# ECONOMICS OF CONTRACT FARMING IN BROILER PRODUCTION – A STUDY IN KARNATAKA

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M.Sc. (Poultry Science)

**DEPARTMENT OF POULTRY SCIENCE**
**KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES UNIVERSITY, BIDAR**

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**IN**

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*Dedicated to*
*revered parents*
*&*
*beloved members*
*of*
*my family*

## DEPARTMENT OF POULTRY SCIENCE

**Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar**

### CERTIFICATE

*This is to certify that the thesis entitled* "**Economics of contract farming in broiler production – A study in Karnataka**" *submitted by* **Mr. B.L. Chidananda**, ID No. PVK-413 *for the degree of* **Doctor of Philosophy in Poultry Science** *to the Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar is a record of bona-fide research work done by him during the period of his study in this university under my guidance and supervision, and the thesis has not previously formed the basis for the award of any other degree, diploma, associateship, fellowship or other similar titles.*

Bangalore
August, 2007

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# Abbreviations

| | |
|---|---|
| ABFL | Aftab Bahumukhi Farm Ltd.- broiler integrator in Bangladesh |
| BCC | Broiler Coordination Committee |
| CF | Contract Farming |
| CP | Charoen Pokphand – Thailand based integrating company |
| DOC | Day Old Chick |
| ELISA | Enzyme Linked Immuno Sorbent Assay |
| EU | European Union |
| FAO | Food & Agriculture Organization |
| FCR | Feed Conversion Ratio |
| FLAG | Farmers Legal Action Group |
| g | gram |
| IFPRI | International Food Policy Research Institute |
| ILRI | International Livestock Research Institute |
| kg | kilogram |
| KHA | Karnataka Hatcheries Association |
| MEE | Mean Economic Efficiency |
| MFC | Marginal Factor Cost |
| MRP | maximum retail price (MRP) |
| MVP | Marginal Value Product |
| NCGI | National Contract Growers Institute |
| NCPGA | National Contract Poultry Growers Association |
| NR | Net Returns |
| sft | Square feet |
| TC | Total Cost |
| TR | Total Returns |
| ton | 1000 kg |
| Tk | Taka – Bangladesh currency |
| USDA | United States Department of Agriculture |

# *Introduction*

# CHAPTER I
# INTRODUCTION

Poultry in India has reached an industry status as well as an agri-business enterprise which was predominantly a backyard activity 30-40 years ago. At present, India stands 4$^{th}$ in poultry meat production globally with 2.2 million tons and propelling at an annual rate of about 12.64 per cent contributing 260 billion rupees to the GDP, providing both direct and indirect employment. Since the early 1990s, poultry meat has been the fastest growing sector in animal production and consumption in India. While demand growth has slowed for other meats, including fish, that for poultry meat has accelerated and poultry continues to lead the expansion of meat trade. Poultry meat is the cheapest animal protein providing food and nutrition security to both urban and rural milieu.

During the past decade, egg production increased to over 45,200 million, and the per capita availability of eggs has increased to 41 eggs (Table 1.1). Broiler meat production increased to 1,650,000 tons and the per capita availability of chicken meat increased to 1.73 kg. Over the years, poultry meat has found broad consumer acceptance, in part due to its low relative price, and the sector is growing at 12.64 per cent per annum. With these, India is ranked fifth in egg production and fourth in broiler meat production in 2005.

**Table 1.1: Growth of Indian poultry industry during the period 1995 – 2005**

| Years | Egg production (million nos.) | Production per capita (Nos./head/annum) | Broilers (000 tons) | Production per capita (kg/cap) |
|---|---|---|---|---|
| 1995 | 25,975 | 29 | 578 | 0.62 |
| 1996 | 27,187 | 30 | 665 | 0.70 |
| 1997 | 27,496 | 29 | 596 | 0.62 |
| 1998 | 28,680 | 30 | 710 | 0.72 |
| 1999 | 29,476 | 30 | 820 | 0.82 |
| 2000 | 30,447 | 32 | 1,080 | 1.06 |
| 2001 | 36,632 | 36 | 1,250 | 1.21 |
| 2002 | 38,729 | 38 | 1,400 | 1.33 |
| 2003 | 39,823 | 39 | 1,600 | 1.50 |
| 2004 | 40,403 | 40 | 1,650 | 1.53 |
| 2005 | 45,200 | 41 | 1,900 | 1.73 |
| Growth rate (%) | 5.7 | | 12.64 | |

Sources: FAO Stat; Ministry of Agriculture, Government of India (2005)

In the USA, the per capita consumption is 50 kg and even a developing country like Brazil boasts of a per capita consumption of 32.3 kg. The low consumption figures in India, indicates an opportunity for Indian poultry industry to grow and generate employment in the process. Bridging the wide gap and achieving the industry desired consumption levels (144 eggs and 8.0 kg poultry meat) is expected to generate direct and indirect employment to over 9 million people. An increase in per capita consumption of just one egg or 50 g poultry meat can create employment for 26,000 people. Hence, most importantly, rapid domestic growth has given an impetus to Indian poultry to take on global markets just as the Brazilian example of the mid-nineties. Brazil, now a player of consequence in the global poultry market, primarily grew because domestic consumption of meat, especially chicken meat, registered a phenomenal growth. This phenomenal growth in poultry production and consumption is attributed to technological advancements in production leading to quantum jump in broiler productivity and reduction in cost of production. The wide fluctuations in poultry were usurped into a new vista due to changed production arrangements, popularly known as “CF” or “Vertical Integration”. Currently, 95 per cent of the broiler production in developed countries is consolidated and managed by a few integrating companies through the mechanism of CF. In Southern and Western India, currently 70-80 per cent production is through broiler CF which is spreading to

Northern and Eastern India (Birthal et al., 2005). Karnataka state with its salubrious climatic conditions for broiler production has made rapid strides in CF accounting for nearly 85 per cent in the peri-urban regions.

### 1.1 Contract Farming Definition And Types:

Contract Farming (CF) can be defined as an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at pre-determined prices. The arrangement also invariably involves the purchaser in providing a degree of production support through, for example, the supply of inputs and the provision of technical advice. The contracts could be of three types: (i) procurement contracts under which only sale and purchase conditions are specified; (ii) partial contracts wherein only some of the inputs are supplied by the contracting firm and produce is bought at pre-agreed prices; and (iii) total contracts under which the contracting firm supplies and manages all the inputs and the farmer becomes just a supplier of basic production facility and labour.

The relevance of each type varies across products and over time. First, the changing needs of markets require changing product attributes, and these changing attributes may not be observable at the time of sale (such as food safety). Contracting may permit processors a higher degree of quality control under these circumstances than employer-employee relationships would do.

Second, different commodities embody different types of transaction costs, and thus require different forms of institutional solutions. For instance the information asymmetries between market participants in milk sales are fundamentally different than those for broiler sales.

Third, CF is sharing of risks and benefits between seller and buyer. As such, the precise form it takes depends greatly on the distribution of power (market and political) between buyers and sellers, as does enforcement of contracts.

Fourth, some risks may be much easier for large numbers of small-scale producers to bear jointly than one large farm by itself; the risk of environmental pollution penalties is a typical case. The latter has probably impacted more on contracting in the developed countries than the developing ones, but is already becoming an issue in India and South East Asia.

### 1.2 Poultry CF - Mode:

Poultry CF companies are commonly called “integrators”. Integration, normally encompassing enterprises ranging from breeding, hatching, feed manufacturing, and contract growing to wholesale and retail marketing, including processing has increased production efficiency and significantly reduced marketing margins and consumer prices.

Vertical integration is where the integrator controls every aspect of the operation from the embryo to the marketable age and beyond. Under contract poultry production, growers (poultry farmers) provide land, buildings, equipment, utilities, and labor in raising the birds to a marketable age, while, the companies supply day-old-chicks (DOC), feed, and medication and provide technical supervision. The grower is also responsible for disposal of dead birds and manure.

Integrated operations include large regional firms that incorporate all aspects of production, including raising grandparent and parent flocks, rearing DOC, contracting production, compounding feed, providing veterinary services, and wholesaling. Most of the integrated firms also have some presence in retail marketing, in order to establish price leadership and have a grip over wholesale-retail margins. Some integrators also process a share of their production in modern, automated, or semi-automated plants. India's poultry industry also has a number of smaller, partially integrated firms that typically omit one or more of the major input enterprises, such as breeding or feed milling, and may have little or no contract production. Large-scale integrated producers are most prominent in the Southern and Western regions. Smaller, independent, and sometimes partially integrated producers account for most poultry production in the Northern and Eastern regions. As integration expanded, some formerly independent hatcheries and

feed millers found it necessary to become integrators themselves or risk going out of poultry business.

### 1.3 Global Scenario:

Contract broiler production contributes to 95 per cent of the poultry grown globally concentrated in four top producers viz. USA, Brazil, China and European Union (EU) accounting for 70 per cent of the global production. Similarly, 88 per cent of the poultry exports were accounted by only four countries, namely USA, Brazil, EU and Thailand. The top four importing countries were Russia, Japan, EU and China which consumed 63 per cent of the global production. The comparisons say that, cost of production is lowest in Brazil mainly due to its own maize and Soya production and lower labour cost.

Virtually all poultry raised in the US is by family farms under contract with corporate agribusiness in a system known as vertical integration. Contract production is preferred by agribusiness giants as it reduces their capital cost to get the product to table. This financial venture has become so profitable that the top five broiler companies now process more than 100 million kg of poultry meat per week. Studies by the National Contract Poultry Growers Association (NCPGA) show that, these companies enjoy a 20 to 30 per cent return on their investment, on the contrary, most of the contract poultry farmers can hope for only a meager 1 to 3 per cent return despite the fact that the growers invest over 50 per cent of the entire

capital needed in broiler production. Studies by Louisiana Tech University and the National Contract Growers Institute (NCGI) revealed that over 71.6 per cent of the US poultry farmers earn a below poverty level income from their poultry operations and by USDA standards would qualify for food stamps if they weren't proud to ask. A Delvarva study on pay of poultry grower by NCGI covered a ten year time frame and revealed that average pay to poultry growers per chicken raised was 16 cents per bird. In conclusion, growers are making the same amount of pay per bird as they did 10 years ago (Carole 2001).

Similarly, CF has raised serious concerns about food production in Thailand and other parts of Asia in terms of social justice, environment sustainability and corporate control (Mohammad et al. 2003).

### 1.4 Indian Scenario:

Integration has brought two important changes to the poultry industry in India: lower average costs of production through improved technology and management practices, and collapsing of the margins previously commanded by various agencies in production. For example, in Tamil Nadu, poultry integrators established their own retail shops, whereby, they priced poultry meat substantially lower than other outlets. Their objective was not necessarily to move a high volume of poultry through their retail shops but to exercise price leadership, discipline other wholesalers

and retailers, bring about substantial reductions in the farm-wholesale margin, and reduce consumer prices. The consequent smaller producer-retail margins and lower retail prices for poultry meat have stimulated demand in the Southern and Western regions. In the past, chicken was considered to be a delicacy and was more expensive than mutton; with the strong gains in poultry production over the years, poultry prices have always remained lower than mutton prices and consumption among middle-class consumers is expanding rapidly. The changing food habits, particularly the 13 to 30 age group imbibing fast food culture has great preference for chicken meat without any religious stigma unlike other meat like pork and beef. The structure and costs of production in the Indian poultry meat industry vary from region to region. Production costs in the Southern, Western, and Eastern regions of India are very competitive with those in other countries, including the US. The technical efficiency in poultry in these Indian regions appears to be better than Brazil where the cost of production is the cheapest.

Factors driving the industry's expansion include quick growth in per capita income. The Southern region has the lowest total costs despite facing the highest feed prices (both corn and soybean meal generally must be shipped from greater distances than in the other regions). DOC costs are lowest in the South, and mortality costs are also lower compared to Eastern and Western regions. The greater cost efficiency in the South stems both from favorable climate and

better management by the integrated poultry operations. Relatively low energy costs for both heating and cooling, hold down other costs in the South.

Most of the poultry meat in India is marketed to consumers in the form of live birds- termed as “wet-market”, with only a small share of output now marketed as chilled, frozen, or further processed products. The costs of moving live birds, including transport, shrinkage, and mortality costs, severely limit inter-regional movements. As a result, Indian poultry markets are regional, rather than national in scope and there is limited potential for low-cost producers to market their product in higher cost regions. Low poultry prices in South India, largely due to the prevalence of poultry integrators in the region, are reported to have stimulated rapid growth in consumption. Several sources indicate that per capita poultry consumption in South India is about 4 kg, which is about four times the national average.

In South India, Tamil Nadu state is leading in broiler integration in the country which has Coimbatore as a major poultry pocket. The broiler prices in Coimbatore act as a reference price for others to fix the wholesale and retail prices in the neighboring states. The farm price formation is facilitated by the Broiler Coordination Committee (BCC). The BCC has about 26 members, including integrators and large independent growers; these together account

for about 95 per cent of Tamil Nadu's poultry output. Because of the cost and difficulty of assembling large numbers of live birds for auction, the BCC provides an institutional framework through which market forces can operate. Each member has an understanding of the demand conditions prevailing within its market area, its sales volume and the production costs. Based on this market information, members place their votes for a live-bird price by telephone or by FAX every Monday and Thursday. Under the BCC voting system, opinion of the majority rules the rate for the day. The BCC producer price then becomes the benchmark for setting producer, wholesale, and retail prices for markets in the Southern region, including Chennai, whole of Tamil Nadu and Kerala, and to a lesser extent Bangalore. For example, an operator in Coimbatore sets the wholesale price as the BCC price plus Rs 1 per kg, and the local retail price are generally the BCC price plus Rs.8-9 per kg. This margin accounts for transport, shrinkage, and mortality costs, plus margins for the wholesaler and retailer. In the more distant Chennai market, the live-bird wholesale price is usually the Coimbatore price plus about Rs.12 per kg to cover these costs and margins. The BCC also occasionally provides a mechanism for regulating supplies when the regional market faces oversupply conditions. In 2000, when excess supplies were pushing market prices below the cost of production, BCC members agreed to bring 10 per cent of their hatching eggs to a common location to be destroyed. A similar action

was taken in the recent Avian Influenza (AI) outbreak in the year 2006 to stabilize chick replacement. However, this mechanism has only worked when prices actually crash. With generally poor market information, it has proved difficult to forecast market conditions, or to convince BCC members of an impending oversupply situation. There is no evidence that the BCC engages in monopoly pricing, judging from the relatively low live-bird prices, retail prices, and margins in Coimbatore compared with other regions. Monopoly pricing seems to be discouraged by the strong price sensitivity of demand for poultry.

High incomes and urbanization in South India in general and Karnataka in particular are supportive of the region's rapid gains in poultry demand, supply, and commercialization.

### 1.5 Scenario in Karnataka:

In Karnataka, more than 80 per cent broiler production is under CF. Bangalore, being a major consumption centre, CF is also concentrated in the peri-urban Bangalore making it a major production hub.

Poultry consumption is higher in urban areas, where both average incomes and the number of high-income consumers are the highest. Second, per capita poultry consumption is higher, perhaps as much as four times , in South India where retail poultry prices are significantly lower than the other regions. Given the evidence of

sensitivity to both income and price, the recent trends toward faster growth in per capita incomes, as well as declining real prices for poultry, are likely to contribute to more rapid growth in poultry consumption. India's States and regions are diverse in terms of economic factors affecting food demand, including population, income, and urbanization.

Integrators now appear to have more influence over poultry marketing unlike in the past wherein independent growers often sold on credit, with wholesalers often delaying payments. Now, integrating companies, controlling a sizeable portion of market supply, have control on wholesale transaction and turned it to be a "cash and carry" business. Although market and volumes have increased, the producer-retail margins have reduced. The Bangalore live-bird price is determined by the Karnataka Hatcheries Association (KHA) in line with Coimbatore BCC price serving as reference price. Sellers are allowed to bargain within Rs.3 range of the price fixed by the KHA. In the South, producers appear to prefer contract growing, with fixed and assured returns regardless of swings in market prices and all marketing risk transferred to the integrator. This is due to the bad experiences of growers with market prices that held below costs of production during much of 2000 and 2001 and created strong incentives to shift to contract growing. Lower retail prices in the South appear to be due largely to the presence of poultry integrators who, in addition to reducing production costs, have sharply reduced

marketing margins between producer and retail prices. Several factors appear to contribute to the reduced margins and retail prices.

First, the process of integration has created regional oversupply conditions that have forced down retail prices and squeezed trader margins.

Second, the integrators have often supplanted traditional wholesalers and also established their own retail presence to squeeze the margins traditionally taken by many small wholesalers and retailers. This strategy, at least in part, reflects an effort by the integrators to exploit the high price elasticity of demand for poultry meat and increase profits by turning poultry into a low-margin, high-volume business from the earlier high-margin, low-volume venture.

Third, in order to expand operations and market share, integrators have likely pursued a strategy of low margins and market prices to help enlist and maintain the loyalty of contract growers.

Although poultry industry is able to make strides in production and profit growth, the poultry farmers have been able to just break even, but are forced to pursue poultry production due to asset specificity of poultry investment and lack of better income earning alternatives. However, in depth inquiries into broiler integration are scant and far between in Karnataka, and particularly

in peri-urban Bangalore, where, more than 90 per cent of broilers are produced through CF.

Hence, an attempt has been made to look into the mechanism of operation of CF with the following specific objectives:

1. to document the contractual arrangements in broiler production in and around Bangalore
2. to compare the production and resource use efficiency of contract and independent farms
3. to assess the impact of integrator practices on contract broiler farmers
4. to identify factors contributing for acceptance of contractual arrangements in poultry production
5. to document the problems of contract broiler production and contracting firms

# *Review of Literature*

# CHAPTER II

# REVIEW OF LITERATURE

The emerging trends in Contract Farming (CF), popularly known as Broiler integration or Vertical integration is hoisting the Poultry industry in terms of exceptionally high growth in production. This has raised the curiosity of policy makers as well as researchers in both developing as well as developed countries.

Considering the objectives of the study in view, relevant past studies were reviewed extensively and the salient findings are summarized under the following sub-headings:

2.1 CF Status

2.2 Prospects And Problems Of CF

## 2.1 CF Status

Kohls and Wiley (1958) in an important study on aspects of multiple owner integration in broiler industry observed the rapid expanding broiler industry and its peculiar quasi-integration arrangements. Georgia and Mississippi states in the US had recorded rather unique arrangements between producers and feed-dealer financiers, where more than two-thirds of the production was under one or more contractual arrangements by which the feed-dealer guaranteed either some form of fixed return or no loss to the grower.

The study was undertaken in two areas of Indiana State where area A was non-integrated and producers made decisions on important aspects of production and marketing. Although they secured large amounts of credit from various sources, conditional sales contracts were little used.

The broiler industry in area B, on the other hand, was characterized as integrated one. Producers as well as the title to the birds reared were contractually tied to their financiers who were invariably feed-dealers. The authors observed that in both the areas broiler production was relatively a new enterprise. Nearly three-fourths of the growers had started broiler operations since World War II. Integrated area had a larger proportion of relatively new growers (82 per cent) while, 58 per cent in non integrated area had a business experience of less than seven years.

Practically all growers purchased chicks and feed from the same supplier and patronized only one source. In brood-size there was no significant difference between non-integrated and integrated areas with an average brood-size of 8,388. There was no significant difference between the two types with respect to number of cycles (3), feed conversion (3.4), and chick mortality (8.1 per cent). The authors observed that the prices received in integrated area were lower than in the non-integrated area.

The feed cost was $97.46 in non-integrated area and $105.71 in integrated area; a difference of $8.25 per ton. Though difference in the composition of feed was not noticed, more medicine was found in the integrated feed and cost of the feed accounted for nearly two thirds of the cost of production. There was some evidence revealed in the study that growers in integration area were encouraged to remain in debt to the dealers in order to prevent them from migrating to other dealers and form a highly personalized relationship to get a feeling of being looked after well. They concluded that the integrator farmer received less income per bird than his non-integrator counterpart.

Rick (2002) while studying the strategies to manage expensive feed on farm reported that in order to measure broiler performance the returns (profits) ought to be used rather than performance or costs. The author suggested alternative way of measuring profits in terms of margin over total costs. Further, he demonstrated that the length of grow-out period and down time significantly influenced the number of broiler cycles per year. A 38-day cycle length with an 11 day cleanout would lead to an extra crop per year. The alternative to commonly used profitability (per kg body weight) was to calculate unit profitability by using the formula [(Income from bird-All costs)/ $m^2$ ] / cycle length. He demonstrated the application of this concept in measuring broiler performance. The paper has illustrated the

effect of changes in broilers on-farm performance and the producer strategies to continue to be in profitable business in times of falling feed price ratio.

Costales *et al*. (2003) observed that contracts somewhat differed across countries and commodities. Forward-price contracts for Indian broilers were more informal than in Philippines, who were in turn more informal than in Brazil. Nevertheless, contracting addressed the same general issues in each country; but is useful for understanding the institutions of the other countries studied. They observed that there were two main types of contracts: fee (or wage) contracts (by animal or by weight) and forward-price contracts (guaranteed or/and with profit-sharing). These contracts were mostly issued by the large multi-national or national integrators; the scale of these contracts was generally around a commercial scale of operations (10,000 birds or more for broilers; 200 heads of fatteners or more for hogs). There were, however, fee contracts that covered as low as 6,000 birds in the Philippines and 4,000 in Southern India. For veterinary services, while qualitative choice models were better suited to the analysis of determinants behind the choices of farmers, the authors concluded that an urgent need existed for empirical research in this area.

Taha (2003) reported that the per capita poultry meat consumption during 1961-2000 in middle-income group countries grew by 635 per cent compared with 370 per cent in high-income countries and 201 per cent in low-income countries. The high share of chicken meat was attributed to its relatively low cost compared to other meat and wider acceptance by consumers without any religious stigma and perceived health benefits

World Poultry (2004) inferred that broiler industry in Philippines was dominated by a few vertically integrated companies. These integrators were involved in both production and marketing of broiler chickens. Together they accounted for about 80 per cent of broiler supply in the country. The broiler industry was at par with the world's best practices in terms of livability, but was slightly below the par in terms of Feed Conversion Ratio (FCR). According to industry sources, the integrators had attained 70 per cent of the international efficiency standards. Since a large proportion of the broilers were sold through wet markets the broiler industry was not benefited much through the economy of scale that existed in production system but not translated to meeting by way of lower prices.

Begum (2005a) evaluated the comparative per bird profitability of vertically integrated contract and independent poultry farming

systems in Bangladesh. A sample size of 50 farms was randomly chosen out of 560 contract-growing farmers. The farmers were categorized according to their poultry farm sizes as Small farmers (average flock size of 1200 birds), Medium farmers (average flock size ranging from 1201 up to 2000 birds), and Large farmers (average flock size of more than 2001 birds). Thus a total of 18 small, 25 medium and 7 large farms were selected. The per bird net return of the CF was more than 1.7 times that of the independent farm. Rate of return also indicated that the contract farm was more profitable than the independent farm. The higher productivity of CF system may be due to transfer of know how from integrators to growers. The profitability of CF for a vertically integrated firm depended, to a large extent, on the firm's pre-fixed contract price and its contract enforcement costs.

Begum (2005b) studied the various components of fixed and variable costs in relation to broiler profitability. Under variable costs, feeds, day-old chicks and medicine/vaccines were the major expenditures, accounting for 56, 28 and 4 per cent, respectively. Variable costs were the major costs (96-98%) of the total cost. The total value of fixed costs per bird was Tk 1.01 while variable costs was Tk 52.93. The total costs per farm for contract growing amounted to Tk 53.94 resulting in a net return of Tk 17.18 per bird. For the independent grower, 98 per cent of total cash returns came

from the sale of broilers. On a per bird basis, the total fixed cost of the independent grower was Tk 2.83 while it was Tk 69.52 for variable costs. In the study period average price received by the independent farmer was 63 Tk per kg. The independent grower incurred Tk 72.35 total cost per bird and obtained a net farm return of Tk 10.04. By utilizing the maximum rearing capacity per batch would have resulted in an average of 8239 birds per year, whereas independent farmers actually reared only 5037 birds.

Goodwin *et al.* (2005) studied 16 poultry production complexes, comprised of 150 to 200 family farms each, in Arkansas, Missouri, and Oklahoma states. The data on costs and returns were obtained for these complexes for three different periods, viz., 1979, 1989, and 1999. The housing and equipment costs per square foot had increased from $3.40 in 1979 to $6.25 in 1999. Contract payments to contract growers in the 16 complexes had increased from $0.0320/lb in 1979 to an average of $0.0465/lb in 1999. The gross revenue per square foot figures in real terms (adjusted for inflation over the period) and expressed in 1999-dollar equivalents were $1.69 in 1979 and $1.62 in 1999. Normally, birds weighing 5.03lb were grown with an average density of 0.765 $ft^2$/ bird (4 flocks at 0.75 $ft^2$/bird and 2 summer flocks at 0.8 $ft^2$/bird). The broiler contract production with and without family labor was profitable as revealed by the net cash flow. Regarding efficiency, the net farm

income ratio was calculated as net farm income before income taxes divided by gross revenue. Net farm income ratios for the 2 scenarios were 0.07 and 0.16, 0.23 and 0.34, and 0.32 and 0.44 in years 1, 11, and 21. Based upon past performance, the existence of green contracts assuring purchase of broilers by the contract integrator and the collateral provided by land and associated assets, most lending institutions view contract broiler production loans favorably as a good investment opportunity for their particular institution.

Prabhu *et al.* (2005) studied the broad changes taking place in agri-food systems worldwide. The paper examined the comparative profitability of poultry production in vertically integrated contract and independent farming systems in Bangladesh. With effective management, vertically integrated CF system was a means to develop markets and to bring about the transfer of technical skill in a way of increasing productivity that was profitable for both integrators and farmers. The primary data were collected from 50 sample farms of Aftab Bahumukhi Farm Ltd (ABFL) Kishorganj, the pioneer vertically integrated farm, and 25 independent sample farms from Gajipur. Although the independent farmer was able to take advantage of the increase in the price of broilers in the market resulting in a higher price per bird as compared with the contract farmers, the latter were still better off in their net return or profit.

Guo *et al* (2007) reported that CF in China had grown rapidly over the last 10 years. They examined the evolution of CF, and explored the incentives to engage in CF, preferred contract farms and contract performance from the perspective of both Chinese farmers and contracting firms. Firm and household perceptions of contracting were assessed using data obtained from village- and firm-level surveys. Farmers identify price stability and market access as the key advantages to contracts, while firms considered improved product quality as the primary incentive to use contracts.

**2.2 Prospects And Problems Of CF**

Kohls and Wiley (1958) in a study on aspects of multiple owner integration in the broiler industry summarized that, in exchange for a guaranteed return, the grower lost his managerial freedom. With the loss of this freedom, the grower loses the incentive to improve his practices and his product.

John (1986) observed that CF was promoted by agribusiness as a more efficient method of crop and livestock production. It was a general observation that contracts diminished control by farmers over their operation and increased their exposure to risk. Further, as the conventional models accounting for the spread of contracting emphasized only on technological factors (e.g., economies of scale, crop perishability, technological complementarities between different

stages of production) were misleading and inadequate; an alternative model for "subcontracting" organization of production for large agribusiness corporations was suggested. A close examination of the spread of contracts revealed that most agribusinesses had pulled back from integration in favor of contracting out and that contracting spread wherever (1) processors were few in relation to producers, (2) producers were specialized, (3) auction and local terminals had declined in number, (4) there was a surplus of farm operations and credit was tight, (5) farmer's were poorly organized and (6) government supports were weak. The author predicted that the trend toward contracting would continue so long as agribusiness concentration continues, government supports deteriorate, and farms become more specialized.

Nadeem (1995) studied the economics of broilers in Bangalore urban district. The sample was post- stratified into 4 groups based on flock size, viz., with more than 10,000(Group 1), 5,001 – 10,000 (Group II), 2001-5000 (Group III) and up to 2,000 (Group IV). The cost of production per kilo varied between Rs.24.36 (Group I), to Rs.27.71 (Group-IV). There was inverse relationship between batch size and production cost per kilo. Feed cost accounted for around 60 per cent while chick cost was around 24-26 per cent of total production cost. Feed cost had inverse relation with flock size due to better bargaining power of large farmers. Around 92 per cent of the

produce passed through wholesalers. The author reported that the traders practiced fraudulent practices in weighing of birds and farmers received payments after 8-10 days of marketing. Only 3.5 per cent of broiler producers had their own retail market outlets. Producers share in consumer rupee was around 75 per cent. The traders followed profit maximization mark-up wherein, during the low prices they charged a higher margin than those of high price situation.

Vukina and Foster (1996) analyzed existing broiler production contracts, with an attempt to establish the degree of efficiency gains possible from contract alteration. With the use of settlement cost and farm level data, an assessment was made of optimal grower input decisions given contract specifications. Using this analytical framework, alternative contract designs were simulated by searching over possible contract parameter values. The foci of the analysis were three contract parameters: base payment, bonus factor and the utilities cost allocation factor. In the first two cases, the simulation generated ambiguous results. In the third case, results seemed to indicate that switching part of the electricity cost from the grower's cost into the settlement cost would result in a mutual welfare gain.

Mills (1998) drew evidences from five country case-studies of contractual arrangements, in India (Bombay), Papua New Guinea,

South Africa, Thailand and Zimbabwe. A variety of evidence, including information on the relative cost and quality of contracted-out directly provided services in the case of South Africa, Thailand, and India, was used to explore whether or not contracting-out to the private sector represented a preferable means of service provision. This analysis, together with information on the capacity of the agency letting the contract, and on the wider environment including the level of development of the private sector, was used to identify which aspects of the contracting process and the context in which it took place were important in influencing whether or not contracting with the private sector was a desirable means of service provision.

Fesperman *et al.* (1999) observed that in an attempt to find a way to help farmers regain control of their farms, many non-profit organizations were working to push legislation that would reform the way contracts were made. The farmers preferred better lines of communication with the company to know exactly when chicks would be dropped off and picked up to avoid death of chicks. Farmers wanted clear policies and how the company wanted their chickens to be raised. They expected a healthier relationship between the grower and company.

Carole (2001) inferred that virtually all poultry raised in the US was done so by family farmers under contract with corporate

agribusiness in a system known as vertical integration. Contract production was preferred by agribusiness giants as it reduced their capital cost to get the product to table. This financial venture had become so profitable that the top five broiler companies now process more than 226 million pounds of poultry meat per week. The author quoted a similar study by the NCPGA showed that these companies enjoyed a 20 to 30 per cent return on their investment while the most contract poultry farmers earned only 1 to 3 per cent return despite the fact that the growers investment was over 50 per cent of the entire capital needed. Yet another study quoted by the same author pertaining to Louisiana Tech University and the NCGI revealed that over 71.6 per cent of the nation's poultry farmers earned a below poverty level income from their poultry operations and by USDA standards were qualified for food stamps if they weren't too proud to ask. The vertically integrated system evolved over 40 years and agribusiness giants viewed the poultry industry as a model for efficient and profitable food production. This system was rapidly adopted in other areas of food production system. Accordingly, over 500 family farms were lost per day due to industrialization of agriculture and this trend would also continue and at a more rapid pace.

The Farmers' Legal Action Group, Inc. (2001) assessed the impact of integrator practices on contract poultry growers and

inferred that changes in contract terms had happened only due to market forces. It was either due to increased bargaining power on the part of growers which forced the companies to offer better terms, legal action by courts, legislation or regulation standards for using contracts, or self-interest of companies to offer better contracts. Under CF, poultry farmers were left with no option to make the market work for them, high demand did not benefit them and they could not sell birds weighing less than 1.8 kg at the market price. On the contrary, the farmers had to pay a penalty for the bird's low FCR as well as high mortality rate. The only benefit they enjoyed was the assurance that the birds would be bought back by the company, without fail. But with the companies' reneging in Alibag, that assurance had also been lost.

Further, it was reported that the prevailing model of CF system was biased and favored large companies. But according to them, CF was the only way ahead for the poultry business in India, others differed and said that individual farmers couldn't stand up against these large integrators, since they didn't have anything except sheds. Hence, it was time that the contract model got reframed keeping the farmer's interest in view.

Jenner (2002) reported that contract broiler grower's pay was unrelated to competitive market prices for a long time in the US.

Broiler companies set their own price to be paid to growers. It was a fixed rate unrelated to the retail price of chicken. The greater problem was that grower's pay was not based on factors that growers could control. Although growers and packers of beef and pork benefited from production contract relationships, it was not so in the case of contract broiler growers. Broiler grower contract settlement pay did not change with the market price for broiler meat. There was no farm-to-retail price spread. The USDA constructs a farm value of broiler production by subtracting the estimated costs to the companies for production and processing from the wholesale prices. The price USDA reported for 2000 for the farm value of production of broilers was $0.336 per pound. Broiler companies set a different price that they paid to contract growers, such as $0.045 per pound as a line item cost of their production budget. Broiler companies kept their total cost of production low by making adjustments across all the costs of production (genetics, feed, transportation, labor, and the settlements to contract growers). There was no market incentive to raise the base contract settlement price that contract growers were paid. Further, companies imposed competition on contract growers by constructing a performance rank within the flocks that were processed each week. Companies viewed the ranking as a measure of grower performance. Growers viewed the ranking as arbitrary and confusing. The settlement pay for broiler growers within a group is

shifted away from the lowest ranking growers to the highest-ranking growers. Expected revenue from growers ranking poorly (on right) was subtracted and used as 'incentive pay' to growers ranking better. Thus half the growers received an amount greater than average pay while the other half received below average pay. It was observed that 80 percent of the growers were able to turn less than 2 pounds of feed into each pound of chicken produced. This was good for the companies and good for the growers. This was not the only factor used to distribute the settlement pay incentives. The companies used other measures to impose a distribution that defined the rank. Although weight gain-per-bird factor gave advantage to the heavier, faster growing birds, the best growers could not overcome company influences like genetics, chick quality, same-sex flocks, age of birds and different feed rations. The companies developed settlement rank to allocate the incentives across the fixed, average pay a company would pay a grower. It did not help the majority of growers with the efficient work they were doing. So growers got docked in pay for management choices made by the companies. The author concluded that production contracts could benefit growers and companies if the incentives benefit both parties. Efficient incentives could be direct (such as a share of company success) or indirect (those dovetail into upstream successes). Spot prices were not necessary for producers to be paid fairly, but for contract production to become equitable,

compensation had to be based on the specific efficiency achieved by growers based on factors they could truly control.

Robert (2002) examined trends in benefits to consumers, integrator returns, and profitability for contract poultry producers in the US. The retail price had declined substantially which reflected increased efficiency in broiler production and processing along with generally lower real feed prices. The Alabama Farm Business Analysis records for contract poultry producers provided cost and return figures based on actual farmer records analyzed with appropriate accounting practices. The inflation-adjusted returns above operating costs averaged for six - year period was $67,465 per year standardized to four poultry sheds. Returns above operative costs were not indicative of profitability, because they did not include charge for family labor or economic depreciation. After accounting for economic depreciation and a very modest charge for family labor ($6.50/hour with no benefits) and a modest return on equity (9%), the farm business records showed that contract production resulted in a loss to management and risk bearing of $7,006 for four poultry sheds. The author observed that records from other impartial sources of information on profitability of contract poultry production in other states also showed decreased profitability to the point where many contract producers had a poverty level of income. Only about one penny per pound more was needed for contract producers to

earn a decent return. Farm business records showed that contract producers who once had acceptable income from their poultry operations had put up a few hundred thousand dollars of equity, and borrowed several hundred thousand more to hire themselves at minimum wage with no benefits and no real rate of return on their equity; on the other hand, integrators continued to earn 10-25% rates of return on equity.

Vishal (2003) reported that the CF provided the latest technology, farm inputs and extension services, which benefited the contract farmers. However contract farmer faced problems such as poor technical assistance, delayed payments and manipulation of the conditions of the contract by the company. Most of poultry meat in India is marketed in the form of live birds termed as “Wet market”. The cost of moving live birds, shrinkage and mortality limits inter-regional movements. The presence of poultry integrators in a region has a significant impact on the returns received by poultry producers and the consumers’ prices. For example, retail prices and producer retail margins were found to be significantly higher in the Northern region, where poultry integration is least prevalent. Producer price formation for poultry varied from region to region. In South India, integrators play a large role in setting daily price, while in West, Mumbai, the wholesale prices had dominion in price fixation. In North India, producer prices were set based on Daily auctions at the

daily Ghazipur market near Delhi. In East India, the integrators provided for the equipment, labour, management and variable inputs with the exception of water and electricity. Integrators rent only poultry sheds from the local farmers or landlords for which Rs. 3/kg of live weight gained, which is much higher compared to South and West India. In South India where contract growing is well established, integrators claim that there is a high degree of loyalty and little switching by contract growers. Although farmers have an incentive to renege on their contracts when prices rise above rate of return provided by the integrator, the integrators were also effective in keeping the market prices and margins low.

Chang (2005) reported that the growth rate for poultry meat during the past 4 decades (1961-2001) averaged about 5 per cent compared to 2 per cent for beef and 3 per cent for pork. Although demand for poultry meat was strong relative to demand for other meats in the developed countries during the 1990's, in recent years the rapid global gains in poultry meat consumption occurred in the developing countries. The share of poultry meat consumption in total meat intake in the developing countries was about five per cent lower than developed countries. The expansion in poultry consumption was more rapid in Asia (China, India, and Thailand) and Latin America (Brazil and Argentina) with per capita consumption in these two regions nearly doubling between 1990-2000. The structure of the

world broiler market was affected basically by three factors namely, resource endowments, consumer preference and government policy. Availability of cheap feeds was one of the most important factors for industry development. In addition, access to advanced technology was also necessary for achieving high growth rate. The broiler industries in major exporting countries were characterized by large scale production and high level of vertical integration. Under these systems, production costs were lowered due to lower average fixed costs and incremental returns were achieved from further processing and value addition.

Ramaswamy *et al* (2005) reported that the profitability per unit of output (excluding family labor) did not differ significantly between small size and large size farms. In other words, profitability was not significantly affected by scale of operations. Factors affecting profitability were price of DOCs, wage rate, feed cost, broiler prices and FCR. Among these, FCR and wage rate were significantly affecting profitability. However, small farmers were relatively inefficient mainly due to high transaction costs and pollution abatement costs associated with policy induced distortion. Further, the differences in the amount of implicit policy subsidies received by farms across regions / states also affected relative profit efficiency of small and large producers. Large farms in Andhra Pradesh were more inefficient compared to their smaller counterparts in Haryana.

Andhra Pradesh levied 4 per cent processing tax on poultry products in addition to the usual sales tax on poultry feed, while, Haryana state levied no such taxes. The profitability of contract farms in general was lower than independent farms. The comparative efficiency of small and large broiler farms was estimated with the help of a profit transfer function. The differential parameters of sample farm were explained in terms of differences in transaction costs and pollution abatement costs. Profitability negatively correlated to the price of chicks, the price of labor (wage rate) and the price of feeds and positively related to the price of broilers. All the coefficients were statistically significant and FCR was found to be significantly different.

Anon, (2006) reported of sham practices in broiler contract production. At times, companies supplied chicks weighing only 25-30 g. though the ideal weight is 40 g. The companies didn't even specify the minimum protein and energy level in the feed supplied. All these affected the final FCR but farmers could do little about it, as the contract had not specified standards for the quality of chicks and feeds supplied by the companies. What farmers got at the end of the contract was Rs.2.80 per kg of the bird, says, a contract poultry farmer in Alibag. Of the Rs.5,000 payment per batch of 1,000 birds, almost Rs.3,000 went into paying the electricity bill, buying paddy

waste and as labor cost. The net income in 35 days of rearing was Rs.2,000. Thus, the farmers were reduced to a serfdom situation.

Bora *et al*. (2006) conducted a study on CF of marine products in East and West Godavari districts of Andhra Pradesh. The marine producers in contractual arrangements had better access to financial infrastructure, whereas the non-contract farmers had better access to telephone and postal facilities. The study revealed that the non-contract farmer incurred 57 per cent higher cost than contract farmers. The net profit realised was 49 per cent higher in contract compared to non-contract farming.

Deepika (2006), indicated that corporate intervention in agriculture through CF was an essential link between the corporate business and the farmer. Strategic partnership of the company, introduction of modern technology which was suitable to the location, timely provision of inputs and extension services, regular and timely payments to the contracted farmers led to the success of contracts by the companies.

Effiong and Onyenweaku (2006) estimated the profit efficiency and its determinants in independent broiler production in Akwa Ibom State of Nigeria using the stochastic frontier profit function approach to analyze profit efficiency results for broiler production as well as the factors influencing efficiency levels. The analysis of data

revealed that labor cost (wage rate), price of feeds/feed supplements, price of drugs/medication, capital inputs and farm size were the major factors determining profit level. Furthermore, level of education, farming experience, extension contact and gender variables were shown as major factors influencing their efficiency levels.

Joshi *et al.* (2006) conducted a study on contract products namely milk from Nestle India Limited, milk and milk products from Mother Dairy Fruits and Vegetables Limited and Broilers from Venkateshwara Hatcheries Limited. The results indicated that there was around 100, 77 and 13 per cent more income realised from contract than non-contract production in milk, vegetables and broilers respectively. The results of the study revealed that in the case of milk, transaction cost accounted to about 1 per cent to the total cost for contract farmers while it was 16 per cent for non-contract farmers. The transaction cost was about 13 times more in non-contract than contract farmers. In the case of vegetables, transaction cost constituted about 2 per cent of the total cost for contract farmers while it was 21 per cent for non-contract farmers. The transaction cost was about 11 times more in non-contract than contract farmers. In the case of broilers, transaction cost share was about 4 per cent of the total cost for contract farmers while it was 0.3

per cent for non-contract farmers. The transaction cost was about 1.3 times more in non-contract than contract farms.

Morrison *et al.* (2006) reported that in relatively unregulated environments of the global economic periphery CF had led to highly regressive socioeconomic outcomes however, CF was not inherently regressive for the small farm sector. In the state of Sarawak, Malaysia, CF was used as part of an affirmative action program that trained indigenous smallholders in commercial poultry production. The state-administered contract scheme in the shorter and medium term, as the paper showed, the small-scale public contract scheme, which itself operated within the protected domestic poultry sector in Sarawak, was more likely to support disadvantaged Bumiputra minorities than produce a pool of competitive entrepreneurs.

Nadeem *et al.* (2006) observed that CF in poultry emerged in India as a response to market imperfections resulting from structural changes in the broiler industry as it moved toward the type of vertical integration seen worldwide with a firm controlling its inputs in production. Increasingly, smallholders were moving away from independent poultry farming to CF with larger firms. The study investigated the resulting production arrangements for poultry products in India and how these affect profitability. The study found that CF's major benefits come from reduction in transaction costs

and assurance of regular income for broiler farmers. Results showed that independent broiler farmers obtained higher profit per unit of output than contract farms, but contract farmers had lower transaction costs and were insulated from market fluctuations as they were paid growing fees based on performance and not on market prices.

# *Material and Methods*

# CHAPTER III
# MATERIAL AND METHODS

In this chapter, a brief description of the following are presented.

3.1 Description of the study area

3.2 Nature and source of data

3.3 Analytical tools and techniques

## 3.1 Description Of The Study Area

The study on CF in broiler production was undertaken in peri-urban Bangalore covering the intensive broiler pockets of Attibele, Hoskote, Devanahalli, Doddaballapur, Nelamangala, Sulibele, Dobbaspet, Nandi and extending up to Bagepalli, Chickballapur (now a district) in Kolar and surrounding regions of Bangalore Rural districts in the Eastern dry zone of Karnataka (Fig.1).

The annual average rainfall was about 817 mm in Bangalore rural district and 744 mm in Kolar district. The mean diurnal temperature ranges between 12-38$^{\circ}$C which is most ideal for poultry production. The demographic features are indicated in Table 3.1. The proximity to urban markets has favored diversified production activities in agriculture and animal husbandry. Poultry and dairy have been major activities in animal husbandry sector due to the

**Table 3.1: Demographic profile of the study area**

| Sl. No | Particulars | Bangalore Rural | Kolar |
|---|---|---|---|
| 1 | Geographical area (ha) | 5,85,431 | 7,79,467 |
| 2 | Taluks (numbers) | 8 | 11 |
| 3 | Villages (numbers) | 1883 | 2931 |
| 4 | Population (numbers) | 18,77,416 | 25,36,069 |
| 5 | Density of population (per sq. km) | 323 | 280 |
| 6 | Average rainfall (mm) | 817 | 744 |
| 7 | Numbers of rainy days (average per year) | 32 | 63.14 |

ease of management and lower space requirement. Further, the presence of branch offices of a number of poultry integrating firms have favored sustenance of the existing farms apart from encouraging establishment of new poultry farms in and around Bangalore. Poultry farming has been practiced and sustained as an additional source of income by some and as main occupation by others because of the inherent advantage of proximity to the major consumption metropolis like Bangalore.

### 3.2 Sampling Framework

The peri-urban Bangalore comprises of Bangalore urban, parts of Bangalore rural and Kolar districts. From these, 10 towns were randomly selected for the survey based on the intensity of location of poultry farms. The final sample comprised of 140 respondents who were selected from the sampling frame obtained from the field offices of the integrating companies. The respondents were personally interviewed with the help of a pre-tested questionnaire developed for the study. Since the objective of the study was to compare the broiler performance across different size groups of farms among contract growers, the respondents were selected accordingly. The sample distributions of large, medium, and small contract farmers and independent growers are indicated in Tables 3.2-3.5. Thus the sample comprised of 99 contract poultry farmers and 41 non-contract farmers; the latter are referred to as ‘independent farmers’.

Poultry integration is concentrated within about 100 km radius from Bangalore center (Fig.1) and over a dozen integrators (companies) are in operation. Based on the business set up and extent of operation, these firms were broadly classified into International, National and Regional integrators. The firm-wise sample distribution is shown in Table 3.7.

The broiler farms were classified as Small (up to 5,000 birds per cycle), Medium (5,000 to 10,000 birds per cycle) and large size (more than 10,000 birds per cycle).

### 3.2.1 Nature and source of data

For evaluating the objectives of the study, field data relating to economics of contract broiler production were obtained from the sample farmers using pre-tested schedule. The data on socio-economic and demographic profile of the respondents pertaining to land holdings, asset position, family size, educational level were obtained. The basic information on the number of chicks, brooding practices, types of feed used, feeding pattern, disease incidence, vaccination schedule, medication practices, dead-bird disposal practices, sanitary measures adopted and market information and particulars on CF were recorded. Further, the data on the lead indicators like broiler live weight gain, feed conversion ratio (FCR) and lag indicators like mortality percentage, stocking density, rejects (runts and culls) were also obtained. The opinion


**Fig. 1: Map Showing Bangalore Urban, Rural and Peri-Urban Districts**

**Table 3.2: Distribution of large broiler farms under contract**

| Sl.No. | Town | Village | No. of farmers |
|---|---|---|---|
| 1 | Acharlahalli | Acharlahalli | 1 |
| 2 | Anekal | Samandur Post | 2 |
| | | Harohalli | 1 |
| | | Bidaraguppe | 1 |
| | | *Sub Total = 4* | |
| 3 | Attibele | Manchanahalli | 1 |
| 4 | Budigere | Chowdappanahalli | 2 |
| 5 | Devanahalli | Batramaranahalli | 1 |
| | | Majjgehosahalli | 1 |
| | | Somattanahalli | 1 |
| | | Neeleri | 1 |
| | | Heggadehalli | 2 |
| | | *Sub Total = 6* | |
| 6 | Doddaballapura | Singanahalli | 1 |
| | | Kuntanahalli | 1 |
| | | Segehalli | 3 |
| | | *Sub Total = 5* | |
| 7 | H-cross | H-cross | 1 |
| 8 | Hessaraghatta | Seethakempanahalli | 3 |
| 9 | Hoskote | Ramanahalli | 1 |
| | | Beechagondanahalli | 1 |
| | | Bendaganahalli | 2 |
| | | Bettadalli | 1 |
| | | Bidaluru | 1 |
| | | Bidlur | 1 |
| | | Budigere | 2 |
| | | Cholappanahally | 1 |
| | | Chowdappanahalli | 1 |
| | | Jodibatterhalli | 1 |
| | | Kerekathiganoor | 1 |
| | | Lakkundahalli | 1 |
| | | Mandur | 3 |
| | | Nagagotta | 1 |
| | | Pallymakempura | 1 |
| | | Ramanahalli | 1 |
| | | *Sub Total = 20* | |
| 10 | Nelamangala | Mylanahalli | 1 |
| | | Dodda Hejjaji | 1 |
| | | Timmasandra | 1 |
| | | *Sub Total = 3* | |
| | | **Grand Total** | **46** |

**Table 3.3: Distribution of medium broiler farms under contract**

| Sl.No. | Town | Village | No. of farmers |
|---|---|---|---|
| 1 | Attibele | Mayasandra | 1 |
| 2 | Chickaballapura | Nandi | 1 |
| | | Segehalli | 1 |
| | | *Sub Total = 2* | |
| | | | |
| 3 | Devanahalli | Vagata | 1 |
| | | Hittarahalli | 1 |
| | | Muthukurki | 2 |
| | | Nakkanahalli | 1 |
| | | Kodukurthi | 1 |
| | | *Sub Total = 6* | |
| 4 | Doddaballapura | Segehally | 2 |
| | | Honnaghatta | 1 |
| | | Tapasipura | 1 |
| | | *Sub Total = 4* | |
| 5 | H-cross | Thirumelanahalli | 1 |
| 6 | Hoskote | Acharlahalli | 1 |
| | | Avalahalli | 1 |
| | | Battaramanahalli | 1 |
| | | Beechagondanahalli | 2 |
| | | Budegere | 2 |
| | | Chowdappanahalli | 1 |
| | | Hittarahalli | 1 |
| | | Honachanahalli | 4 |
| | | Lakkundahalli | 1 |
| | | Muddanayakanahalli | 1 |
| | | Narasenahalli | 1 |
| | | Shanthinagar | 1 |
| | | Singanahalli | 3 |
| | | Somathanahalli | 1 |
| | | Sonyalapur | 1 |
| | | *Sub Total = 22* | |
| 7 | Kolar | Kuduvathi cross | 1 |
| 8 | Nelamangala | Kudulihosahalli | 1 |
| 9 | Dasarahalli | Vishwanathapura | 1 |
| 10 | Sulibele | Sulibele | 1 |
| | | **Grand Total** | **40** |

**Table 3.4: Distribution of small broiler farms under contract**

| Sl.No. | Town | Village | No. of farmers |
|---|---|---|---|
| 1 | Devanahalli | Neeleri | 1 |
| | | Hurulugurki | 1 |
| | | Pillanaguppe | 1 |
| | | *Sub Total =3* | |
| 2 | Doddaballapura | Segehalli | 2 |
| | | Heggadehalli | 1 |
| | | *Sub Total =3* | |
| 3 | Hoskote | Budigere | 1 |
| | | Kuntanahalli | 1 |
| | | Shanthinagar | 1 |
| | | Beechgondahalli | 1 |
| | | Cholappanahally | 1 |
| | | *Sub Total =5* | |
| 4 | Nandi | Kanivepura | 1 |
| 5 | Nelamangala | Kattehosahalli | 1 |
| | | **Grand Total** | **13** |

**Table 3.5: Distribution of independent broiler farms**

| Sl.No. | Town | Village | No. of farmers |
|---|---|---|---|
| 1 | Bagepalli | Bagepalli | 6 |
| | | Lakumuddepalli | 2 |
| | | Madhunkepalli | 1 |
| | | Pathunkepalli | 3 |
| | | Sadli | 3 |
| | | Yalampalli | 6 |
| | *Sub Total = 21* | | |
| 2 | Devanahalli | Chikkajala | 2 |
| 3 | Dasanpura | Mallarabanasavadi | 1 |
| 4 | Dibbur | Gollu | 1 |
| 5 | Doddaballapura | Uddichikanahalli | 1 |
| 6 | Gudibande | Kopparahalli | 1 |
| 7 | Guntur Post | Muthunkapalli | 2 |
| 8 | Hanchipura Post | Mantanakurchi | 1 |
| 9 | Jala | Begur | 2 |
| 10 | Nelamangala | Chikkudutihosahalli | 5 |
| | | Chikkanahalli | 1 |
| | | Hulikunte | 1 |
| | | Sompura | 1 |
| | | Dobbaspete | 1 |
| | *Sub Total = 9* | | |
| | **Grand Total** | | **41** |

**Table 3.6: Sample Distribution of farmers**

(No's)

| Particulars | Town | Village | No. of farmers |
|---|---|---|---|
| Contract Large | 10 | 35 | 46 |
| Contract Medium | 10 | 31 | 40 |
| Contract Small | 5 | 12 | 13 |
| Non-contract | 10 | 19 | 41 |

**Table 3.7: Firm-wise distribution of the sample farmers**

(No's)

| Category | International | National | Local | Non contract | Total |
|---|---|---|---|---|---|
| Small Sized (< 5000 chicks /cycle) | 06 | 05 | 02 | 21 | 34 |
| Medium Sized (5000-10000 chicks /cycle ) | 23 | 09 | 08 | 10 | 50 |
| Large Sized (>10000 chicks / cycle) | 09 | 26 | 11 | 10 | 56 |
| **Total** | **38** | **40** | **21** | **41** | **140** |

about CF and problems faced by the contract farmers were recorded. In addition, the opinion and problems of staunch independent farmers were collected for the close and sharp comparison between the two types of broiler production which are the main objectives of the study. The data pertains to the year 2005.

The other equal partner in the integration process, the six Integrators representing national and local level operators were randomly selected. However a lone international firm (CP) refused to divulge information as a matter of business policy. Hence the firm is dropped from the list of integrators but its farmers are considered in the sample. The information on business establishment, scale of operation, area of operations, production management was obtained through a pre-tested schedule developed for the study.

### 3.3 Analytical Tools And Techniques

Various analytical tools and techniques employed for statistical analysis for proper understanding of the data and accurate interpretation of results are listed below:

1. The cost of production was assessed by computing variable and fixed costs of production.

2. The costs and returns per cycle for the year 2005 were collected.

The following items of costs were considered to compute the profitability of contract broiler production in comparison to independent production:

1. **Day Old Chicks (DOC):** The DOC are supplied at the farm gate to the broiler farmers.
2. **Feed:** Rations like pre-starter, starter and finisher in the form of mash or pellet.
3. **Veterinary services:** This includes expenditure on administration of vaccines and disease diagnostic services and medication in case of disease outbreak.
4. **Litter:** Paddy husk was commonly used in the study area.
5. **Brooding:** Brooding provided by means of coal and / or electricity.
6. **Sanitizers;** These are the chemicals like formalin, bleaching powder and detergents used for cleaning the sheds, equipments after the completion of each cycle.
7. **Electricity charges:** This comprises of expenditure on lighting and water pumping cost.
8. **Burning, White wash and Fumigation:** After removal of litter, the floor, walls and other surface areas are burnt using flame gun. Floors and walls are coated with quick lime for disinfection. Formalin is used as a fumigant.

9. **Labor cost:** The actual expenditure on hired men and women labor as well as imputed value of family labor was considered.
10. **Annual depreciation:** The annual depreciation on poultry sheds; equipment and machinery used were calculated using the straight-line method. This was apportioned on per cycle basis.
11. **Total Cost (TC):** It is the summation of all the above expenditure per production cycle.
12. **Total Returns (TR):** Returns comprises of growing charges realized, sale of litter and empty gunny bags in the case of contract farmers. While for independent farmers it is as follows:

    Total Returns (TR) = Sale of birds + Sale of raw manure + Sale of empty gunny bags.
13. **Net Returns (NR):** Net returns were obtained by deducting total cost from total returns.
14. **Net returns per kg:** Net returns per kg were worked out by dividing total net returns by weight of birds per cycle.

### 3.3.1 Resource use efficiency

In order to obtain the cause and effect relationship between the total output of broilers and the major inputs, production function was estimated. Several forms of production function such as Cobb-Douglas, transcendental and quadratic models were tried. After a careful examination of the results and the emergent implications, it

was decided to use the Cobb-Douglas form of the production function.

The form of the Cobb-Douglas production used is as under

$$Y = AX_i^{\beta i} U$$

Where, $X_i$s indicate flock size ($X_1$), years of experience in poultry ($X_2$), labour days ($X_3$), brooding charges ($X_4$), FCR ($X_5$), U refers to the error in the model and Y is the growing charges of broiler per cycle. The βi's indicate elasticity coefficients of independent variables. The resource is optimally allocated when its Marginal Value Product (MVP)= Marginal Factor Cost (MFC). The marginal product of input is calculated as $X_i = \beta_i Y / X_i$, where Y and X are considered at their geometric means. The returns to scale were computed by adding the elasticity of production, which are the coefficients themselves.

### 3.3.2 Impact of CF on income

The impact of CF on household income was assessed by computing Gini coefficient. The value of Gini coefficient varies between 0 and 1. If the Gini coefficient is zero, it indicates perfect equality where as if it is one, it implies perfect inequality.

Following Lerman and Yitzhaki (1985), the Gini coefficient for total income inequality, *G*, can be represented as:

$$G = \sum_{k=1}^{K} R_k G_k S_k \qquad (1)$$

Where, $S_k$ represents the share of component k in total income, $G_k$ is the source Gini, corresponding to the distribution of income from source k, and $R_k$ is the Gini correlation of income from source k with the distribution of total income.

Equation (1) permits evaluation of the influence of any income component, in the case of poultry contract, upon total income inequality, as the product of three easily interpreted terms:

a) How important the income source is with respect to total income ($S_k$)

b) How equally or unequally distributed the income source is ($G_k$)

c) Whether or not the income source is correlated with total income ($R_k$)

### 3.3.4 Impact of CF on income and investment

In order to appreciate how far the CF has benefited the different categories of farmers, the respondents were asked to indicate the perceived income changes due to CF as compared to their original independent production. Similarly the extent of contribution of contract poultry income on investment during the past five years was assessed to quantify the benefits. Broadly five categories of investments were considered viz., 1.Tractor/power tiller purchase, 2. Construction of cattle shed, 3. Purchase of pump set, 4. Buying agricultural equipments, 5. Renovation of house and

6. Others. The results thus obtained were tabulated.

### 3.3.5 Transitional probabilities

To determine the farmer's loyalty and switching pattern to specific integrating firm, the transitional probabilities were computed using Markov chain analysis. A single period Markov analysis was employed to estimate the transitional probabilities, which minimizes the sum of absolute deviations (Dent, 1967).

The transitional probabilities were calculated as follows,

(i) $$P_{ij} = \frac{m_{ij}}{\sum_{i=1}^{n} m_{ij}}$$

(ii) $$\sum_{j=1}^{m} P_{ij} = 1; \qquad i = 1, 2, 3, 4 \ldots n$$

(iii) $$0 \leq P_{ij} \leq 1$$

Where,

$P_{ij}$ = Estimated probability that a farmer in $i^{th}$ integrating company in $(t-1)^{th}$ period moves into $j^{th}$ firm in $t^{th}$ period

$m_{ij}$= Number of farmers in the $i^{th}$ firm in $(t-1)^{th}$ period moving to $j^{th}$ integrator in the $t^{th}$ period

In a transitional probability matrix, the retention probabilities are shown by diagonal elements. While the gain probabilities are given by off-diagonal column values, loss probabilities are given by off-diagonal row values.

### 3.3.6 Factors contributing for acceptance of an integrating firm

The reasons for joining a specific contracting firm was obtained in order to know the factors contributing to the acceptance of a particular integrating firm: The respondents were asked to indicate the single important reason for joining that particular company for contract production.

The important reasons prompting the choice of a specific integrating firm are listed below.

1. This was the only company locally accessible
2. Others gave good opinion about the company
3. The company gives better contract terms
4. The company is big and has good name
5. Personally know people who have succeeded through contract production

### 3.3.7 Opinion survey of the respondents on CF

The opinions of sample contract farmers were sought to elicit the felt advantages and constraints of CF. They were asked to assign/ report two important reasons for contract production. A total of six reasons illustrating the positive impact were listed and the two most important reasons were recorded. The response list comprises of the following responses:

1. No initial investment

2. Higher price for the produce

3. Buyback arrangement

4. Access to inputs

5. Access to technical know how on production practices

6. Fixed price for produce, less risk, and assured market. .

Finally, the list of disadvantages includes the following responses and the top two important reasons were listed to compute simple percentages.

1. Poor quality chicks

2. Charging high costs for inputs

3. Delay in delivery of inputs

4. Delay in DOC supply

5. Not adequate batch size

6. Early lifting

7. Firm asking to supplement feed

8. High mortality

9. Fewer number of cycles

10. Too many conditions

11. Delay in payment

12. Delay in lifting the birds

The results were analyzed using simple percentages and are presented in the results chapter.

# *Results*

# CHAPTER IV
# RESULTS

The results of the study are presented under the following broad headings according to the objectives laid down for the study. The details are presented by comparing across different flock size groups under contract production in line with non-contract (independent) poultry production.

4.1 Contractual arrangements in broiler production

4.2 General characteristics of sample farmers

4.3 Resource use pattern

4.4 Economics of broiler production

4.5 Resource use efficiency

4.6 Impact of CF on income

4.7 Factors influencing CF

## 4.1 Contractual Arrangements In Broiler Production

### 4.1.1 General characteristics of contract company

In the study area it was observed that many integrators were operating in the same locality. Therefore, six firms were randomly selected for obtaining the operational details and general characteristics of integrating firms through a pre-tested questionnaire developed for the survey. The details on two National and four local firms are presented in Tables 4.1, 4.2 and 4.2a for comparison of integrator practices in selection of contract farmers, method of determining growing charges and dealing with contract

**Table 4.1 Salient features of the contracting firms at national level**

| Sl.No | Particulars | Firm 1 | Firm 2 |
|---|---|---|---|
| 1. | Year of establishment | 1999 | 1999 |
| 2. | Type of ownership | Private domestic limited | Private domestic limited |
| 3. | Number of districts covered in Karnataka | 5 | 1 |
| 4. | Number of farmers covered | 250 | 100 |
| 5. | Total shed capacity | 35 Lakh sft | NA |
| 6. | Criteria for choosing farmers (in the order of importance) | Water quality, not thickly populated poultry, one road leading to all the farmers, no history of disease problem, farmers history | Farmers trust worthiness, location of farms within 100 Km. from the processing plant |
| 7. | Farm size<br>a. Minimum<br>b. Maximum<br>c. Ideal | <br>5000<br>50000<br>10000 | <br>5000<br>No upper limit |
| 8. | Main products sold | Live and Processed chicken | Processed chicken and Parent Stock |
| 9. | Brand Name | Present | Present |
| 10. | Type of product Exports | Hatching eggs to Asian markets | No |
| 11. | Annual value of domestic sales in 2005 | 150 Cr. | 30 Cr. |
| 12. | Annual value of domestic sales in 2000 | 50 Cr. | 6 Cr. |
| 13. | Volume of domestic sales<br>a. live birds<br>b. dressed & processed chicken<br>c. parent stock<br>d. hatching eggs | <br>18 Lakhs birds/pm<br><br>100 ton/pm | <br>1600 metric tons<br><br>2500 metric tons<br>05 lakhs<br>50 lakhs |
| 14. | Percent sales to<br>Super markets<br>Wholesalers | <br>03<br>95 | <br>70<br>00 |

| | | | |
|---|---|---|---|
| | Others (Institutions) | 02 | 30 |
| 15. | Inputs supplied<br>a. Chicks<br>b. Sanitizers<br>c. Feed<br>d. Vaccine<br>e. medicine | Percentages<br>100<br>100<br>100<br>100<br>100 | Percentages<br>100<br>---<br>100<br>100<br>100 |
| 16. | Price fixation<br>Base price | Rs. 2.45/kg linked to mortality, cost of production, FCR and market price incentive | Rs. 2.5 / kg plus one rupee brooding charge per bird |
| 17. | Price revision | Yes, once in a year | Yes |
| 18. | Type of contract | Written | Written |
| 19. | Violation of contract | Very rarely less than half percent | Nil |
| 20. | Common type of contract violations | Short age of birds | No violations |
| 21. | Dealing with violations | Discontinue with violating farmers | No violations |
| 22. | Recommendations to government | Quality assurance for feed ingredients, export subsidy, Ban street slaughter of birds, propagate chilled chicken. | Allow import of vaccines, no ban on import of GP's, Simplified SPF test procedures |
| 23. | Notion on consumer preference ( quality attributes) | Hygiene of shop, yield of bird (0.9 to 1.0 kg dress weight), tenderness and healthy bird | Weight 0.8 to 1.1 Kg, tender and juicy processed chicken |
| 24. | Quality control | Health monitoring, ELISA test | BIS standards (bacterial contamination), Short shelf life for chilled meat (72 Hrs). |
| 25. | Products not meeting the pre defined standards | Small birds are rejected. Farmers have to pay the market price for the rejected quantity | Leave it to the farmers |

**Table 4.2: Salient features of the local contract farming companies**

| Sl.No | Particulars | Firm 1 | Firm 2 |
|---|---|---|---|
| 1. | Year of establishment | 1990 | 1998 |
| 2. | Type of ownership | Family | Family |
| 3. | Number of districts covered in Karnataka | 1 | 6 |
| 4. | Number of farmers covered | 65 | 150 |
| 5. | Total shed capacity | 18 lakh Sft | 21 lakh Sft |
| 6. | Criteria for choosing farmers (in the order of importance) | Trust worthiness, farms located within 35 Km from feed mixing plant, quality water | Farms within 50 Km from the service branch, honest and literate farmers |
| 7. | Farm size<br>a. Minimum<br>b. Maximum<br>c. Ideal | <br>5000<br>20000<br>Nil | <br>2500<br>25000<br>Nil |
| 8. | Main products sold | Unbranded live birds | Unbranded live birds |
| 9. | Annual value of domestic sales in 2005 | 41 Cr. | 2.5 Cr. |
| 10. | Annual value of domestic sales in 2000 | 18 Cr. | 30 Lakhs |
| 11. | Volume of domestic sales<br>a. live birds | 98 Lakhs birds | 10 lakhs kg/pm |
| 12. | Percent sales to<br>Super markets<br>Wholesalers<br>Others (Institutions) | <br>10<br>80<br>10 | <br>-<br>100<br>- |
| 13. | Input supplied<br>a. Chicks<br>b. Sanitizers<br>c. Feed<br>d. Vaccine<br>e. medicine<br>f. credit | Percentage<br>100<br>100<br>100<br>100<br>100<br>Nil | Percentage<br>100<br>100<br>100<br>100<br>100<br>yes, recovery in 3 to 4 batches |

| | | | |
|---|---|---|---|
| 14. | Price fixation<br>Base price | Rs. 1.8/kg<br>Cost of production and FCR | 2.65/kg<br>Based on price in the market both input and out put, mortality and price incentive |
| 15. | Price revision | Yes | No |
| 16. | Type of contract | Written | Written |
| 17. | Violation of contract | Rarely | Negligible (less than 0.5 percent) |
| 18. | Dealing with contract violations | Discontinue with violating farmers | Charge for shortages and give three chances for improvement |
| 19. | Common type of contract violations | Short age of birds | Selling birds and feed to others |
| 20. | Recommendations to government | Stringent Avian influenza quarantine, allow liberal import of vaccines | Extension education for farmers, streamline availability of feed ingredients |
| 21. | Notion on consumer preference ( quality attributes) | Body weight 2 kg live bird, less fat tender and juicy | Less price, hygiene, birds weighing more than two kg lives birds |
| 22. | Quality control | Regular heck on respiratory disease of birds | Regular checks and monitoring on the farm rejecting week chicks |
| 23. | Products not meeting the pre defined standards | Provide same price and lift all the birds. Culling birds not meeting the standards in third week itself | Give special care for some time, then sell to specific buyers |

**Table 4.2a: Salient features of the local contract farming companies**

| Sl.No | Particulars | Firm 3 | Firm 4 |
|---|---|---|---|
| 1. | Year of establishment | 2002 | 1991 |
| 2. | Type of ownership | Partnership | Partnership |
| 3. | Number of districts covered in Karnataka | 5 | 2 |
| 4. | Number of farmers covered | 60 | 67 |
| 5. | Total shed capacity | 3 Lakhs sft. | 2.5 Lakhs sft. |
| 6. | Criteria for choosing farmers | Trust worthy, farm located on clustering road, own labour, good infrastructure | Trust worthy, operating near farms farm located on clustering road, own labour, good infrastructure |
| 7. | Farm size<br>a. Minimum<br>b. Maximum<br>c. Ideal | <br>4000<br>25000<br>- | <br>4000<br>30000<br>5000 |
| 8. | Main products sold | Unbranded live birds | Unbranded live birds |
| 9. | Annual value of domestic sales in 2005 | 6.0 Cr. | 25 Cr. |
| 10. | Annual value of domestic sales in 2000 | 5.5 Cr. | 15 Cr. |
| 11. | Domestic live birds sales | 18 Lakhs | 13 Lakhs |
| 12. | Percent sales to<br>Super markets<br>Wholesalers<br>Others (Institutions) | <br>-<br>100<br>- | <br>-<br>100<br>- |
| 13. | Input supplied<br>a. Chicks<br>b. Sanitizers<br>c. Feed<br>d. Vaccine<br>e. medicine<br>f. credit | Percentage<br>100<br>100<br>100<br>100<br>100<br>100 | Percentage<br>100<br>100<br>100<br>100<br>100<br>100 |

**Table 4.2a contd...**

| | | | |
|---|---|---|---|
| 14. | Price fixation<br>Base price | Rs.2/kg<br>Plus cost and price incentive | Rs.2/kg based on FCR and technical norms |
| 15. | Price revision | No | No |
| 16. | Type of contract | Written | Written |
| 17. | Violation of contract | Yes (may be 10 %) | No |
| 18. | Dealing with violations | Discontinue | Not reported |
| 19. | Common type of contract violations | Inability to source labour | No |
| 20. | Recommendations to government | Improve processing industry, allow free import of vaccine,<br>Exporting of birds | Latest Statistics on poultry farms, birds, Hatcheries should be made available,<br>Allow import of vaccines and feed ingredients. |
| 21. | Notion on consumer preference (quality attributes) | Tender, hygienic, appropriate bird size for rural and urban consumers | Hygienic, reasonable price medium sized birds tender and low fat |
| 22. | Quality control | Quality checks Sanitation, chick weight (35 to 40 gm) of DOC | Ingredient testing, afflatoxin and moisture levels are monitored for feed ingredients. |
| 23. | Products not meeting the pre defined standards | Lift all the birds | Will offer discount and lift. |

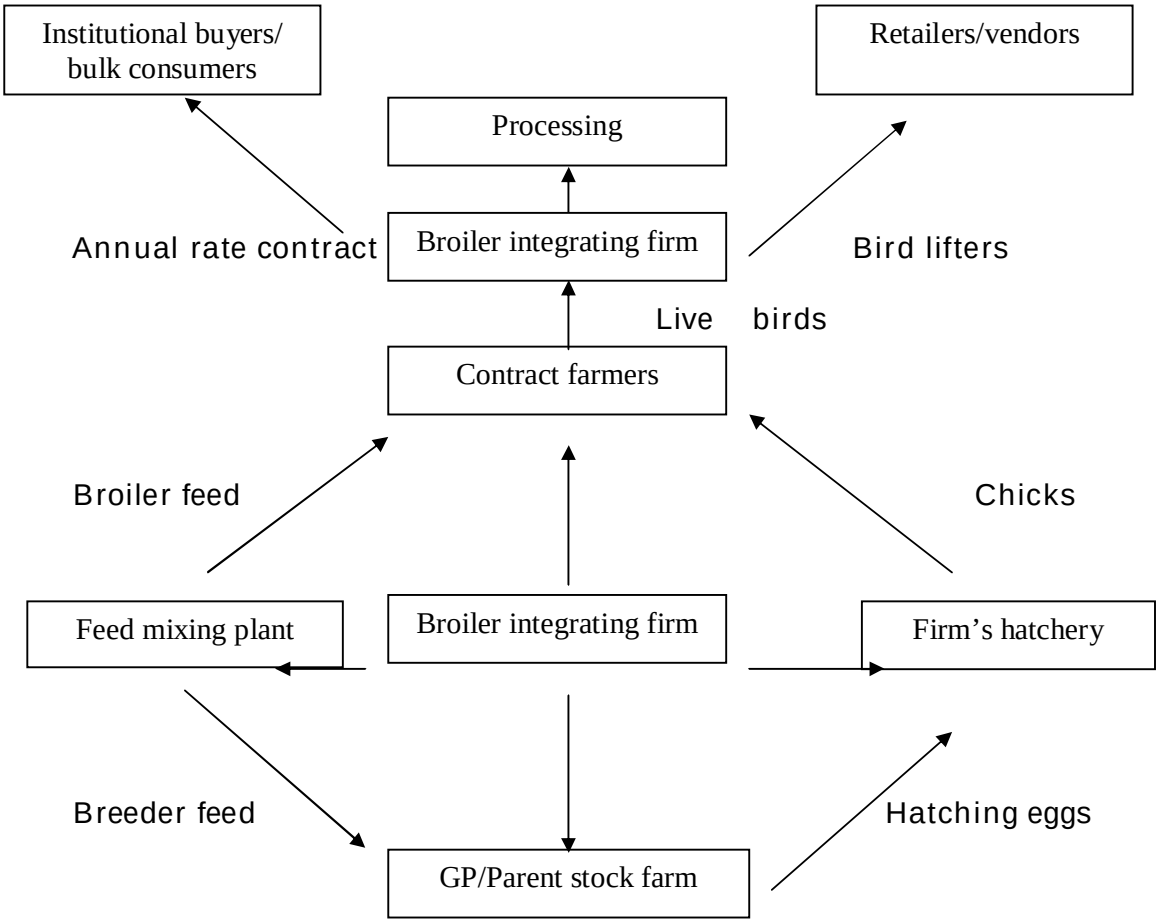


**Fig. 2: Flow diagram for institutional structure in broiler production of national / international firms**

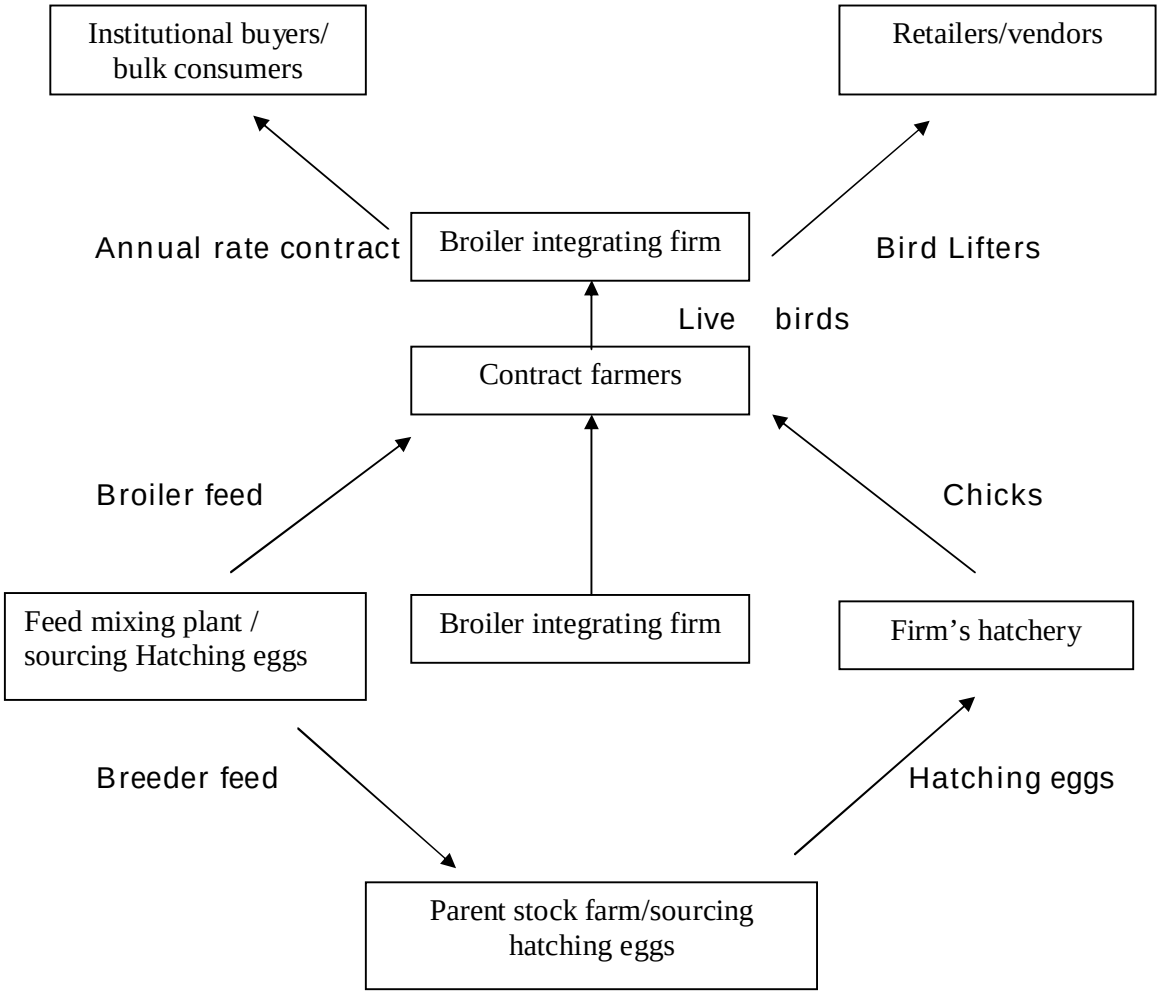


**Fig. 3: Flow diagram for institutional structure in broiler production of local firms**

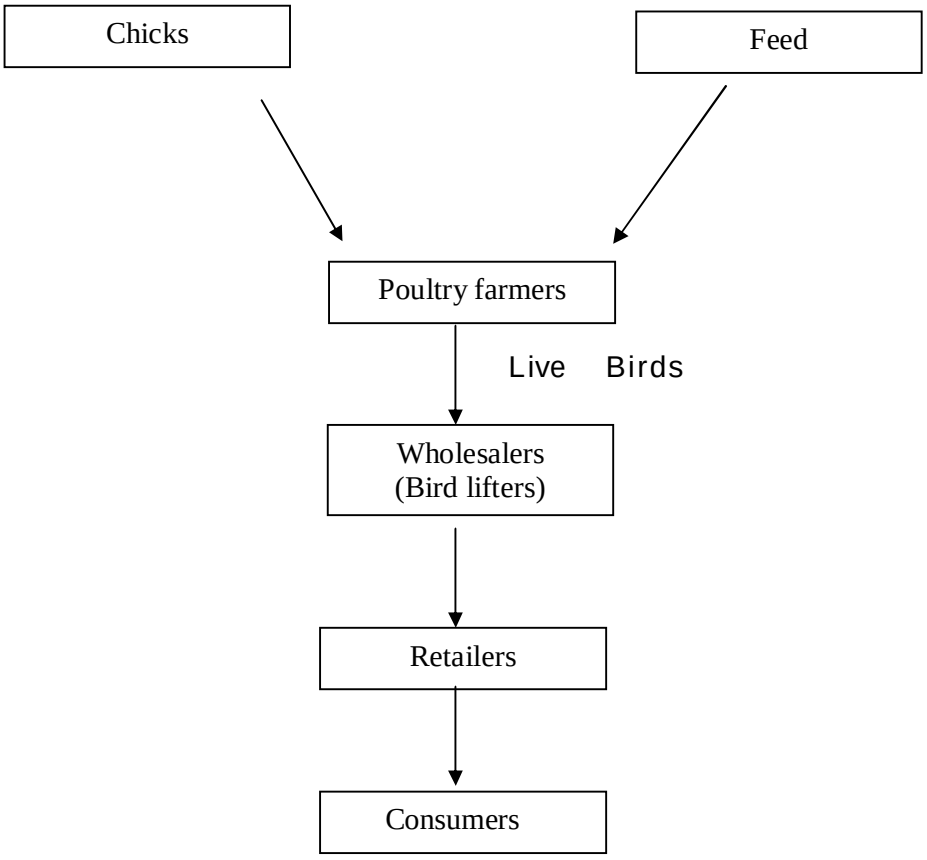


**Fig. 4: Flow diagram depicting sourcing inputs in broiler production by independent farmers**

violations. The institutional arrangements in National and Local firms are presented in the flow diagrams (Fig. 2 and 3). Similarly, the arrangements for sourcing inputs of independent farmers are presented in Fig. 4.

It could be observed from the Tables 4.1, 4.2 and 4.2a that the poultry integrators had written contracts with the farmers for one production year, which was renewable thereafter. The integrating firms had a set of criteria like water quality, ease of input supply, logistics, supervision and lifting of birds for marketing, trustworthiness of farmers and other similar locational characteristics for choosing farmers for contract production. Invariably the farmers already in broiler production business have opted for integration and a few first timers have started the business availing the loan facilities.

The contract violations were dealt with seriously, either by terminating the contract unilaterally or by stringent warnings but not a single case have reached the court; either the farmer or the firm has given up the issue with the farmer moving to another integrator. On the other hand, integrators delay or stop supply of DOC. Thus, the firms reported few contract violations from farmers. Some of the integrating firms had a rewarding system for motivating

better performance. The integrators also managed to produce birds to meet the consumer preference in important consumption centers.

Lifting of birds for marketing was managed by wholesalers for both contract and independent farms. In the case of contract farmers, the wholesalers contacted the company branch office for permission after making the requisite payment. On the other hand, for the independent poultry farms, payments were made after 8-10 days of lifting. Normally the farmers are paid Rs.3-5 below the reference price which is termed as 'cutting'.

## 4.2 General Characteristics Of Sample Farmers

### 4.2.1 Demographic profile

The demographic profile of sample respondents is presented in Table 4.3. It may be noted that over 80 per cent of the respondents were literate up to high school level. There were no significant differences in other attributes across contract and independent farm groups.

### 4.2.2 Experience in CF

The distribution of farmers according to number of years experience in poultry production (Table 4.4 and Fig. 5) revealed that a majority of the farmers among 'independent' and 'large' categories had 5-10 years experience. However, among small farmers, a majority of them had less than 5 years of experience in poultry

**Table 4.3: Demographic profiles of sample farmers**

| Sl. No | Particulars | Unit | Large | Medium | Small | Non contract |
|---|---|---|---|---|---|---|
| 1 | Age of the farmer | Years | 49.83 | 48.05 | 50.62 | 50.05 |
| 2 | Size of the Family | Number | 4.83 | 5.00 | 4.54 | 5.61 |
| 3 | Years of schooling | - | 9.52 | 9.22 | 6.84 | 8.07 |
| 4 | Illiterate | Number | 5 (10.87) | 4 (10.00) | 2 (15.38) | 7 (17.07) |
| 5 | Literate | Number | 41 (89.13) | 36 (90.00) | 11 (84.62) | 34 (82.93) |
| | a. Primary School | Number | 5 (10.87) | 9 (22.50) | 6 (46.15) | 10 (24.39) |
| | b. High school | Number | 23 (50.00) | 18 (45.00) | 4 (30.77) | 15 (36.59) |
| | c. College & above | Number | 13 (28.26) | 9 (22.50) | 1 (7.69) | 9 (21.95) |

Note: Figures in parentheses indicate percentages to total

**Table 4.4: Classification of respondents according to years of experience in broiler farming**

| Particulars | Large | Medium | Small | Independent |
|---|---|---|---|---|
| Fresh (<5 years) | 16 (34.78) | 17 (42.5) | 6 (46.15) | 6 (14.63) |
| Experience (5-10 years) | 20 (43.48) | 17 (42.5) | 5 (38.46) | 22 (53.66) |
| More experience (>10 years) | 10 (21.74) | 6 (15.0) | 2 (15.38) | 13 (31.71) |

Note: Figures in the parentheses indicate percentages

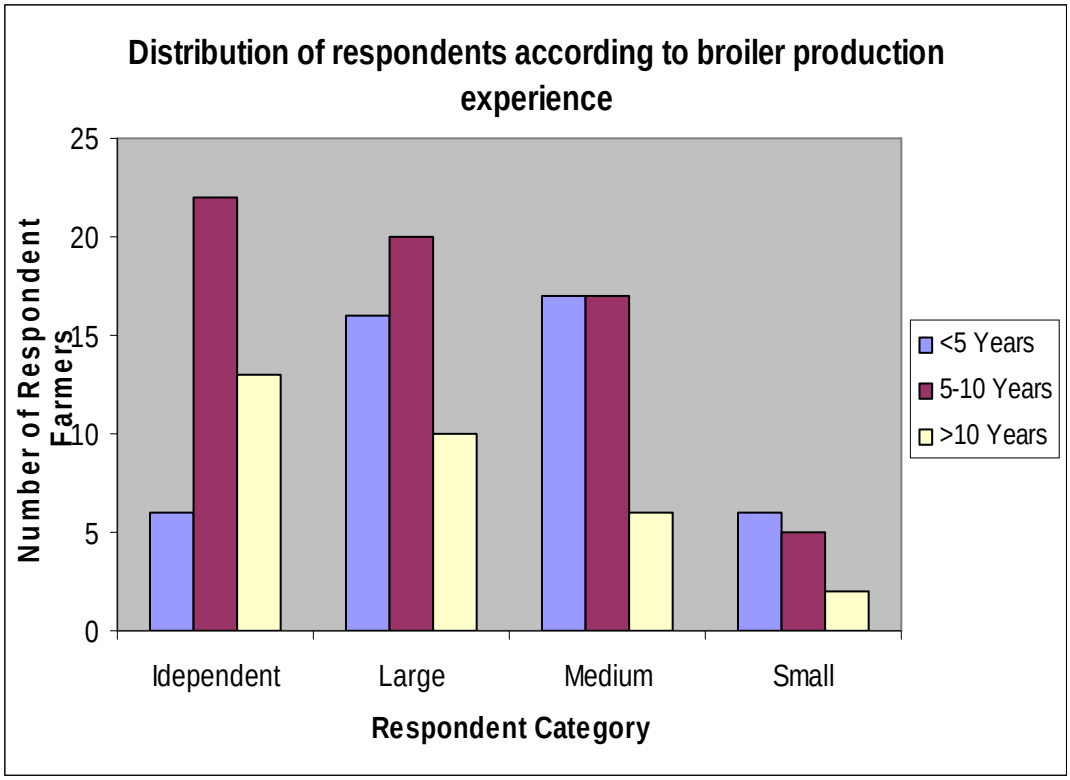


**Fig 5: Schematic representation of distribution of respondents according to broiler production experience**

production. On the other hand, medium farms had equal number of experienced (5-10 years) and fresh (less than 5 years) farmers among the sample respondents. It may be noted here that among the independent farms the longest years of experience in poultry farming was 18 years. Similarly, among contract farmers, the longest year of poultry experience was 30 years who entered into CF 7 years ago.

Further, it could be observed from Table 4.5 that the large farmers have got the longest duration of experience in poultry production but small farmers had the longest experience in contract production of above 5 years. The first contract was for a period of more than 2½ years in all the categories.

### 4.2.3 Mode of entry into CF

The type of farmers who took to CF (Table 4.6 and Fig. 6) revealed that large contact farmers comprised of highest number of independent farms (61%) shifting to CF as compared to those who directly took up contractual production (39%). The medium farms also comprised of more number of previously independent farms becoming contract producers. However, among small farms, a majority of farmers directly took to CF (61.54%).

**Table 4.5: Experience in contract farming**

(in months )

| Sl. No. | Terms | Large | Medium | Small |
|---|---|---|---|---|
| 1 | Experience in Poultry farming | 95.04 | 72.00 | 77.52 |
| 2 | C F experience | 52.20 | 55.68 | 61.80 |
| 3 | Duration of the first contract | 32.35 | 40.22 | 30.07 |

**Table 4.6: Mode of entry into contract farming**

| Particulars | Large | Medium | Small |
|---|---|---|---|
| Directly into contract | 18 (39.00) | 18 (45.00) | 8 (61.54) |
| Shifting from Independent to contract | 28 (61.00) | 22 (55.00) | 5 (38.46) |
| **Total** | 46 | 40 | 13 |

Note: Values in parentheses indicate percentages

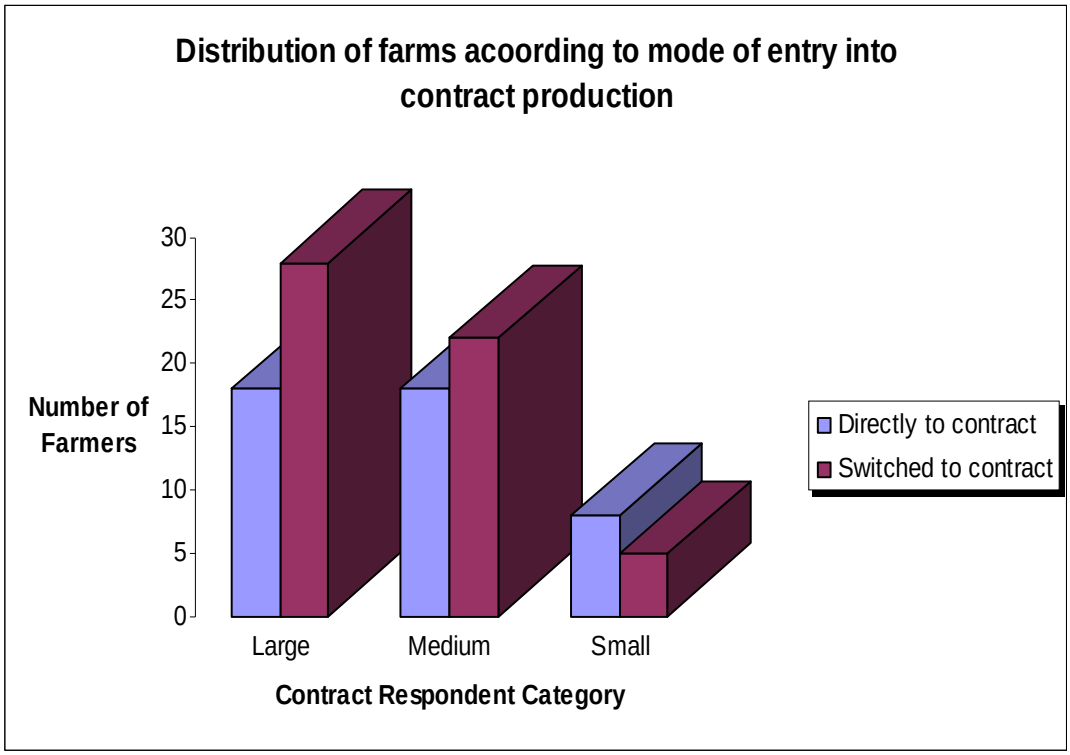


**Fig 6: Schematic representation of distribution of farms according to mode of entry into contract production**

### 4.2.4 General asset possession

The general asset possession of contract and independent farmer is provided in Table 4.7. It may be noted that some household possessed more than one piece of the same item. From Table 4.7 it can be seen that a majority of the respondents owned telecommunication gadgets like land-line and mobile telephone, refrigerator, radio, and television. Similarly they owned production assets like land, dwelling house and water pump. The automobiles like cars, tractors and trucks were owned by only a few respondents in each category.

## 4.3 Resource Use Pattern

Land holding pattern of the farmers by way of crop diversification is indicated in Table 4.7. The average size of holding in acres was 10.49 for large contract producers, while it was 7.41 and 3 acres, respectively for medium and small CF. The independent farms had an average land holding size of 6.68 acres (Table 4.7).

### 4.3.1 Crop diversification

The contract farmers had grown both subsistence and commercial crops to meet the household requirements. The Large contract group revealed that the respondents, in total, had grown 16 different crops (Table 4.8). The highest area was under eucalyptus accounting for 44 per cent of the area and 27 respondents cultivated

**Table 4.7: General asset possession of the sample farmers**

(in numbers)

| Items | Large (n=46) | Medium (n=40) | Small (n=13) | Independent (n=41) |
|---|---|---|---|---|
| House size (sft) | 1529.56 | 1501.3 | 1088.46 | 1196.44 |
| Land holdings (acres) | 10.49 | 7.41 | 3.0 | 6.68 |
| Radios | 54 | 45 | 31 | 40 |
| Televisions | 58 | 53 | 33 | 40 |
| Washing Machines | 14 | 12 | 3 | 8 |
| Refrigerators | 49 | 39 | 17 | 26 |
| Land Line phones | 55 | 50 | 27 | 35 |
| Mobile phones | 62 | 64 | 21 | 32 |
| Bikes | 67 | 61 | 30 | 33 |
| Cars | 11 | 13 | 1 | 3 |
| Trucks | 5 | 7 | 4 | 3 |
| Tractors | 14 | 15 | 2 | 5 |
| Bullock carts | 11 | 15 | 6 | 8 |
| Water pumps | 72 | 50 | 13 | 38 |
| Modern Kitchen Stoves | 46 | 40 | 11 | 38 |

**Table 4.8: Crop diversification of large contract farms**

(n= 46)

| Sl. No | Crops | Irrigated | Rain fed | Total | Per cent | No. of farmers |
|---|---|---|---|---|---|---|
| 1 | Paddy | 0.5 | - | 0.5 | 0.163 | 1 |
| 2 | Potato | 20 | 2 | 22 | 7.165 | 7 |
| 3 | Other tubers | 3.5 | - | 3.5 | 1.140 | 2 |
| 4 | Tomato | 0.5 | - | 0.5 | 0.163 | 1 |
| 5 | Onion | 5 | - | 5 | 1.628 | 2 |
| 6 | Other vegetables | 1 | - | 1 | 0.326 | 1 |
| 7 | Grapes | 13.75 | - | 13.75 | 4.478 | 5 |
| 8 | Other fruits | 1.75 | - | 1.75 | 0.570 | 2 |
| 9 | Sericulture | 24.5 | - | 24.5 | 7.979 | 8 |
| 10 | Other tree crops | 3 | - | 3 | 0.977 | 1 |
| 11 | Other annual crops | 7 | 2.5 | 9.5 | 3.094 | 4 |
| 12 | *Ragi* (millet) | 27 | 50.5 | 77.5 | 25.241 | 15 |
| 13 | Flowers | 1 | - | 1 | 0.326 | 1 |
| 14 | Mango | - | - | 0 | 0 | 1 |
| 15 | Coconut | 5 | 1.54 | 6.54 | 2.130 | 3 |
| 16 | Eucalyptus | | 137 | 137 | 44.620 | 27 |
| **Total acres** | | | | **307.04** | **100.00** | |

this crop. The other crops in the order of importance were *ragi* (25% of the area), sericulture and potato (Fig.7).

The cropping pattern of medium contract farms also followed similar crop combinations with eucalyptus being grown in 36 per cent of area, followed by ragi (21 %), potato (11.78 %) and sericulture (5.61 %) (Table 4.9 and Fig.8).

Small farmers had slightly different crop combinations as they cultivated vegetables commercially. The largest percentage of area was for eucalyptus (28.98%) followed by *ragi* (24.63). However, majority of farmers raised *ragi* crop as it is a staple crop in the area (Table 4.10 and Fig.9).

The crop combination of independent farms had a marked difference compared to contract farms (Table 4.11). Majority of farmers (63.41%) cultivated maize in approximately 43 per cent of the area, followed by *ragi*, and eucalyptus, in that order. Unlike contract farmers, majority of independent farmers had formulated poultry feed for which maize is an important ingredient (Fig.10).

The composition of assets used in poultry production across size groups are indicated in Table 4.12. It may be noted here that the indicated values are the actual prices paid by the respondents while they bought these inputs. Large integrating farmers had invested around Rs.11.35 lakhs on poultry sheds, while small farmers owned

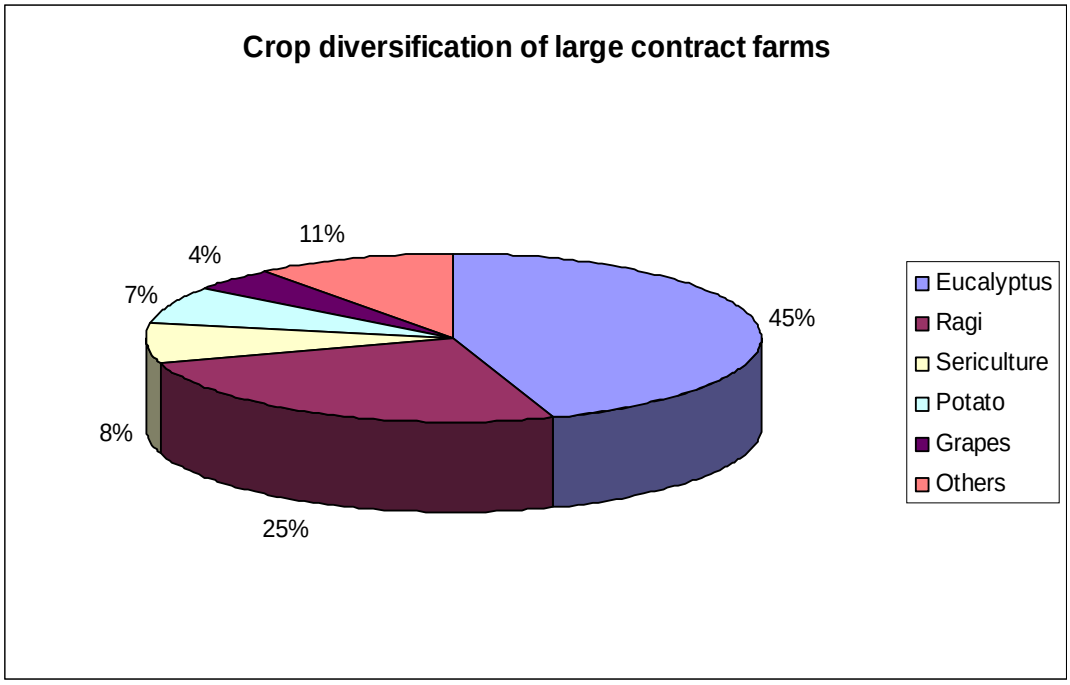


**Fig 7: Schematic representation of crop diversification of large contract farms**

**Table 4.9: Crop diversification of medium contract farms**

(n=40)

| Sl. No | Crops | Irrigated | Rain fed | Total | Per cent | No. of farmers |
|---|---|---|---|---|---|---|
| 1 | Paddy | 1 | 1.5 | 2.5 | 0.935 | 2 |
| 2 | Potato | 29.5 | 2 | 31.5 | 11.786 | 12 |
| 3 | Beans | 2.5 | - | 2.5 | 0.935 | 3 |
| 4 | Groundnut | 3 | - | 3 | 1.122 | 2 |
| 5 | Other tubers | 6 | - | 6 | 2.245 | 3 |
| 6 | Chinese cabbage | 3 | - | 3 | 1.122 | 1 |
| 7 | Other vegetables | 6.75 | - | 6.75 | 2.525 | 7 |
| 8 | Grapes | 10 | - | 10 | 3.742 | 2 |
| 9 | Other fruits | 2 | - | 2 | 0.748 | 2 |
| 10 | Sugarcane | 0.5 | - | 0.5 | 0.187 | 1 |
| 11 | Sericulture | 15 | - | 15 | 5.613 | 7 |
| 12 | Other annual crops | 2.5 | - | 2.5 | 0.935 | 1 |
| 13 | *Ragi* (millet) | 0.5 | 56 | 56.5 | 21.141 | 22 |
| 14 | Flowers | 2 | - | 2 | 0.7483 | 2 |
| 15 | Mango | 9 | - | 9 | 3.367 | 1 |
| 16 | Coconut | - | 18 | 18 | 6.735 | 1 |
| 17 | Eucalyptus | 5.5 | 91 | 96.5 | 36.108 | 26 |
| **Total acres** | | | | **267.25** | **100.00** | |

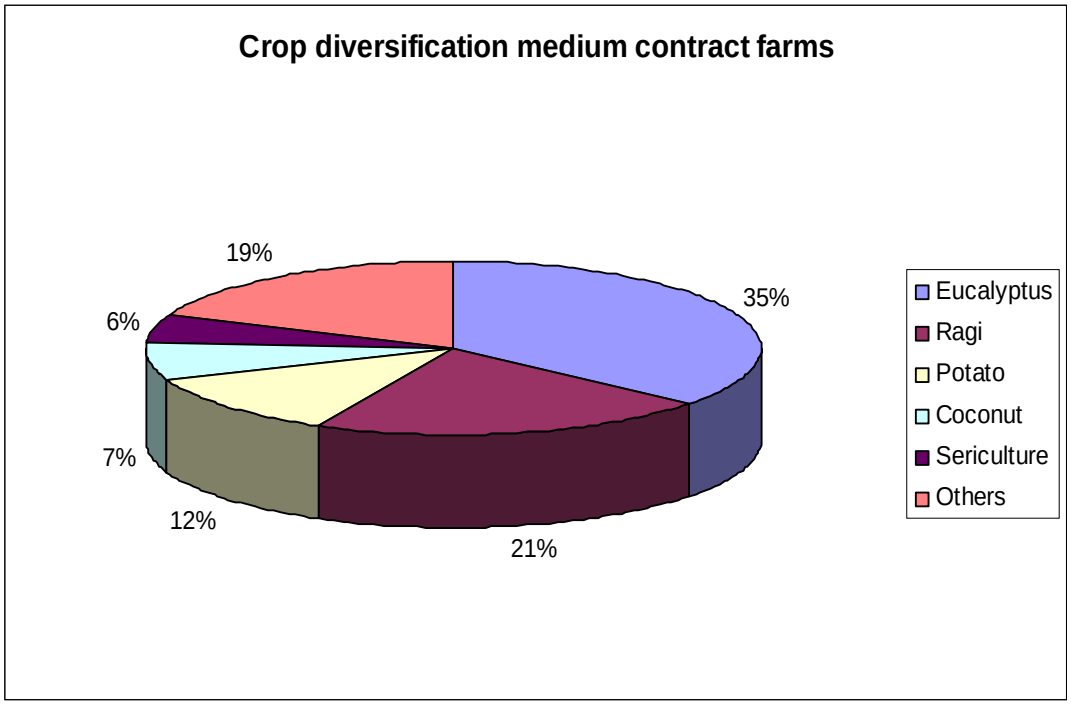


**Fig 8: Schematic representation of crop diversification medium contract farms**

**Table 4.10: Crop diversification of small contract farms**

(n=13)

| Sl. No | Crops | Irrigated | Rain fed | Total | Per cent | No. of farmers |
|---|---|---|---|---|---|---|
| 1 | Maize | 4.5 | 2 | 6.5 | 9.420 | 3 |
| 2 | Beans | 1 | - | 1 | 1.449 | 2 |
| 3 | Potato | 2 | - | 2 | 2.898 | 1 |
| 4 | Onion | 2 | - | 2 | 2.898 | 1 |
| 5 | Other vegetables | 3 | - | 3 | 4.348 | 3 |
| 6 | Other fruits | 4.5 | - | 4.5 | 6.522 | 2 |
| 7 | Sugarcane | 0.5 | - | 0.5 | 0.725 | 1 |
| 8 | Sericulture | 4 | - | 4 | 5.797 | 3 |
| 9 | Other tree crops | 0.5 | - | 0.5 | 0.724 | 1 |
| 10 | *Ragi* (millet) | 2 | 15 | 17 | 24.638 | 10 |
| 11 | Mango | 8 | - | 8 | 11.594 | 1 |
| 12 | Eucalyptus | - | 20 | 20 | 28.985 | 6 |
| **Total Area** | | | | **69** | **100.00** | |

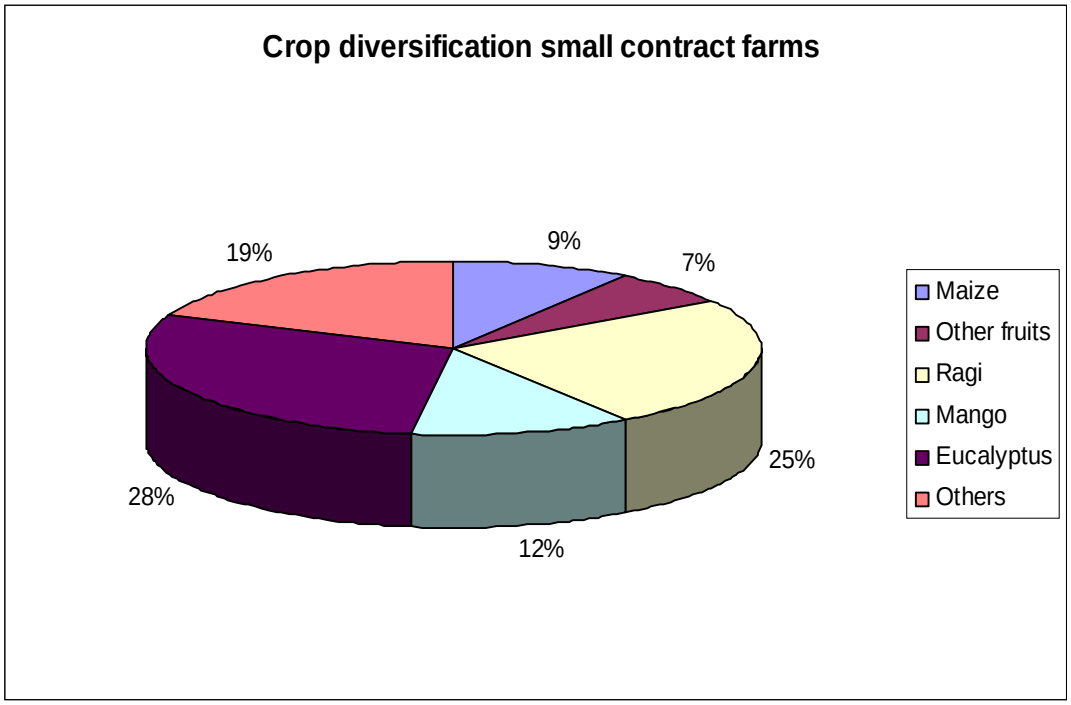


**Fig 9: Schematic representation of crop diversification small contract farms**

**Table 4.11: Crop diversification pattern of independent farmers**

(n=41)

| Sl. No | Crops | Irrigated | Rain fed | Total | Per cent | No. of farmers |
|---|---|---|---|---|---|---|
| 1 | Paddy | 4.5 | - | 4.5 | 2.007 | 6 |
| 2 | Maize | 9.5 | 86.75 | 96.25 | 42.920 | 26 |
| 3 | Sorghum | 1 | - | 1 | 0.4461 | 1 |
| 4 | Beans | 0.5 | - | 0.5 | 0.223 | 1 |
| 5 | Other pulses | - | 1.5 | 1.5 | 0.669 | 2 |
| 6 | Ground nut | 0.5 | 0.5 | 1 | 0.446 | 2 |
| 7 | Potato | 1 | - | 1 | 0.446 | 1 |
| 8 | Tomato | 8.25 | 0 | 8.25 | 3.679 | 7 |
| 9 | Onion | 1 | - | 1 | 0.446 | 1 |
| 10 | Cabbage | 0.5 | - | 0.5 | 0.223 | 1 |
| 11 | Other fruits | 3.5 | 0.5 | 4 | 1.784 | 5 |
| 12 | Sericulture | 1.25 | - | 1.25 | 0.557 | 2 |
| 13 | Other tree crops | 2 | - | 2 | 0.892 | 2 |
| 14 | Other annual crops | 4.5 | - | 4.5 | 2.007 | 3 |
| 15 | *Ragi* (millet) | 1 | 44.5 | 45.5 | 20.290 | 21 |
| 16 | Mango | 4 | - | 4 | 1.784 | 1 |
| 17 | Coconut | 4 | 1 | 5 | 2.229 | 3 |
| 18 | Eucalyptus | - | 42.5 | 42.5 | 18.952 | 12 |
| **Total Area** | | | | **224.25** | **100.00** | |

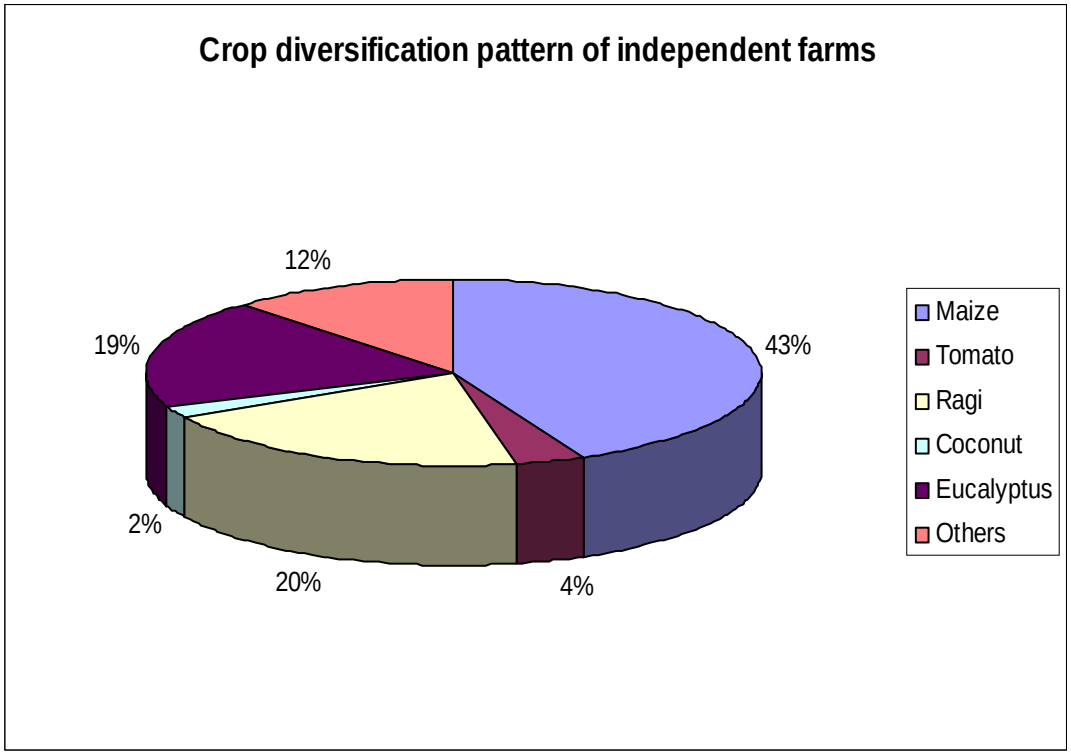


**Fig 10: Schematic representation of crop diversification pattern of independent farmers**

**Table 4.12: Poultry asset composition**

(Value in Rs.)

| Assets | Large | Medium | Small | Independent |
|---|---|---|---|---|
| Land for poultry production (Acres) | 1.06 | 0.91 | 0.88 | 0.97 |
| Poultry house number | 3.79 | 1.85 | 1.38 | 2.44 |
| Poultry house value | 11,35250 | 38,3550 | 21,6923 | 35,3963 |
| Feed warehouse value | 45,473.68 | 32,777.78 | 20,000.00 | 38,928.57 |
| Per cent respondents owning | 41.30 | 22.5 | 15.38 | 34.15 |
| Water tank number | 2.63 | 1.62 | 1.15 | 2.02 |
| Water tank value | 13,608.70 | 12,987.50 | 7,461.54 | 10,326.83 |
| Chick feeders number | 533 | 295 | 128 | 291 |
| Chick feeders value | 26,330.0 | 14,462.5 | 6,411.54 | 14,461.46 |
| Tube feeders number | 451 | 247 | 118 | 236 |
| Tube feeders value | 74,512.50 | 41,111.25 | 20,996.15 | 39,266.59 |
| Drinkers/waterers number | 716 | 412 | 201 | 442 |
| Drinkers/waterers Value | 77,566.30 | 47,477.50 | 23,144.23 | 50,893.90 |
| Brooders -Number | 43 | 22 | 12 | 56 |
| -Value | 4001.08 | 673.75 | 291.92 | 489.15 |

sheds worth Rs.2.16 lakhs. It is evident from the Tables that the value of poultry house accounted for the single largest investment across all the respondents. Most of the poultry farms did not have a separate feed warehouse; only 41.3 per cent of large farms, 22.5 per cent medium farms and 15.38 per cent small farms owned feed ware house. Similarly, around 34.15 per cent of independent farms owned poultry warehouse. A majority of the respondents used coal for brooding, while a smaller percentage of large farms still owned conventional electrical brooding.

### 4.3.2 Loan acquisition and utilization pattern

Hitherto, institutional agencies were not lending to poultry sector due to the prevalence of high degree of price and production risk and branded it as 'Risky sector'. However, recently the integrators, broiler farmers and banks have evolved a tripartite arrangement for extending investment credit. Under the broiler plus scheme banks like SBI, ICICI, and HDFC have memorandum of understanding with the integrators wherein the unit cost is fixed at Rs.3.0 lakhs for 5000 birds unit and a maximum cost of Rs.15 lakhs (5 Units). The repayments are by way of crediting the growing charges earned by the farmer directly to the loan account of contract farmers and the remaining amount would be credited to the farmers' account. From Table 4.13, it is clear that only 20 per cent of the respondents availed of loan during the period 2002-2005. The

**Table 4. 13: Loan acquisition and utilization pattern**

(Value in Rs.)

| Particulars | Large (n=46) | Medium (n=40) | Small (n=13) | Non contract (n=41) |
|---|---|---|---|---|
| Number of farmers applied for loan | 9 | 8 | 4 | 8 |
| Average amount of loan applied (Rs.) | 4,08,333.33 | 3,53,125 | 2,50,000 | 3,46,875.00 |
| Source of Loan | - | - | - | - |
| Money lenders | 3 | - | - | 1 |
| Banks | 6 | 7 | 4 | 5 |
| Friends | - | - | - | 1 |
| Cooperative | - | 1 | - | 1 |
| Purpose of Loan | | | | |
| Agri. inputs | 3 | 1 | 2 | 3 |
| Agri. investments | 6 | - | - | 1 |
| Poultry purpose | - | 2 | 2 | 4 |
| Education | - | 5 | - | - |
| Others | - | - | - | - |
| Able to repay the loan | | | | |
| Yes, all | 3 | - | - | 4 |
| Only part | 6 | 5 | 4 | 3 |
| Not yet due | - | 3 | - | 1 |

average loan amount of these borrowers varied between Rs.2.50 lakhs and Rs.4.08 lakhs across different categories of farms. The major source of loan was the commercial banks and the respondents mostly utilized the loan for agricultural investments. The respondents opined that they preferred to source investments out of equity capital rather than through borrowings. No over dues were reported by the respondents.

### 4.3.3 Information search cost

The study proposed was to test the hypothesis that the CF reduces the information search cost for farmers. It was reported in the literature that farmers spent considerable time in gathering information pertaining to production and marketing. One of the advantages of CF is that of reduction in this information search cost. The total information search was sub-divided into three broad heads namely, general information search cost, marketing information search and contract negotiation expenditure.

The main office of most of the contracting firms is situated in and around Bangalore due to logistical advantages. The area of operation extends up to 150 km radius in peri-urban Bangalore. Hence the travel cost and imputed value of travel time accounted for a major share of information search cost for poultry contract farmers (Table 4.14).

**Table 4.14 Information search cost**

(Value in Rs.)

| **Information search cost to collect general market information** | | | | |
|---|---|---|---|---|
| | **Large** | **Medium** | **Small** | **Non contract** |
| Travel cost | 236.95 | 191.25 | 199.23 | 371.22 |
| Travel time | 223.64 | 176.25 | 186.53 | 346.04 |
| Communication cost | 26.95 | 21.87 | 16.15 | 34.75 |
| **Sub total** | **487.54** | **389.37** | **401.91** | **752.01** |
| **Information search cost to collect general contract information before entering the contract** | | | | |
| Travel cost | 77.28 | 81.37 | 56.15 | 178.05 |
| Travel time | 149.46 | 128.75 | 168.27 | 119.51 |
| Communication cost | 24.30 | 20.38 | 14.28 | 19.38 |
| **Sub total** | **251.04** | **230.50** | **238.70** | **316.94** |
| **Contract negotiation cost (only for contract farmers)** | | | | |
| Travel cost | 69.78 | 81.87 | 96.92 | |
| Travel time | 140.76 | 105.93 | 159.61 | |
| Communication cost | 15.34 | 15.70 | 10.00 | |
| Others | 20.00 | 17.37 | 20.00 | |
| **Sub total** | **245.88** | **220.87** | **286.53** | |
| **Grand total** | **984.46** | **840.74** | **927.14** | **1068.95** |

The general information search cost was the highest for independent farmers amounting to around Rs.752.01 compared to Rs.487.54 for large, Rs.389.37 for medium and Rs.401.91 in the case of small contract producers. The information search cost on CF was lowest among medium contract farmers at Rs.230.50, while the highest was for independent farmers amounting to Rs.316.94. Similarly the contract negotiation cost was also computed by imputing time spent in traveling and actual transport and communication expenditure. The comparison of total information search cost revealed that the independent farms spent Rs.1068.95 as compared to Rs.984.46, Rs.927.14 and Rs.840.74 among large, small and large contract producers, in that order.

### 4. 4. Economics Of Broiler Production

The broiler profitability is computed by considering the contribution to household income and also through per batch earnings.

#### 4.4.1 Source-wise farm average income earnings

The household income earnings were categorized into four important sources, namely crops, livestock (other than poultry), business, and poultry (Fig.11).

The source-wise per farm income earnings revealed that crop and animal husbandry were the two important sources for income

**Table 4.15 Source wise average income earnings per farm**

(Value in Rs.)

| Sources of income | Large contract | | Medium contract | | Small contract | | Independent | |
|---|---|---|---|---|---|---|---|---|
| | Amount | Per cent | Amount | Per cent | Amount | Per cent | Amount | Per cent |
| Crops | 28,6137 | 44.14 | 18,3468 | 44.80 | 67,886 | 35.48 | 84,921 | 20.07 |
| Live stock | 2333 | 0.35 | 4779 | 1.17 | 3708 | 1.94 | 4248 | 1.00 |
| Other business | 49,304 | 7.60 | 77,550 | 18.94 | 51,230 | 26.77 | 48,878 | 11.55 |
| Poultry | 3,10,407 | 47.88 | 1,43,669 | 35.09 | 68,529 | 35.81 | 2,85,001 | 67.36 |
| Total | 6,48,181 | | 4,09,466 | | 1,91,353 | | 4,23,048 | |

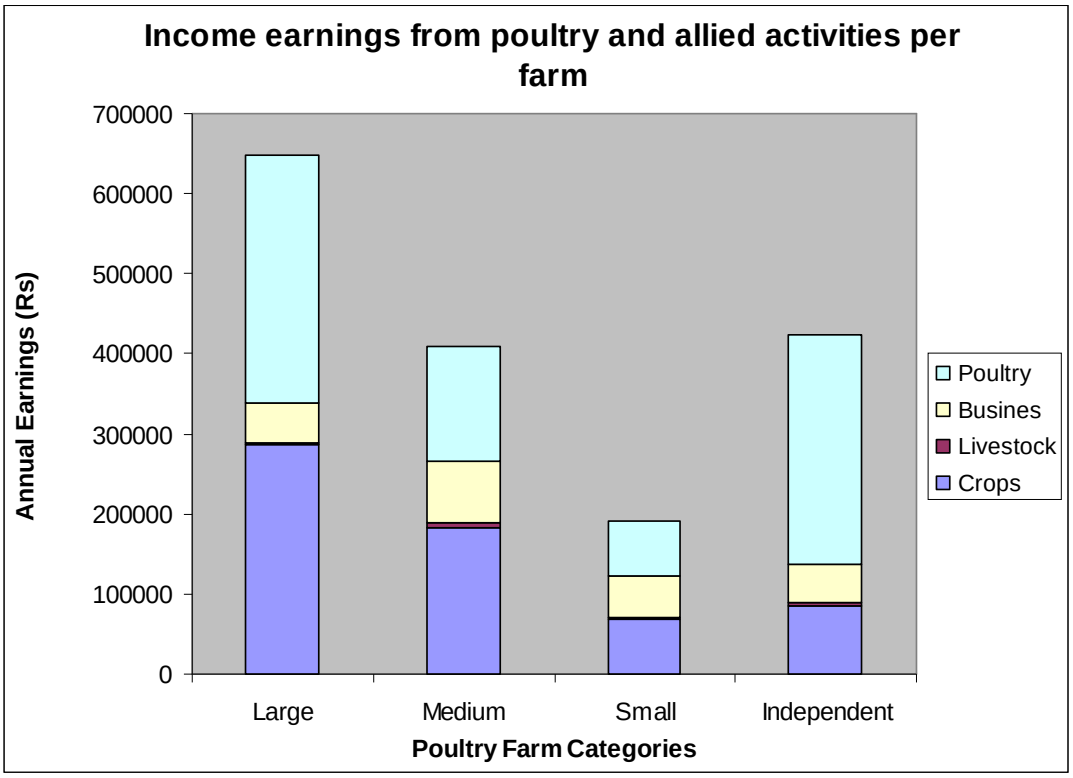


**Fig 11: Schematic representation of per farm income earnings from poultry and allied activities**

earnings. Other business income earnings comprising of, off-farm employment and trade, also contributed substantial income to the households. Many of the independent poultry farmers had their own poultry retail outlets. The total earnings of contract farmers varied directly with flock size, while for independent farms such a classification was beyond the purview of this study. The per farm earnings was the highest among large farm category with 6.48 lakhs, followed by independent farms having 4.23 lakhs, medium farms with 4.09 lakhs, and small farms (1.91 lakhs), in that order (Table 4.15).

### 4.4.2 Economics of per batch earnings

The profitability of poultry is directly related to the number of effective batches per year. An average of six batches per annum is ideally required to make poultry a profitable venture. Fewer numbers of batches would result in too little average monthly earnings for the household and inflate the fixed cost per batch. The cycle length is the duration in days between chick replacements. It could be observed from Table 4.16 that the average number of batches was the highest in the case of independent farms compared to contract producers. Further, the medium farms had slightly higher number of batches compared to other two contract categories. The production policies of the company and market conditions are the factors determining the batch length.

**Table 4.16 Number and length of poultry batches per year**

| Firms | Average no. of cycles per year | Average no. of days per cycle |
|---|---|---|
| Large | 4.05 | 83.26 |
| Medium | 4.32 | 77.30 |
| Small | 4.23 | 79.62 |
| Non-contract | 4.74 | 68.83 |

Integrating company provided inputs like DOCs, feed, antibiotics, technical advice, and disease diagnostics. Farmers provided litter, cleaning supplies, whitewash and fumigation, brooding and lighting expenditure and labor management including supervisory role (Table 4.17). The average flock size of large integrators was 16141 which resulted in growing charges sale of birds of Rs.77,939. Similarly, medium farms had 7610 flock size resulting in a revenue realization of Rs.36,170 by way of sale of birds. Similarly, small integrators had a flock size of 3473 which resulted in Rs.16,830 earnings. The independent farms had an average flock size of 7453 which resulted in realizing Rs.4.62 lakhs from sale of birds. However, the net return realization among independent farms was to the extent of Rs.55,814 which is comparable to the earnings by large contract producers.

Large farms had used more of hired labor than small farms; the latter being entirely managed by members of the family. The total fixed and variable expenditure amounted to Rs.45,350 for large integrators, while it was Rs.25,958 and Rs.12,862 for medium and small integrators, respectively. The independent farms incurred a total of Rs.4.13 lakhs towards production of which feed and chick costs constituted 68 per cent and 25 per cent, respectively. Although independent farmers realized Rs.4.62 lakhs from sale of birds, the net earnings from broiler sale was to the extent of Rs.48,499 per

**Table 4.17 Economics of poultry production**

(Rs./cycle)

| Items | Contract producers | | | Independent |
|---|---|---|---|---|
| | Large | Medium | Small | |
| **Cost** | | | | |
| Chicks Number | 16,141 | 7,610 | 3,473 | 7,453 |
| Chick cost | By Integrator | By Integrator | By Integrator | 1,03,437 |
| Feed cost | By Integrator | By Integrator | By Integrator | 282330 |
| Hired labor | 12,074 | 4,848 | 992 | 3,155 |
| House hold labor | 2882 | 3571 | 3969 | 3728 |
| Litter | 11,365 | 5,783 | 2,592 | 4,052 |
| Cleaning supplies | 1,369 | 715 | 423 | 1,437.50 |
| Antibiotics and other medicine | By Integrator | By Integrator | By Integrator | 1,110 |
| Veterinary services | By Integrator | By Integrator | By Integrator | 2,622.22 |
| Electricity | 4,648 | 2,384 | 1,669 | 3,422 |
| Brooding Charges | 7,263 | 4,185 | 1,389 | 4,099 |
| White wash and fumigation | 2,158 | 1,600 | 625 | 1,400 |
| Deprecation charges | 3,591 | 2,870.20 | 1,203 | 2,600 |
| Total cost | 45,350 | 25,956.20 | 12,862 | 41,3392.7 |
| **Returns (Rs.)** | | | | |
| Birds lifted | 15,251 | 7228 | 3,304 | 7,189 |
| Average weight (kg) | 32,085.26 | 15,033.56 | 7,204.22 | 14,804.66 |
| Mortality (%) | 5.51 | 5.01 | 4.87 | 3.54 |
| Growing charges / Sale of birds | 77,939 | 36,170 | 16,106.9 | 46,1892 |
| Raw manure | 6828.30 | 4275 | 505.75 | 5767.10 |
| Gunny bag | 835.28 | 505 | 218 | 1547.44 |
| Total income | 85,602.58 | 40,950 | 16,830.65 | 4,69,206.50 |
| Net income | 40,252.58 | 14,993.80 | 3,968.65 | 55,813.82 |
| Average growing charges | 2.43 | 2.41 | 2.24 | 6.60 |
| **Net income per kg only from bird sale** | 1.01 | 0.68 | 0.45 | 0.69 |
| **Net income per kg** | 1.25 | 1.00 | 0.55 | 0.80 |

cycle. The per kg profits were computed for income derived exclusively from the sale of birds and also by considering income from all the three sources viz., sale of birds, gunny bag and manure (Fig.12-15). It may be noted that the actual net income realization from sale of birds was the highest for large contract farms which was a little over one rupee, followed by independent farms (Rs.0.69), medium (Rs.0.68), and small contract farms (Rs.0.45), in that order.

The profitability of poultry production was compared across groups and the significance of per kg profits was tested using one way ANOVA. The average annual per kg profits were computed to study if there is any difference in the broiler performance across the four groups. The significant F statistic (Table 4.18) indicates that the null hypothesis that average annual per kg profits are same among all the four groups meaning that there is significant difference in the average profits earned per kg of bird marketed. The critical differences for all the six pairs were calculated and compared with the actual difference between the group means. It was observed that the observed mean difference between independent and all the three contract producer groups were higher than the respective critical differences meaning that there is significant difference in broiler profitability between contract and independent growers. However, there were no differences among the three contract grower groups.

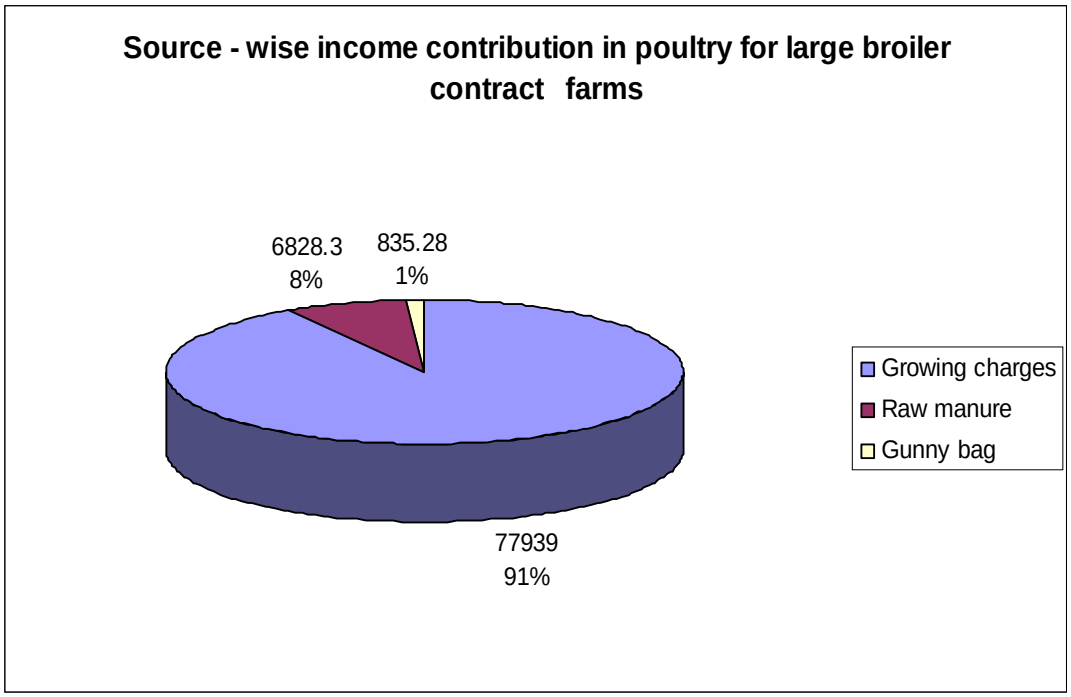


**Fig. 12: Schematic representation of source wise income contribution in poultry for large broiler contract farmers**

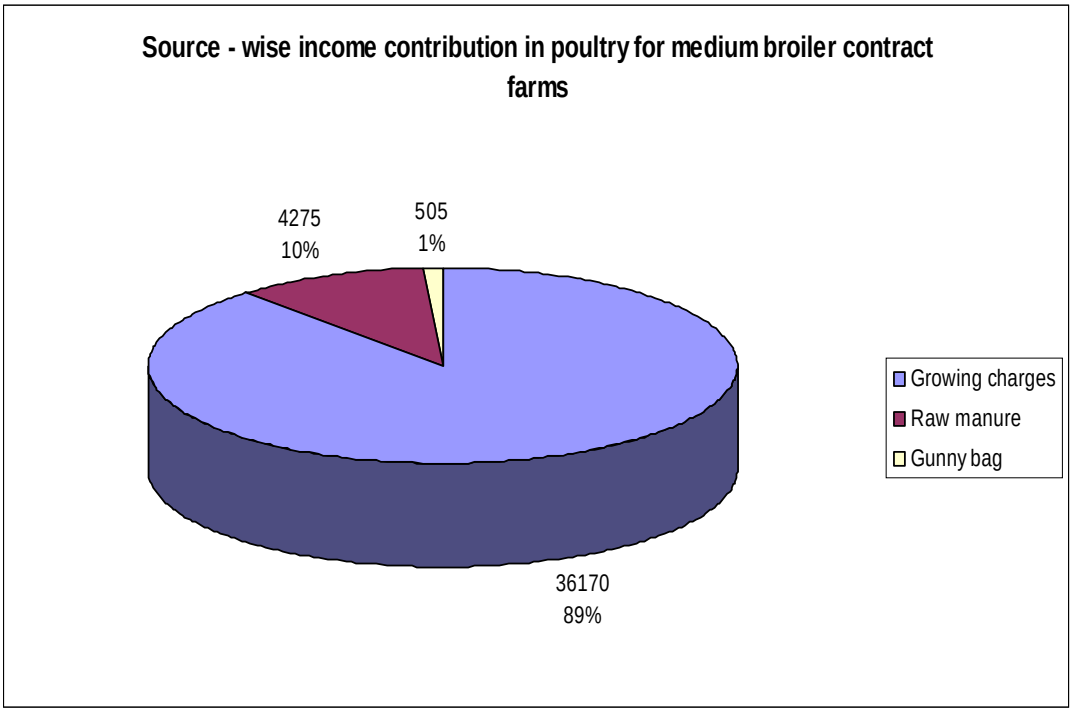


**Fig. 13: Schematic representation of source wise income contribution in poultry for medium broiler contract farmers**

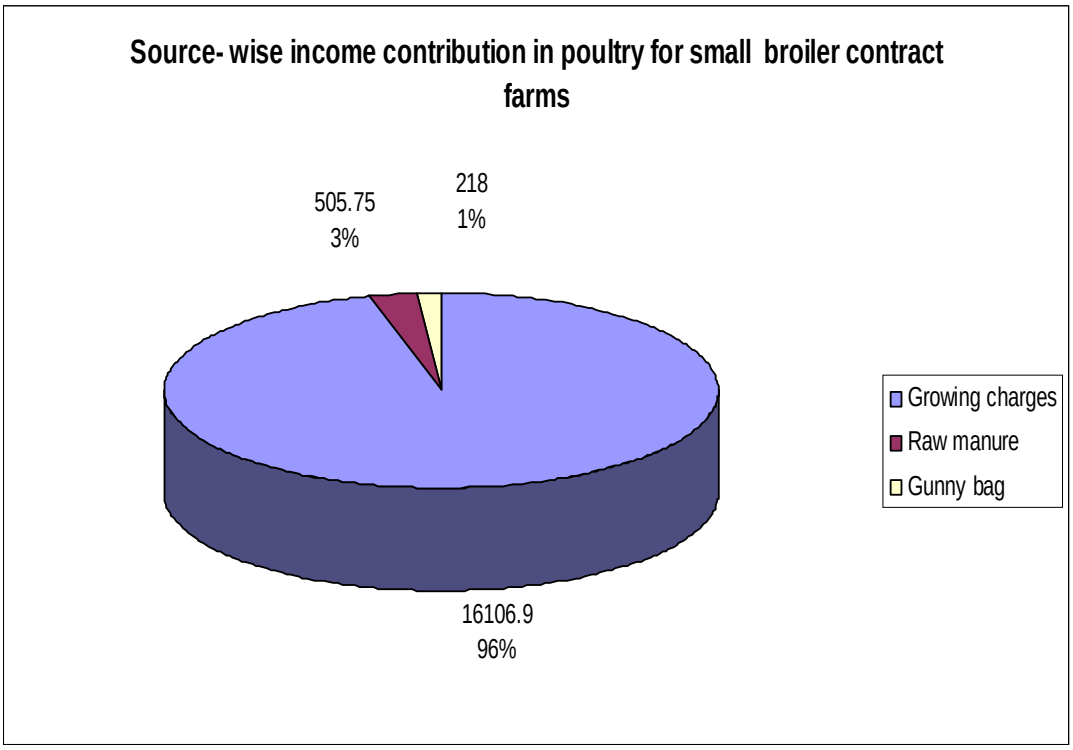


**Fig 14: Schematic representation of source wise income contribution in poultry for small broiler contract farmers**

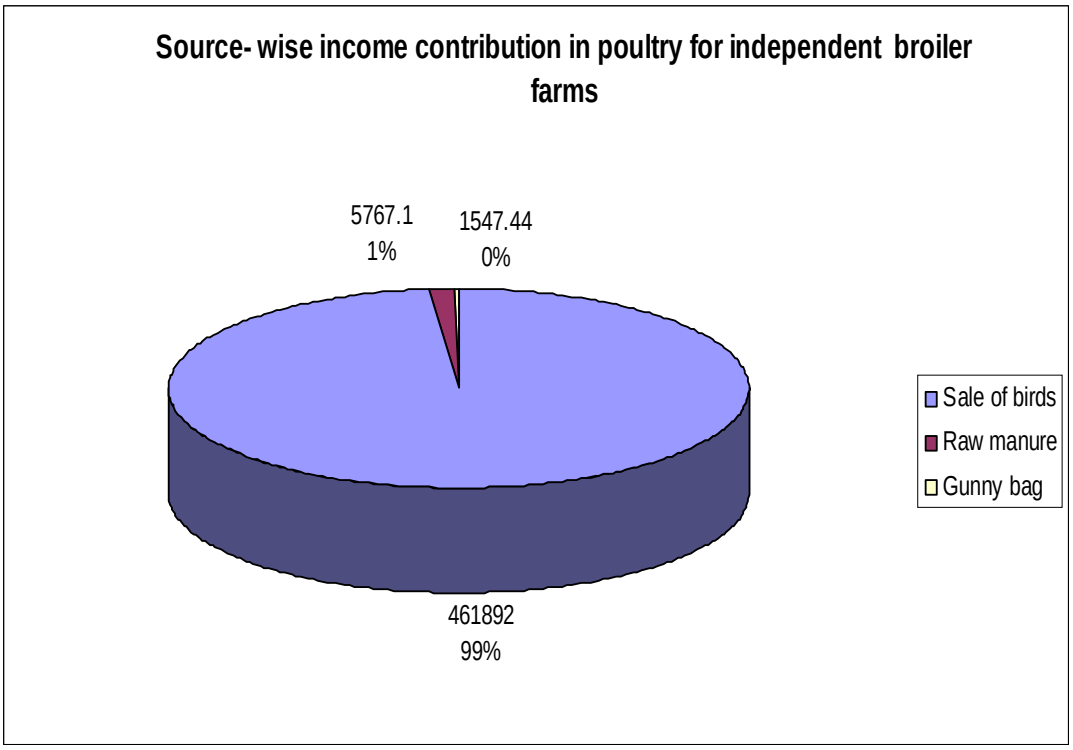


**Fig 15: Schematic representation of source wise income contribution in poultry for independent broiler contract farmers**

**Table 4.18: Broiler profitability for different categories**

(Per kg)

| Groups | Contract Producers | | | Independent |
|---|---|---|---|---|
| | Large | Medium | Small | |
| **Mean** | 2.4340[a] | 2.4359 [a] | 2.4660 [a] | 3.2199 [b] |
| **SD** | 0.2339 | 0.2213 | 0.1175 | 2.088 |
| **n** | 46 | 40 | 13 | 41 |

**ANOVA for per kg profit**

| Source | df | MSS |
|---|---|---|
| **Between group** | 3 | 7.10* |
| **Error** | 136 | 2.63 |
| CD:0.2726 | | |

**Note:** * Significant ($p < 0.05$)

a & b The means with different superscripts differ significantly.

## 4.5 Resource Use Efficiency

The resource use efficiency among broiler farms was estimated using Cobb Douglas production. The results indicated that, among contract farms the elasticity with respect to flock size (0.796) was significant (Table 4.19) which was the only variable from the function influencing the per farm growing charges earned. The other variables considered like experience, labour, brooding expenditure and FCR were not statistically significant.

Cobb-Douglas production estimation with respect to independent farms revealed that flock size (0.877) and number of years of poultry experience (0.103) were significantly influencing per farm income. However, the other variables considered were not statistically significant (Table 4.20).

## 4.6 Impact Of CF On Income

The impact of CF on income was assessed by computing the effect of income earnings from poultry on household income inequality and assets gained through CF.

### 4.6.1 Decomposition of income inequality by income sources

The summary of the contributions of income sources to household income inequality among poultry farmers is provided in Table 4.21. Column-1 presents income source shares. Income from poultry accounted for approximately 50 per cent of the household

**Table 4.19: Resource use efficiency in contract broiler farms - Cobb- Douglas regression results**

| Particulars | Elasticity of production | Standard Error |
|---|---|---|
| Intercept | 2.514* | 0.435 |
| Flock size | 0.796* | 0.074 |
| Experience | 0.023 | 0.027 |
| Labour | 0.046 | 0.089 |
| Brooding charges | 0.073 | 0.051 |
| FCR | 0.020 | 0.221 |
| Coefficient of determination ($R^2$) | 0.85 | |

Note: * significant ($p < 0.05$)

**Table 4.20: Resource use efficiency in independent broiler farms - Cobb- Douglas regression results**

| Particulars | Elasticity of production | Standardized beta coefficients |
|---|---|---|
| Intercept | 4.672* | 0.193 |
| Flock size | 0.877* | 0.071 |
| Experience | 0.103* | 0.031 |
| Labour | 0.102 | 0.063 |
| Brooding Charges | -0.018 | 0.059 |
| FCR | 0.023 | 0.076 |
| Coefficient of determination ($R^2$) | 0.97 | |

Note: * significant ($p < 0.05$)

**Table 4. 21: Gini decomposition by net income source**

| Sl. No | Income source (Gy) | Share in total income (Sk) | Income source gini (Gk) | Gini correlation with total income rankings (Rk) | Share in total income inequality (SkGkRk/Gy) | (SkGkRk/Gy) - (Sk) |
|---|---|---|---|---|---|---|
| 1 | Total Income | | 0.4169 | | | |
| 2 | Poultry | 0.4990 | 0.4640 | 0.8292 | 0.4606 | -0.0384 |
| 3 | Crop | 0.3806 | 0.6532 | 0.7727 | 0.4608 | 0.0802 |
| 4 | Livestock | 0.0078 | 0.6114 | 0.0386 | 0.0004 | -0.0074 |
| 5 | Others | 0.1125 | 0.7337 | 0.3944 | 0.0781 | -0.0344 |

income while crops accounted for 38 per cent share. Income from other sources was to a tune of 11 per cent and the remaining was from livestock other than poultry. Income source Gini for crop, livestock and income from other sources were above 0.60. However, a high source Gini does not imply that an income source has an un-equalizing effect on total income inequality. An income source could favor the poor even though it is unequally distributed. The Gini correlation between income from poultry and total income was 0.8292 while all other sources had a lower correlation with total income. However, the percentage contribution of both poultry and crop income to inequality was almost the same at 46 per cent each and the other two sources had negligible contribution to income inequality.

### 4.6.2 Assets gained through CF

The assets accumulated by the sample farmers during the last five years are presented in Table 4. 22. Among the six types of assets, majority of the contract sample farmers reported to have purchased pump sets. The other categories of assets comprised of renovation of houses, cattle sheds and purchase of vehicles. Although a large percentage of farmers had made investments on farm improvements, the extent of income available out of CF for such venture is only a small percentage. It was also observed that majority of (41%) independent farmers have renovated their houses, while, 24 per cent

**Table 4.22: Assets gained through contract farming during the last five years (2000-2005)**

| Sl.No | Particulars | Farmers | | Average value of asset (lakhs) | Contribution from contract farming | Number of respondents |
|---|---|---|---|---|---|---|
| | | No | Per cent to total | | | |
| **Large contract (n=46)** | | | | | | |
| 1 | Tractor | 7 | 15.2174 | 2.1571 | 0 - 25 % | 5 |
| 2 | Cattle shed | 4 | 8.6956 | 2.5250 | | |
| 3 | Pump set | 26 | 56.5217 | 0.9792 | 25-50% | 13 |
| 4 | Agricultural equipments | 3 | 6.5217 | 0.2 | | |
| 5 | House renovation | 9 | 19.5652 | 0.95 | 50-75% | 6 |
| 6 | Others (Poultry, car, site , bike) | 9 | 19.5652 | 11.45 | | |
| **Medium (n=40)** | | | | | | |
| 1 | Tractor | 8 | 20 | 3.8125 | 0 – 25 % | 3 |
| 2 | Cattle shed | 3 | 7.5 | 1.1667 | | |
| 3 | Pump set | 23 | 57.5 | 0.9804 | 25-50% | 15 |
| 4 | Agricultural equipments | Nil | Nil | - | | |
| 5 | Renovate house | 11 | 27.5 | 3.1954 | 50-75% | 3 |
| 6 | Others (Poultry, bike,) | 11 | 27.5 | 5.3509 | | |
| **Small (n=13)** | | | | | | |
| 1 | Tractor | Nil | Nil | Nil | 0 –25 % | 2 |
| 2 | Cattle shed | 2 | 15.3846 | 1.15 | | |
| 3 | Pump set | 7 | 53.8461 | 0.8214 | 25-50% | 4 |
| 4 | Agricultural equipments | Nil | Nil | Nil | | |
| 5 | Renovate house | 6 | 46.1538 | 2.075 | 50-75% | 1 |
| 6 | Others(poultry) | 1 | 7.6923 | 2.5 | | |

**Table 4.23: Per cent change in income due to contract farming**

| Sl. No | Extent of change | Number of farmers reporting | | |
|---|---|---|---|---|
| | | Large n=46) | Medium (n=41) | Small (n=13) |
| 1. | Large decrease (> 50 %) | Nil | Nil | Nil |
| 2. | Small decrease (<50%) | 3 (6.52) | 1 (2.50) | Nil |
| 3. | No change | 2 (4.36) | 5 (12.50) | Nil |
| 4. | Small increase (<50 %) | 37 (80.43) | 32 (80.00) | 11 (84.61) |
| 5. | Large increase (50-100%) | 3 (6.52) | 1 (2.50) | 1 (7.69) |

Note: Values in parentheses indicate percentages

**Table 4.24: Reasons for contracting a specific firm**

(%)

| Sl. No. | Reasons | Large farm | Medium farm | Small farm |
|---|---|---|---|---|
| 1. | This was the only company locally accessible | 15.12 | 7.50 | Nil |
| 2. | Others gave good opinion about the company | 52.17 | 52.50 | 61.50 |
| 3. | The company gives better contract terms | 15.21 | 10.00 | 15.38 |
| 4. | The company is big and has good name | 6.52 | 12.50 | 7.69 |
| 5. | Personally know people who have succeeded through contract production | 8.69 | 15.00 | 7.69 |
| 6. | Other reasons | 2.17 | 2.50 | 7.69 |

have made investments in pump sets, and a smaller number have gone in for tractors and poultry houses.

### 4.7 Factors Influencing Broiler CF

Various factors have led the independent broiler farmers to switch over to CF including the new farmers to the field.

From Table 4.23, it could be observed that a majority of the respondents realized a small increase in income ranging between one to 50 per cent as compared to the previous mode of independent broiler production; A positive change in income after entering into contract production. On the other hand, 6.52 per cent of large farmers, 2.50 per cent of medium farmers and 7.69 per cent of small farmers reported to have realized a large increase in their income ranging between 50 and100 per cent. However 4.36 per cent of large farmers and 12.50 per cent of medium farmers indicated that there was no change in income.

The reasons offered by the respondents for entering into contract with a specific firm are reported in Table 4.24. It was observed that over 50 per cent of respondent farmers negotiated contracts after hearing good reports about the company. Thus, acquaintance with others in the business formed the most important motivation to join the contracting firm. The second reason was that of better contractual terms offered by the company.

#### 4.7.1 Integrator loyalty among contract farmers

The integrator loyalty analysis is used as a satisfaction indicator of CF performance. The transition probability analysis depicted high retention probability of the existing contract farmers by CP, VHL and Sujay companies as revealed by the higher values of diagonal elements of transition probability matrix (Table 4.25). The column values other than diagonal elements indicate gains for the specific firm while row values indicate to whom the firm is losing its existing contract farmers. It may be observed that there were farmers shifting from Suguna to other integrators as well as Suguna gaining from all the others. Similar is the case for Pioneer which has a 0.23 probability of retaining its share of contract farmers. CP is gaining new farmers (o.47) into contract while losing some farmers to others (0.3); it has a high loyalty patronage farmers. VHL is gaining contract farmers (0.6) from others while it is not losing many of its customers (0.2).

The number of shifts by contract farmers was computed to study the extent of loyalty. It could be noticed from Table 4.26 that the respondent farmers exhibited different extent of loyalty towards integrators. The highest number of respondents had complete loyalty (38.89%) as they had not shifted to other integrators. One or two shifts were noticed among 25 five per cent each of the respondents.

**Table 4.25: Transition probability matrix for integrating companies**

| | CP | Godrej | Lotus | Nutri | Pioneer | Suguna | Sujay | VHL |
|---|---|---|---|---|---|---|---|---|
| CP | **0.7** | 0 | 0 | 0.03 | 0.03 | 0.17 | 0 | 0.07 |
| Godrej | 0 | **0** | 0 | 0 | 0.5 | 0.5 | 0 | 0 |
| Lotus | 0.25 | 0 | **0** | 0 | 0.5 | 0 | 0 | 0.25 |
| Nutri | 0 | 0 | 0 | **0** | 0 | 1 | 0 | 0 |
| Pioneer | 0.11 | 0.11 | 0.11 | 0.22 | **0.23** | 0.11 | 0 | 0.11 |
| Suguna | 0.11 | 0 | 0.05 | 0 | 0.39 | **0.28** | 0 | 0.17 |
| Sujay | 0 | 0 | 0 | 0 | 0 | 0.5 | **0.5** | 0 |
| VHL | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 | **0.8** |

**Table4.26: Extent of integrator loyalty among contract farmers**

| Extent of loyalty | Number of shifts | Percentage of respondents |
|---|---|---|
| Completely loyal | Zero | 38.89 |
| Loyal | One | 25.00 |
| Partially loyal | Two | 25.00 |
| Least loyal | Three | 8.33 |
| No loyalty | Four | 2.77 |

While a smaller percentage (2.77) had no loyalty as they had shifted integrators four times (Fig.16).

As a sequel to this, nine of the large farmers were ready to switch over to another integrating firm if there were any better options in the offing. Similarly five medium farmers and one small farmer also expressed the desire to shift the company.

### 4.7.2 Problems of contract farmers

The respondents were asked to indicate two most important problems encountered in contract production and are presented in Table 4.27. It is evident that over 21.05 to 26.09 per cent of the respondents under all the three categories reported that the most important problem encountered in contract production was that of integrators charging higher cost for inputs. Delay in chick supply was expressed by medium farms (16.39%) followed by small and large with 15.79 and 13.03 per cent, respectively. Supply of poor quality chicks by integrators was expressed by 21.05 per cent of small farmers followed by large farms (15.93%) and medium farms (11.47%) respectively. Although, the integrators are expected to make arrangements for lifting birds in 38- 40 days, it was observed that the respondents had extended marketing period reaching up to 46 days (Fig.17). However, 26.31 per cent of small farmers, 18.03 per cent of medium and 17.40 per cent of large farmers were satisfied with contract production and indicated no problems.

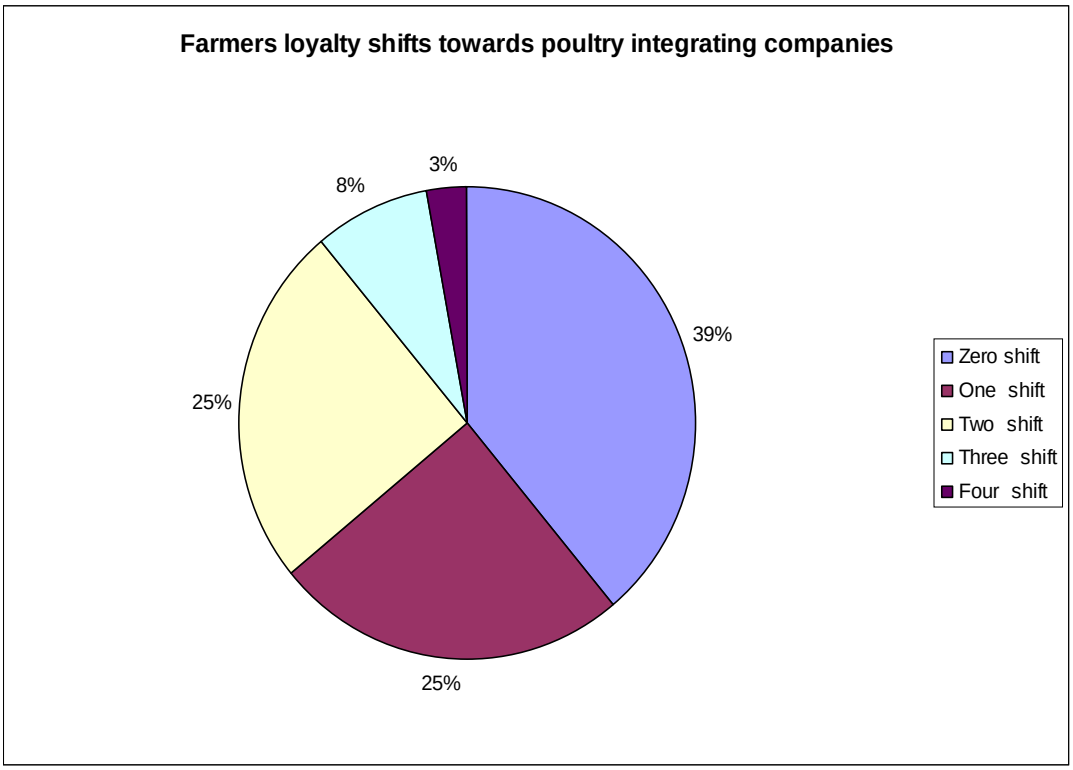


**Fig. 16: Schematic representation of farmers loyalty shifts towards poultry integrating companies**

**Table 4. 27: Major problems experienced in contract farming**

(%)

| Sl. No. | Problems | Large | Medium | Small |
|---|---|---|---|---|
| 1. | Poor quality chicks | 15.93 | 11.47 | 21.05 |
| 2 | Charging high costs for inputs | 26.09 | 21.31 | 21.05 |
| 3 | Delays in delivery of inputs | 1.45 | 3.29 | 0 |
| 4 | Delays in Chick supply | 13.03 | 16.39 | 15.79 |
| 5 | Not adequate batch size | 2.90 | 0 | 0 |
| 6 | Early lifting | 1.45 | 3.28 | 0 |
| 7 | Firm asking to supplement feed | 1.45 | 0 | 0 |
| 8 | High mortality | 4.35 | 8.19 | 0 |
| 9 | Fewer number of cycles | 1.45 | 1.64 | 0 |
| 10 | Too many conditions | 5.80 | 0 | 10.53 |
| 11 | Delay in payment | 4.35 | 6.56 | 5.26 |
| 12 | Delay in lifting the products | 4.35 | 9.84 | 0 |
| 13 | No problems | 17.40 | 18.03 | 26.31 |

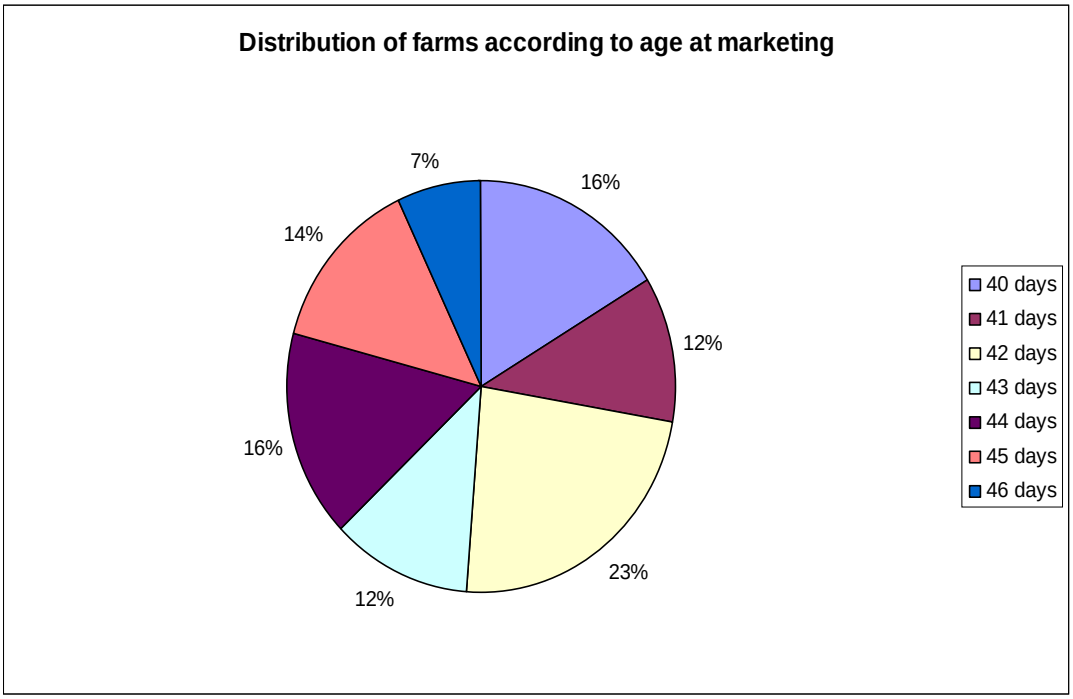


**Fig. 17: Schematic representation of distribution of farms according to age at marketing**

# *Discussion*

# CHAPTER V
# DISCUSSION

In this chapter the results of the study are discussed under the following headings:

5.1 Contractual arrangements in broiler production

5.2 General characteristics of sample farmers

5.3 Resource use pattern

5.4 Economics of broiler production

5.5 Resource use efficiency

5.6 Impact of CF on income

5.7 Factors influencing CF

## 5.1 Contractual Arrangements In Broiler Production

The streamlining of production through CF has imparted stability to otherwise volatile broiler market. The survey findings of six contracting companies (integrators) are used for studying integrating practices in broiler farming.

### 5.1.1 General characteristics of contract company

In the study area it is observed that integrators with large business establishments as well as those with a smaller scale of operation co-existed. The details on two national and four local firms are presented in Tables 4.1, 4.2, and 4.2a for comparison of integrator practices in selection of contract farmers, method of determining growing charges and dealing with contract violations.

The poultry integrators have written contracts with the farmers normally for one production year, which could be renewed if both the parties are satisfied. Normally the integrating firm's prime concern is effective coverage of contract farmers by minimizing the expenditure on logistics. In addition, business environment and farmers attitude through a set of criteria like water quality, ease of input supply, logistics, supervision and lifting of birds for marketing, trust-worthiness of farmers and other similar locational characteristics are included for choosing farmers for contract production. Invariably the farmers already in broiler production business have opted for integration and a few first-timers have started the business by availing of loan facilities. The inherent characteristics of poultry contract production have motivated farmers to accept contract production.

The contract violations are dealt with seriously, either by terminating the contract unilaterally or by stringent warnings but not a single case has been taken to the court. This is because the farmer is free to opt for another company operating in the locality and so also the integrators can terminate contract by way of disassociating with the farmers. Thus, the firms have reports of a few contract violations from farmers. Some of the integrating firms have a rewarding system for best performance. Certain government policies on import of vaccine, feed ingredients, and marketing

practices need slight modifications for spreading CF on a large scale. The integrators also take into account market preference at the time of production. The integrating firms with their large capital base, and consolidated supply operations are in a position to motivate farmers to comply with their contractual terms.

## 5.2 General Characteristics Of Sample Farmers

### 5. 2.1 Demographic profile

The demographic profile of sample respondents is presented in Table 4.3. The respondents are classified into three categories based on the flock size viz., contract large with more than 10,000 birds/ cycle, contract medium (5000-10,000 birds/cycle) and contract small (less than 5000 birds). Apart from this, 41 independent farmers are considered for comparison. It may be noted that over 80 per cent of the respondents were literate up to high school level. There were no significant differences in other attributes across contract and independent farm groups. In general, those farmers with enterprising skills have switched over to poultry farming from crop cultivation. Within a household, one or two people would manage poultry rearing.

It is observed in the study area that most of the large farmers pioneered poultry production; this may be due to their higher risk bearing ability. Many of the large poultry farmers have longest

experience in poultry production but small farmers have longest experience in contract production of above five years (Table 4.4) as they preferred to take shelter under CF from fluctuating market forces. Although contract farmers have shifted from one company to another, the first contract continued for a period of 2½ years in all the three categories. The distribution of respondents according to years of experience in poultry revealed that most of the new farms established are under CF owing to its inherent advantages of stable income, lower risk and lesser working capital requirements. On the other hand, not many new entrants are taking the risk of independent farming. Among independent farmers, only those with longer experience in poultry are thriving as they have their own feed mixing facility and established retail marketing outlets (Table 4.5).

The mode of entry into CF reveals that both large and medium contract farms changed over to contract production from their previous independent status. This is mainly to cope up with market failures and the large working capital requirements for poultry rearing. However, the small independent farmers are able to find a regular market for their product and hence, they continued to be independent. A large percentage (61.54) of small farms directly entered into contract production as compared to change over from independent production (Table 4.6).

### 5.2.2 General asset possession

The general asset possession of contract and independent farms are provided in Table 4.7. It may be noted here that some household may have multiple possessions of the same item. A majority of the respondents owned telecommunication gadgets for better connectivity and information flow. Almost all the respondents have their own poultry sheds, except for a small percentage of leased poultry sheds from local farmers. Only a few respondents in each category owned the automobiles like cars, tractors and trucks.

## 5.3 Resource Use Pattern

Three major resources are required for successful farming, namely land, poultry assets, credit and market information. All the other inputs required for poultry are more or less standardized as poultry rearing has become more scientific. The average size of holding is 10.49 acres for large contract producers, while it is 7.41 and 3 acres, respectively, for medium and small contract farms. The independent farms have land holding size of 6.68 acres (Table 4.7).

### 5.3.1 Crop diversification

The contract farmers have cultivated both subsistence and commercial crops to meet the household requirements. The Large contract group, in total, has grown 16 different crops with the highest area being under eucalyptus accounting for 44 per cent of the area from 58 per cent of the respondents. The other crops in the order of importance are *ragi* (finger millet) comprising 25% of the area, followed by sericulture and potato (Table 4.8).

The cropping pattern of medium contract farms also exhibited similar crop combinations with eucalyptus being grown in 36 per cent of area, followed by *ragi* (21%), potato (11.78%) and sericulture (5.61%) (Table 4.9). The preference for eucalyptus is attributed to labor scarcity and to mitigate water crisis in crop cultivation.

Small farmers have slightly different crop combinations as they also cultivated vegetables commercially. The largest percentage of area is for eucalyptus (28.98%) followed by *ragi* (24.63). However, a majority of small farmers raised *ragi* crop required for home consumption as it is the staple food of the region (Table 4.10).

Majority of independent farmers (63.41%) cultivated maize in approximately 43 per cent of their area, followed by *ragi* and eucalyptus, in that order. Unlike contract farmers, a majority of

independent farmers have formulated their own poultry feed by milling maize and mixing with poultry concentrates (Table 4.11).

The composition of assets used in poultry production across different size groups are indicated in Table 4.12. Large integrating farmers have invested Rs.11,35,250 on poultry sheds, while small farmers owned sheds worth Rs.2,16,923. It is evident from table 4.12 that the value of poultry house accounted for the single largest investment across all the respondents. Most of the poultry farms did not have a separate feed warehouse since only 41.3 per cent of large farms, 22.5 per cent medium farms and 15.38 per cent small farms owned feed warehouse. Similarly, 34.15 per cent of independent farms owned poultry feed warehouse. Majority of the respondents used coal for brooding, while a smaller percentage of large farms still used conventional electrical brooding.

### 5.3.2 Loan acquisition and utilization pattern

From Table 4.13 it is clear that only 20 per cent of the respondents availed loan during the period 2002-2005. The average loan amount of these borrowers varied between Rs.2,50,000 and Rs.4,08,333 across different categories of farms. The commercial banks served the requirements of respondents which is mostly utilized for agricultural investments. The respondents opined that they preferred to source poultry investments out of equity capital

rather than through borrowings. No over dues are reported by the respondents. These findings are different from those reported by Robert (2002) who observed that poultry operators had borrowed huge sums on poultry.

### 5.3.3 Information search cost

The availability of up-to-date market information and intelligence would add to the profitability of many enterprises. Similarly, farmers before entering into contract, spend sizeable amount of money and efforts to source particulars on contract and other related information. It is reported by Nadeem *et al*. (2006) that farmers spent considerable time in gathering information pertaining to production and marketing. One of the advantages of CF is that of reduction in the information search cost.

The main office of most of the contracting firms is situated in and around Bangalore due to logistic advantages. The area of operation of these firms extends up to 100 Km radius in peri-urban Bangalore. Hence, the travel cost and imputed value of travel time accounted for a major share of information search cost for poultry contract farmers (Table 4.14).

The general information search cost pertaining to selling product and buying input, is the highest for independent farmers amounting to around Rs.752 compared to less than Rs.500 in the

case of contract producers. The information search cost on CF ranged from Rs.230 to Rs.316 for various categories of farms. These findings are similar to those reported by Joshi *et al*. (2006) who observed that non-contract farmers incurred higher transaction cost than contract farmers. Similarly the contract negotiation cost also is imputed by taking into account the time spent in traveling and actual transport and communication expenditure. The comparison of total information search cost reveals that the independent farmers spent around Rs.1069 compared to Rs.1000 by contract producers. However, the information search cost for beginning a contract production is a one- time investment and later on, the farmers would easily manage to get into contract production. Hence, contract farmers have spent less by way of information search cost.

## 5. 4 Economics Of Broiler Production

The broiler profitability is computed by considering the contribution to household income and also through per batch earnings.

### 5.4.1 Source-wise average income earnings on per farm

The proximity to Bangalore city which is a hub for various business activities has given opportunities for diversification of income earnings. The household income earnings are categorized

into four important sources, namely crops, livestock (other than poultry), business, and poultry.

The source-wise per farm income earnings revealed that crop and animal husbandry are the two important source for income earnings. Other business income earnings are taken up only by a few of the respondent farmers mostly by way of off-farm employment and trade which contributed substantial income to the households. Many of the independent poultry farmers have their own poultry retail outlets (30%). The total earnings of contract farmers varied directly with flock size, while for independent farms such a classification is beyond the purview of this study. The per farm earnings is the highest among large contract farm category (Rs.6,48,181), followed by independent farms (Rs.4,23,048), medium contract farms (Rs.4,09,466), and small contract farms (Rs.1,91,353), in that order (Table 4.15).

Similar observations were made by Nadeem (1995) who reported scale economies with increase in batch size. However, in his study only 3.5 per cent of farmers had retail outlets compared to 30 per cent of the independent farmers having retail outlets in the present study.

### 5. 4.2 Economics of per batch earnings

The profitability of poultry is directly related to the number of effective batches per year. The integrators determine the batch size as well as batch interval by providing their justifications. Normally the per bird space requirement is maintained above 1.1 sft and the gap between batches ranges between 15 to 40 days. Delays are likely in lifting of birds which eats away the profitability for farmers. The average number of batches is higher in the case of independent farms compared to contact producers. On the whole, contract farmers have an average of 4.5 batches per year, while, independent farms have flexibility in number of batches as they follow batch system of rearing. These observations are similar to Rick (2002) who demonstrated that length of grow-out period and down time significantly influence the number of broiler cycles per year.

The broiler profitability is estimated for the last cycle of the data period. The integrating company provided inputs like DOC, feed, antibiotics, technical advice, and disease diagnostics. Farmers provided litter, cleaning supplies, white-wash and fumigation, brooding & lighting expenditure and labor management including supervisory role (Table 4.17). The farmers are provided with a base fee in combination with market linked incentive. Some firms have penalty for higher FCR and mortality. The large integrators realized a sum of Rs.77,939 growing charges which resulted in earning

Rs. 2.43 per kg of bird lifted. Similarly, medium farms have realized Rs. 36,170 revenue by way of growing charges, which amounts to Rs.2.41 per kg of bird lifted and small integrators from a flock size of 3473 realized Rs.16,830 earnings which amounts Rs.2.24 per kilo of bird marketed. The independent farms realized Rs.6.6 per kg of bird marketed which amounted to a net return realization of Rs.55,814 after deducting the chick cost and feed cost from gross returns. The expression of net return in this manner helps in easy comparison between contracting and independent farms as the company supplies chicks and feed in the latter case. These findings are contrary to Begum (2005a) who observed that contract farmers are receiving 1.7 times higher net returns compared to independent growers. Further, the share of returns from sale of birds accounted for 98 per cent while the remaining is by way of manure and gunny bag sale. This result is similar to the findings of Begum (2005b) who also observed that 98 per cent of cash returns came from the sale of broilers.

### 5.5 Resource Use Efficiency

The resource use pattern reveals that large farms have more of hired laborers than small farms; latter being entirely managed by members of the family. The total fixed and variable expenditure per batch amounts to Rs.45,350 for large contract farms, while it is Rs.25,956.20 and Rs.12,862 for medium and small farms, respectively. The independent farms incurred a total of

Rs.4,133,92.7 towards production, of which feed and chick costs constituted 68 and 25 per cent, respectively. This finding is slightly different from Nadeem (1995) who reported that feed accounted for 60 percent of the cost of production. However, the share of chick cost is the same as that reported by the author.

Although independent farmers realized Rs.4,61,892 from sale of birds, the net earnings from broiler sale is to the extent of Rs.48,499 per cycle. Profits per kg were computed for income derived exclusively from the sale of birds and also by considering income from all the three sources viz., sale of birds, gunny bag and manure. It may be noted here that the actual net income realization from sale of birds is the highest for large contract farms which is a little over one rupee, while all the other categories had less than a rupee earning per kilo. Similar observations were made by Anonymous (2006) who reported that contract farmers received Rs.2 per bird. Although independent farmer realized higher gross returns, the actual net income realization per kg sale of birds is lower than both large and medium integrator farmers. Similar observations were made by Prabhu *et al*. (2005) from a study in Bangladesh. This clearly drives home the fact that, if any farmer avails of investment credit for poultry, it must be for a large unit to have adequate repayment capacity. These findings are similar to those reported by Kohls and Wiley (1958).

The significance of per kg profits of poultry production is tested using one way ANOVA. The significant F statistic (Table 4.18) indicates that the null hypothesis of no difference between the per kg profits across groups is not acceptable meaning that there is significant difference in the average profits earned per kg of bird marketed. The critical differences for all the six pairs were calculated and compared with the actual difference between the group means. The mean differences between independent and all the three contract producer groups were higher than the respective critical differences. Thus, it is concluded that the performance of broilers is significantly different between contract and independent farms.

The resource use efficiency of contract and independent farms is analyzed with the help of Cobb-Douglas production function. It was hypothesized that, profitability of contract and independent broiler farms is influenced by management practices like brooding and feeding. Therefore, brooding and electricity charges, labour days, FCR, Flock size and the experience of the farmers were considered for functional analysis. The elasticity with respect to flock size (0.796) was significant ($p<0.05$) among contract farms (Table 4.19). The significant intercept value is an indication that in poultry production, the finer management practices which are not quantifiable have a bearing on broiler profitability.

Similarly production estimation with respect to independent farms revealed that flock size (0.877) and number of years of poultry experience (0.103) are influencing per farm income along with intangible management factors as indicated by significant intercept (Table 4.20). The tabular analysis also corroborated these findings.

## 5.6 Impact Of CF On Income

The contract production is considered as a panacea for market imperfections. Therefore, in this study the impact of CF, is assessed by computing the income source Gini and assets gained through contract farming. The farmer would help in delineating major contributing factors to income inequality while the latter would help to know the tangible impact of contract production.

### 5.6.1 Sources of income inequality

Since there is substantial difference in broiler performance across different flock sizes and among independent and contract producers, it is intriguing to study if poultry production adds to inequality across households. The income decomposition Gini is computed to study the sources contributing to income inequality. The summary of the contributions of income sources to household income inequality among poultry farmers is provided in Table 4.21. Income from poultry accounts for approximately 50 per cent of the household income while crops account for 38 per cent share. Income

from other sources is to a tune of 11 per cent and the remaining is from livestock other than poultry. Income source Gini for crop, livestock and income from other sources are above 0.60. However, a high source Gini does not imply that an income source has an unequalizing effect on total income inequality. An income source could favor the poor even though it is unequally distributed. The percentage contribution of both poultry and crop income to inequality is almost the same at 46 per cent each and the other two sources have negligible contribution to income inequality. From the results it is clear that the crop income has an inequalizing effect on household income which contributes for income inequality across households. On the other hand, income from livestock, poultry and other sources tended to reduce inequality as they have a negative coefficient in the last column.

### 5.6.2 Assets gained through CF

The assets accumulated by the sample farmers during the past five years are presented in Table 4.22. Among the six categories of investments, a majority of the contract farmers reported to have purchased pump sets. The other categories of assets purchased or improved included renovation of houses, cattle sheds and purchase of vehicles. Although a large percentage of farmers have made investments on farm improvements, the extent of income available out of CF for such venture is only a small percentage. Only a small

percentage of farmers in large and small categories have made additional investments in poultry unlike medium contract farms with 20 per cent of households investing in poultry during the last 5 years. The income derived out of contract poultry production accounted for 25-50 per cent of the asset value among the majority of farmers.

It may be noted here that large contract farmers have made more investments compared to other two categories. It is also observed that majority (41%) of independent farmers have renovated their houses, while, 24 per cent have made investments in pump sets, and a smaller number have gone in for tractors (12%), and poultry houses (4%).

### 5.7 Factors Influencing Broiler CF

Various factors have led the independent broiler farmers to switch over to CF and attracting new farmers to broiler production.

The opinion of respondent's perceived change in income is computed to understand whether farmers were motivated due to profitability of the venture. The income accruals ranged from one to 50 per cent as compared to the previous mode of independent broiler production in majority of respondents. On the other hand, 6.52 per cent of large farmers, 7.69 per cent of medium farmers and 2.50 per cent of small farmers reported to have realized a large increase in

their income ranging between 50 and 100 per cent. On the contrary, 4.36 per cent of large farmers and 12.50 per cent of medium farmers indicated that there was no change in income.

The reasons offered by the respondents for entering into contract with a specific firm were compiled. Over 50 per cent of respondent farmers negotiated contracts after hearing good reports about the company. Thus, good report about the company is the major driving force for new entrants to a particular firm. The second reason is that of better contractual terms offered by the company. Thus, the attractive earnings promised by contract grower were not the real reason for farmers entering into contract production. Surprisingly, all the contract poultry respondents quoted that fixed grower charges, less risk, assured income and absence of investment capital as reasons for entering into contract production. Thus, farmers are seeking stability rather than maximum profits out of contract production.

Sometimes, farmers are expected to provide any one or a combination of feed additives like carrot juice, *tulasi* juice mixed with garlic/ ginger, sprouted pulses like horse gram or green gram, jaggery/ sugar, palm oil, alcohol or any such items. Fourteen of the respondents reported to have given a combination of the above feed

additives which resulted in an extra expenditure of Rs.1357 per cycle.

The results of first order Markov process reveal that only a few firms are able to have high retention probabilities of the existing contract farmers. However, in the case of majority of firms, the farmers shifting from one firm to another is common. In terms of farmers' loyalty, three firms namely, CP, VHL and Sujay have relatively better performance.

The integrator practices have a direct bearing on extent of loyalty exercised by farmers. Sometimes, the problem could be from farmer's side leading to under performance of batches. It could be observed that majority of farmers (38.89%) were completely loyal as they exhibited no shifts (Table 4.26). A slightly smaller percentage (25.0) had shifted one or two times each. On the other hand, a very small percentage had no loyalty as reflected through higher number of shifts.

The respondents were asked to indicate two most important integrator practices in contract production which were reported in the form of problems encountered in contract production (Table 4.27). The most important problem was that of integrators charging higher cost for inputs than on independent farmers as reported by over 21 per cent of the respondents in all the categories.

A higher percentage of medium farms expressed delay in chick supply (16.39%) than small (15.79%) and large (13.03%) farms, respectively. Supply of poor quality of chicks by integrators was experienced by 21.05 per cent of small farmers followed by large (15.93%) and medium farms (11.47%), respectively. The age at marketing had a bearing on profitability and majority of the farmers opined that the weight gain accelerated after 35 days. The results revealed that on some farms birds were kept for an extended period (up to 46 days) which eroded profitability. However, 26.31 per cent of small farmers, 18.03 per cent of medium and 17.40 per cent of large farmers are satisfied with contract production and indicated no problems. It is observed that the terms of written contract lays down conditions only on farmer's side. These findings are similar to Anonymous (2006) who reported that the integrator practices affected the final FCR but the contract had not specified any standards for chick and feed quality.

As a sequel to this, nine large farmers wanted to switch over to another integrating firm if there were any better options in the offing. Similarly, five medium farmers and one small farmer also expressed the desire to shift to another company. However, others through their rich experience in CF were aware of the real working of CF through regular deliberations among integrators regarding various aspects on the working of CF.

# *Summary and Conclusion*

# CHAPTER VI
# SUMMARY AND CONCLUSION

The study on the CF of broiler production in the peri-urban districts of Bangalore in Karnataka has revealed various economic facets of the issue. A few interesting facts and figures that have emerged act as indicators and serve as future policy guidelines on CF to protect the interests of the farmers as well as encourage growth of the broiler industry.

The major findings of the study are summarized as follows:

1. The institutional arrangements in international, national, local firms and arrangements for sourcing inputs of independent farmers were well-defined. Poultry integrators had written contracts with the farmers for one production year, which was renewable thereafter. They had a set of criterion like water quality, ease of input supply, logistics, supervision and lifting of birds, trust-worthiness of farmers and other similar locational characteristics for choosing farmers for contract production.

2. Among contract farms, there were relatively new entrants, but most of the existing independent farms continued their poultry business.

3. Some of the integrating firms had a rewarding system to motivate farmers for best FCR. A price incentive of 10 paisa per rupee increase in the wholesale price per kg live weight was extended to farmers by some integrators.

4. Shortages of birds were viewed seriously and recovered from the bill at the prevailing market rates.

5. Broiler marketing was managed by wholesale lifters for both contract and independent farms. In the case of contract farmers, the lifters contacted the company branch office for permission slip after making the required payment. On the other hand, for the independent poultry farms, payments were made after 8-10 days of lifting. Normally the lifters pay Rs.3-5 below the reference price which is termed as 'cutting'.

6. It was observed that 80 per cent of the respondents were literate up to high school level and no significant differences were observed in other attributes across contract and independent farm groups.

7. Crop combinations for different categories of contract farmers revealed that both subsistence and commercial crops were taken up and the highest area was under eucalyptus for large farms accounting for 44 per cent of the area and 58 per cent of respondents. Medium contract farmers also followed similar

crop combinations with eucalyptus in 36 per cent of area, followed by *ragi*, potato and sericulture. The crop combinations of independent farms had a marked difference compared to contract farms as majority of farmers (63.41%) cultivated maize in approximately 43 per cent of the area to facilitate formulation of their own poultry feed by independent farmers.

8. It was evident that the poultry house accounted for the single largest investment across all the respondents. Large integrating farmers had invested around Rs.11.35 lakhs on poultry sheds, while small farmers owned sheds worth Rs.2.16 lakhs. A majority of the respondents used coal for brooding to overcome unscheduled power failure in the rural areas and it was also a cheaper viable alternative.

9. Only 20 per cent of the respondents availed of loan and average loan amount varied between Rs.2.50 and 4.08 lakhs. The major source of loan was commercial banks and the respondents mostly utilized the loan for agricultural investments. The respondents opined that they preferred to source investments out of equity capital rather than through borrowings.

10. The total earnings of contract farmers varied directly with flock size, while for independent farms such a classification was beyond the purview of this study. The per farm earnings was the

highest among large contract farm category with Rs.6.48 lakhs, followed by independent farms (Rs.4.23 lakhs), medium contract farms (Rs.4.09 lakhs) and small contract farms (Rs.1.91 lakhs), in that order.

11. Average number of batches was the highest in the case of independent farms compared to contract producers. The production policies of the company and market conditions were the factors determining the batch length.

12. Integrating company provided inputs like cleaning supplies, DOC, feed, antibiotics, technical advice, and disease diagnostics. Farmers provided litter, whitewash, fumigation, brooding and lighting expenditure and labor management including supervision.

13. The average flock size of large integrators was 16,141 realizing Rs.77,939; medium farms with 7610 birds realized Rs.36,170, small integrators had 3,473 birds with Rs.16,830 earnings while independent farms having 7,453 birds resulted in a net return realization of Rs.55,814; the latter was comparable to the earnings by large contract producers.

14. The total fixed and variable expenditure amounted to Rs.45,350, Rs.25,958 and Rs.12,862 for large, medium and small integrators, in that order. The independent farms incurred

a total of Rs.4.13 lakhs towards production, of which feed and chick costs constituted 68 per cent and 25 per cent, respectively.

15. The per kg profits were computed for income derived exclusively from the sale of birds and also by considering income from all the three sources viz., sale of birds, gunny bags and manure. The actual net income realization from sale of birds was highest for large contract farms which was a little over one rupee, followed by independent farms (0.69), medium contract farms (0.68), and small contract farms (0.45), in that order.

16. The Cobb-Douglas analysis revealed that flock size significantly contributed to per farm poultry income for both contract and independent farms. Poultry experience significantly influenced only independent farms.

17. Income source Gini revealed that crop incomes have an unequalizing effect on household income. On the other hand, income from livestock, poultry and other sources tended to reduce inequality.

18. Although a large percentage of farmers made investments on farm improvements, the extent of income available out of CF for such a venture was only a small percentage. The income derived

out of contract poultry production accounted for 25-50 per cent of the asset value among majority of farmers.

19. Majority of the respondents realized a small increase in income ranging from one to 50 per cent over the previous mode of independent broiler production.

20. Good reports about the company from others motivated over 50 per cent of respondent farmers to contract with a particular firm.

21. Over 21 per cent of the respondents reported that the most important problem encountered in contract production was that of integrators charging higher costs for inputs.

22. Among the integrating firms, 26.31 per cent of small farmers, 18.03 per cent of medium and 17.40 per cent of large farmers were satisfied with contract production and indicated no problems.

23. The transition probability analysis revealed that only a few firms had loyal contract farmers as indicated by high retention coefficients.

24. Nine of the large contract farms wanted to switch over to another integrating firm if there were any better options in the offing. Similarly five medium farms and one small farm also

expressed the desire to shift the company. And none of the independent farmers wanted to shift to CF of broilers.

**Conclusion**

1. All categories of broiler farmers have the same terms and conditions under a written contract which is more leaning towards the integrators than the farmers with a glaring practice of collecting two blank cheques. And none of the integrators have insurance to cover the risk. Hardly any farmer has a copy of the written agreement and the document has little or no legal teeth in favour of the farmer in the court of law. The farmer gets a growing charge for steering the chicks from day one to marketable age. The base fee varies across firms ranging between Rs. 1.80 to Rs. 2.65 in addition to market price, production cost, and FCR linked incentives. The number of farmers contracted by each integrator varies between 60 and 300. The integrator practices like batch length, batch number, and additional organic supplements have affected the net profitability of broiler contract farms.

2. Despite market uncertainties, independent farmers are in poultry business for decades mainly due to own feed mixing, own retail outlets or trusted vendors. The profits per kg body weight are comparable to contract farms. The independent farmers preferred to continue to be independent.

3. The Cobb-Douglas production function indicated that flock size significantly influenced per batch returns for CF while for independent farms it was flock size and poultry farming experience.

4. The broiler integration has its inherent problems both for farmers as well as integrators. The farmers do not get quality chicks (minimum weight 40g.) which is most important basic input in broiler production. Even feed quality is not easily quantifiable and varies between batches. The integrators charge higher rates for chicks, feed, vaccines, medicines, sanitizers etc., and also insist use of medicines though not warranted, thus increasing the cost of production; the cost is debited from the growing charges. Delays in stocking of chicks were a common complaint from farmers and the study revealed that the average number of batches per year was fewer than the maximum possible of 6 batches. The flock density is less particularly during summer months reducing farmers returns. Higher mortality, surpassing the fixed cost of production attracts penalty. The penalty clause is only for farmers and no mention of it for integrators for any delay, deviations or violations.

**Policy implications:**

1. Legally enforceable contractual laws have to be introduced which is much easier with the recently introduced Model Act by Government of Karnataka.

2. Mandatory standards and certification ought to be introduced for various inputs like minimum DOC weight, feed quality, medicines and vaccines and even management practices.

3. The input prices need to be uniform and disclosing maximum retail price (MRP) on the bags or containers should be mandatory at least within the state for all the integrating companies.

4. All the integrating companies should get registered with the state department of Animal Husbandry and Poultry Federation disclosing the companies financial details and CF terms confirming to the existing laws.

5. The integrating companies should be permitted to import grand parent (GP) stock, vaccines and medicines to break the monopoly and create a healthy and competitive spirit among the industry players.

6. An autonomous body comprising representatives from industry, farmers, all line departments and related universities is strongly

advocated in the interest of all the stake holders of the broiler farming industry.

7. Common code for industry, farmer and consumer in production and rearing, keeping in view the environmental issues, pollution, health hazards and scarce natural resources.

8. Crop insurance to be raised by the company to cover the risks like natural calamities of flood, fire and the increasing repeated threats from diseases like Avian Influenza, Gumboro, Newcastle etc.,

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# CHAPTER VI
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