	141.28	44.85
Total		199.78	100	298.56	100	315	100

Source: Primary data

It is observed from Table 5.1 that cost incurred by the integrator in marketing of 100 kilograms of broiler chicken worked out to Rs.199.78 in channel I, Rs.298.56 in channel II and Rs.315 in Channel III.

Among the various costs in marketing of broiler in channel I, supervisors' salary had a major share of 46.53 per cent in total marketing cost followed by lifting cost with 41.69 percent. Both these items constituted 88.22 percent of the total marketing cost. Supervisor salary had a major share in channel II also. Supervisor salary accounted for 45.62 percent to the total marketing cost followed by the lifting cost with 37.22 percent.

In channel III, supervisor salary constituted a major share with Rs.141.28 per 100 kilogram accounting for 44.85 percent of the total marketing cost. The cost for lifting of birds was the second major item accounting 41.32 percent of the total marketing cost.

Marketing Cost of Retailer

The details of marketing cost incurred by the retailer in marketing of 100 kilogram of broiler chicken was worked out and the results obtained are presented in Table 5.2.

Table 5.2

COST INCURRED BY THE RETAILER IN MARKETING OF BROILER CHICKEN

S.No	Particulars	Channel I		Channel II		Channel III	
		Cost (Rs / quintal)	(%)	Cost (Rs / quintal)	(%)	Cost (Rs/ quintal)	(%)
1	Transport	-	-	-	-	542.81	27.16
2	Weight loss and Mortality	93.56	6.43	93.56	6.43	93.56	4.68
3	Establishment	50.66	3.48	50.66	3.48	50.66	2.53
4	Labour Cost	113.24	7.78	113.24	7.78	113.24	5.67
5	Dressing Wastage	1198.56	82.32	1198.56	82.32	1198.56	59.96
Total		1456.02	100	1456.02	100	1998.83	100

Source: Primary data

It is observed from Table 5.2 that cost incurred by the retailer in marketing of 100 kilograms of broiler chicken worked out to Rs.1456.02 in Channel I and Channel II and Rs.1998.83 in Channel III. The excess marketing cost Rs.542.81 in Channel III was due to additional transport cost incurred by the retailer which was more than the cost in Channel I and II.

Among different components of marketing cost incurred, dressing wastage had a major share in all the three channels. The same cost worked out to 82.32 percent each in Channel I and II and 59.96 percent in Channel III. The major cost on dressing wastage is normally due to removing feathers, skin, gizzards and the like.

Among the various costs in marketing of broiler in Channel I and II, labour cost had a second major share of 7.78 percent each in the total marketing cost followed by weight loss and mortality with 6.43 percent in each channel. The transportation cost worked out to 27.16 percent which was the second major item in Channel III followed by labour cost with 5.67 percent and weight loss and mortality with 4.68 percent.

Marketing Cost of Wholesaler

The details of marketing cost incurred by wholesaler in marketing of broiler chicken were worked out and the results obtained are furnished in Table 5.3.

Table 5.3

COST INCURRED BY THE WHOLESALER IN MARKETING OF BROILER CHICKEN

Sl. No.	Particulars	Cost (Rs / quintal)	(%)
1.	Transport	168.95	21.09
2.	Weight loss and Mortality	231.89	28.95
3.	Establishment	89.52	11.17
4.	Labour Cost	310.74	38.79
	Total	801.10	100.00

Source: Primary data

It could be observed from Table 5.6 that the total marketing cost incurred by the Wholesaler was Rs.801.10 per 100 kilogram of broiler purchase. The labour cost constituted a major share accounting for 38.79 per cent of the total marketing cost, followed by cost of weight loss and mortality with 28.95 per cent and transport including loading and unloading with 21.09 per cent. The cost on labour is high since the wholesaler engages more number of labourers than the retailer and commission agent. During transportation, the birds are more and congested and the heat rose from crowded birds which may lead to increased rate of mortality. The weight loss is due to the fact that feed is not given to birds two hours before bird catching. No feed is given from the point of feed control to reaching the wholesaler destination and thereafter only, the birds are to be fed. The cost incurred for establishment had 11.17 per cent out of total marketing cost of wholesaler.

Marketing Cost of Commission Agent

The details of marketing cost incurred by commission agent in marketing of broiler chicken were worked out and the results obtained are furnished in Table 5.4.

Table 5.4

COST INCURRED BY THE COMMISSION AGENT IN MARKETING OF BROILER CHICKEN

Sl. No.	Particulars	Cost (Rs/quintal)	%
1	Establishment Cost	129.19	64.42
2	Communication Cost	22.88	11.41
3	Staffing	48.46	24.17
Total		200.53	100.00

Source: Primary data

From Table 5.4 it could be observed that the total marketing cost incurred by the commission agent was Rs.200.53 per 100 kilograms of broiler. Among the different items of marketing cost, establishment cost was the largest item, accounting for 64.42 percent of the total marketing cost, followed by Staffing cost with 24.17 percent.

PRICE-SPREAD IN BROILER SALES

The price-spread refers to the difference between the actual price received by producers and the price paid by the consumers or margin between the farm price and the ultimate consumers' price. The study of price-spread in broiler marketing is an important aspect, since it reflects the shares of the producer and different market functionaries as well as the cost of marketing met from the price paid by the consumer. The price-spread varies depending on the number of intermediaries involved in the marketing channel. Hence more the number of intermediaries, higher are the price-spread preferred. The price-spread is one of the important factors which will have a decisive impact on the profit margin of the producers. The costs incurred and margin earned by various market intermediaries in different channels in the process of marketing of 100 kilograms of broiler in the study area are presented in Table 5.5.

Table 5.5
PRICE-SPREAD IN BROILER MARKETING

S.No.	Particulars	Channel I		Channel II		Channel III	
		Cost (Rs. / 100 Kg)	(%)	Cost (Rs. / 100 Kg)	(%)	Cost (Rs. / 100 Kg)	(%)
1.0	**Integrator**						
1.1	Net price received	6215.56	61.45	6493.89	64.20	6895.78	68.17
1.2	Marketing cost	199.78	1.98	298.56	2.95	315.00	3.11
1.3	Gross price received	6415.34	63.42	6792.45	67.15	7210.78	71.29
2.0	**Commission Agent**						
2.1	Price paid	6415.34	63.42	0.00	-	0.00	-
2.2	Marketing cost	200.53	1.98	0.00	-	0.00	-
2.3	Marketing margin	199.47	1.97	0.00	-	0.00	-
2.4	Price received	6815.34	67.38	0.00	-	0.00	-
3.0	**Wholesaler**						
3.1	Price paid	6815.34	67.38	6792.45	67.15	0.00	-
3.2	Marketing cost	801.13	7.92	801.13	7.92	0.00	-
3.3	Marketing margin	275.98	2.73	298.87	2.95	0.00	-
3.4	Price received	7892.45	78.02	7892.45	78.02	0.00	-
4.0	**Retailer**						
4.1	Price paid	7892.45	78.02	7892.45	78.02	7210.78	71.29
4.2	Marketing cost	1456.02	14.39	1456.02	14.39	1998.73	19.76
4.3	Marketing margin	766.87	7.58	766.87	7.58	905.83	8.96
5.0	**Price received/ Price Paid by Consumer**	10115.34	100.00	10115.34	100.00	10115.34	100.00

Source: Primary data

It could be observed from Table 5.5 that the producers share the price paid by the consumer was 63.42 percent in channel I, 67.15 percent in channel II and 71.29 percent in Channel III. The net share of the producer is found to be the highest in the channel III. This is due to fact that the producer directly sells his produce to the retailers. The net share of the producer is found to be the lowest in channel I because of involvement of one more intermediary between the integrator and the wholesaler that is commission agent. The commission agent earned 1.97 percent of margin while he incurred 1.98 percent of marketing cost in channel I.

The wholesalers incurred 7.92 percent of marketing cost and earned 2.73 percent of the margin in the case of channel I whereas the wholesalers earned 2.95 percent of margin in channel II. The increase

of 0.22 percent marketing margin in channel II over channel I is due to direct purchase from the integrators in channel II.

The marketing cost incurred by the retailer was found to be the largest among all intermediaries. This was due to the loss of weight of feather, skin and inner organs of chicken before sale.

The retailers incurred 14.39 percent of marketing cost in channel I and II and 19.76 per cent in channel III. The increase in marketing cost in channel III was due to additional transport cost incurred in channel III. The margin earned by the retailer was found to be the highest among all the intermediaries with 7.5 percent of consumer price in channel I & II and 8.96 percent in channel III.

Price-spread analysis shows that of all, Channel III is the best from the integrators' point of view. In broiler marketing, the stock should be cleared as early as possible since it is perishable in nature. The producer may not expect retailer all the time to sell their produce. A sustainable marketing intermediary is wholesaler, though the price paid was lesser than retailer who purchases more quantity. However the producer prefers Wholesaler marketing intermediaries. Among the three Channels, Channel III is more preferable and profitable to the integrator.

Overview of Channels with their Price-Spread

In order to identify the channel having the lowest price-spread, comparison was made among different channels and the details are presented in Table 5.6.

Table 5.6

PRICE-SPREAD UNDER DIFFERENT MARKETING CHANNELS

Sl. No.	Particulars	Channel I	Channel II	Channel III
1.	Consumers' Price	10115.34	10115.34	10115.34
2.	Producers' Price	6215.56	6493.89	6895.78
3.	Price-Spread	3899.78	3621.45	3219.56
4.	Marketing Cost	2657.46	2555.71	2313.73
5.	Marketing Margin	1242.32	1065.74	905.83

Source: Primary data

Table 5.6 reveals that price-spread in Channel III is the lowest with Rs.3219.56 per 100 kilogram of broiler because of lesser marketing cost and higher producer's price. The producer's price was the maximum in Channel III with Rs.6895.78 per 100 kilograms of broiler followed by Rs.6493.89 per 100 kilograms in Channel II. The price-spread in Channel I was the highest among all the channels because of the existence of more number of marketing intermediaries and more marketing cost.

MARKETING EFFICIENCY

Marketing efficiency refers to the effectiveness or competence with which a market structure performs its designated function. Marketing efficiency is directly related to the cost involved in moving goods from the producer to the consumer and the quantity of service offered. A reduction in marketing cost without reduction in consumer satisfaction indicates improvement in efficiency. A higher level of consumer satisfaction at higher marketing cost might have increased efficiency if the additional satisfaction derived by consumer outweighs the additional cost incurred on the marketing process. But a change that reduces cost as well as consumer satisfaction need not indicate increase in marketing efficiency. In the present study the marketing efficiency of the different channels has been studied under Shepherd's method.

Shepherd's Method

The economic efficiency of the marketing system can be measured as the ratio of the consumer price per unit of broiler chicken to the marketing cost per unit. The higher the ratio the greater is the efficiency of the marketing system.

In order to assess the marketing efficiency in the sale of broiler birds Shepherd's formula[143] of the following form is used.

$$(ME) = V / I$$

Where,

V – Value of produce sold (or) Consumer Price per unit of broiler

I – Total Marketing Cost incurred (or) Marketing Cost per unit

ME – Marketing Efficiency

The marketing efficiency of the different channels is worked out using Shepherd's Method and the results obtained are furnished in Table 5.7.

Table 5.7

MARKETING EFFICIENCY ANALYSIS USING SHEPHERD'S METHOD

S.No.	Particulars	Channel		
		I	II	III
1	Consumer Price (V) (Rs. Per 100 Kg)	10115.34	10115.34	10115.34
2	Total Marketing Cost (I) (Rs. Per 100 Kg)	2657.46	2555.71	2313.73
3	Marketing Efficiency	3.81	3.96	4.37

Source: Primary data

Table 5.7 reveals that among the three channels. Channel III is seen to be the most efficient. The efficiency index for Channel III is the maximum with 4.37, followed by Channel II with 3.96. The

[143] SHEPHERD, G.S. **Marketing Farm Products – Economic Analysis,** IOWA State University Press Ltd., USA, 1965, p.254

marketing efficiency in Channel III is higher than Channel I and II due to absence of intermediaries like wholesaler and commission Agent.

BEHAVIOUR OF BROILER PRICE

Prices are of great importance to the producers, wholesalers, retailers and the consumers. They are the prices at which goods are offered for sale by one person to another for the purchase of the same. It may be defined as "a ration of value of a given amount of commodity or service to the value of a given amount of some commodity used as money. It is a ratio of two values. Each value is determined by the supply and demand for that thing[144]."

Broiler prices do not remain constant throughout the year because of seasonal difference in production costs and changes in volume of consumption. Because of price fluctuations, integrators are not able to get remunerative prices. Further the poor storage facilities available with the integrators, the lack of their retention capacity and the perishable nature of the commodity, the behaviour of broiler prices become significant. Hence an attempt is made to analyse the pattern of the behaviour of prices of broiler over a period of time in terms of seasonal variation, secular trend, cyclical and irregular fluctuations.

The Analytical Framework

Time series analysis was carried out to study the behavior of prices of broiler chicken over a period of time. A multiplicative model[145] of the following type has been used.

$$Y = T \times C \times S \times I$$

Where,

[144] GREWAL, MAMORIA, C.B.JOSHI, R.L., **"Principles and Practice of Marketing in India".** Kitab Mahal, 15 Thozh Hill Road, Allahabad, 1987, pp. 216-219.
[145] GUPTA, S.P. **Statistical Methods**, Sultan Chand and Sons, New Delhi, 1990, pp-14.4

Y = Actual Price in Rupees per Kilogram

T = Secular Trend

C = Cyclical Variation

S = Seasonal Variation

I = Irregular Variation

In the present study, due to non-availability of monthly average price statistics over years, the components were decomposed into three categories namely secular trend, cyclical variation and irregular variation. The seasonal variation was separately analysed with ten years' monthly data.

Secular Trend

The secular trend is the basic tendency of prices to increase or decrease over a period of time. It describes the pattern of behavior which has characteristics of the series in the past. In the present study, the trend of time series of prices worked out, with linear regression equation, since the prices exhibited linear relationship with time. A trend equation fitted for the price of broiler chicken is

Y = a + bt

Where,

Y = Price of Broiler chicken rupees per Kilogram

a = Constant

b = Regression co-efficient

t = Time in years

Cyclical Variation

A careful study of cyclical variation facilitates to face recession period and to reap the benefits during booms. In the present study, the cyclical variation in annual prices of broiler chicken was studied

through moving average method. The steps involved are shown below.

Step 1 Dividing the actual average yearly price by the trend price.

Step 2 Computation of six yearly centered moving averages for the de-trended data and this formed cyclical variation.

Seasonal Variation

It is a variation which occurs with some degree of regularity within a specific period of one year or shorter. This study is useful to take policy decisions regarding purchase, Production, inventory control and the like. In the present study, the seasonal variation in the monthly average prices was studied for ten years by applying the moving average method. The steps involved are shown below.

Step I Computation of 12 months moving averages for monthly average price series of broiler chicken.

Step 2 Obtaining the percentage series of actual prices to moving average prices and arranging them by month.

Step 3 Calculating median for each month and eventually arriving at the seasonal (monthly) indices through adjustment factor.

Irregular Variation

It is the irregular movement of prices over a period of time due to random factors. In the present study, Cyclical-Irregular (CI) components were derived by dividing the actual time series with trend element since seasonal element was absent in the annual price series. This Cyclical-Irregular (CI) component was again divided by Cyclical component (C) to estimate the irregular variation.

Temporal Variation

A study on temporal variation of prices would be useful in forecasting the price movements in future. This would in turn help the producers and traders in making effective decision in production and marketing.

Broiler Coordination Committee (BCC) declares the price of chicken every day on the basis of information collected from

members as well as the demand and supply position. The committee fixes a floor price for different brands and the members are at liberty to fix a premium or discount on base price depending upon the market position.

The present study analysed the temporal variation of broiler chicken declared by BCC using yearly average prices of broiler chicken for the period from 1992 to 20011. Table 5.8 shows the trend, cyclical and irregular variations of prices of broiler chicken as announced by Broiler Co-ordination Committee, Palladam, Tamil Nadu.

Table 5.8

TREND, CYCLICAL AND IRREGULAR VARIATIONS OF PRICE OF BROILER CHICKEN IN TAMIL NADU

S. No.	Year	Actual Price (Rs. per Kg)	Trend Price (Rs. per Kg)	Index of Cyclical Variations	Index of Irregular Variations
1	1992	26.55	22.69	-	-
2	1993	27.08	23.89	-	-
3	1994	27.71	25.09	-	-
4	1995	28.63	26.28	1.09	1.19
5	1996	29.41	27.48	1.05	1.03
6	1997	34.12	28.68	0.99	1.10
7	1998	30.87	29.88	0.92	1.10
8	1999	29.02	31.07	0.86	0.78
9	2000	29.55	32.27	0.85	0.79
10	2001	29.05	33.47	0.87	0.82
11	2002	28.20	34.67	0.91	0.99
12	2003	29.48	35.86	0.94	1.23
13	2004	29.80	37.06	0.96	1.32
14	2005	33.22	38.26	0.97	0.90
15	2006	30.20	39.46	0.94	0.89
16	2007	36.11	40.65	0.90	0.81
17	2008	41.87	41.85	0.93	1.08
18	2009	48.41	43.05	-	-
19	2010	56.16	44.25	-	-
20	2011	55.93	45.44	-	-

Source: Broiler Co-ordination Committee, Palladam, Tamil Nadu.

Secular Trend

Secular Trend is the basic tendency of prices to increase or decrease over a period of time. The concept does not include short-range oscillations in prices but the steady movement over a long time. To identify the trend in prices of broiler chicken declared by BCC, Palladam, for the period from 1992 to 20011 the linear regression equation was fitted and estimated trend function was,

$$Y = \underset{(466.654)}{-2362} + \underset{(0.233)}{1.197t^{**}}$$

$$R^2 = 0.594$$

Figures in Parentheses denote standard error.

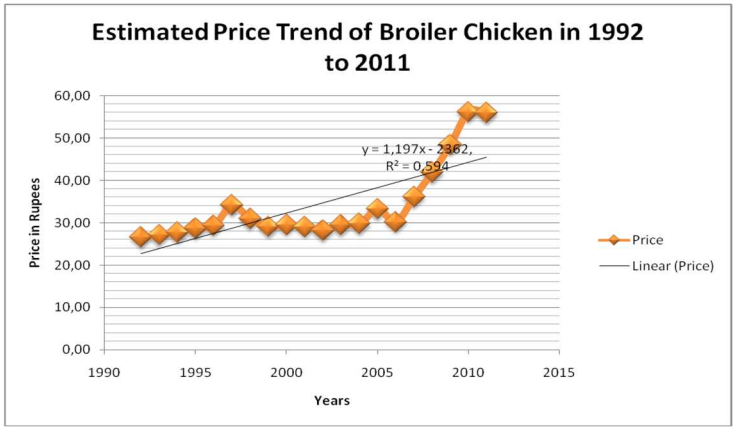
** Significant at one percent level.

It could be observed from the aforesaid function that the co-efficient of determination ($R^{2)}$ was 0.594 which indicates that 59.40 per cent of variation in the price of broiler chicken was explained by the dependent variable.

The results also show that there has been a significant increase in the price of broiler chicken over the years. The annual average price of broiler chicken per kilogram has increased at the rate of Rs.1.20 per annum.

The actual price series with the estimated trend value is presented in Table 5.8 and is plotted in Figure 5.2.

Figure 5.2
ESTIMATED PRICE TREND OF BROILER CHICKEN FROM 1992 TO 2011



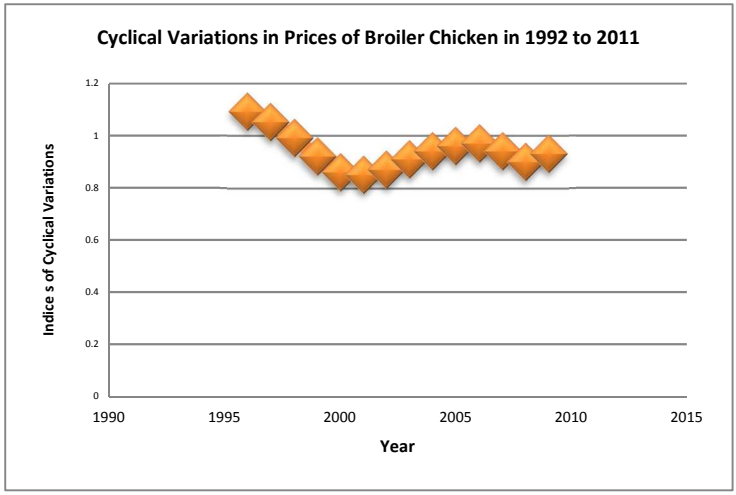
Source: Computed from data available in the office of Broiler Co-ordination Committee, Palladam, Coimbatore.

Cyclical Variation

Cyclical variation in price of broiler chicken refers to recurrent up and down movements around secular trend levels which have duration anywhere from 1 to 12 years. These cycles may or may not be periodic. This study is useful in framing suitable policies for stabilizing the price level. The cyclical variation in prices of broiler chicken is analysed by moving average method.

The results are presented in Table 5.8 and the indices of cyclical variations have been plotted in figure 5.3.

Figure 5.3
CYCLICAL VARIATIONS IN PRICE OF BROILER CHICKEN FROM 1992 TO 2011



Source: Computed from data available in the office of Broiler Co-ordination Committee, Palladam. Coimbatore.

It could be seen from Figure 5.3 that the indices of cyclical variation in the prices of broiler chicken reached the maximum in 1995 and it started declining until 1999-2000 and it started increasing and reached the peak level in 2005.

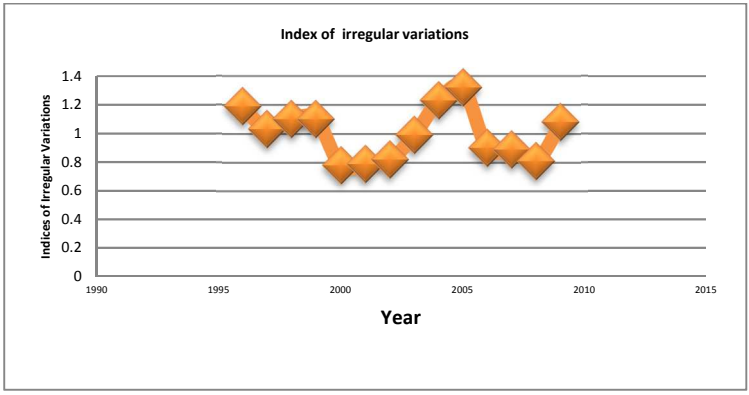
Irregular Variation

Irregular variation refers to such variations in price of broiler chicken which do not repeat themselves in a definite pattern. Irregular variation in price includes all types of variation other than the trend, seasonal and cyclical movements. Irregular variation in price is caused by certain special isolated occurrences such as sudden change in demand or rapid technological progress which may cause increase in production. By their nature these movements

are irregular and unpredictable. An analysis of irregular variation in price of Broiler chicken was carried out and the results obtained are presented in Table 5.8 and are depicted in Figure 5.4.

Figure 5.4

IRREGULAR VARIATIONS IN PRICE OF BROILER CHICKEN IN 1992 TO 2011



Source: Computed from data available in the office of Broiler Co-ordination Committee, Palladam, Coimbatore.

It could be observed from Table 5.8 that once in four years the price of broiler chicken varied much by irregular factors. The indices of irregular variations for the price of broiler chicken at Tamil Nadu market ranged from 0.78 to 1.32. Thus it is inferred from Table 5.8 that irregular variation in price of broiler chicken was seen which was variation in price of broiler chicken and this may be due to sudden changes in demand influenced by the changes in taste and buying behavior, the price of substitute, changes in relative income level and the like.

Seasonal Variation

Broiler Chicken, being a consumable product is subjected to seasonal variation in prices. Seasonal variation in the price of broiler chicken was observed within a year due to its characteristic supply. The consumption of broiler chicken varies from time to time mainly due to religious factor and the supply also varies from time to time due to changes in weather condition. During summer, the production may be comparatively less than other seasons while the demand for broiler chicken is more. Weather condition for broiler rearing during winter is highly productive while the consumption is low due to religious issues like devotees of Murugan, shakthi and Ayyappa. Hence an analysis of seasonal variation in the price of broiler chicken is pertinent.

In the present study, seasonal variations in the monthly average wholesale prices of broiler chicken are studied for ten years from 2002-03 to 2011-12 by applying 12 months moving average and the results obtained are presented in Table 5.9 and are depicted in figure 5.5.

Table 5.9

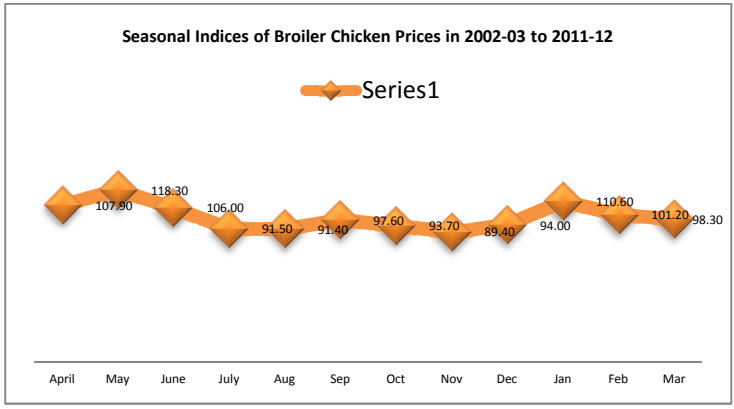
AVERAGE SEASONAL INDICES OF BROILER CHICKEN DURING 2002-03 TO 2011-12

S. No.	MONTH	SEASONAL INDEX
1.	April	107.90
2.	May	118.30
3.	June	106.00
4.	July	91.50
5.	August	91.40
6.	September	97.60
7.	October	93.70
8.	November	89.40
9.	December	94.00
10.	January	110.60
11.	February	101.20
12.	March	98.30

Source: Computed from data available in the office of Broiler Co-ordination Committee, Palladam, Coimbatore.

Table 5.9 reveals that much variation exists in the price of broiler chicken in different months of a year. It could be observed from the seasonal indices that the lower prices prevailed from July to November. This is due to religious fasting like Adi Perukku, Vinayaka Chathurthi, Ramjan, Purattasi and Margazhi months fasting. Though the prices are lower than production cost it is sold at market regularly. The highest price index in January February and April to June was due to New Year, Pongal, demi-god festivals and summer.

Figure 5.5
SEASONAL INDICES OF BROILER CHICKEN PRICES IN 2002-03 TO 2011-13



Source: Computed from data available in the office of Broiler Co-ordination Committee, Palladam, Coimbatore.

Problems in Marketing of Broiler Birds

The problems faced by the integrators in marketing of broilers were identified and they were asked to rank them in the order of importance. The problems of the integrators in the marketing of broiler chicken are analysed with the help of Garrett's Ranking Technique and the results are presented in Table 5.10.

Table 5.10

THE PROBLEM FACED BY INTEGRATOR IN MARKETING OF BROILER CHICKEN

S.No.	Problem	Rank	Mean Score
1.	Price Fluctuation	**I**	60.45
2.	Price Cutting	**II**	59.75
3.	Competition among Integrators	**III**	56.42
4.	Absence of assured Market	**IV**	50.66
5.	Inadequate transport facility	**V**	47.43
6.	Too many Middlemen	**VI**	42.63

Source: Primary data

It could be observed from Table 5.10 that price fluctuation is the major problem faced by the integrator with a mean score of 60.45. The integrators could not get right price for their produce due to price cutting that means selling the birds less than price fixed by BCC. The mean score of price cutting is the second important problem with a mean score of 59.75. There are competitions among integrators to market their broiler birds with a mean score of 56.42. The integrators could not get right price for their birds in the absence of assured market. The absence of assured market is the fourth important problem with a mean score of 50.66. There is another problem of inadequate transport facility to move the broiler birds from farm to market. It is the fifth problem of marketing of broiler birds with a mean score of 47.43. There are too many middlemen acting in the broiler marketing. They are to be paid by the integrator and ranked as sixth problem in broiler marketing with a mean score of 42.63.

SUMMARY

Price-spread analysis revealed that Channel III was the most efficient channel and the most profitable one for integrators. The overall analysis of marketing efficiency indicated that Channel III was the most efficient of all the Channels. 'Price fluctuation' was the most

important constraint in marketing of broiler birds by the integrator, followed by 'Price cutting' and 'Competition' in marketing of broiler birds in the study area.

CHAPTER VI
PROBLEMS IN INTEGRATED BROILER FARMING

INTRODUCTION

Poultry industry in Theni district has emerged as a potential economic activity with much scope for employment generation. It has been an agro-based industry which involves large number of skilled and unskilled people of rural areas. In the context of gradual decline in agricultural sector that facing serious challenges of various kinds, broiler farming is being undertaken as a prospective venture by the agriculturalists and the other entrepreneurs. The broiler meat is a health nourisher with abundant measure of amino acids and animal protein. Protein is an essential component of a balanced diet and in a country like ours, protein from animals is an affordable source for millions of the Indian people. However, the per capita consumption of broiler meat in India per annum is deplorably low which only 2.9 kg/pa when compared to people of other countries like UAE where it is high with 107 kgs /pa, 74 kgs in Pakistan and 49 kgs in the USA.

The quantum of consumption of broiler meat can be increased to a great extent among the people. And the volume of production therefore must also increase by leaps and bounds. During the recent years, many prospective broiler farms have started functioning across the length and breadth of the district and many of them are integrating in nature.

Though broiler farming is highly lucrative to the integrators and the individual entrepreneurs, the industry is not devoid of inherent problems. These problems pose challenges to the broiler farmers in various ways.

Identification and elimination of constraints in the integrated broiler farming which cause losses and poses serious problems to the

farmers will help in strengthening the integrated broiler production. The researcher has identified five constraints and tabulated them for analysis.

In order to find out the extent and magnitude of problems faced by the respondents, the researcher has measured the attitude of the broiler farmers towards the various constraints with the help of mean score.

The researcher has framed five statements to find the perception of the respondents towards various constraints faced by them which reflect on the various aspects of inputs. The respondents are asked to rate the aforesaid statements on the basis of the quantum of problems they face on a five point scale namely, Strongly Agree (SA), Agree (A), No Opinion (NO), Disagree (DA), Strongly Disagree (SDA). These scales are assigned scores in the order of 5,4,3,2 and 1 respectively.

The farmers with high perception of the statements are assigned high scores and lesser ones with scores in the descending order from 5 points. While the high scores indicate a greater measure of problems due to such constraints, the lesser scores indicate the lesser degree of problems.

In order to find out the significant difference among the three categories of farmers with regard to their perception on the aforesaid statements about the different types of constraints, the one way analysis of variance has been administered.

The following problems pose challenges to the broiler farmers in various ways.

ABSENCE OF QUALITY INPUT

The success of a broiler farm largely depends on the inputs supplied by the integrators to the broiler farmers. The essential

inputs are chicks, feed and medicines and quality of these provisions must be o cent per cent high quality. The chicks must be healthy and uniform in age and size. The feed must contain all the essential nutrients in sufficient quantity and must be pathogen free. The required medicines like vaccines must be of high quality and must be supplied in time. If there is any lacunin any of these, it will have adverse and serious effects on the broiler birds. Therefore, this constitutes a major constraint for the broiler farmers. The resulted mean score and the respective 'F' statistics are shown in table 6.1.

Table 6.1

ATTITUDE TOWARDS ABSENCE OF QUALITY INPUT

S.No.	Variable	Mean Score of Broiler Farmers				F-Statistics
		Small	Medium	Large	Overall	
1.	Supply of Uneven Chicks	3.6444	3.9000	3.9333	3.8333	1.250^{NS}
2.	Supply of LowQuality Chicks	4.0222	4.3333	4.2889	4.2267	2.812*
3.	Medicine and Vaccine are not provided in Time and Properly	3.6444	3.8167	3.7778	3.7533	0.430^{NS}
4.	Supply of low quality feed	4.0222	4.3333	4.2727	4.2215	2.905*
5.	Feed is not supplied in time	3.6444	3.8167	3.8444	3.7733	0.583^{NS}

Source: Primary data

Of the five variables pertained to the constraints faced by the broiler farmers, the large size farmers have significant perception on the factor "Supply of low quality chicks" and "Supply of low quality feed" since the mean scores are 4.2889 and 4.2215 respectively which implies that the integrator does not give guarantee for quality inputs though it is clearly stated in the agreement between the integrator and the broiler farmers. Quality of input is the important constraints for them. The small and medium categories of broiler farmers have high perception on "Supply of low

quality chicks" and "Supply of low quality feed" since the mean scores is4.0222 for small size farm and 4.3333 for medium size farms. Small and medium farmers also have low perceptions on factors 1, 3 and 5. This indicates that integrated broiler farms run with moderate quality inputs.

The significant difference among the three categories of farmers is identified regarding the perception on the two statements related to the absence of Quality, since the respective F-statistics is significant at one per cent level.

Absence of Quality Input Index (AQII) among the Broiler Farmers

The input is essential part in any business. In broiler farming inputs like chicks, feed and medicine should be worthy to have productivity. In order to know about the quantum of these constraints faced by the broiler farmers towards absence of quality input on broiler production, attitude towards Absence of Quality Input Index (AQII) among the broiler farmers was worked out for further analysis. The AQII is computed by the formula:

$$AQII = \frac{\sum_{i=1}^{n} SAQIV_i}{\sum_{i=1}^{n} MSAQIV_i} \times 100$$

Where,

AQII - Absence of Quality Input Index

SAQIV - Score on Absence of Quality Input Variables

MSAQIV - Maximum Score on Absence of Quality Input Variables

i = 1, … n - Number of (Absence of Quality Input) Variables

The distribution of the farmers on the basis of their attitude towards Absence of Quality Input Constraint is summarized in Table 6.2.

Table 6.2

ABSENCE OF QUALITY INPUT INDEX

S.No.	Index Range (Percentage)	Size of Broiler Farmers			
		Small	***Medium***	***Large***	***Total***
1.	**Less Than 25**	1(2.2)	1(1.7)	-	2(1.3)
2.	**25 – 50**	7(15.6)	3(5.0)	1(2.2)	11(7.3)
3.	**50 – 75**	11(24.4)	16(26.7)	15(33.3)	42(28.0)
4.	**75 – 100**	26(57.8)	40(66.7)	29(64.4)	95(63.3)
	Total	45(100.0)	60(100.0)	45(100.0)	150(100.0)

Source: Primary data

It is inferred from Table 6.2 that the majority 66.7 per cent of medium size farms are in the index range of 75 to 100 per cent followed by 64.4 per cent in large size farms signifying that Absence of Quality Input is a major constraint in their production. It implies that the impact of constraint Attitude towards Absence of Quality Input is high in all size farms.

LACK OF CAPITAL

Finance is as important in poultry farming as in the case of any other business activity. The integrators provide chicks, feed and medicines but the broiler farmers have to invest capital on raising sheds, fittings and spending on electricity, labour, water, cleaning and maintenance. The sheds can be used for a long period of time for the existing capacity. But when a farmer plans to expand, he requires funds to accommodate the additional bird strength. Such improvement is inevitable for successful poultry farming. Finance is considered to be the life blood of any business activity. Lack of capital will hamper the successful functioning of an organization. Therefore an attempt was made to analyse the factor 'lack of capital' in broiler industry with the help of five variables. The broiler farmers

are asked to rate these variables at five point scale according to the order of existence from very high to low. The resulted mean score and the respective 'F' statistics are shown in Table 6.3.

Table 6.3

ATTITUDE OF THE BROILER FARMERS TOWARDS LACK OF CAPITAL

S.No.	*Variable*	Mean Score of Broiler Farmers				*F-Statistics*
		Small	*Medium*	*Large*	*Overall*	
1.	Farmers are facing problems in arranging initial capital	4.0000	3.4833	3.6889	3.7000	5.020**
2.	The loan is not available easily and quickly	3.4222	3.8833	3.8444	3.7333	3.087*
3.	Rate of interest on loan from money lender is comparatively higher	3.6444	3.7833	3.7778	3.7400	0.295NS
4.	For bank loan, farmers are not able to provide collateral securities	4.0222	4.3333	4.3111	4.2333	3.024*
5.	Finance is not available for re-construction of broiler shed	3.7778	4.3000	4.2889	4.1400	7.078**

Source: Primary data

Of the five variables pertained to the level and importance of constraints, the medium farmers perceived highly of all the statements defining the constraint except 'Farmers are facing problems in arranging initial capital' with mean scores of 3.883, 3.7833, 4.3333 and 4.3000 respectively in the order of the statements presented in Table 6.16. The medium and small size farmers also perceive highly of the two constraints "the loan is not available easily and quickly" and "For bank loan, farmers are not able to provide collateral securities". With regard to the constraint on "Rate of interest on loan from money lender is comparatively higher" the small and medium categories have low perception with mean scores of 3.6444 and 3.4833 respectively whereas the large size farmers perceived highly of the statement. Perhaps the large size farmers are the main sufferers due to the constraints mentioned in the above two statements. Thus variability in the attitudes could be observed among the three categories of farmers.

The significant difference among the three categories of farmers is identified regarding the perception on the four statements related to the Lack of Capital, since the respective F-statistics is significant at 5 per cent level.

Lack of Capital Index (LCI) among the Broiler Farmers

In order to know about the quantum of these constraints stated in Table 6.3 on the broiler production,attitude towards Lack of Capital Index (LCI)among the farmers was worked out for further analysis. The LCI is computed by the formula:

$$LCI = \frac{\sum_{i=1}^{n} SLCV_i}{\sum_{i=1}^{n} MSLCV_i} \times 100$$

Where,

LCI - Lack of Capital Index

SLCV - Score on Lack of Capital Variables

MSLCV - Maximum Score on Lack of Capital Variables

i = 1, … n - Number of (Lack of Capital) Variables

The distribution of the farmers on the basis of their attitude towards LCI is summarized in Table 6.4.

Table 6.4

LACK OF CAPITAL INDEX

S.No.	Index Range (Percentage)	Size of Broiler Farmers			
		Small	Medium	Large	Total
1.	**25 – 50**	1(2.2)	4(6.7)	1(2.2)	6(4.0)
2.	**50 – 75**	21(46.7)	21(35.0)	20(44.4)	62(41.3)
3.	**75 – 100**	23(51.1)	35(58.3)	24(53.3)	82(54.7)
	Total	45(100.0)	60(100.0)	45(100.0)	150(100.0)

Source: Primary data

It is inferred from Table 6.4 that the majority of all the three categories of farmers fall in the index range of 75 to 100 per cent signifying that 'Lack of Capital' is a major constraint, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their broiler production.

DISEASES AND MORTALITY

In broiler farms, live-birds are reared in large number according to the size of the farm. Though health care measures are undertaken very carefully in the farms, the broiler birds are very much prone to be infected by epidemics like Avian-flu, RD, IBD and the like which play havoc on the broiler farms. This will result in a huge loss because, the entire lot of broiler birds will have to be destroyed and the successive batches also cannot be undertaken in the same locale. The casualty at the off spring stage may not be great. But if the growing birds after being fed with feed and administered with growth promoters and vaccines happen to die, such mortality will result in a huge loss in the farm. Therefore an attempt was made to analyse the factor 'disease and mortality' in broiler industry with the help of five variables. The broiler farmers are asked to rate these variables at five point scale according to the order of existence from very high to low. The resulted mean score and the respective 'F' statistics are shown in Table 6.5.

Table 6.5

ATTITUDE TOWARDS DISEASE AND MORTALITY

S.No.	Description	Mean Score of Broiler Farmers				F-Statistics
		Small	*Medium*	*Large*	*Overall*	
1.	Diseases	3.4667	3.9000	3.8444	3.7533	2.990*
2.	Weak chicks	3.6444	3.8667	3.9333	3.8200	1.116NS
3.	Due to predators like Dogs, Goose, etc.,	3.5333	3.9000	3.9333	3.8000	2.425NS
4.	Poor Management	3.4000	3.8833	3.8667	3.7333	3.546*
5.	Accidents and Natural Calamities	3.6444	3.8833	3.8889	3.8133	1.041NS

Source: Primary data

Of the five variables pertained to the level and importance of the constraint Disease and Mortality, the large size farmers' perceived highly on all the statements defining the constraint with the mean scores of 3.8444, 3.933, 3.933, 3.8667 and 3.8889 respectively in the order of the statements presented in Table 6.17.The medium and small farmers also perceive significantly of the constraints "Diseases" and "Poor Management". Variability also existed among the statements concerning this constraint.

The significant difference among the three categories of farmers is identified regarding the perception on the two statements related to Disease and Mortality, since the respective F-statistics is significant at 5 per cent level.

Disease and Mortality Index (DMI) among Broiler Farmers

In order to know about the quantum of these constraints stated in Table 6.17 on the broiler production, attitude towards Disease and Mortality Index (DMI) among broiler farmers was worked out for further analysis. The DMI is computed by the formula:

$$UMI = \frac{\sum_{i=1}^{n} SD\,M\,V_i}{\sum_{n} M\,S\,D\,MV_i} \times 100$$

i=1

Where,

DMI - Disease and Mortality Index

SDMV - Score on Disease and Mortality Variables

MSDMV - Maximum Score on Disease and Mortality Variables

i = 1, … n - Number of (Disease and Mortality) Variables

The distribution of the sample farmers on the basis of their attitude towards ATDMC is summarized in Table 6.6.

Table 6.6

DISEASE AND MORTALITY INDEX

S.No.	Index Range (Percentage)	Size of Broiler Farmers			
		Small	Medium	Large	Total
1.	Less Than 25	-	1(1.7)	-	1(0.7)
2.	25 – 50	10(22.2)	3(5.0)	1(2.2)	14(9.3)
3.	50 – 75	12(26.7)	15(25.0)	13(28.9)	40(26.7)
4.	75 – 100	23(51.1)	41(68.3)	31(68.9)	95(63.3)
	Total	45(100.0)	60(100.0)	45(100.0)	150(100.0)

Source: Primary data

It is inferred from Table 6.18 that the majority of all the three categories of sample farmers fall in the index range of 75 to 100 per cent signifying that 'Disease and Mortality' is a major constraint, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their broiler production. The large farmers with 28.9 percent and 26.7 percent of small farmers fall in the index range of 50 – 75 percent also share the same opinion.

LACK OF HEALTHCARE SUPPORT

Providing required poultry feed with all the essential nutrients in sufficient quantity is of foremost importance in broiler farming. The broiler birds are to be fed properly and to be taken care of regularly. The broiler birds are susceptible to environmental and seasonal infections and therefore, the farmers need to take care accordingly. The very purpose of vaccination is to protect flocks against infective diseases. Vaccines should be scientifically inoculated into the flock to

strengthen its immune system. If adequate healthcare measures are not taken by proper medical attention, sanitation and hygiene, nutritious feed both the integrator and the farmer will have to incur loss. Therefore, an attempt was made to analyse factor 'lack of healthcare support' in broiler industry with the help of five variables. The broiler farmers were asked to rate these variables at five point scale according to the order of existence from very high to low. The resulted mean score and the respective 'F' statistics are shown in Table 6.7.

Table 6.7

ATTITUDE TOWARDS LACK OF HEALTHCARE SUPPORT

S.No.	*Variable*	**Mean Score of Broiler Farmers**				*F-Statistics*
		Small	*Medium*	*Large*	*Overall*	
1.	Inadequate Supply of Vaccine and Medicine	3.5111	3.9167	3.9111	3.7933	2.552^{NS}
2.	Bio-security is not maintained in the farm	3.6444	3.8667	3.9111	3.8133	1.027^{NS}
3.	No permanent remedy for Heat stroke, IBD, RD, etc	3.5333	3.8167	3.8444	3.7400	1.411^{NS}
4.	Avian Influenza	3.8444	4.2500	4.2000	4.1133	3.833^{*}
5.	Quality of Vaccine and Medicine	3.8000	4.3167	4.2889	4.1533	7.262^{**}

Source: Primary data

Of the five statements pertained to the level and importance of the constraint 'Lack of Healthcare support', the large size farmers perceived significantly of all the statements defining the constraint with mean score of 3.9111, 3.9111, 3.8444, 4.2000 and 4.2889 respectively in the order of the statements presented in Table 6.19 whereas the small and medium size farmers had low perception on three statements namely "Bio-security is not maintained in the farm level" and "Inadequate Supply of Vaccine and Medicine" as observed from Table 6.7.

The significant difference among the three categories of farmers is identified regarding the perception on the two statements

related to Lack of Healthcare Support, since the respective F-statistics is significant at 5 per cent level.

Lack of Healthcare Support Index (LHSI) among the Broiler Farmers

In order to know about the quantum of these constraints stated in Table 6.7 on the broiler production, attitude towards Lack of Healthcare Support Index (LHS) among broiler farmers was worked out for further analysis. The LHSI is computed by the formula:

$$LHSI = \frac{\sum_{i=1}^{n} SL\ H\ S\ V_i}{\sum_{i=1}^{n} M\ S\ L\ H\ SV_i} \times 100$$

Where,

LHSI - Lack of Healthcare Support Index

SLHSV - Score on Lack of Healthcare Support Variables

MSLHSV - Maximum Score on Lack of Healthcare Support Variables

i = 1, … n - Number of (Lack of Healthcare Support) Variables

The distribution of the farmers on the basis of their attitude towards LHSI is summarized in Table 6.8.

Table 6.8

ATTITUDE TOWARDS LACK OF HEALTHCARE SUPPORT INDEX

S.No.	*Index Range (Percentage)*	Size of Broiler Farmers			
		Small	*Medium*	*Large*	*Total*
1.	**25 – 50**	5(11.1)	2(3.3)	1(2.2)	8(5.3)
2.	**50 – 75**	17(37.8)	20(33.3)	16(35.6)	53(35.3)
3.	**75 – 100**	23(51.1)	38(63.3)	28(62.2)	89(59.3)
Total		45(100.0)	60(100.0)	45(100.0)	150(100.0)

Source: Primary data

It is inferred from Table 6.8 that the majority of all the three categories of farmers fall in the index range of 75 to 100 per cent signifying that 'Lack of Healthcare Support' is a major constraint, thereby confirming the fact that almost all the statements of constraint do cause adverse impacts in their broiler production. The small farmers with 37.8 percent and the large famers with 35.6 percent being in the index range of 50-75 percent share the same opinion.

PROBLEMS RELATED TO GROWING CHARGE

Growing charge is a return for the farmers in integrated broiler farming system. The farmers work round the clock only to earn from the broiler farming. But sometimes they face problems in receiving the charge for growing the broiler birds. The rate of Growing charge is different from the Integrator to Integrator though almost all the farmers are working hard to increase the productivity. Most of the integrators are reluctant to provide any advance for meeting the operating expenses of the broiler farm out of the growing charge payment. If the final payment is delayed, the farmers cannot prepare the farm for the next batch.

In addition to farm expenses the farmers may be in need of funds for meeting their domestic and personal expenses. In such situations the farmers cannot carry on the broiler farm works enthusiastically and effectively. With such constraints, the farmers may resort to borrowing from outside. Therefore an attempt was made to analyse the factor'Problems related to Growing Charge' in broiler industry with the help of five variables. The broiler farmers were asked to rate these variables at five point scale according to the order of existence from very high to low. The resulted mean score and the respective 'F' statistics are shown in Table 6.9.

Table 6.9

ATTITUDE TOWARDS PROBLEMS RELATED TO GROWING CHARGE

S.No.	*Variable*	**Mean Score of Broiler Farmers**				*F-Statistics*
		Small	*Medium*	*Large*	*Overall*	
1.	Low rate of Growing Charge	4.0222	4.3833	4.5111	4.3133	6.495**
2.	Payment is not made in time	3.3111	2.5500	3.6667	3.1133	10.311**
3.	Difference in Growing Charge among integrators	4.4444	4.5000	4.5556	4.5000	0.258NS
4.	No advance is paid from the Growing Charge	3.6444	3.8667	3.8667	3.8000	0.814NS
5.	Power cut and high rate of Electricity Tariff	3.6444	3.7667	3.6444	3.6933	0.261NS

Source: Primary data

Of the five variables pertained to the level and importance of the constraint, problem related to growing charge, the broiler farmers of all the categories, namely small, medium and large size farmers perceive highly of the variables 'difference in growing charge among integrators' and 'Low rate of growing charge' with high mean scores, thereby agreeing to the fact that there are problems in the practice of payment of growing charge to the farmers.

The significant difference among the three categories of farmers is identified regarding the perception on the Problems related to Growing Charge, especially in Low rate of growing charge and payment is not made in time, since the respective F-statistics is significant at 5 per cent level.

Problems related to Growing Charge Index (PGCI) among the Broiler Farmers

In order to know about the quantum of these constraints stated in Table 6.9 on the broiler production, attitude towards Problems related to Growing Charge Index (PGCI) among broiler farmers was worked out for further analysis. The PGCI is computed by the formula:

$$\sum_{i=1}^{n} S\ P\ G\ C\ V_i$$

$$PGCI = \frac{\text{SPGCV}}{\sum_{i=1}^{n} \text{MSPGCV}_i} \times 100$$

Where,

PGCI - Problems related to Growing Charge Index

SPGCV - Score on Problems related to Growing Charge Variables

MSPGCV - Maximum Score on Problems related to Growing Charge Variables

i = 1, … n - Number of (Problems related to Growing Charge) Variables

The distribution of the farmers on the basis of their attitude towards PGCI is summarized in Table 6.10.

Table 6.10

PROBLEMS RELATED TO GROWING CHARGE INDEX

S.No.	*Index Range (Percentage)*	Size of Broiler Farmers			
		Small	***Medium***	***Large***	***Total***
1.	**25 – 50**	2(4.4)	1(1.7)	-	3(2.0)
2.	**50 – 75**	18(40.0)	18(30.0)	9(20.0)	45(30.0)
3.	**75 – 100**	25(55.6)	41(68.3)	36(80.0)	102(68.0)
	Total	45(100.0)	60(100.0)	45(100.0)	150(100.0)

Source: Primary data

It is inferred from Table 6.12 that the majority of the large size farmers contributing 80 percent fall in the index range of 75 to 100 per cent thereby confirming that payment of growing charge is delayed. The medium and small size farmers with 55.6 per cent and 68.3 per cent also share the same opinion but severity in their case is less as compared to the large size farmers.

OVERALL CONSTRAINTS INDEX

The overall Constraints Index (OCI) is computed by the formula:

n

$$OCI = \frac{\sum_{i=1} SOCV_i}{\sum_{i=1}^{n} MSOCV_i} \times 100$$

Where,

OCI - Overall Constraint Index

SOCV - Score on Overall Constraint Variables

MSOCV - Maximum Score on Overall Constraint Variables

i = 1,.... n - Number of (Overall) Variables

The overall broiler farming constraints were calculated and presented in Table 6.11.

Table 6.11

OVERALL CONSTRAINTS INDEX

S.No.	*Index Range (Percentage)*	**Size of Broiler Farmers**			
		Small	***Medium***	***Large***	***Total***
1.	**25 – 50**	8(17.8)	6(10.0)	3(6.8)	17(11.4)
2.	**50 – 75**	28(62.2)	41(68.3)	35(79.5)	104(69.8)
3.	**75 – 100**	9(20.0)	13(21.7)	6(13.6)	28(18.8)
	Total	45(100.0)	60(100.0)	45(100.0)	150(100.0)

Source: Primary data

The analysis of the overall index of the constraints in the integrated broiler farming in Theni District clusters shows that the majority of the small, medium and large size categories of farmers constituting 62.2, 68.3 and 79.5 per cent respectively fall in the index range of 50 – 75 per cent. The numbers of broiler farmers who are in the index range of above 50 percent constitute 88.6 percent of the total. It implies that almost all the broiler farmers are facing problems. Large size farms faced majority of constraints while the others are quite moderate in this regard.

IMPACT OF PROBLEMS ON PROFIT IN BROILER FARMING

The impact of important Production Problem in the integrated broiler farming may have its own influence on the profit

of the farms. It is highly imperative to analyse the impact of IPPs on the profit of the farms to exhibit the relative importance of each IPPs on the profit of the farms. The multiple regression analysis has been executed to analyse such impact in broiler farm in small, medium and large sizes separately. The annual average gross return of the broiler farmer is treated as dependent variable whereas production problems such as absence of quality input, lack of capital, disease and mortality, medicine support and Problems related to growing charge are taken as independent variables. The fitted regression model is

$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + eu$

Where,

Y - Gross Return of the Broiler Farmer (in rupees)

x_1 - Score on Absence of Quality Input

x_2 - Score on Lack of Capital

x_3 - Score on Disease and Mortality

x_4 - Score on Lack of Healthcare Support

x_5 - Score on Problems related to Growing Charge

$b_1, b_2, ..., b_5$ - Regression coefficient of independent variables

a - Intercept and

eu - Error term

The result of regression analysis is presented in Table 6.12.

Table6.12

IMPACT OF PROBLEMS ON PROFIT IN BROILER FARMING

S. No.	Independent Variable	Regression Co-efficient in			
		Small	Medium	Large	Overall
1.	Absence of Quality Input	0.0845^{NS}	-0.2138*	-0.2758*	-0.2043*

2.	Lack of Capital	-0.2511*	-0.1759*	-0.1964*	-0.1983*
3.	Disease and Mortality	-0.180*	-0.1342*	-0.0947*	-0.1172*
4.	Lack of HealthCare Support	-0.1660	-0.2791*	-0.2150*	-0.2072*
5.	Problems related to Growing Charge	-0.2530*	-0.2160^{NS}	-0.1883^{NS}	-0.2078^{NS}
	Constant	-1.2738	-1.758	-3.1294	-1.9816
	R^2	0.7251	0.6947	0.7652	0.7150
	F-statistics	65.380*	45.916*	72.916*	63.542

Source: Primary data

*Significantly at five per cent level.

The regression analysis for small farms reveals the R^2 value of 0.7251. This implies that 72.51 percent of variation in the gross returns of the broiler farm has been explained by all the five independent variables included in the regression model. The F-value is significant at one percent level indicating that the model is fit for analytical interpretation.

The significantly influencing Important Production Problems (IPP) on the gross returns of the Broiler Farms in small size broiler farm is Lack of Capital, Disease and Mortality and Problems related to Growing Charge, since their respective regression coefficients are significant at five per cent level. One percent increase in the perception on the above said IPPs results in a decline in profit by 0.2511, 0.180 and 0.2530 percent respectively from its mean level.

In case of medium size broiler farms, the analysis pointed out that regression co-efficient of absence of quality input, lack of capital, disease and mortality and absence of healthcare support have been negative and statistically significant. This implies that one percent increase in the above said production problems results in decrease in gross returns of the farmer by 0.2138 percent, 0.1759 percent, 0.1342 percent and 0.2791 percent respectively from the mean level. The change in perception on IPPs explains the changes in the gross returns of the medium size farms to the extent of 69.47per cent since its R^2 is 0.6947.

Among the large farmers, the significantly influencing independent variables are absence of quality input, lack of capital, disease and mortality and absence of health care support. One percent increase in the above variables will result in a decrease in gross return among large farmers by 0.2758, 0.1964, 0.0947 and 0.1883 percent respectively from its mean level. The change in perception on IPPs explains the changes in the profit of the large size farms to the extent of 76.52per cent since its Co-efficient of determination is 0.7652.

In case of broiler farming in the study area as a whole, the significantly influencing independent variables are absence of quality of input, lack of capital, disease and mortality and lack of health care support. The regression co-efficient of the said variables are negative and statistically significant. It implies that one percent increase in the said problems would decrease the gross returns of the broiler farms by 0.2043, 0.1983, 0.1172 and 0.2072 percent respectively from its mean level. The change in perception on IPPs explains the changes in the profit of the overall farms to the extent of 71.50 percent since its co-efficient of determination is 0.7150.

Association between the Profile of the Farmers and their Perception on Problems in Broiler Farming

The profile of the owners may be associated with their perception on Important Production Problems (IPP)s. In order to analyse this aspect, the included profile variables are gender, age, level of education, marital status, nature of family, family size and income score. The one way analysis of variance has been executed to analyse such association. The results are presented in Table 6.13.

Table 6.13
ASSOCIATION BETWEEN THE PROFILE OF THE FARMERS AND THEIR PERCEPTION ON PROBLEMS IN BROILER FARMING

S.No.	Profile Variable	Regression Co-efficient in				
		Absence of Quality Input	Lack of Capital	Disease and Mortality	Lack of Healthcare Support	Problems related to Growing Charge
1.	Gender	2.498*	2.165^{NS}	1.932^{NS}	1.753^{NS}	1.3395^{NS}
2.	Age	2.1325*	3.059*	2.878*	2.653*	2.638*
3.	Level of Education	2.985*	3.231*	2.475*	1.934^{NS}	2.8072*
4.	Marital Status	1.392^{NS}	1.7092^{NS}	1.0052^{NS}	2.067^{NS}	1.856^{NS}
5.	Community	0.592^{NS}	1.355^{NS}	3.7329*	0.826^{NS}	3.519*
6.	Family Size	3.128*	2.993*	2.781*	2.599*	2.902*
7.	Income	2.886*	2.409*	3.181*	2.493*	2.708*

Source: Computed data

Regarding the perception on 'Absence of Quality Input' problem, the significantly associating profile variables are gender, age, level of education, family size and income since their 'F' statistics are significant at five per cent level. In the case of perception on 'Lack of Capital' problem, the significantly associating profile variables are age, level of education, family size and income. In the case of perception on 'Disease and Mortality' the significantly associating profile variables are age, level of education, community, family size and income. In the case of perception on 'Lack of Healthcare Support', the significantly associating profile variables are age, family size and income. In the case of perception on 'Problems related to Growing Charge', the significantly associating profile variables are age, level of education, community and income since their respective 'F' statistics are significant at five per cent level.

SUGGESTIONS TO SOLVE THE PROBLEMS FACED BY THE BROILER FARMERS IN THENI DISTRICT

Any activity will naturally have some problems but at the same time there will be suitable solutions also to those problems.

Broiler farming is not an exception to it. Therefore an attempt has been made to analyse the farmers' perception on the suggestions to solve the problems faced by them.

The researcher has enlisted, twenty five suggestions given by the broiler farmers to find their perception towards each of them which reflects on the various aspects of the constraints and the possible solutions. They are bank loan to broiler farming, less rate of interest, more number of instalment for repayment, relaxation in collateral securities, subsidies for early repayment, timely vaccination, immediate diagnosis of disease and treatment, guarding the birds from predators, cleaning and sanitation, foot path to avoid disease carriage, grading weak chicks before delivery, rejection of uneven chicks on delivery, healthy and active chicks should be delivered, proper brooding and heating, timely feed supply, feeding without wastage, feed control for weight gain, subsidy for influenza, research and development by government, subsidies for natural calamities, free or reduced electricity tariff, special law for the broiler industry, increase in the rate of growing charge, advance against growing charge and prompt payment. The respondents were asked to rate the aforesaid statements on the basis of the importance of the statements on a five point scale.

The farmers with high perception of the statements are assigned high scores and the lesser ones with scores in the descending order from 5 points. While the high scores indicate the intensity of the problems and the possible solutions the lesser scores indicate the lesser degree in their intensity and importance.

In order to find out the significant difference among the three categories of farmers with regard to their perception on the aforesaid statements about the different suggestions, the one way analysis of variance has been administered. The resulted mean score of the variables and the respective 'F' statistics are presented in Table 6.14.

Table 6.14
ATTITUDE OF FARMERS TOWARDS THE SUGGESTIONS TO SOLVE THE PROBLEMS FACED IN BROILER FARMS

S.No.	Variable	Small	Medium	Large	Overall	F-Statistics
1.	Bank loan to broiler farming	3.8444	3.9167	3.5111	3.7733	2.996*
2.	Less Rate of Interest	3.8444	3.9167	3.6889	3.8267	0.956^{NS}
3.	More number of Instalment for repayment	3.9556	3.9167	3.5556	3.8200	3.415*
4.	Relaxation in Collateral securities	4.1778	4.0667	3.9333	4.0600	0.615^{NS}
5.	Subsidies for early repayment	3.9556	3.9167	3.5778	3.8267	3.032*
6.	Timely Vaccination	4.4000	4.4167	4.2667	4.3667	0.644^{NS}
7.	Immediate diagnosis of Disease and Treatment	4.5111	4.3500	4.1333	4.3333	2.972*
8.	Guarding the birds from predators	4.0889	3.9167	3.6667	3.8933	2.981*
9.	Cleaning and sanitation	4.000	4.0667	3.6444	3.9200	2.323NS
10.	Foot path to avoid disease carriage	3.8444	3.9167	3.3778	3.7333	5.891**
11.	Grading weak chicks before delivery	3.7333	3.7000	3.3111	3.5933	2.090^{NS}
12.	Rejection of Uneven chicks on delivery	3.4444	3.3333	2.9778	3.2600	2.045NS
13.	Healthy and active chicks should be delivered	3.8444	3.9167	3.6444	3.8133	1.494^{NS}
14.	Proper Brooding and Heating	3.3333	3.6000	3.2889	3.4267	1.134^{NS}
15.	Timely feed supply	3.8444	3.9167	3.4889	3.7667	3.541*
16.	Feeding without wastage	3.8444	3.8000	3.4667	3.7133	1.907^{NS}
17.	Feed control for weight gain	3.9556	3.9167	3.5556	3.8200	3.415*
18.	Subsidy for influenza	4.2222	4.0500	4.0000	4.0867	0.642^{NS}
19.	Research and Development by Government	3.9556	3.9167	3.5556	3.8200	3.217*
20.	Subsidies for Natural Calamities	3.8444	3.9167	3.7111	3.8333	0.791^{NS}
21.	Free or reduced Electricity tariff	3.6000	3.6000	3.4444	3.5533	0.368^{NS}
22.	Special law for the broiler industry	3.8444	3.9167	3.6000	3.8000	2.003^{NS}
23.	Increase in the rate of Growing Charge	4.0667	3.9167	3.6000	3.8667	3.935*
24.	Advance Growing Charge	4.0667	4.1000	3.3933	4.0400	0.542^{NS}

25.	Prompt payment	3.8444	3.9167	3.5111	3.7733	3.649*

Source: Primary data

* Significant at five percent level

The highly perceived variables among small farmers on the suggestions to solve the problems faced by the broiler farmers are immediate diagnosis of disease, timely vaccination, Research and Development by government and relaxation in collateral securities and they perceived since their mean scores are 4.5111, 4.4000, 4.222 and 4.1778 respectively.

In case of medium farmers, the highly perceived variables are timely vaccination, immediate diagnosis of disease and treatment, advance growing charge and collateral securities since their mean scores are 4.4167, 4.3500, 4.1000 and 4.0667 respectively.

The highly perceived variables among large farmers are timely vaccination, immediate diagnosis of disease and treatment, relaxation in collateral securities and research and development by government since their mean scores are 4.2667, 4.1333, 4.0600 and 4.000 respectively.

The overall perception on the suggestions to solve the problems faced by the broiler farmers are timely vaccination, immediate diagnosis of disease and treatment, research and development by government and relaxation in collateral securities since their mean scores are 4.3667, 4.3333, 4.0867 and 4.0600 respectively.

The significant difference among the three groups of broiler farmers is identified regarding 11 variables since the respective F statistics are significant at five percent level. The above-said 25 variables related to the suggestions to overcome the problems in broiler farms are taken for narration analysis with the help of factor analysis. The rotated factor matrix for the factors suggesting possible solutions to the problems faced by the broiler farmers is analysed and the details are presented in Table 6.15.

Table 6.15
ROTATED MATRIX FOR THE SUGGESTIONS TO SOLVE THE PROBLEMS FACED BY BROILER FARMERS

S.No.	Variable	Factor						
		1	2	3	4	5	6	7
1.	Bank loan to broiler farming	0.713	0.063	0.194	0.066	-0.86	0.293	0.229
2.	Less Rate of Interest	0.694	0.223	0.180	0.206	0.315	-0.141	0.24
3.	More number of Instalment for repayment	0.581	0.143	0.264	0.186	0.280	-0.003	-0.065
4.	Relaxation in Collateral securities	0.577	0.099	-0.005	0.096	0.068	0.437	0.265
5.	Subsidies for early repayment	0.556	0.438	0.046	0.279	-0.023	0.176	0.037
6.	Timely Vaccination	0.177	0.717	0.119	0.317	0.067	0.085	-0.057
7.	Immediate diagnosis of Disease and Treatment	0.032	0.665	0.034	-0.331	0.180	0.081	0.402
8.	Guarding the birds from predators	0.103	0.644	0.051	0.201	0.421	0.085	0.017
9.	Cleaning and sanitation	0.438	0.483	0.141	0.143	0.267	0.039	0.105
10.	Foot path to avoid disease carriage	0.281	0.408	0.304	0.085	0.365	-0.362	0.053
11.	Grading weak chicks before delivery	0.175	-0.058	0.742	0.126	0.166	0.257	0.045
12.	Rejection of Uneven chicks on delivery	0.030	0.227	0.719	0.264	0.240	0.001	0.197
13.	Healthy and active chicks should be delivered	0.356	0.360	0.683	0.119	-0.171	0.047	0.182
14.	Proper Brooding and Heating	0.215	-0.051	0.603	0.111	0.213	0.517	0.110
15.	Timely feed supply	-0.017	0.092	0.322	0.774	0.138	0.109	0.136
16.	Feeding without wastage	0.217	0.097	0.100	0.766	0.062	0.112	0.102
17.	Feed control for weight gain	0.336	0.167	0.072	0.684	0.106	-0.044	0.246
18.	Subsidy for influenza	0.080	0.322	0.046	0.038	0.695	0.031	0.196
19.	Research and Development by Government	0.098	0.122	0.163	0.131	0.640	0.122	0.072
20.	Subsidies for Natural Calamities	0.563	-0.092	0.117	0.004	0.601	0.198	0.106
21.	Free or reduced Electricity tariff	0.210	0.074	0.338	0.062	0.081	0.722	0.012

22.	Special law for the broiler industry	0.025	0.248	0.071	0.105	0.445	0.546	-0.010
23.	Increase in the rate of Growing Charge	-0.044	0.167	0.146	0.224	0.121	-0.082	0.762
24.	Advance Growing Charge	0.229	0.116	0.037	0.250	-0.009	0.329	0.609
25.	Prompt payment	0.311	-0.172	0.218	0.032	0.248	-0.019	0.550

Source: Primary data

The resulted factors in the attitude towards those suggestions and their respective Eigen value, percent of variation and the reliability co-efficient are illustrated in Table 6.16.

Table 6.16

THE FACTORS TO SOLVE THE PROBLEMS FACED BY THE BROILER FARMERS

S.No.	Factor	Number of Variable	Reliability Co-efficient	Eigen Value	Percent Variation
1.	Institutional Credit	5	0.783	7.973	31.89
2.	Disease Control	5	0.677	1.976	7.90
3.	Chick Quality	4	0.714	1.635	6.54
4.	Feed Management	3	0.693	1.418	5.67
5.	Government Subsidies	3	0.688	1.269	5.07
6.	Enactment of Law	2	0.723	1.163	4.65
7.	Reasonable Growing Charge	3	0.740	1.127	4.51

Source: Primary data

Kaiser-Meyer-Olkin measures of Sampling Adequacy : 0.827

Bartlett's Test of Sphericity

Chi-Square : 1682.385

Degrees of Freedom : 300

Significance : 0.000

The twenty five variables included for the analysis of the farmers attitudes towards suggestion in solving problems faced by the broiler farmers have resulted in seven important factors namely 'institutional credit', 'disease control', 'chick quality', 'feed management', 'government subsidies', 'enactment of law' and 'reasonable growing charge'.

Institutional credit is an important component in broiler farming which involves so many expenses to the farmers from the preparation of the shed up to the lifting of the birds. Most of the farmers depend on institutional credit to meet out these expenses. If such credits are made available to the farmers on hassle free and less cumbersome procedures, they can continue their broiler farming activities without interruption. But many of these institutions like banks are not always farmer friendly. This is the reason why the farmers have to depend on the local money lenders to get credit on higher rates of interest.

Diseases in broiler farms pose serious problems in broiler farming which result in huge loss on profit and discourage the farmers. Avian Flu and other diseases have become common in broiler farms. The services of the veterinary physicians must be effectively carried on to prevent and eradicate the diseases. Timely vaccination will help in preventing the onset of infections on the birds. Even healthy chicks are susceptible for many air-brone and water-brone diseases which need to be attended immediately.

Provision of healthy chicks is the major factor which ensures success in broiler farming. If weak and unhealthy chicks are provided, there will occur a higher rate of mortality which will result in huge loss to the farmers. Therefore the integrator must provide healthy and properly immunised chicks to the farmers whose prospects' largely depend on the chicks only.

Feed Management in broiler farming is an important component which has to be done with care and efficiency. Fixed quantity of feed to each bird is provided. In proportionate to it, the birds will gain weight. This is measured by feed conversion rate. The birds have to be fed judiciously as prescribed in broiler farming. Otherwise there will be large scale wastage of feed which will result in loss to the farmers.

In broiler farming the farmers meet out many kinds of expenses in these days of increasing cost for inputs and labourers, the farmers struggle to gain profit in broiler farming. In such situations the government can extend helps to the farmers by giving them subsidies like waiver of interest on institutional credit, stabilising the cost of inputs, free or lesser cost for electricity and the like. Such gestures will help the farmers sustain their broiler farming activity and get substantial profit in this venture.

In broiler farming the integrator and the farmer enter into an agreement before the commencement of the batch. If the quality of inputs provided is of lower quality and if the chicks are not healthy the farmer will have to incur loss. Therefore there should be sufficient legal provisions to get remedies in such situations through legal proceedings. Though there are general laws in force specific laws can be enacted for cases like delayed or non-payment, inferior quality of feed, weak and uneven chicks and the like.

Payment of growing charge in broiler farming is a mandatory provision agreed upon both by the integrator and the farmer. In these days of increasing cost of inputs and labourer, the farmers feel the growing charges could be increased to some extent in order to help the farmers. Prompt payment on lifting of the birds is essential to enable the farmers to continue their batches and also advance-payments to farmers will help them to carry on the broiler farm operations effectively and enthusiastically.

The above-said seven factors explain the attitude towards the suggestions to solve the problems faced by the broiler farmers to the extent of 66.23 per cent. The resulted important is 'institutional credit' and 'disease control' which consist of five variables in it since respective factor loading of the variable is higher in that factor compared to the other factors. The five variables included in 'institutional credit' and 'disease control' factors explain to the extent

of 78.30 percent and 67.70 percent respectively. The Eigen value and the percent of variation of the factor 'institutional credit' are 7.973 and 31.89 percent respectively. The Eigen value and the percent of variation of the factor 'disease control' are 1.976 and 7.90 per cent respectively.

The next important factor is the 'chick quality' factor which includes four variables with the reliability co-efficient of 0.714.The Eigen value and the percent of variation of this factor are 1.635 and 6.54 percent respectively. The other important factors in the suggestions to solve the problems faced by the broiler farmers are feed management, government subsidies and growing charge which consist of three variables in each with the reliability co-efficient of 0.693, 0.688 and 0.740 respectively. These three factors extracted from the factor analysis have the Eigen value of 1.418, 1.269 and 1.127 respectively. The three factors together explain the attitude towards the suggestions to solve the problems faced by the broiler farmers to the extent of 15.25 percent.

The other factor 'Enactment of Law' consists of two variables with reliability co-efficient, the Eigen value and percent of variation of 0.723, 1.163 and 4.65 respectively.

SUMMARY

The analysis of the overall index of the constraints in the integrated broiler farming in Theni District clusters shows that the majority of the small, medium and large size categories of farmers constituting 62.2, 68.3 and 79.5 per cent respectively fall in the index range of 50 – 75 per cent. Large size farms faced majority of constraints while the others are quite moderate in this regard. The overall perception on the suggestions to solve the problems faced by the broiler farmers are institutional credit, disease control, chick quality, feed management, government subsidies, enactment of law and reasonable growing charge.

CHAPTER VII

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

INTRODUCTION

Poultry farming, once a traditional backyard activity in Indian society in the past, has at present transformed into a large scale commercial farming. Over the years it has grown into a technology driven broiler industry helping in economic growth, employment generation and supplementing nutrition to the malnourished teaming millions of the people in India. India, today, has large and rapidly expanding poultry sector providing employment to both skilled and unskilled workers with great scope for other industries like feed industry, pharmaceutical industry, logistics, wholesalers and retailers to flourish. It contributes 2.5 per cent to GDP.

The introduction of the concept of integration in the poultry sector makes the broiler industry more attractive. This concept is both beneficial and profitable to both the integrator and broiler farmers. Under integration scheme, the farmer has to invest very less and can expect an assured income at the end of each batch. He spends only on shed, labour, water and electricity whereas the integrator provides all the essential requirements like chicks, feed, medicine and the like. With farmers today losing their hope in agriculture, they consider broiler farming as a suitable alternative for self employment and economy. Therefore broiler farming has a great potential to grow further in our country.

Theni District, the study area, is basically an agriculture oriented district where a large number of people are engaged in broiler farming. New capital formation, higher amount of direct and indirect employment oppourtunity and the like from this business activity plays a vital role in furthering economic development of this region. Integrators like Suguna Poultry Ltd., Shanthi Poultry Farm Ltd., Mani Broilers and so on are functioning in this district

helping in the establishment of small, medium and large categories of broiler farming.

However, there are inherent problems also like disease and mortality, fluctuations in price, demand and supply and the like which sometime seem to dampen the spirit of entrepreneurship among the farmers in broiler farming.

Under this backdrop, the study was undertaken in Theni district to analyse the performance of broiler farms under integration and to find out whether this venture is viable and profitable to the farmers.

In this study an attempt was made to study the broiler-farming scenario in terms of trend, growth and magnitude of variability in broiler production all over the world in general and broiler farming in India, Tamil Nadu and the Study area in particular. An attempt was also made to study the vertical integration in broiler farming and the socio-economic conditions of sample respondents in order to ascertain the cost, returns and profit in Broiler farming and to analyse the resource use efficiency in integrated broiler farming in the study area. Further, the researcher made an extensive study to evaluate marketing cost, marketing margin, price-spread and marketing efficiency of different channels to examine the temporal variations in prices of Broiler chicken and also to study the problems encountered by the farmers in integrated broiler farming for the improvement in the study area.

Both primary and secondary data were used to make analysis. Hundred and fifty samples were chosen in Theni District.

Percentages, Trend analysis, Compound Growth Rate, Co-Efficient Of Variations, Cobb-Douglas Production Function, Cost and Return analysis, Capital Productivity, Marketing cost, Price-spread, Marketing Efficiency, Discriminator Factor analysis, Problem Index and Garrett Ranking technique were used to analyse the collected data.

SUMMARY OF MAJOR FINDINGS

Vertical Integration in Broiler Farming and Socio-Economic Characteristics of Respondents

- Vertical integration with contract farming is a widely prevailing system adopted by many of the integrators in Indian Broiler Industry.
- Integrated Broiler Farming was first introduced in the state of Tamil Nadu and later on it got extended to other parts of India.
- More than 85 per cent of Poultry meat consumption in South India comes from integrated farms.
- The farmers in India generally follow more conservative practices in Broiler rearing than in those of the developed countries.
- Due to less demand for frozen broiler meat and the high cost of moving live birds to distant markets, the Integrators mostly confine to local markets.
- Foreign Direct Investment has been a minor factor in the expansion of Integrated Broiler Industry in India.

The analysis of Socio Economic Characteristics of the sample respondents in Broiler Farming in the study area reveals that

- Majority of the respondents were in the age group of 30 – 50 years.
- Vast majority of the respondents had literacy up to secondary level only
- Substantial numbers of respondents are from Hindu religion.
- Most of the respondents are belonging to Backward Community.
- Most of the respondents are married.
- With regard to annual income of respondents, the personal income of respondents in large category of farms is higher than the other categories.

- Regarding the type of family of respondents the nuclear type of family is commonly prevalent in all the small, medium and large categories.
- Most of the sample respondents in all the three categories had at least four members each in their families.
- The analysis regarding the source of motivation for the respondents to start broiler farming reveals that 'friends' was the prime source of motivation for majority of the respondents. However in the case of large farm category neighbours and Integrators were the prime sources of motivation.
- Most of the respondents had only one earning member in their family.
- With regard to occupational background of broiler farmers, the main occupation of respondents in all the three categories was agriculture and only a few were businessmen and employees.
- In the study, it was found that majority of the respondents were residing in rural area.
- With regard to the years of experience of respondents in broiler farming, the respondents with 5 – 8 years of experience category were more in number followed by respondents having 3 – 5 years experience.
- Only negligible number of respondents had the habit of maintaining broiler farm accounts.
- Supply of good quality of chick was the prime reason for selecting Integrator according to majority of the farmers. Supply of quality feed and prompt and timely payment were the least consideration.
- Suguna Poultry Farm Pvt.Ltd. was more popular among the respondents in the study area followed by Shanthi Poultry Farm India Ltd.

Broiler Farming – A Perspective

- The analysis of country-wise production of broiler indicates that USA tops in the list followed by China and Brazil. India stood at sixth place. The percentage of contribution to the world broiler production in all other countries (including India) was only in single digit.
- Analysis of trend in growth and magnitude of variability indicates that Russian Federation stood first with the compound growth rate of 13.5 per cent per annum during the study period, followed by India with the growth rate of 10.92 per cent per annum and Iran with 7.4 per cent per annum. Brazil Indonesia and China followed suit with 5.44 per cent 4.23 per cent and 3.3 per cent per annum respectively. Interestingly USA, the world's largest producer of broiler chicken experienced only 2.1 per cent growth rate per annum during the study period. However, as indicated by the co-efficient of variation, USA was more consistent in growth over the years and the variability was the highest in Russian Federation and India.
- Analysis of broiler population in India according to the 17th and 18th Livestock Census conducted by the Dept. of Animal Husbandry shows there was an annual average growth of 7.8 per cent.
- Analysis of growth of broiler production in India shows that there was an increasing trend over the study period. Throughout the country the growth rate was 10.92 per cent per annum with a magnitude of variation of 31.65 per cent.
- As far as Broiler production in Tamil Nadu is concerned, the analysis reveals that the year-wise statistics vary to a greater extent though there was an increasing trend. On an average the production increased at the rate of 7.65 per annum with a magnitude of variability of 21.78 per cent during the period under review.

- The trend analysis also indicates that broiler production was on the increase in Theni District, the study area with an annual average growth rate of 9.14 per cent which is higher than the state's average. The magnitude of variability also indicates that the growth of Broiler production is more consistent than that of the states.
- Source of finance indicates that the share of own capital and borrowed capital were 41.65 percent and 58.35 percent respectively. Out of borrowed capital, bank loan had highest of 62.94 percent in case of large farmers followed by 54.08 percent by medium farmers. It implies that the large farmers availed more bank loan than other size of farmers.
- As far as the NABARD's finance to broiler farming in Theni District is concerned, there was an average growth rate of 35.51 per cent per annum with 81.01 per cent variation during the study period.

Motivating Factors

- Factor analysis in respect of 14 variables selected for the study and grouped under five factors, indicates that the first and the foremost reason for selecting broiler farming under Integration in the study area was "lesser risk". This was followed by 'Profitable Venture', possession of 'technical knowledge' and the best 'alternative to agriculture'. The least important cause was the 'pride of self employment'.
- Regarding the personal profile of the sample respondents which had a far reaching effect on motivation to start the broiler farming, the following inferences were made.
- Religion of the respondents had no influence on 'less risk' aspect; community and marital status had no influence on the perception of 'profitable venture'; religion, community and income had less significant effect on technical knowledge; marital status played no role in respect of perception

'alternative to agriculture' and sex and religion were the insignificant variables that enhanced the motivational level.

Cost and Return Analysis

- The cost analysis reveals that the variable cost incurred by the small farmers was higher (53.68 %) when compared to medium farmers (51.92%) and large farmers (52.29%) to the total cost. Among the variable cost in all size of farms, the labour cost was the highest.
- Net returns of the farmers under integrated broiler farming in large farms was the highest (Rs.218784.10), followed by medium farmers (Rs.62888.46). In the case of small farmers, the net return was Rs.28357.34.
- Cost of production small farms was Rs.52.50 per kg which was higher than that of medium and large farms (Rs.50.85 and Rs.49.32).
- The cost and return analysis reassured that integrated broiler farming was profitable.
- To ascertain the scope for the further increase of net return per unit, resource use efficiency was analysed. Cobb-Douglas type production function was fitted to evaluate resource productivity and returns to scale in broiler farming and the results show the following;
- The relationship between yield of broiler chicken and independent variables indicated that for every one per cent increase in the level of labour used, expenditure on shed cleaning, brooding and heating and the like would increase, **ceteris paribus**, broiler production. In case of small farms, one per cent increase in the level of labour cost, keeping all other factors constant, would increase the production by 0.544 per cent from its mean level. The elasticity co-efficient of the variable brooding and heating was 0.168 which indicates that by increasing the expenditure on brooding and heating by

one per cent, there would be an increase in broiler production by 0.168 per cent from its mean level.

- In medium size farms, the variable 'labour cost' is one of the important costs contributing to the production of broiler. Its co-efficient was 0.157 and it was significant at one per cent level indicating that one per cent increase in the labour cost would increase the output of broiler by 0.157 per cent from its mean level.
- In large farms, the elasticity of co-efficient for the variable 'medicine cost' was 0.143 which indicates that by increasing the expenditure on medicine by one per cent, there would be an increase in output of broiler production by 0.143 per cent, **ceteris paribus.**
- Overall, the elasticity of co-efficient for the variable 'medicine cost' was 0.239 which indicates that by increasing the expenditure on medicine by one per cent, there would be an increase in output of broiler production by 0.239 per cent, **ceteris paribus.**
- Since the elasticity co-efficient was more than one in all size of integrated broiler farms, the return to scale remained increasing.
- Analysis of Capital Productivity showed that the payback period for broiler production project in the study area had been 3.72 years, 3.18 years and 2.81 years in small, medium and large farms respectively. At 15 per cent cost of capital, the cut-off year was 6.67 years. Since the payback period was lesser than the cut-off year, the investment in broiler farming in the study area was profitable. The net present value was also positive in small, medium and large size farms which were Rs.196210.33, Rs.413132.52 and Rs.1033091.10 respectively at 15 per cent discount rate. It indicated that the capacity to generate more wealth was larger in integrated broiler farms. The analysis revealed that broiler production in the study area

fetched an internal rate of return of 33 per cent, 43 per cent and 53 per cent in small, medium and large size farms respectively. Therefore the results of the capital productivity analysis justified the economic viability of the investment on integrated broiler production.

- The analysis also revealed that the sum of production elasticities in small, medium and large farms was 1.233, 1.210 and 1.325 respectively which indicated that there was an increasing return to scale.

Marketing of Broilers

- In the marketing arena, it has been identified that commission agent, wholesaler and retailer were the major intermediaries engaged. They formed part of three different channels to distribute the products to the ultimate consumes as shown below:

  Channel I Broiler Integrator – Commission Agent – Wholesaler – Retailer – Consumer

  Channel II Broiler Integrator – Wholesaler – Retailer – Consumer.

  Channel III Broiler Integrator –– Retailer – Consumer.

- The analysis of cost incurred by the integrator in marketing of broiler birds revealed that the marketing cost incurred in Channel I was Rs.199.78 per 100 kilogram, in Channel II it was Rs.298.56 and in Channel III it was Rs.315. The marketing cost was found cheap in Channel I because of the presence of commission agents and the marketing cost was high in Channel III since integrators supply broiler birds directly to the retailers.
- In the cost incurred by the retailers, among different components of marketing cost incurred, dressing wastage had a major share in all the three channels. The same cost worked out to 82.32 percent each in Channel I and II and 59.96 percent

in Channel III. The major cost on dressing wastage is normally due to removing feathers, skin, gizzards and the like.

- In the marketing cost incurred by wholesalers, the labour cost constituted a major share accounting for 38.79 per cent of the total marketing cost, followed by cost of weight loss and mortality with 28.95 per cent and transport including loading and unloading with 21.09 per cent. The cost on labour is high since the wholesaler engages more number of labourers than the retailer and commission agent.
- The marketing cost incurred by commission agents was Rs.200.53 per 100 kilograms of broiler. Among the different items of marketing cost, establishment cost was the largest item, accounting for 64.42 percent of the total marketing cost, followed by Staffing cost with 24.17 percent.
- Price spread analysis in the market revealed that the producers share the price paid by the consumer at 63.42 percent in channel I, 67.15 percent in channel II and 71.29 percent in Channel III. The net share of the producer is found to be the highest in the Channel III. This is due to fact that the producer directly sells his produce to the retailers. The net share of the producer is found to be the lowest in channel I because of involvement of one more intermediary between the integrator and the wholesaler that is commission agent. The commission agent earned 1.97 percent of margin while he incurred 1.98 percent of marketing cost in Channel I. The wholesalers incurred 7.92 percent of marketing cost and earned 2.73 percent of the margin in the case of Channel I whereas the wholesalers earned 2.95 percent of margin in Channel II. The increase of 0.22 percent marketing margin in Channel II over Channel I is due to direct purchase from the integrators in Channel II.
- The price of broiler chicken always depends on the demand and supply position. As the demand and consumption pattern

varies from time to time, the price also fluctuates in the market.

- Secular trend analysis of the prices that prevailed in Tamil Nadu market over the years showed that there had been a significant increase in the price of broiler chicken. The annual average price of broiler chicken per kilogram increased at the rate of Rs.1.20 per annum. The result of cyclical variation indicated that there were recurrent up and down movements around secular trend levels.
- The indices of irregular variations for the price of broiler chicken at Tamil Nadu market ranged from 0.81 to 1.32 which may be due to sudden changes in demand influenced by the changes in taste and buying behaviour, the price of substitute changes in relative income level and the like.
- Analysis of seasonal variation of broiler chicken price during a short period exhibited that lower prices prevailed from the month of July to December and March due to religious fasting like Sravan, Adi, Puratasi, Sabarimalai season and the like.
- The analysis of the most crucial problems faced by the integrators in marketing of broiler chicken with the help of Garrett's ranking technique showed that price fluctuation is the major problem faced by the integrator with a mean score of 60.45. The integrators could not get right price for their produce due to price cutting. The mean score of price cutting is the second important problem with a mean score of 59.75. There are competitions among integrators to market their broiler birds with a mean score of 56.42. The integrators could not get right price for their birds in the absence of assured market. The absence of assured market is the fourth important problem with a mean score of 50.66. There is another problem of inadequate transport facility to move the broiler birds from farm to market. It is the fifth problem of marketing of broiler birds with a mean score of 47.43. There are too many

middlemen acting in the process of broiler marketing. They are to be paid by integrators and it ranked as the sixth problem in broiler marketing with a mean score of 42.63.

Problem in Broiler Production

- The problem and its impacts on profit were analysed with constraints such as Absence of Quality input, Lack of Capital, Disease and Mortality, Lack of healthcare support and Delayed Payment of Growing Charge. The analysis of the overall index of the constraints in the integrated broiler farming in Theni District shows that the majority of the small, medium and large size categories of farmers constituting 62.2, 68.3 and 79.5 percent respectively faced most of the problems and fall in the index range of 50 – 75 percent which is above the satisfactory level. Large size farms faced majority of the aforementioned constraints while the others faced these problems is varying degrees of importance.
- Analysis of factors that pose challenges in attaining the optimum profit by the sample farmers reveals that regarding the perception on 'Absence of Quality Input' problem, the significantly associating profile variables are gender, age, level of education, family size and income since their 'F' statistics are significant at five per cent level. In the case of perception on 'Lack of Capital' problem, the significantly associating profile variables are age, level of education, family size, income. In the case of perception on 'Disease and Mortality' the significantly associating profile variables are age, level of education, community, family size and income. In the case of perception on 'Lack of Healthcare Support', the significantly associating profile variables are age, family size and income. In the case of perception on 'Problems on Growing Charge', the significantly associating profile variables are age, level of education, community and income since their respective 'F' statistics are significant at five per cent level.

- Analysis of suggestions that solve the problems faced by the broiler farmers are institutional credit, disease control, chick quality, feed management, government subsidies, enactment of law and reasonable growing charge.

SUGGESTIONS

1. For the sustenance of the integrated broiler farming the interests of the contract farmers must be protected. The widely prevalent problem among the broiler contract farmers is the payment of lesser rate of growing charges. This problem may be addressed effectively by strengthening the bargaining power of the association of farmers. Large farmers may take the lead role in this respect.
2. To ensure cent percent survival of the broiler birds and to reduce the rate of mortality well-bred chicks only must be supplied to the contract farmers. And the feed supplied for the birds to the farmers also must be sufficiently nutritive to ensure the expected and the optimum growth of the broiler birds.
3. Time is an important factor in the successful functioning of the broiler farms. Supply of feed, lifting of grown-up birds and the payments due to the farmers must be done sufficiently in time.
4. Poultry farming is a successful venture both in terms of entrepreneurship and nutrition. Realising the importance of this industry, steps must be taken to start broiler farming in almost all the districts of the state so as to make broiler meat easily available supplement as nutrition and enabling the thousands of people of the farming community to get employment in this sector. It also provides employment to the traders, feed suppliers, logistic networks and hatchery owners with sizeable profits.
5. Since poultry farming is an allied agricultural activity, the State Government must offer electricity at free of cost as in the case of agriculture, especially to the small farmers. Medium and

large farmers may be given electricity for broiler farming at subsidised rates.

6. Since broiler farming involves, among other things, the cooperation of rural people, the Central Government must give priority to start more and more farms under the Rural Development Programme.
7. The existing law may suitably be amended to protect the interests of the integrated broiler farmers against the unfair trade practices followed by some major integrators. Specific legal measures may be enforced by passing separate statutes in the line of Broiler Act of USA wherein broiler farming is treated on par with agriculture for getting government's patronage and support and regulatory measures in the functioning of Integrators. This will protect the broiler farmers of India from the large scale exploitation of oligopolistic Integrators. This is important because many of the rural innocent farmers undertake the broiler farming activities under the many of the integrators.

CONCLUSION

'Vertical Integration in Broiler farming' is a novel concept which motivates large number of rural as well urban entrepreneurs to take up this venture not only as an additional vocation but also as a better substitute to the otherwise fading agriculture activities due to urbanization. As the meat eating habit among people is bound to increase every year, there is a great scope for large scale availability of animal protein in broiler meat at affordable costs. Beside, the potential for new capital formation and direct and indirect employment generation the broiler industry is poised for great success in India. With the effective implementations of the suggestions put forward in the present study the Integrated farming Industry, which is yet another goose for India will lay golden eggs in the ensuing future.

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