

ROLE OF BACKYARD POULTRY IN HOUSEHOLD ECONOMY OF CHAMBA DISTRICT IN HIMACHAL PRADESH

THESIS

By

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(A-2017-30-014)**

Submitted to



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in

Partial fulfilment of the requirements for the degree

of

**MASTER OF SCIENCE IN AGRICULTURE
(DEPARTMENT OF AGRICULTURAL ECONOMICS,
EXTENSION EDUCATION & RURAL SOCIOLOGY)
(AGRICULTURAL ECONOMICS)**

2019

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CERTIFICATE – I

This is to certify that the thesis entitled “**Role of Backyard Poultry in Household Economy of Chamba District in Himachal Pradesh**” submitted in partial fulfillment of the requirements for the award of the degree of **Master of Science (Agriculture)** in the discipline of **Agricultural Economics** of CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur is a bonafide research work carried out by **Ms. Nitika Kapoor (A-2017-30-014)** daughter of **Smt. Raj Kumari** and **Shri Paras Ram Kapoor** under my supervision and that no part of this thesis has been submitted for any other degree or diploma.

The assistance and help received during the course of this investigation have been fully acknowledged.

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CERTIFICATE- II

This is to certify that the thesis entitled, “**Role of Backyard Poultry in Household Economy of Chamba District in Himachal Pradesh**” submitted by **Ms. Nitika Kapoor (A-2017-30-014)** daughter of **Shri Paras Ram Kapoor** to the CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur in partial fulfilment of the requirements for the degree of **Master of Science (Agriculture)** in the discipline of **Agricultural Economics** has been approved by the Advisory Committee after an oral examination of the student in collaboration with an External Examiner.

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ACKNOWLEDGEMENTS

This treatise, a humble expression of my life's ambition and a scientific dream come true, would have not materialized the way it is, without the benediction from almighty God. I am grateful to God, the merciful, the compassionate, for bestowing me with health, tenacity and courage enough to go through this crucial juncture.

*With the overwhelming sense of legitimate pride and genuine obligation, I would like to express my eternal gratitude to my learned and revered advisor, **Dr. Rajesh Kumar Thakur**, Principal Scientist, Department of Agricultural Economics, Extension Education and Rural Sociology for his excellent and praiseworthy guidance, keen interest, constant encouragement and parental affection during whole course of my study. I shall always remain indebted to him.*

*No expression of thanks will be sufficient without recognition of intelligent and professional dexterity of the members of my Advisory Committee viz., **Dr. Virender Kumar**, Principal Scientist (Agricultural Economics), **Dr. Manoj Bhargava**, Professor and Head, Department of Physical Sciences and Languages, **Dr. Shweta Pathania**, Assistant Professor, Department of Physical Sciences and Languages, **Dr. Yudhvir Singh Chauhan**, Professor, Department of Vegetable Science and Floriculture and **Dr. Akhilesh Sharma** Professor and Head, Department of Vegetable Science and Floriculture for their valuable guidance and constructive suggestions.*

*I emphatically express my venerable thanks to **Dr. K.D. Sharma**, Professor and Head, Department of Agriculture Economics, Extension Education and Rural Sociology for extending necessary facilities as and when required. Financial assistance in the form of stipend provided by the university is fully acknowledged. I would also like to extended my sincere gratitude to faculty members of Department of Agriculture Economics, Extension Education and Rural Sociology for their suggestions and kind cooperation during the period of investigation.*

*I sincerely thank **Dr. Ashok Kumar Sarial** Hon'ble Vice Chancellor, **Dr. R.K. Agnihotri**, Dean, Postgraduate Studies and other university authorities of CSK HPKV for providing necessary facilities and help during the course of investigation.*

*My special thanks to **Dr. Bhuvnesh Thakur** (Department of Animal Husbandry), **Sh. O.P. Kapoor** (Director, RSETI Chamba), **Parminder Bhaiya** and **Sonu Bhaiya** for the help extended by them during survey. Heartfelt thanks are also due to all the members of ministerial staff of the Department of Agricultural Economics, Extension Education and Rural Sociology for their cordial assistance and timely help extended during the study.*

*All the words in the lexicon will be futile and meaningless, if I fail to divulge my extreme sense of regards to my adorable parents (**Smt. Raj Kumari** and **Sh. Paras Ram Kapoor**) for their sacrifice, prayers and blessings without which this work would have been a sweet dream. I am yet to find suitable words to express my heartiest affection for my brothers **Amit**, **Munish**, **Ravinder**, **Rakinder**, **Anish**, sisters **Anjali**, **Meenakshi di**, **Indu di**, **Yesmine**, **Jesmine** for their tender attachment and constant encouragement during the course of investigation.*

*I can hardly overlook the co-operation, timely help, moral support extended by the galaxy of my seniors especially **Shivalika Di**, **Diksha Di**, **Divya Di**, **Mahima Di**, **Kanika Di**, **Manju Di** and **Avinash Sir**.*

*Genuine appreciation goes for my classmates **Shivali**, **Bharti**, **Pratibha**, **Damini**, **Shalvi**, **Narender**, **Harjeet** and **Arshdeep** for their kind cooperation, support and help rendered. I extend my heartfelt thanks to my friends; **Apoorva**, **Sonali**, **Farook**, **Sharath** for their ever-cherishing love, inspiration, caring and unending encouragement.*

Needless to say, all omissions and errors are mine.

Place : Palampur

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LIST OF ABBREVIATIONS USED

Sr. No.	Abbreviation	Meaning
1	BDO	Block Development Officer
2	et al.	et alii (and others)
3	etc.	Etcetera
4	FYM	Farm Yard Manure
5	Fig.	Figure
6	ha	Hectare
7	i.e.	id est (that is to say)
8	kg	Kilogram
9	KVK	Krishi Vigyan Kendra
10	L	Litre
11	No.	Number
12	/	Per
13	%	Per cent
14	Qty.	Quantity
15	q	Quintal
16	Rs.	Rupees
17	sq. km	Square Kilometre
18	SMS	Subject Matter Specialist
19	t	Tonnes
20	TC	Total Cost
21	TFC	Total Fixed Cost
22	TVC	Total Variable Cost
23	viz.	videlicet (namely)

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Title of thesis : Role of Backyard Poultry in Household Economy of Chamba District in Himachal Pradesh
Name of the student : Nitika Kapoor
Admission number : A-2017-30-014
Major discipline : Agricultural Economics
Minor discipline : Statistics
Date of thesis submission : 23rd July, 2019
Total pages of the thesis :
Major Advisor : Dr. Rajesh Kumar Thakur

ABSTRACT

Backyard poultry is one of the important activities being promoted in the state for the supplementation of household income by the Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur. The backyard poultry has a potential of improving the socio-economic status of marginal, small farms and even landless households through the generation of supplementary income along with other farm activities. The present study was conducted in Chamba district of Himachal Pradesh to study socio-economic status of households and workout the economics of backyard poultry. Both primary data were collected from 60 backyard poultry owners of Chamba and Mehla block, selected by using two stage random sampling technique. Simple tabular method was used for the analysis of data and results have been presented by working averages, percentages, indices, etc. The average size of land holding was 0.22 ha in which 86 per cent area was under cultivation crops. The analysis of cropping pattern revealed that maize and wheat were the major crops grown by the respondents. The livestock inventory was about 5.79 animals which comprised cattle, bullocks, sheep and goat. Among the cereal crops, the productivity of maize was highest (about 23q/ha) followed by wheat. The total per farm value of farm inventories except land was worth Rs. 2,56,539 comprising buildings Rs. 1,91,916, livestock Rs. 57,548 and farm machinery and implements Rs. 7075. The size of backyard poultry unit was about 47 birds comprising 31 hens and 16 broilers. Under backyard poultry schemes, the respondents had purchased 76.67 chicks on subsidized rates while 3.52 waterers, 3.6 feeders and 60 kg of feed were supplied to the respondents free of cost. The average total initial investment on backyard poultry was around Rs. 23,898 out of which, investment on poultry shed was highest (89.62%) followed by cost of chicks (6.74%). The average annual use working capital in the backyard poultry was Rs. 41,048 in which poultry feed accounted for about 60 per cent followed by cost of family labour (31.27%). The total annual cost of managing the backyard poultry was estimated at Rs. 44,596/annum. The annual production of poultry unit comprised 4640 eggs, about 20 poultry birds sold for meat and 10.28q of poultry manure. The gross value of all these products was estimated at Rs. 59114 in which major share was from the sale of eggs (86%). Backyard poultry in the study area was found to be profitable activity as the net returns over total cost were to the tune of Rs. 14518/unit and 309/bird, respectively. Moreover, the Benefit cost ratio worked out 1:1.33, which indicated total investment of worth Rs.1 in backyard poultry will generate an income of Rs. 1.33. The major portion of total production of main products of poultry *viz.*, eggs (86.26%) and bird meat (100%) was marketed. The share of income from backyard poultry was about 17 per cent of the total agricultural income. The major problems in backyard poultry were loss by predators, losses due to the insect pest and diseases, costly feed and damage to field crops by poultry birds.

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1. INTRODUCTION

Agriculture is a land-based activity. The farmers with sufficient land resources has more opportunities for increasing their farm income by increasing the scale of production compared to the farmers having limited level resources. Under this situation of limited land resources, higher level of farm income is only possible through the adoption of high value crops and (or) adoption of allied farm enterprises like mushroom, bee keeping, protected cultivation of high value crops, backyard poultry etc., where the land requirement is quite low compared to crop enterprises. In India, poultry farming occupies a pivotal position for acceleration of rapid economic growth. India is one of the world's largest and fastest growing poultry industries, ranking 3rd in egg production with annual production of 66.4 billion eggs (Anonymous 2010). Backyard poultry is an important source for generating an additional income, especially among poor strata of the population vis-a-vis an imperative factor for improving the nutritional security of rural poor (Pathak and Nath 2013). Most of the backyard poultry production units are rearing indigenous birds, capable of producing only 40-50 eggs per year. With rearing improved varieties in backyard poultry, birds will increase the production of eggs as well as meat, thereby resulting an increase in the income.

The backyard poultry farming may emerge as a potential tool for poverty alleviation, which can be adopted as a major as well as subsidiary occupation depending on the number of birds in the unit. It requires low input and can be managed easily with other household activities (Rath et al. 2015). Through the rearing of backyard poultry, poor households can fulfil their food demand as well as can get additional profits (Conan et al. 2012). Traditional family-based poultry production system still contributes more than 80 per cent of the global poultry population (Mack et al. 2005). Small scale poultry helps in achieving food security through its contribution to mixed farming practices, women empowerment and enabling access to health care and education (Wong et al. 2017). Pulses used to be a major source of protein for majority of population but unfortunately, the per capital availability of pulses in the country has come down in last few years. This gap in the diet of common man has to be bridged and eggs provide an affordable alternative source of protein. The per capita availability eggs in the country has increased from 5 eggs/person/year to the level of 41 eggs in present scenario. Besides this, meat is another nutritious product of poultry bird which is also a source of high-quality proteins.

Therefore, increase in the production of eggs and meat will also lead in strengthening the economic base of the rural farmers.

Himachal Pradesh has a varied type of agro-climatic conditions which are suitable for undertaking wide range of crops and allied farm enterprises. In the recent past, the state has shown a remarkable progress in field of agriculture especially in fruit and off-season vegetable production. The proportion of cropped area in the state is quite low i.e. about 10 per cent of the total geographical area of the state mainly due to hilly topography. Thus, the majority of land holdings in the state are small and marginal (84.5%). The average size of land in the state is around 1 hectare of which about 80 per cent is rainfed. Due the non-availability of assured irrigation, the productivity levels of different crops are low compared to irrigated areas. In order to improve the socio-economic status of farming community, the line departments of the state are promoting the adoption of allied farm enterprises. Among the potential allied farm enterprises, backyard poultry is being popularized by the Department of Animal Husbandry and CSK HPKV, Palampur under different schemes and projects in the state. The backyard poultry act as supplementary farm enterprise and does not compete potentially with other farm enterprises, especially for land, labour and other farm resources. To start with, the farmers of the state are being provided with chicks and critical inputs as per the provisions of schemes/projects. During the period of last few years, a good number of backyard poultry units have been promoted in different parts of the state. Therefore, it is imperative to analyse the role of backyard poultry in the farm economy of Chamba district of the state, so as to assess the impact of aforesaid intervention, especially with respect to change in socio-economic status of farmers, economics of backyard poultry, related issues and constraints faced.

Keeping these aforesaid points in view the present study has been carried out with following outstanding objectives

Objectives

- i) To study the socio-economic status of sample household.
- ii) To work out the economics of Backyard Poultry and analyze factor affecting its adoption.

2. REVIEW OF LITERATURE

In this chapter, an attempt has been made to review some of the important studies related to present investigation. The review of literature is one of the most important aspects of any research investigation which helps a researcher to get acquainted with the subject matter under study and further canalize efforts in a desirable direction. It provides necessary guidelines and motivates the researcher to proceed in research. It also helps the researcher to delineate his research problem. A review of past study on adoption of backyard poultry practices has been collected from various journals and research articles thus review pertaining to various independent and dependent variables for study is incorporated in this chapter. A brief account of available literature that has direct or indirect bearing on the present topic and other related topics is given below under the following heads:

- 2.1 Socio-economic status
- 2.2 Cost and returns
- 2.3 Management practices in backyard poultry
- 2.4 Problems associated with backyard poultry

2.1 Socio-economic status

Mandal et al. (2006) carried out a study on backyard poultry farming in Bareilly district of Uttar Pradesh, India. The results indicated that 27.08 per cent of poultry owners were landless, 27.92 per cent of respondents possessed less than one hectare of land (marginal farmers), 20 per cent of the farmers had 1-2 hectares of land (small farmers) and only 5 per cent of poultry owners had more than 2 hectares of land (large farmers). Majority of the poultry owners (92.92%) belonged to nuclear families and only 7.06 per cent belonged to joint families. 52.92 per cent of the poultry owners were laborers, 22.50 per cent poultry owners were earning livelihood from agriculture and 14.58 per cent respondents were earning through animal husbandry. Service and business provided occupational livelihood to 2.92 per cent and 7.08 per cent families respectively.

Singh and Jadoun (2014) carried out a study on backyard poultry farming in Malda district of West Bengal. 110 rural women were selected at random and approximately 650 families were surveyed from randomly selected five villages of the district and out of them, 400

families were directly involved in backyard poultry rearing. About 56.36 per cent of respondents fell under young age group (<30 years), 33.64 per cent aged between 31 to 55 years and only 10 per cent aged more than 55 years. Among the 110 respondents, 26.37 per cent of the respondents were earning less than Rs. 2000 per month, falling under low income group, 51.82 per cent were earning Rs. 3000 to 10,000 per month and 21.81 per cent of the respondents earned more than Rs. 10,000 in a month.

Dumrya et al. (2015) carried out a study on characterization of backyard poultry farming in Sundarban region of West Bengal. Fifteen villages were selected randomly from seven blocks and from each village, the prominent backyard poultry growers were identified by the villagers themselves, from which samples were randomly drawn. The number varied from 10-15 in most of the villages. In total, 201 respondents were randomly selected from fifteen villages covered by the survey. The findings of the study showed that majority of the backyard poultry farmers (75.6%) were middle-aged women and they played a significant role in backyard poultry farming that contributed towards their family's subsistence. Majority of the respondents belonged to general caste (46%) followed by scheduled caste (24%), other backward castes (22%) and scheduled tribe (8%). 54 per cent of poultry owners had landholding 'up to 1 acre' followed by 'more than 1 acre' (34%) and 'no land' (12%). The study concluded that 58.7 per cent of the poultry farmers were from poverty-stricken family and had very less extension contacts and alternative livelihood option.

Balamurgan et al. (2017) analyzed the socio-economic status of backyard poultry farmers of Theni district of Tamil Nadu. A sample of 100 backyard poultry farmers was selected through simple random sampling for the study purpose and then the farmers were grouped into small, medium and large categories depending on size of their poultry holding *viz.*, 1 to 50, 51 to 100 and more than 100 birds, respectively. The study indicated that proportionately most of the farmers belonged to young age group (45%) followed by middle (33%) and old age (22%) group. Highest number of respondents (28%) were graduates, whereas, 24 and 23 per cent respondents studied up to school level and illiterates, respectively. Majority of farmers had small size family (70%), whereas, 21 per cent farmers were belonging to medium size family. The study also showed that 84 per cent of the respondents were rearing the backyard poultry as subsidiary occupation to earn additional income, while 16 per cent of the respondents were running the farm as main occupation.

Venkat (2017) studied the role of Rajashri (backyard poultry) in nutritional and economic security among tribal households of Warangal district in Telangana state. A total of 120 respondents were selected and data were collected personally according to the interview schedule. The study indicated that majority of the respondents were middle aged (41.67%) and females (78.33%). Majority of backyard poultry growers were illiterates (62.50%) and agriculture was their primary occupation (91.67%). The respondents in the study area had nuclear families (68.33%) with medium family size (70.83%), lived in brick walled and tiled house (62.50%), possessed chairs (81.67%) and television (77.50%). Almost all (98.33%) the respondents were members of one organization. Majority (73.33%) had medium flock size with an average of 5.13 rajashri birds and 4.38 desi birds.

Sharma et al. (2018) conducted a study to find out the socio-economic profile of poultry owners and the constraints perceived by the farmers in raising the poultry under backyard system in Jammu district of Jammu and Kashmir. A total of 120 respondents were selected from 5 villages from 2 blocks (Bishnah and Marh). The study indicated that majority (48.33%) of the poultry farmers were from the middle age group followed by 34 per cent of the respondents belonged to young age group and only 17.50 per cent respondents were from old age group. About 29.17 per cent of the respondents had education up to high school and senior secondary level, followed by middle pass (23.33%), illiterate (22.50%), 20 per cent were educated up to primary level and only 5 per cent of respondents had education up to graduation and above. The study also showed that majority (32.50%) were having agriculture as their main occupation, 30 per cent were labourer and 15.10 per cent were engaged in government services. 13 per cent adopted their own business, and only 10 per cent were engaged in animal husbandry practices. 52.50 per cent of the respondents were marginal farmers, 35 per cent were landless, 9.16 per cent respondents were small farmers, and 3.33 per cent were semi medium.

Pathak et al. (2019) analyzed the role of Vanaraja as backyard poultry in rural economy of tribal farmers of east district of Sikkim. The data were collected from 200 tribal farmers from 10 villages comprised of six blocks through a pre-tested structured interview schedule. The study revealed that 67 per cent respondents were females and 36.5 per cent of respondents studied till class-VIII to class X followed by 24 per cent that passed class I to class IV, 16.5 per cent of respondents passed class-IV to class-VII. About 38.5 per cent of respondents had 3-5 years of experience in backyard poultry production with Vanaraja and indigenous poultry birds.

The average family size of sample households was 5.7. The average land holding and flock size per household were 1.1 ha and 13 number, respectively.

2.2 Cost and returns

Kothandaraman and Narahari (1982) studied the economics of broiler production in India. The results of their study showed that among different items of expenditure of maintenance cost, feed cost was the major item (53%) in broiler production followed by chick cost (29%), health cover (6%) and housing and equipment (5%) respectively. They also found that the sale of broiler contributed 98 per cent and remaining 2 per cent through sale of manure and empty gunny bags. The study also showed that 84 per cent was spent on purchase of broiler units and remaining 16 per cent was the net profit, so profit margins was mainly decided by the factors of feed cost, sale price of broiler and mortality.

Mishra et al. (1988) estimated economic efficiency of broiler farms of different sizes under hot humid conditions in district Orissa by selecting 12 broiler units ranging from 100-1000 birds located in around Bhubaneswar. It was reported that the expenditure on feed was in the range of Rs. 12.57 to 12.87 per bird and Rs. 5.84 to Rs. 6 in case of broiler and chicks, respectively. They further found that the per bird value of gross cost and gross returns ranged from Rs. 23.64 to Rs. 25.38 and Rs. 26.18 to Rs. 26.31, respectively. The net return per bird varied from Rs. 0.93 to 2.59 and without payment interest rates from Rs. 2.82 to 4.22.

Verma and Supekar (1990) developed a scheme for 1000 broiler production units along with its economics from a study conducted at College of Science and Animal Husbandry, Mhow (M.P). The operational cost, fixed cost and total cost for rearing 1000 birds for eight cycles, were at Rs. 1,39,200, Rs. 4,045 and Rs. 1,43,245, respectively. The per broiler profits were estimated at Rs. 5.87 which reduced to Rs. 5.37 when the depreciation of buildings, equipments etc. were also included in the cost of production.

Moorti et al. (1991) studied prospects and problems of poultry farming in Himachal Pradesh. The results showed that the total fixed costs in broiler farming was estimated to be Rs. 302 and Rs. 256 per 100 birds for small and large farms, respectively, while the average fixed cost was worked out to be Rs. 267 per 100 birds. The total variable costs were to the tune of Rs. 1885 and Rs. 1804 for small and large farms of per 100 birds, respectively. The total costs in broiler farming were Rs. 2,187 and Rs. 2,060 per 100 birds on small and large farms,

respectively. It was also found that the total cost per 100 broilers decreased with an increase in the farm size.

Shanmugam (1991) conducted a study on production and marketing of broilers in Salem district of Tamil Nadu. The results of the study showed that the feed cost accounted for highest share (52.64%) in total cost followed by cost of chicks (24.68%), medicine (6.15%), labour charges (2.94%) and electricity charges (2.51%). The net returns per bird over total cost were estimated to be Rs. 4.50.

Prasad and Shankarmurthy (1992) in their study on production and marketing of eggs and broilers in Bellary district, Karnataka, reported that the feed charges constituted 52.33 per cent share in the variable cost expenditure and 34.02 per cent on chicks. They further estimated that the total cost of production per bird was Rs. 23, in which variable cost accounted for 97 per cent. Sale of broiler shared to 97.90 per cent of gross returns followed by sale of gunny bags and manure amounted to 2.10 per cent. He further estimated the net returns on broiler farms and per broiler were Rs. 62, 942 and Rs. 4 respectively.

Shaikh and Zala (2011) examined production performance and economic appraisal of broiler farms in Anand District of Gujrat. A sample of 60 farms were selected at random ensuring proportionate representation of the three strata. Thus, 14 farms from small group, 22 from medium group and 24 from large group were selected. The data were collected from the selected poultry farmers through personal interview using the pre-tested interview schedules. The study indicated that average cost of production per broiler were estimated to be 64 and per kilogram live weight of broiler as 32. The variable cost and fixed cost constitute 84.5 per cent and 15.5 per cent of total cost, respectively. The major cost components were feed (58.6%), chick (21.5%) and depreciation on buildings (10.7%). The net profit per broiler as well as per kilogram body weight were Rs. 7 and Rs. 4, respectively for the sample as a whole. The benefit-cost ratio was worked out to be 1.11 for the sample as a whole and it increased with an increase in farm-size, indicating that as farm-size increases, the net margin over the rupee invested on broilers also increases.

Islam et al. (2015) analyzed benefit-cost (B:C) ratio of Vanaraja and local chicken of Assam under backyard system of rearing. A sample 100 farm women were selected randomly from five blocks of Sivasagar district. The farm women were selected on the basis of their early experience in keeping local poultry along with Vanaraja chicken at backyard system for the

purpose of the study. Items of cost included fixed cost such as land and building, equipments and variable costs includes cost of day-old chick, feed cost, vaccine cost, medicine cost, labour cost, depreciation on poultry shed and miscellaneous cost. Return items included egg, cocks and spent hens. The study revealed that the labour cost accounted for 58.48 per cent of the total cost of production of Vanaraja chicken followed by feed cost (13.58%), chick cost (12.80%) and depreciation on poultry house (9.70%) up to 18 months of age. The total cost of production up to 72 weeks of age was found to be higher in Vanaraja (Rs. 2,577) than its local counterpart (Rs. 2,150). The maximum amount of income was contributed by selling of eggs (40%) followed by sale of cocks (34.36%) and sale of spent hens (25.64%) in case of local chicken. The benefit-cost (B:C) ratio in Vanaraja and local chicken were recorded as 2.60 and 2.27, respectively in the present study. The study concluded that small scale Vanaraja rearing is a profitable venture for farm women.

Baruah and Raghav (2017) studied viability and economics of backyard poultry rearing both with local chicken and improved strain Vanaraja in west Siang district of Arunachal Pradesh. A sample of 60 poultry farmer having early experience of backyard poultry farming were randomly selected from 12 villages of West Siang District for the present study. The study revealed that the labour cost of rearing 20 Vanaraja for 18 months of age was estimated to be 58.78 per cent, followed by cost of feed (16.72%), chicks (13.93%), depreciation cost on poultry shed (8.17%), cost of medicine, feed supplements (1.31%) and cost of vaccine (0.56%). In case of local chicken also, the expenses on the labour were highest (71.73%) among the other expenses of rearing. The expenses on feed, chicks, poultry shed depreciation cost, medicine and feed supplement and vaccines were Rs. 5, Rs. 11, Rs. 11, Rs. 1 and Rs. 0.68, respectively. The total cost of production for Vanaraja was found to be higher (Rs.5741) than that of local chicken (Rs. 4704). The total gross and net income from Vanaraja chicken was Rs. 16,320 and Rs. 10,578, respectively, which was 57.15 and 46.78 per cent higher than gross income (Rs. 10,605) and net income (Rs.5900) from the local chicken.

Jha and Chakrabarti (2017) evaluated the intervention of improved breed of poultry Divyan Red as backyard poultry in tribal village of Saraitoli, Ranchi, Jharkhand. The farmers rearing indigenous chickens by traditional skill and having interest in poultry rearing were identified among 55 households by the Gram sabha. They recommended 12 households in participatory mode for scientific rearing of Divyan Red as backyard poultry farming. The average age of bird which laid first egg was 163 ± 2.57 days and body weight was 1950 ± 10.23

g. The weight of first laid egg was recorded to be 35 ± 3.13 g, whereas, after 36 and 52 weeks, it was recorded to be 47 ± 3.98 g and 54 ± 4.41 g, respectively. The average total egg production per bird was 133 ± 7.0 numbers. The total cost of production was found to be Rs. 336 per bird and production cost per kg of live weight was Rs. 161. The cost of feed and 30 days old chick was about 54 per cent and 44 per cent of the total production cost, respectively. The gross returns per bird were Rs. 569. The net returns per live poultry bird including sell of egg and fresh live weight was Rs. 232. The proportion of eggs and meat in gross income accounted for 26.88 per cent and 73.12 per cent, respectively. The gross expenditure incurred in backyard poultry farming was found to be Rs. 52,499 and gross income was Rs. 88,808. The net income obtained from the backyard poultry was Rs. 3025/household/year with B:C ratio of 1:1.69. The meat-feed ratio was found to be 2.89. The result revealed that poultry breed Divyan Red birds improved tribal peoples' source of income and backyard poultry farming significantly contributed to rural livelihoods.

Roy (2017) analyzed the resource investment pattern, cost and return structure of poultry birds on an average in poultry farms in West Bengal. The study was based on primary and secondary data collected from 120 poultry farmers by adopting purposive sampling. The study showed that the total fixed cost in layer farming was estimated to be 0.66 per cent of the total cost for 1000 birds per batch. The return structure of layer farms indicated the total returns from the sale of eggs, sale of culled birds and manure from 1000 birds as Rs. 4,31,590. Among the overall total returns, the sale of eggs accounted for about 91 per cent followed by sale of culled birds (7.83%). The net returns were Rs. 82,946 per annum per 1000 birds. Net returns per month were found to be Rs. 6912 per 1000 birds.

Athilakshmy et al. (2018) studied the economics of improved strain of backyard poultry rearing in Vellore district of Tamil Nadu. A total of 30 poultry farms rearing Vanaraja strain were selected by simple random sampling and data were collected through pre-tested structured interview schedule. The results revealed that the total cost per year in small farm, medium farm, large farm and overall were Rs. 83,097 (Total fixed cost was 13.16% and total variable cost was 86.39%), Rs. 1,57,320 (11.90% total fixed cost and 88.10% total variable cost), Rs. 1,72,343 (9.81% total fixed cost and 90.19% total variable cost), respectively. The net returns in small farm, medium farm, large farm and overall were Rs. 42,921, Rs. 1,32,085, Rs. 2,70,209 and Rs. 1,48,405, respectively. The benefit cost ratio in small farm, medium farm, large farm and overall were 1.52, 1.84, 1.98, and 1.86, respectively.

Preetam et al. (2018) carried out a study to assess the economic viability of Rajasri, a synthetic variety suitable for backyard rearing under different management and feeding regimen. 400 birds (7 week of age) were randomly distributed to 5 treatment groups (T1 intensive deep litter with feed: T2 and T3 under semi-intensive with 20 and 40 per cent of feed: T4 and T5 under scavenging at farm and farmer's backyard, respectively) with 4 replicates each. The input cost for rearing of T1 group during grower and layer phase (Rs.4769 and Rs. 23,680) was significantly higher than other treatment groups. Accordingly, the cost of 20 weeks' pullet was high for intensive rearing rather than farmer's backyard. Total input cost during laying phase was also higher in T2 compared to T3, T4 and T5. Total returns during laying phase were Rs. 26,825, 12775, 15391, 16774 and 16317 for T1, T2, T3, T4 and T5, respectively. The net profit per bird was high in farmer's backyard rearing of birds followed by farm backyard rearing. It can be concluded that rearing of Rajasri birds under scavenging system is more beneficial as compared to intensive and semi-intensive rearing, as in these systems of rearing input cost was high for feed supplementation ranging between 71.19 to 87.4 per cent.

Singh et al. (2018) analyzed socio-economic impact of Vanaraja backyard poultry farming in Sikkim Himalayas. The study indicated that in case of Vanaraja, the labour cost accounted for 61.63 per cent of the total cost of production, followed by poultry shed (13.69%), cost of day-old chicks (11.98%) and feed (10.27%). Whereas, in case of local poultry, labour cost accounted for 81.55 per cent, followed by poultry shed (9.06 %), chick cost (7.24%) and feed cost (1.81%). Labour cost accounted for the highest proportion of total cost of production. The cost of vaccine accounted for only 0.60 and 0.32 per cent of the total cost of production in case of Vanaraja and local chicken, respectively. The net income per bird was significantly higher (Rs. 995) from Vanaraja than local bird (Rs. 287). Benefit-cost (B: C) ratio in Vanaraja and local chicken was recorded as 4.41 and 1.57, respectively. The study concluded that Vanaraja rearing is much more profitable than the local poultry birds.

2.3 Management practices in backyard poultry

Talwar et al. (1990) assessed the knowledge level and consultancy pattern of poultry farmers in Maharashtra. It was found that majority of farmers i.e. 80.28 per cent were having the knowledge about the feeding practices while 75.66 per cent were conversant about housing and other management practices. Management of diseases was reported to be one of the major issues in poultry farming, about 66.57 per cent having requisite knowledge about their control.

Rahman et al. (2002) studied scientific knowledge and management skill in commercial broiler keeping programme at the keeper level of Rajshahi district. The study revealed that 37.86 per cent of the respondent had high level of management skill based scientific knowledge. About 52.85 per cent of the respondent possessed medium management skill and a very few of them (9.29%) never cared about acquiring management skills. This indicates that broiler keepers need to be trained in routine management aspects.

Saha (2003) studied the status of rural poultry production in North 24 Parganas district of West Bengal. The study indicated that in backyard poultry rearing system, respondents generally lived in small houses made of locally available materials viz., bamboo, mud, wood, net, jute stalk, tiles, tin, straw etc. The study also revealed that the adult birds were housed together during the night with little consideration of space available per bird and chicks were kept separately in order to avoid huddling and consequent death. Most of the respondents left birds for free scavenging during day time, whereas, some respondents housed the birds in the poultry houses or bamboo baskets in the afternoon, in order to avoid dispute with neighbors and attack of predators.

Mandal et al. (2006) studied the backyard poultry farming in Bareilly district of Uttar Pradesh, India. They reported that the majority of the poultry farmers were rearing the birds in backyard/ free-range system but they made necessary arrangement for night shelter of the birds to protect them from predators. Majority (97.50%) of the poultry owners constructed separate houses for birds, out of which 89.58 per cent poultry owners kept the birds in *kuchcha* house, whereas, 10.42 per cent respondent kept the birds in *pucca* house. Few respondents also housed the chicks separately in order to avoid huddling and consequent death. The average length, breath and height of the poultry house were 4 ft, 3.5 ft and 2.5 ft, respectively. The study also revealed that majority of the respondents (93.75%) did not provide any litter material for their birds and only 6.25 per cent poultry owners provided litter material. Out of the total respondents who provided litter material, 80 per cent used wheat straw and 20 per cent used dry leaves, gunny bag.

Khandait et al. (2011) conducted a study on adoption of backyard poultry rearing practices in Bhandara district of Maharashtra. The study revealed that majority of the respondents (57.50%) were medium level adopters followed by high level (21.67%) and low level (20.83%) adopters. The study has also revealed that the marketing (69.20%) was highly

adopted followed by feeding and watering (59.17%), housing (49.70%), general management (46.67%), breeds and breeding (43.48%) and the least adoption was for health care practices (27.44%). The study also concluded that backyard poultry rearing is an important part of the integrated farming system as it is helpful in income generation as well as in nutritional need of the resource poor farmers with very less input and minimum care.

Dumrya et al. (2015) carried out a study on characterization of backyard poultry farming in Sundarban region of West Bengal. Fifteen villages were selected randomly from seven blocks and from each village, the prominent backyard poultry growers were identified by the villagers themselves, from which samples were randomly drawn. The number varied from 10-15 in most of the villages. In total, 201 respondents were randomly selected from fifteen villages covered by the survey. The study revealed that all respondents (100%) kept their birds on scavenging along with some supplementary feeds. Majority (57.2%) of the poultry farmers followed better management practices in terms of use of vaccination, deworming, brooder box. About 62 per cent of poultry farmers did not use any source of energy for maintaining their farms. However, 25.4 per cent, 7.4 per cent and 5.5 per cent respondents used electrical energy, kerosene and solar energy, respectively, as source of energy for brooding. The study also showed that majority (50.2%) of the poultry farmers did not use any litter materials at all for their poultry whereas some of poultry farmers used rice husk (16.4%), straw (12%) or saw dusts (21.4%) as litter materials. Most of the respondents were unaware of litter borne diseases of poultry and they seldom used lime or any disinfectants to keep the litter germ-free.

Sarwar et al. (2015) studied the key aspects of backyard poultry management practices in rural areas of district Rawalpindi, Pakistan. This study was based on the data collected from 8 villages of Rawalpindi with respect to managerial practices of the farmers. The findings of the study indicated that the diseases, predators and lack of veterinary services were the most quoted reasons for mortality in poultry birds. It was found that only 18 per cent families vaccinated their birds while 40 per cent rural women kept their birds in coops or under woven baskets. The feed of the birds was quite poor in protein; however, scavenging was the major source of protein in backyard poultry.

Kumar et al. (2016) carried out a study in the Bastar district of Chhattisgarh with the specific objective to assess existing housing, feeding and breeding practices related to backyard poultry production of desi birds. A sample of 120 poultry rearers (12 respondents from each

village) were randomly selected from two blocks (Bakawand and Jagdalpur) of Bastar district of Chhattisgarh. The study revealed that 68.33 per cent poultry owners constructed separate small houses with locally available materials *viz.*, bamboo, mud, wood, net, jute stalk, tiles, tin, straw etc. The poultry houses were constructed at different heights. About 45 per cent of the respondents following a free-range system had the poultry houses with height of 1-2 feet, 0-1 feet (28.33%), 2-3 feet (15.83%) and 10.83 per cent hung the poultry house in roofs in order to avoid disputes with neighbors and attack of predators. In free range system, only 48.33 per cent respondents provided litter material for their birds, out of which, 20 per cent of the respondents used straw, followed by rice husk (11.67%), dry leaves/gunny bags (10.83%), saw dust (4.71%) and wheat straw (1.67%). The birds were left for scavenging on insects, worms, grasses, seeds and flowers in morning and evening. The birds were also offered kitchen waste, broken rice, and boiled rice to supplement feed at an average rate of 50.29 ± 0.87 grams per birds per day. The study also revealed that scientific practices for housing and feeding were not followed in tribal areas of Chhattisgarh.

Kannadhasan et al. (2017) studied the adoption of recommended feeding practices in backyard poultry farming in Palakkarai, Chinna Veerasangili and Periya Veerasangili villages of Perundurai block in Erode district, Tamil Nadu. A total of 120 respondents were selected by applying proportionate random sampling technique. The result showed that only 10 per cent of the respondents were having high level of knowledge on recommended backyard poultry feeding practices while 88.33 per cent and 1.67 per cent possessed medium and low level of knowledge, respectively. The study also revealed that cent per cent of the respondents provided supplementary feeding to their birds. About 93 per cent of the respondents used feeder and/or waterer and 90 per cent of the respondents provided clean water to their birds.

Choudhary et al. (2018) studied the relationship between differential management practices of poultry owners in Rajouri district of Jammu and Kashmir state. The data were collected from 120 respondents belonging to Nowshera, Sunderban, Rajouri, Darhal and Thanamandi blocks with the help of structured interview schedule. The study indicated that majority (95%) of the respondents in organized system were practicing semi-intensive system of poultry farming, whereas, only 3 per cent were practicing intensive systems of poultry farming. 75 per cent of poultry owners in unorganized system had different shelter for night enclosure under the same roof and only 8.3 per cent shared the same room with the family. The study further showed that in unorganized system 65 per cent were providing torn and used

gunny bags 65 per cent and rest 35 per cent used combination of straw and dry leaves as the bedding material whereas in case of organized system of poultry production 83.3 per cent use saw dust and 16.7 per cent rice husk. Majority of poultry owners in unorganized system (70%) kept the birds in kuccha house prepared by locally available material like mud broken bricks, tiles, and wire net whereas 21.67 per cent and 8.33 per cent respondents kept their birds in wooden and chapper house, respectively.

Sharma et al. (2018) conducted study in Jammu district of Jammu and Kashmir state with the objective to study the feeding, breeding, housing, health care and marketing practices followed in backyard poultry rearing. The data were collected from 120 respondents belonging to 10 randomly selected villages of Jammu district. The study showed that the farmers reared the birds in extensive system (free range with night shelter) and no supplementary feed was given to birds to increase production. Majority of the respondents (75.83%) provided both grains and kitchen waste as feed material. About 90 per cent of the respondents gave 6-10 hours for scavenging to poultry birds. The study further revealed that majority (34.16%) of the respondents provided shelter to the birds in *kuchcha* house, about 32.50 per cent provided shelter in mixed houses and only about 18 per cent were provided shelter in pucca house. Natural hatching was the main source of chicks (65.17%) and majority of the respondents (84.16%) do not purchase chicks from reliable source. 92.5 per cent of the respondent's birds were not vaccinated against diseases.

2.4 Problems associated with backyard poultry

Kumtakar (1999) studied backyard poultry system in the tribal areas of Shahpura block in Jabalpur district, Madhya Pradesh, India. The study revealed that the people were able to identify some common diseases but had no knowledge about the remedy for their control or cure and 66 per cent of the respondents explained that their birds were suffer and died of 'Kata' (i.e., Newcastle Disease), 4 per cent could identify 'Fafooni' (fungus and toxicity) as the reason for mortality. 30 per cent expressed that they were not aware of and could not identify the diseases. Other problems were attacked by predators (79%), 64 per cent mentioned disease as a major problem while 3 per cent mentioned non-availability of feed and medicine. 52 per cent felt that the adult birds were able to look after themselves and they did not need any special protection or security measures, while 17 per cent said that the birds found a place for themselves within the house in a basket or some secure corner. About 31 per cent felt that the birds needed personal care particularly to prevent attacks of wild cats and snakes.

Khalache (2003) studied socio-economic profile of the backyard poultry rearing keeper in drought prone area. The study showed that majority of backyard poultry owners were facing the constraints namely non availability of market for poultry product (80%), non-availability of fair price of poultry product (80%), non-availability of knowledge regarding improved poultry production technology (76%), exploitation through middleman (73.33%) and lack of knowledge regarding scientific poultry management practice (72 %).

Mandal et al. (2006) carried out a study on backyard poultry farming in Bareilly district of Uttar Pradesh, India. A sample of 240 farmers were selected from 15 villages of Bareilly district. The study revealed that the high mortality due to incidence of disease was the major constraint which was encountered by all the respondents (100%) followed by, lack of suitable germ-plasm (91.25%), attack of predators (86.67%) hatching mortality (75%), lack of financial support (67.50%) and high cost of inputs/chicks (54.56%). Inadequate knowledge, shortage of space, complaints by neighbors and hygiene menace was also reported as constraints by 19.17, 18.75, 19.58 and 24.17 per cent of the poultry owners, respectively.

Thorat (2010) studied constraints experienced by poultry owners in adoption of poultry keeping district of Gujarat. The study revealed that main constraints faced by poultry owner were low egg price during summer (95.45%) high charge of electricity (74.34%), costly birds (86.36%), high cost of feed 92.72 per cent high rate of interest on loan wholesale price of eggs low, 76.36 per cent risk and uncertainty in poultry keeping 70.91 per cent.

Khandait et al. (2011) conducted a study on adoption of backyard poultry rearing practices in Bhandara district of Maharashtra and was carried out at Nagpur Veterinary College, Nagpur. Regarding adoption of backyard poultry rearing practices the study revealed that majority of the respondents (57.50%) were medium level adopters followed by high level (21.67%) and low level (20.83%) adopters. The practice wise adoption showed that marketing (69.20%) were highly adopted followed by feeding and watering (59.17%), housing (49.70%), general management (46.67%) and breeds and breeding (43.48%). The least adoption as for health care practices (27.44%). The study also revealed that cent per cent of the backyard poultry reported high incidence of disease (89.17%) attack of predators, 56.25 per cent reported lack of knowledge about scientific poultry management and 23.33 per cent reported improper service of veterinary doctors at village level.

Nath et al. (2012) conducted a study at five villages of Dzungu, North Sikkim in India to identify various constraints faced by the farmers during poultry production. The respondents were selected on the basis of simple random techniques and data collected through structured questionnaire as well as self-observations. The study indicated that the input (82.25%), economical (74.60%), veterinary/health service (73.50%) and market (63.5%) constraints/problems were the most serious constraints as it was ranked 1st, 2nd, 3rd and 4th, respectively. Non availability of day-old chicks, lack of feed supply, improper housing facility, high price rate of day-old chick, lack of technical knowledge, non-availability of medicines and vaccines, poor government support for credit facility (soft loan) to farmers were the most important constraints perceived by the poultry farmers of Dzungu area. The suggestion indicated that the introduction of improved dual-purpose birds, providing credit and health care facilities and establishment of market can bring a significant improvement in sustainable poultry production in Dzungu area, North Sikkim.

Thakur et al. (2012) analyzed the status of backyard poultry rearing practices in remote high-altitude regions of Chamba district of Himachal Pradesh. A total of 80 farming families were randomly selected within the district and interviewed with the help of a semi structured interview schedule. The study showed that the female members in the study regions had higher knowledge with respect to poultry rearing and had greater control over income generated through backyard poultry farming. The study also revealed that lack of superior stock (88.75%), poultry ailments like parasites, fever, dullness (46.25%) and lesser production (42.50%) and problem of predators (40%), were felt as major constraints in promoting poultry enterprise. The institutional support from government agencies was found to be less and activity was being carried in primitive manner in term of bird stock, feeding, housing, predator and disease management. The study recommended the improved technological interventions in form of selection and training of experienced poultry owners, provision of improved indigenous germplasm, better housing and predator management.

Sankhyan et al. (2013) evaluated the characteristics and improvement strategies of rural poultry in Himachal Pradesh. The study revealed that losses due to predators were the major constraints followed by disease. About 48 per cent of respondents gave first rank to the problem related to losses due to predators, whereas, 21 per cent gave this problem second rank. 34 per cent of the farmers gave second rank to problem related to diseases. Other constraints were the lack of inputs on health services and improved germplasm. Marketing problem was found to be

less among the respondents as most of farmers gave fifth rank (74%). It can be concluded from the study that suitable package of practices for rural poultry farming addressing the important issues like diseases must be developed and effective extension message addressing sub-optimal management must be incorporated in strategies for improvement in village poultry farming.

Sharma et al. (2018) conducted a study to find out the socio-economic profile of poultry owners and the constraints perceived by the farmers in raising the poultry under backyard system in Jammu district of Jammu and Kashmir. The data were collected from 120 respondents belonging to 10 randomly selected villages of Jammu district. The analysis of the data revealed that the lack of production against predators was reported by 90 per cent of the respondents. Lack of knowledge of schedule of vaccine was second major constraint reported by 87.5 per cent of farmers and hence majority of the farmers had not vaccinated their birds resulting in high incidence of disease. High cost of treatment (85%) and lack of knowledge of deworming schedule (79.16%) was identified as third and fourth major constraint. Lack of knowledge of sanitation was identified as fifth constraint and lack of knowledge of contagious disease was sixth (77.50%) constraint. Inefficient treatment of birds was seventh (75%) constraint, whereas lack of knowledge about services provided by government was placed at ninth (73.33%) position. Complaints from the neighbors was reported by 37.5 per cent of the respondents. Inadequate space for scavenging was reported by 20.83 per cent of the respondents as a least serious constraint.

The forgoing review studied the importance of backyard poultry as potential source of supplementary income of farmers. This becomes more important at this juncture when strenuous efforts are made in the country to double the farmers income by 2022. There are very few studies conducted at the state level to examine the economic importance of backyard poultry. Therefore, this study has been undertaken to examine the role of backyard poultry in farm economy of Chamba district that has been ranked as the most backward district in the state.

3. MATERIALS AND METHODS

Systematic methodology is the base of any scientific enquiry as it adds the precision, reliability and validity to the findings related to the research problem. An elaborative view of methodology employed in the study will be helpful to the researchers in determining the data requirements for the study in the same or related fields of this kind. This chapter has been carefully planned and describes in detail the methodology adopted and the various tools employed to obtain and interpret the results of the study. The different aspects of the methodology of the study have been described under the following categories.

3.1 Selection of study area

3.2 Sampling design

3.3 Data collection

3.4 Analytical framework

3.5 Limitation of the study

3.1 Selection of study area

The proposed study has been carried out in district Chamba of Himachal Pradesh because it is the most backward district of the state and many programmes for improving the socio-economic status of rural household are being implemented in the district. Backyard poultry is being promoted in the district by the state Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur.

3.2 Sampling design

Two stage random sampling technique was used for the selection of respondents. In first stage of sampling, out of seven development blocks of the district, two blocks namely Chamba and Mehla were selected randomly. At the second stage of sampling, the list of beneficiary backyard poultry farmers adopted by the Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur was prepared for selected blocks in consultation with the officials of departments.

From the list so prepared a sample of 60 farmers comprising 33 and 27 from Chamba and Mehla blocks, respectively, was selected through proportional allocation method depending on the number beneficiaries in the selected development blocks. Schematic chart of the sampling design is depicted through Fig. 3.1.

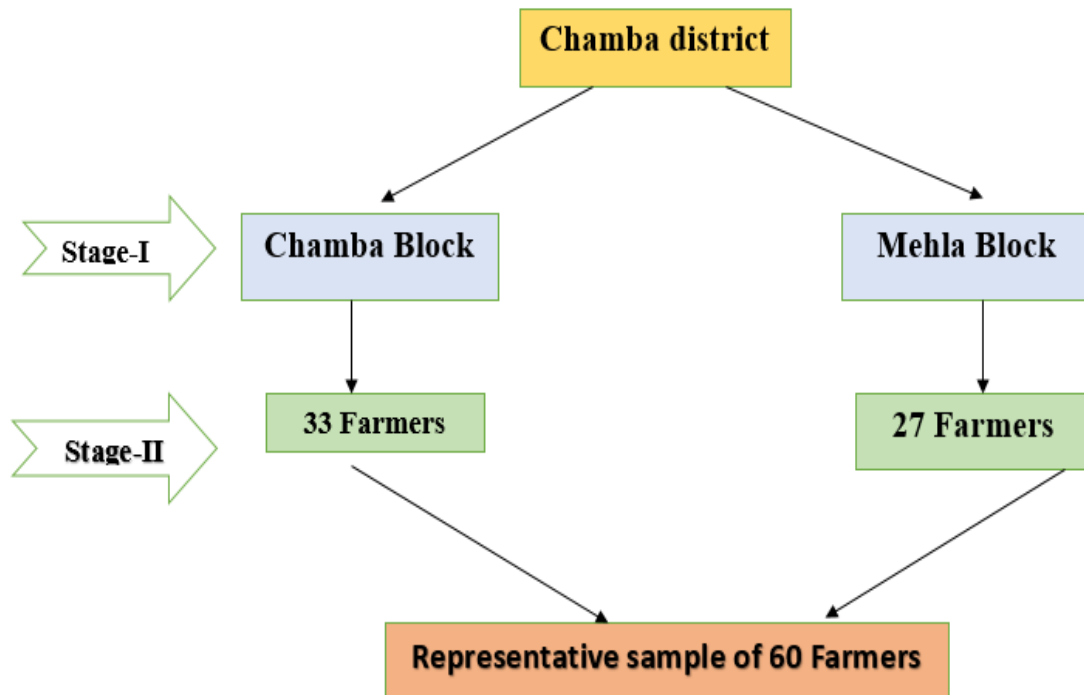


Fig. 3.1 Schematic chart of sampling design

3.3 Data Collections

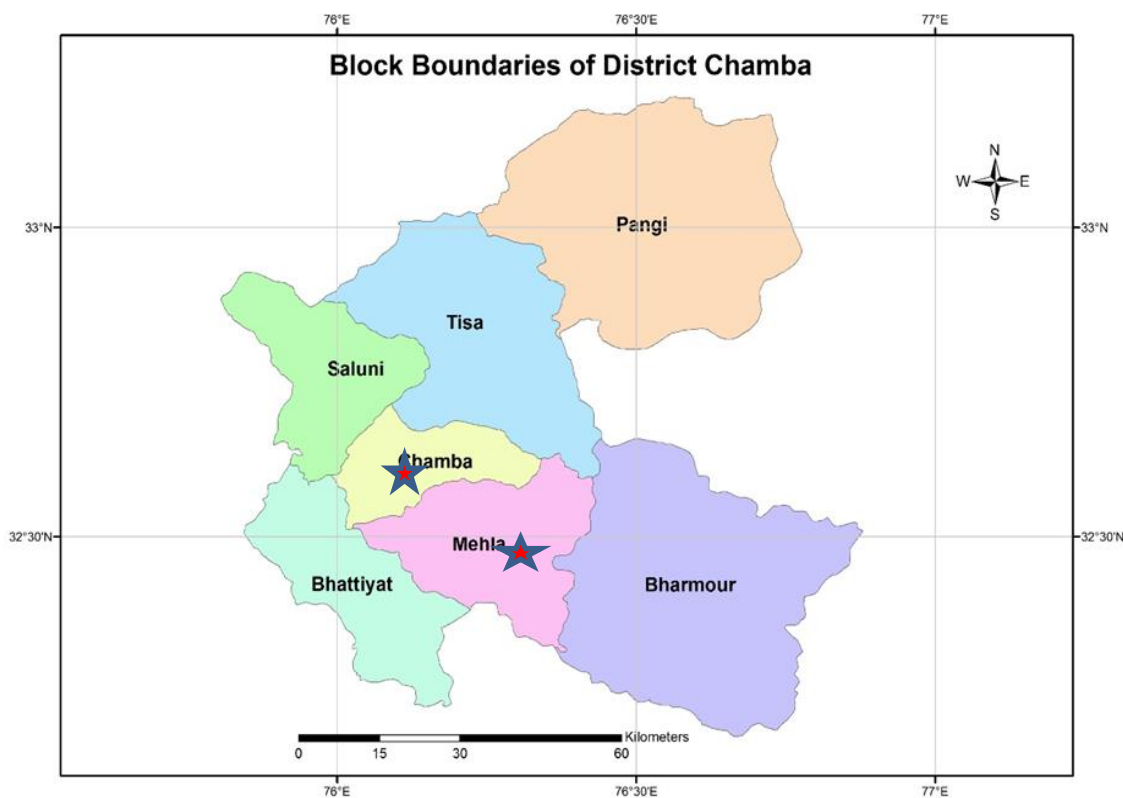
Both primary and secondary data were used to achieve the objectives of the study. The details of data collection are described as under:

3.3.1 Primary data

In order to fulfil the requirements of the specific objectives of the study, the primary data were collected from beneficiary farmers of the schemes/projects of backyard poultry being implemented by state Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur. The data were collected through personal interview method on a specifically designed survey schedule.

The survey schedule was pre-tested in the field before the final data collection. The detailed information on the following aspects was collected from farmers.

- i. Size and composition of family
- ii. Educational status of the sample population
- iii. Pattern of occupation, sources of income and employment
- iv. Farm inventories: buildings, land, livestock, farm implements/tools
- v. Size and composition of backyard poultry unit
- vi. Investment in backyard poultry unit (Fixed and Working capital)
- vii. Benefits availed under backyard poultry schemes of department
- viii. Utilization pattern of backyard poultry units
- ix. Agencies involved in marketing of produce
- x. Factors affecting adoption of backyard poultry
- xi. Management practices adopted by backyard poultry farmers
- xii. Cost and returns of backyard poultry
- xiii. Problems faced by the respondents in management of poultry unit.



 Indicates the selected blocks of Chamba district

Fig. 3.2 Map of Chamba district showing different development blocks

3.3.2 Secondary data

The secondary data with respect to backyard poultry were collected from the various reports of the state Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur.

3.4 Analytical Framework

The primary and secondary data so collected were compiled, scrutinized and tabulated by simple tabular method in excel worksheet. The results have been presented by working out averages, percentages, indices etc. The following algorithms were employed to achieve the objectives of present study.

3.4.1 Sex ratio

Sex ratio represents the number of females per thousand males and was calculated for the total sample population by using following form.

$$\text{Sex-ratio} = \frac{\text{Total population of females}}{\text{Total population of males}} \times 1000$$

3.4.2 Literacy rate

Literacy rate is one of the important criteria to judge the quality of human resource available on the sample households. It was estimated by deducting the population below the age of five years (non-school going) from the total sample population

$$\text{Literacy rate (\%)} = \frac{\text{Total number of literate population}}{\text{Total population} - \text{population below 5 years age}} \times 100$$

3.4.3 Cropping pattern

Cropping pattern refers to the proportion of area under various crops to the total cropped area during a particular agricultural year. It includes the relative importance of field crops among farmers of a region. The cropping pattern of sample households was analyzed by using following formula:

$$P_i = \frac{A_i}{A_t} \times 100$$

where,

P_i = Proportion of area under i^{th} crop

A_i = Actual area under i^{th} crop

A_t = Total cropped area during the year

3.4.4 Cropping intensity

The cropping intensity indicates the degree of using cultivated area during the particular agricultural year. It has been estimated as the ratio of total cropped area to the net sown area and expressed in percentage terms.

$$\text{Cropping intensity (\%)} = \frac{\text{Total cropped area}}{\text{Net cultivated area}} \times 100$$

3.4.5 Economics of backyard poultry

The state department of animal husbandry is implementing various schemes for promotion of backyard poultry in different districts of the state. Although backyard poultry is a small unit of poultry birds, which may be managed on scavenging, yet for better performance, there is need of fixed and working capital investment with respect to poultry shed, day to day expenditure on supplementary feeding, health care and marketing etc. Thus, cost and returns of backyard poultry worked out as under:

3.4.5.1 Cost of backyard poultry

Following cost concepts were used for estimation of total cost of management of backyard poultry unit.

a) Fixed cost

In order to establish a backyard poultry unit initial fixed investment on following items of was taken into account:

- i. Construction of poultry shed
- ii. Purchase of feeders, waterers
- iii. Purchase of birds

The expenditure on these items was considered as initial investment or fixed investment and fixed cost was estimated as under:

- i. Interest on fixed capital investment @ 10 % annum
- ii. Depreciation on equipment's and poultry shed @ 10% per annum

b) Variable cost

Variable cost includes expenditure on feed, litter, health care, electricity charges, marketing cost, egg trays etc. In addition to this, the farmers have to purchase chicks every year to maintain the size of unit. Since every time, in purchased lot of chicks, some of the birds are male and females. Most of the male birds were sold as broiler (6-7 weeks) while the hens were reared for 2-3 years for egg laying. Thus, the annual purchase of chicks was regular practice and amount spent for the purchase of chicks was considered as routine expenditure as a part of working capital. Since in backyard poultry the cash flows (in flows and out flows) goes side by side on regular basis, hence, interest on working capital was not taken into account for calculation of variable cost. Thus, the amount of working capital and variable cost were equal and includes the expenditure on the items like cost of feed, litter, electricity, health care, eggs trays, marketing expenses, purchase of chicks etc.

$$\text{Total Variable Cost (TVC)} = \sum_{i=1}^n x_i p_i$$

where,

x_i – quantity of i^{th} item of expenditure

p_i – per unit price of i^{th} item

c) Total cost = Total Fixed Cost (TFC) + Total Variable Cost (TVC)

3.4.5.2 Estimation of Returns

The major products of the backyard poultry units are eggs and meat whereas poultry manure is a by-product of the unit. In addition to these items there may be miscellaneous items of income i.e. empty gunny bags etc., which were not taken into account for estimation of total return. The returns were estimated as under:

a) Gross returns (GR)

The gross returns of backyard poultry were computed by taking account the income from main products and by-products. The main products backyard poultry are eggs and meat

while poultry compost was the by-product of the of unit. The gross returns of the unit were estimated by using the following formula:

$$\text{Gross Returns (GR)} = \text{TP}_e \times \text{P}_e + \text{TP}_m \times \text{P}_m + \text{TP}_c \times \text{P}_c$$

where,

TP_e – Total production eggs (No./annum)

TP_m – Total number of poultry birds sold for meat (No./annum)

TP_c – Total production of poultry manure (q/annum)

P_e – Average price of egg (Rs/egg)

P_m – Average price of the poultry bird sold for meat purpose (Rs/bird)

P_c – Average price of the poultry manure (Rs/q)

b) Net returns

The net returns over total cost or profits of backyard poultry unit were estimated for a period of one year by using the following formula:

$$\text{Net returns over total cost} = \text{GR} - \text{TC}$$

3.4.5.3 Input-output ratio

Input-output ratio indicates the relation between the quantity of material used in the production and the quantity of final output.

$$\text{Input-output ratio} = \frac{\text{Total returns (Rs.)}}{\text{Total cost of production (Rs.)}}$$

3.4.6 Break-even output

Break even output is that level of production which must be achieved so that the project covers the total. The output below this level would result into net loss to the producer. In general, the poultry units are maintained either as a broiler unit or a layer unit. In case of broiler poultry unit, the major production of the unit is meat whereas in case of layer unit the total production of the unit is in the form of eggs as well as meat. The poultry unit is a mixture of above-mentioned cases i.e. usually the male poultry birds are sold as broilers (6-7 week) while

the female (hens) are maintained as layers for egg production and later sold for meat purpose. Thus, the break-even has been estimated for both of the situations as per the details given below:

a) Layer production

In this the break-even point has been estimated for level of production of eggs and was converted to the number of poultry birds to be reared for breakeven output in terms of egg production.

$$\text{Break even output} = \frac{\text{TFC}}{P_y - \text{AVC}}$$

where,

TFC = Total fixed cost of backyard poultry unit

P_y = Average price of the egg

AVC = Average variable cost (Rs/egg)

Since, the male birds/hens of the unit were also sold for meat purpose, thus, while estimating the AVC of egg production the income of unit derived from the meat and poultry compost was deducted from the total variable cost of unit.

b) Backyard poultry unit

It is the case which take into account both type of outputs i.e. eggs and sale of birds for meat purpose. Since, the price of both the products were different and as such the above-mentioned relationship of for breakeven analysis was not applicable. Thus, keeping in view the composite nature of products (eggs and meat) and different prices of the products following relationship was used for break-even analysis as indicated below:

$$\text{Break even output} = \frac{\text{TFC}}{\text{AGR} - \text{AVC}}$$

where,

AGR (Rs/bird) = GR per unit size of backyard poultry unit (No.)

AVC (Rs/bird) = TVC per unit size of backyard poultry unit (No.)

TVC = Total variable cost of backyard poultry unit

GR = Gross returns of backyard poultry unit

3.4.7 Garrett ranking

To find out the most significant factor which influences the respondent, Garrett's ranking technique was used. This technique was used to evaluate the problems faced by the farmers. Basically, it gives the change of orders of constraints and advantages into numerical scores. The major advantage of this technique as compared to simple frequency distribution is that the constraints are arranged based on their importance from the point of view of respondents. Hence, the same number of respondents on two or more constraints may have been given different rank. Garrett's formula for converting ranks into per cents is given by:

$$\text{Per cent position} = \frac{100 \times (R_{ij} - 0.5)}{N_j}$$

where,

R_{ij} = Rank given for i^{th} factor by j^{th} individual

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

The per cent position of each rank was converted into scores referring to the table given by Garrett and Woodworth (1969). For each factor, the scores of individual respondents were added together and divided by the total number of the respondents for whom scores were added. These mean scores for all the factors were arranged in descending order, ranks were given and most important factors were identified.

3.5 Limitation of the study

The present study has been carried out systematically by using scientific methodology. Due to time and resources constraints limited area was selected for the study. Hence, the results are largely applicable to those areas where similar conditions prevail. Since none of the respondents maintained the proper farm records, the estimates of various parameters of the study are based on the memory of the respondents. Efforts were made to treat respondents politely and tactfully but even then, they were suspicious of the research worker, thinking the worker could be a government agent. Some of the respondents thought that the information was being collected by the government to decide on a new scheme of giving aid to the poor. Therefore, everybody was inclined to be disgruntled and under sizing himself. However, the degree of discrepancy, if any, would be negligible as the estimates presented are in averages.

4. RESULTS AND DISCUSSION

This chapter is of utmost importance as the findings of investigation pertaining to the study area have been presented. In this chapter, the results are presented on different aspects of the sample farmers *viz.*, socio-personal, socio-economic characteristics, knowledge and adoption of the backyard poultry rearing practices by the owners. An attempt was made to study the different factors influencing the adoption of backyard poultry practices. The present chapter embodies the result of the study under following subheading:

- 4.1 Description of the study area
- 4.2 Socio-economic profile of sample households
- 4.3 Inventory of sample households
- 4.4 Income from livestock
- 4.5 Cropping Pattern
- 4.6 Pattern of household income
- 4.7 Status of backyard poultry
- 4.8 Existing pattern of management of backyard poultry
- 4.9 Economics of backyard poultry
- 4.10 Costs and returns from backyard poultry
- 4.11 Production and utilization pattern of backyard poultry products
- 4.12 Problems and constraints

4.1 Description of study area

The study pertained to Chamba district. Chamba is the north–western district of Himachal Pradesh in India and district headquarter is situated at Chamba town. The Chamba district lies between north latitude 32° 11' 30" and 33° 13' 6" and east longitude 75°49' and 77° 3' 30", with an estimated area of 6522 sq. km. It is surrounded by lofty hill ranges on all sides. Geographically, the town Chamba is placed on the bank of Ravi river between two mountain

ranges, the Dhauladhar range and Zaskar range. The main natural divisions of Chamba district are the Ravi valley (which includes the Chamba valley including Bharmour, the Churah area and the part of Bhattiyat tehsil) and the Chenab valley (which comprises Pangi, inclusive of Chamba, Lahaul and Beas region which takes in the rest of Bhattiyat). This is one of the remotest and most beautiful tracts of the western himalayas. Chamba is bounded on north west by Jammu & Kashmir, on the north-east and east by Ladakh area of Jammu & Kashmir state and Lahaul and Bada Bhangal area of Himachal Pradesh, on the south east and south by the district Kangra of Himachal Pradesh and Gurdaspur district of Punjab.

Chamba district has several ancient temples and monuments that reflect its glory *viz.*, Kailash Manimahesh, Chaurasi temple, Bhuri Singh Museum, Lakshminarayan temple, Chaugan, Chamunda Devi temple, Hari rai temple, Chamba church and Chamba library. The district is epitome of natural habitat and famous Khajjiar is dubbed as “Mini Switzerland” of India. Chamba district hosts a popular fair ‘Minjar fair’, which is celebrated at the time of the harvesting of the maize crop which is the main crop of this region. Minjar means flowers of maize crop. Cultivation and culture are etymologically interrelated in Chamba. Bhuri Singh Museum built during 1908 is the main attraction to archaeological lovers visiting the Chamba town. At the last but not the least, the Chaugan, which is the heart of the town and the nucleus of all socio-economic and cultural activities of Chamba town, still holds the place of prominence. Chaugan, a terraced grass green field measuring about 800 m in length and 80 m in width is exceptionally large for a hill station and is used as a playground for all types of sports and matches, picnics and promenade especially during the mid-summer months. During the annual “Minjar Fair”, the entire Chaugan becomes a flea market.

4.1.1 Demographic profile

The demographic features of Chamba district have been presented in Table 4.1. The table shows that the district contributes 11.71 and 7.56 per cent of total geographical area and population of the state. The sex ratio is higher (986 females/1000 males) in Chamba district as compared to state figure (972 females/1000 males). The literacy rate in the district is lower (72.20%) as compared to the literacy rate of the state (82.80%). The rural population is distributed in 1,110 villages. Out of the total 1,591 villages in the district, 1,110 are inhabited villages while 481 villages are uninhabited. In terms of population density, Chamba district with 80 persons per sq.km., stands at 9th rank in the state.

Table 4.1 Chamba district at a glance (Census, 2011)

Sr. No.	Particulars	Himachal Pradesh	Chamba	Percentage of Chamba district in Himachal Pradesh
1	Area (sq.km)	55673	6522	11.71
i)	Rural	55402.18	6501.26	11.73
ii)	Urban	270.82	20.74	-
2	Tehsils (No.)	102	8	-
3	Sub-tehsils	56	3	-
4	No. of villages	20690	1591	-
i)	Inhabited	17882	1110	-
ii)	Un-inhabited	2808	481	-
5	Developmental blocks	78	7	-
6	Total population (No.)	6864602	519080	7.56
i)	Males	3481873	261320	-
ii)	Females	3382729	257760	-
7	Density of population (persons per sq.km)	123	80	
8	Sex-ratio (Females per thousand males)	972	986	
9	Literacy rate (%)	82.80	72.20	
i)	Males	89.53	82.60	
ii)	Females	75.90	61.70	
10	Average size of household	4.60	5.10	
11	Average annual rainfall (mm)	917.70	1059.30	
12	Net sown area	549964	41528	7.55
13	Total cropped area	931862	66825	7.17
14	Total irrigated area	112749	3525	

Source: Statistical Yearbook of Himachal Pradesh, 2016-17, Census 2011 and District Census Handbook (Chamba), Directorate of Census Operations Himachal Pradesh, 2011

4.1.2 Location and boundaries

Physiographically, the entire district is mountainous with an altitude ranging from 559 metres to 6,162 metres above the mean sea level. The habitation is found only up to 3,000 metres. The Chamba district is situated between north latitude $32^{\circ} 11' 30''$ and $33^{\circ} 13' 6''$ and east longitude $75^{\circ} 49'$ and $77^{\circ} 3' 30''$, with an estimated area of 6522 sq. km. The district is bounded on the north and west by Jammu and Kashmir state, on the south-west by Punjab state, on the south and south-east by Kangra district whereas Lahaul & Spiti district encloses it from east.

4.1.3 Physiographic features

Physiography of the region reveals that the Dhauladhar in Chamba district forms a mountain barrier with high peaks. Hathidhar is another important lower hill range which runs parallel to Dhauladhar, in its south. A narrow tract formed between Dhauladhar range and Hathidhar is plain and fertile. Talang glacier is also located in south-western part of the region. The region has an altitude varying between 1,188 metres and 4,692 metres above the mean sea level. *Bhed khad*, *Barahl khad*, *Dramman khad* and *Khauli khad* are minor *khads* of this region whereas *Chakki khad* is an important *khad* which rises in the western part of this region and flows towards west. In the lower part of the region, the climatic conditions are similar to Kangra district and Shivalik areas while in the higher portion, it is temperate. During winter, snowfall on the Dhauladhar range is very heavy. This range also receives very high rainfall during monsoon.

4.1.4 Climate and rainfall

In the lower part of Bhattiyat tehsil and Sihunta sub-tehsil, the climatic conditions are similar to those of Kangra and the Shivalik area. The temperature begins to increase rapidly after the middle of April and this rise continues till the break of rains in July. Summer is exceedingly mild and pleasant. Owing to the scanty rainfall the degree of humidity is always low. The winter is very severe and snowfall starts in October and continues till March and April. The rainy season begins from middle of June and ends by the mid of September with heavy rainfall during this season. Snow may fall as early as the beginning of October. The snowfall on the Dhauladhar and Pangi ranges and Zanskar range is heavy and the severe winters experienced it from the early November to late March. Highest average annual rainfall in the

district i.e. 1019.0 millimetres was recorded during the year 2009 where as in 2007 it was recorded as 706.4 millimetres.

4.1.5 Soil types

The soil is generally loamy in texture with a little more percentage of clay on the high tops as well as at lower elevations in valleys of Bhattiyat, Dalhousie, Sihunta and Chamba Tehsils. At the higher elevations the soil is well supplied with organic matters. Its extent is low at mid elevation and minimum in the low-lying valleys.

4.1.6 Administrative setup of district

For effective administration, Chamba district has been divided into 7 sub- divisions, 8 tehsils, 5 sub tehsils and 7 development blocks. The proportion of these figures account for 10.14, 7.84, 8.93 and 8.97 per cent, respectively of the state (Table 4.2).

Sub divisions: Chamba, Dalhousie, Tissa, Chowari, Bharmour, Pangi and Salooni

Tehsils: Chamba, Dalhousie, Tissa, Chowari, Bharmour, Pangi, Bhattiyat and Salooni

Sub-tehsils: Dharwala, Holi, Bhallai, Kakira and Pukhri

Developmental blocks: Chamba, Mehla, Tissa, Bhattiyat, Bharmour, Pangi and Salooni

Table 4.2 Administrative setup of Himachal Pradesh and Chamba district

Sr. No.	Particulars	Himachal Pradesh	Chamba	Percentage of district to HP
1	Tehsil	102	8	7.84
2	Sub-Tehsils	56	5	8.93
3	Sub-Divisions	69	7	10.14
4	Development blocks	78	7	8.97
5	Panchayats	3226	283	8.77

Source: Statistical Outline of Himachal Pradesh (2017-18)

4.1.7 Population

According to the Census 2011, the total population of Chamba district is 5,19,080 persons comprising 2,61,320 males and 2,57,760 females. Of the total population (5,19,080) of the district, 1,11,690 persons constituting 21.5 per cent of the total population belongs to the Scheduled Castes and 1,35,500 persons accounting for 26.1 per cent to Scheduled Tribes. Chamba district holds the 1st rank in terms of scheduled tribe population in the state. It has reported 1,35,500 persons as scheduled tribe. The Scheduled Tribes population in the district is mainly concentrated in Pangti, Sihunta, and Holi and Bharmour sub-districts.

4.1.8 Livestock population

Livestock population is integral part of farming in all parts of Himachal Pradesh. There is also complementary relationship between cropping system and livestock population system. The total population of livestock at the district level was about 8.14 lakhs. The population of cattle was ranked 1st with 3.13 lakhs of total population. (Table 4.5)

The population of sheep and goat is quite high in the Chamba district it was 2.54 and 2.05 lakhs. Moreover, population of camels and donkeys was lowest only 10 and 279, respectively in the Chamba district.

4.1.9 Backyard poultry population

The people of Himachal Pradesh traditionally practice cattle, sheep and goat rearing and keep backyard poultry as a source of supplementary income. Table 4.6 depicts the district wise population of backyard poultry in Himachal Pradesh. The highest population of backyard was observed to be in district Kangra followed by Chamba. The total population of backyard poultry in Chamba district was 43576.

4.1.10 Backyard poultry schemes

The Animal Husbandry Department has introduced Backyard poultry schemes under the Centrally Sponsored Scheme “Assistance to the state poultry farms” which is an 80:20 scheme where the state poultry farms were strengthened. Now under National Livestock Mission, various departmental poultry farms were strengthened in a phased manner. The chicks of low input technology type are being produced at the departmental hatcheries.

Table 4.3 Block-wise human population of Chamba district of Himachal Pradesh

Sr. No.	Particulars	Households	Population			SC	ST	Sex ratio	Literacy rate (%)
			Male	Female	Total				
1	HP	14,83,280	34,81,873	33,82,729	68,64,602	17,29,252	3,92,126	972	82.8
2	Chamba	1,02,460	2,61,320	2,57,760	5,19,080	1,11,690	1,35,500	986	72.17
3	Block-wise population of Chamba district								
i	Pangi	3,952	9,579	9,289	18,868	1,246	17,016	970	62.37
ii	Tisa	12,680	38,504	37,243	75,747	20,338	6,054	967	47.78
iii	Saluni	15,051	38,406	38,100	76,506	22,385	5,416	992	61.65
iv	Chamba	14,914	36,936	37,639	74,575	22,365	16,474	1019	64.75
v	Bhattiyat	23,400	56,137	57,286	1,13,423	17,616	33,617	1020	66.43
vi	Mehla	16,430	42,292	42,453	84,745	17,125	22,214	1004	58.46
vii	Bharmour	8,169	20,109	18,999	39,108	4,560	32,116	945	64.84

Source: Statistical Outline of Himachal Pradesh (2017-18)

Table 4.4 Land utilization pattern of Chamba district of Himachal Pradesh

Sr. No.	Particulars	Himachal Pradesh	Chamba
1	Total geographical area	4575566	692419
2	Forest land	1126124 (24.61)	272008 (39.28)
3	Area under permanent pasture/grazing land	1510434 (33.01)	348862 (50.38)
4	Cultivable waste land	121667 (2.66)	6893 (1.00)
5	Area not available for cultivation		
i	Land put under non-agricultural uses	349804 (7.65)	15395 (2.22)
ii	Barren and Uncultivable land	777484 (16.99)	4747 (0.69)
6	Area under miscellaneous tree Crops	63670 (1.39)	225 (0.03)
7	Current fallow land	54154 (1.18)	2050 (0.30)
8	Net sown area	549964 (12.02)	41528 (6.00)
9	Total cropped area	931865	66825
10	Net irrigated area	112749	5200
11	Cropping pattern (%)	169.44	160.91

Source: Statistical Year Book of Himachal Pradesh 2017-18

Note: Figures in parentheses indicate the percentages to the total geographical area

Table 4.5 Livestock population in Chamba district of Himachal Pradesh

Sr. No.	Livestock	Population
1	Sheep	254929
2	Goat	204511
3	Cattle	313194
4	Buffaloes	32465
3	Horse& ponies	1596
4	Mule	5418
5	Donkeys	279
6	Camel	10
7	Yak	643
8	Pig	1114
9	Others	83
Total		814232

Source: Livestock Census 2012

Table 4.6 District wise population of backyard poultry in Himachal Pradesh

Sr. No.	District	Backyard poultry
1	Bilaspur	21143
2	Chamba	43576
3	Hamirpur	10492
4	Kangra	58419
5	Kinnuar	9149
6	Kullu	13634
7	Lahaul-Spiti	1854
8	Mandi	36101
9	Shimla	27778
10	Sirmour	10860
11	Solan	15451
12	Una	6041

Source: Livestock Census – 2012

These chicks are reared for 2-3 weeks at different government poultry farms/ extension centres prior their distribution in the field. Since the medium and the large poultry farms have come up of late in the state due to the efforts of the department whereby training and other help in the form of project reports for the opening of such units is being provided to interested poultry farmers. Therefore, the department has been trying to give more attention to the small and marginal poultry farmers who have specific requirements with respect to the strain of the poultry birds being provided. This is important because with the limited resources such group of poultry farmers need a disease resistant strain with local availability.

The poultry farming in Himachal Pradesh plays an important role in improving the social and economic status of rural population. The sale of eggs on day to day basis helps in providing supplementary income as well as nutrition of high protein without incurring extra expenditure. There are 2 hatcheries and 10 poultry farms/extension centres working in the state for the benefit of the farmers. The department is implementing Backyard Poultry Scheme, 200-Chicks scheme and 5000-Broiler Scheme under National Livestock Mission. Various types of poultry inputs are provided to the farmers under these schemes.

As a result of above-mentioned activities, production of egg in the state during year 2016-17 was observed to be 958.99 million.

4.1.11 Nodal agency for implementation of schemes

The development of the poultry sector in the state is being looked after by the Deputy Director, Poultry Development, Directorate of Animal Husbandry, Shimla-5. The Deputy Director, Poultry Development who has been designated as Nodal officer under the centrally sponsored scheme is ably assisted by the Technical officer (Poultry) along with existing staff of the Poultry project in the running poultry schemes efficiently under the able guidance of the Director, Animal Husbandry, Himachal Pradesh.

4.1.12 Infrastructural facilities

In order to minimize the problems and difficulties of the farmers of the state and to develop the poultry sector in the state of Himachal Pradesh, the department of Animal Husbandry through the office of the Deputy Director (Poultry) has taken steps to increase poultry production in the

state through the establishment of two hatcheries and poultry farms/extension centres in the various districts of the state. The chicks are being supplied to the poultry farmers through poultry farms and the extension centres. The farmers/ poultry breeders are also imparted training in poultry farming at the government poultry farms so that these farmers are able to establish their units properly.

4.1.13 Backyard Poultry Development Scheme

Poultry breeders belonging to SC/ST/General categories are provided with low input technology chicks up-to 3 weeks of age on cost basis on nearest road-head. These chicks are distributed to farmers at rate depending up-on age of chick i.e.:

0 Days	Rs 21
2 Days to 1 week	Rs 23
1 to 2 weeks	Rs 27
2 to 3 weeks	Rs 29

Under the scheme low input technology bird of coloured strain but disease resistant type was supplied to the farmers of the state @ Rs. 29/ chick of 2- 3 weeks age to prevent the early mortality. This scheme has been an instant success because it not only supplements the income of the poor farmers of the state but also provide nutrition of high order to them which is ample clear from the ever-increasing demand for coloured chicks. Under the Backyard poultry scheme a unit consists of 20-50 chicks of 2- 3 weeks old.

There is also provision of training to the farmers opting for the scheme where the beneficiaries are being provided 6 days training at the government poultry farms and 15 days training at the government hatcheries, free of cost. In case, there is demand for day old chicks then the same are also provided to the farmers.

4.1.14 Rural backyard poultry development

With objectives to augment the income of rural people, good diet to rural population and high-grade manure at minimal cost a poultry project under National Livestock Mission is operational in the state. 4 weeks old 40 no. low input technology chicks were distributed among

poultry breeders belonging to BPL category and 75% subsidy is provided to beneficiaries on cost of chicks. A budget of Rs. 98,43,750 has been allocated for year 2016-17 and in total 3750 units have been established.

i) 200- Chick Scheme

The budget is being provided under SCA (Special Central Assistance) and SCSP (Scheduled Castes Sub Plan). In this scheme 200 no. chicks, feeders, drinkers and feed are distributed to beneficiary. Poultry breeder belonging to SC family is eligible beneficiary in this scheme. For year 2017-18 a budget of Rs. 90 Lac has been allocated for scheme.

Under this scheme any person, whose annual income is less than Rs. 24,000 and has land less than 25 bighas are provided assistance by way of supply of 200 chicks, feed, feeders, drinkers, medicines along with their transportation to the nearest road head. These benefits are met within the subsidy limit of Rs. 10,000 per beneficiary.

ii) 5000- Broiler Scheme

At present small poultry units are established as department is providing low input technology chicks on cost/ subsidy/ basis under National Livestock Mission and Backyard poultry scheme. There is now to focus on commercial broiler strain project.

The beneficiaries belonging to SC/ST/ General categories, who have undertaken training regarding poultry farming from government poultry farms. The funds will be provided against capital investment in this scheme under subsidy component i.e. 60 per cent. Chicks will be provided in multiples of 1000 chicks up-to 5000 (i.e. Maximum 5 rotations). There is a provision of Rs. 2 Cr for this scheme in the budget.

Table 4.7 Detail of the poultry units established under backyard poultry project in the state of Himachal Pradesh for the 2015-16

Sr. No.	Name of district	Target	Chicks allotted by hatcheries	No. of chicks actually received
1	Chamba	38000		29289
2	Shimla	28000		30563
3	Solan	28000	348976	27247
4	Sirmour	28000		32324
5	Kinnaur	28000		21704
6	Una	28000		27074
7	Bilaspur	28000		28579
8	Kullu	32000		23248
9	Mandi	34000		33683
10	Kangra	45000		44686
11	Hamirpur	23000		22540
12	Lahaul & Spiti	0		0
Total		340000	348976	320937

Table 4.8 District wise beneficiaries to whom chicks were distributed in 2015-16

Sr. No.	Name of district	No. of beneficiaries				
		SC	ST	Women	General	Total
1	Chamba	274	642	316	358	1590
2	Shimla	277	5	82	383	747
3	Solan	545	23	81	332	981
4	Sirmour	299	9	85	310	703
5	Kinnaur	355	515	150	4	1024
6	Una	285	144	308	545	1282
7	Bilaspur	220	22	88	344	674
8	Kullu	185	22	149	311	667
9	Mandi	278	23	158	353	812
10	Kangra	246	67	385	695	1393
11	Hamirpur	183	10	97	290	580
12	Lahaul spiti	0	0	0	0	0

Table 4.9 Detail of the poultry units established under the backyard poultry project in the state of Himachal Pradesh for the year 2016-17

Sr. No.	Name of district	Target	No. of birds actually received by farmers
1	Chamba	49000	39929
2	Shimla	29000	29490
3	Solan	29000	29686
4	Sirmour	33000	33332
5	Kinnaur	29000	30136
6	Una	27000	30112
7	Bilaspur	35000	32131
8	Kullu	27000	28739
9	Mandi	33000	36616
10	Kangra	47000	55482
11	Hamirpur	22000	24071
12	Lahaul & Spiti	0	0

Table 4.10 District wise beneficiaries to whom chicks were distributed in 2016-17

Sr. No.	Name of district	No. of beneficiaries				
		SC	ST	Women	General	Total
1	Chamba	379	543	397	461	1780
2	Shimla	254	8	125	315	702
3	Solan	467	40	91	337	935
4	Sirmour	390	30	109	268	797
5	Kinnaur	360	472	196	12	1040
6	Una	222	112	207	471	1012
7	Bilaspur	281	7	83	397	768
8	Kullu	235	38	150	326	749
9	Mandi	388	21	264	425	1098
10	Kangra	358	102	286	1046	1792
11	Hamirpur	237	9	118	349	713
12	Lahaul - spiti	0	0	0	0	0

Table 4.11 Detail of the personal imparted poultry training under the backyard poultry project and at government poultry farms operational in H.P. (2016-17)

Sr. No.	District	Number of persons trained under backyard poultry scheme				
		S.C.	S.T.	Women	General	Total
1.	Shimla	254	8	125	315	702
2.	Solan	467	40	91	337	935
3.	Sirmour	390	30	109	268	797
4.	Kinnaur	360	472	196	12	1040
5.	Una	222	112	207	471	1012
6.	Bilaspur	281	7	83	397	768
7.	Kullu	235	38	150	326	749
8.	Mandi	388	21	264	425	1098
9.	Chamba	379	543	397	461	1780
10.	Kangra	358	102	286	1046	1792
11.	Hamirpur	237	9	118	349	713
12.	Lahaul & Spiti	0	0	0	0	0
	Total	3571	1382	2026	4407	11386

4.2 Socio- economic profile of sample households

The socio- economic characteristics of farmers affect the organization and management of farms as well as the adoption of improved and modern technologies. The nature of ownership of land, size of family, educational level and occupation pattern of farmers, etc. have great bearing on decision making in the adoption of innovations and improved practices to great extent. Thus, it is imperative to study the existing socio-economic status of sample households. An attempt has been made to know the socio-economic features of the sample households in the study area. The brief description of key parameters is as under:

4.2.1 Family system

The family structure and size are important indicators determining the social and economic well-being of the family and play a vital role in decision-making process in running the farm business. It is so because most of the farm activities are performed by members of family only. The

distribution of sample households according to family structure and size is presented in Table 4.12. The table reveals that majority of sample farms were having nuclear family system i.e. 53.33 per cent of the total sample households. However, about 46.67 per cent of the total sample population were residing in joint family system. It was reported by the majority of respondents that the system of family is rapidly changing towards nuclear family system mainly because of the government schemes are family based.

Table 4.12 Size of family and its structure on sample farms

Sr. No.	Particulars	Number
1	Average family size	4.97
2	Family composition	
i)	Male	157 (52.68)
ii)	Female	141 (47.32)
	Total	298
3	Family structure	
i)	Nuclear	32 (53.33)
ii)	Joint	28 (46.67)
	Total	60

Note: Figures in parentheses indicate percentages to the total in each category

4.2.2 Age-wise distribution

The decisions related to the selection of farm enterprises and the availability of active work force on the farm can be assessed through the size and composition of family members. Age plays an important role in taking decision related to the farm management which include investment, resource allocation, marketing etc. The information related to age-wise distribution of the head of the family as well as family members of the sample households was collected and given as under:

i. Head of the family

It can be seen from the table that majority of the heads of the families were in the age group of 41-60 years (55%) followed by above 60 years (26.67%). The data indicate that majority of heads of families were aged (above 40 years). It was mainly due to the fact that ownership of land

and household assets lies with the elder people. However, about 18 per cent of head were found to be in middle age group i.e. 25-40 years age group (Table 4.13). It can be concluded that majority of families in the study area was headed by the aged family members.

Table 4.13 Age wise distribution of heads of the families on sample farm of study area

Sr. No.	Age group (in years)	Number	Percentage
1	Up to 25	-	-
2	26 to 40	11	18.33
3	41 to 60	33	55.00
4	Above 60	16	26.67
Total		60	100.00

ii. Family members

The age wise distribution of the family member is given in the Table 4.14. It can be seen from the table that the average size of the family was estimated to be 5 members. The table further reveals that about 22 per cent of the sample population was lying in age group of 16-25 years on sample farm. About 6.38 per cent of the sample population was found to be falling under age group of above 60 years. The population in the age group of up to 6-15 years accounted for about 13 per cent. The majority of members in the age group up to 15 years were school going. About 28 per cent of the family members belongs to age group of 26-40 years. The sex- ratio of sample population was estimated to be 986.67 on sample farm.

4.2.3 Educational status

The general awareness and knowledge of an individual is judged through his educational level. When one has to take decisions related to the adoption of new technology and associated enterprises on the farm, the role of education becomes quite important. An educated farmer is better equipped to take judicious decisions by making use of available scientific information. Thus, the study of educational status of the family members is one of the important factors to determine the ability of the farming communities to acquire knowledge/skill, to make judicious decision to adopt new technologies and innovations in agriculture and allied enterprises. The distribution of sample

households according to the educational status of heads of the families and their family members are described under:

Table 4.14 Age-wise distribution of the family member of sample households of study area

Sr. No.	Age groups (Years)	Number		
		Male	Female	Total
1	Up to 5	6 (4.00)	18 (12.16)	24 (8.05)
2	6 to 15	22 (14.67)	19 (12.84)	41 (13.76)
3	16 to 25	38 (25.33)	28 (18.92)	66 (22.15)
4	26 to 40	41 (27.33)	42 (28.38)	83 (27.85)
5	41 to 60	32 (21.33)	33 (22.30)	65 (21.81)
6	Above 60	11 (7.33)	8 (5.41)	19 (6.38)
Total		150 (100.00)	148 (100.00)	298 (100.00)
Sex ratio		986.67		

Note: Figures in parentheses indicate percentages to the total in each category

i) Head of the family

The educational status of the heads of the families of sample household has been analyzed and is depicted in the Table 4.15. The table clearly indicates the literacy among heads of the families was relatively low as about 37 per cent of the heads of families were illiterate compared to total sample population. Moreover, among the different categories of education, the proportion of heads of the families having education up to primary was also high (25%) followed by middle (23.33%). Among the heads of the families, only 5 per cent heads of the families were found to be educated beyond matriculation education level i.e. only about 3 and 2 per cent were senior secondary and graduates, respectively.

Table 4.15 Educational status of heads of the families on sample farms of study area

Sr. No.	Education	Number	Percentage
1	Illiterate	22	36.67
2	Primary	15	25.00
3	Middle	14	23.33
4	Matriculation	6	10.00
5	Senior secondary	2	3.33
6	Graduation & above	1	1.67
Total		60	100.00

i) Family members

The educational status of family is also important as it plays an important role in decision making on farms with respect to production and marketing. Therefore, the educational status of the family members of the sample households has also been analyzed and is given in Table 4.16. The table indicates that, about 19.80 per cent of the sample population was observed to be illiterate, while 8.05 per cent was non-school going which comprises the children below the age of 5 years. Among the different categories of education, the major proportion of family members i.e. 25.17 per cent was having education up to primary. About 12.75 per cent of the family members were educated up to middle. The table further reveals that the 14.77 per cent family members were educated up to senior secondary and the corresponding figures for males and females were 17.33 and 12.16 per cent, respectively. The table further indicates that the proportion of members having higher level of education i.e. graduation was quite low. The proportion of family members in this category was 6.71 per cent which was marginally higher in case of males (7.33%). The overall literacy rate of sample population was 78.47 per cent, whereas it was about 81 and 76 per cent in male and female population respectively.

Table 4.16 Gender wise educational status of the family members on sample farms of study area

Sr. No.	Education	Number		
		Male	Female	Total
1	Illiterate	28 (18.67)	31 (20.95)	59 (19.80)
2	Non-school going	6 (4.00)	18 (12.16)	24 (8.05)
3	Primary	35 (23.33)	40 (27.03)	75 (25.17)
4	Middle	27 (18.00)	11 (7.43)	38 (12.75)
5	High	17 (11.33)	21 (14.19)	38 (12.75)
6	Senior secondary	26 (17.33)	18 (12.16)	44 (14.77)
7	Graduation and above	11 7.33	9 (6.08)	20 (6.71)
Total		150	148	298
		100.00	100.00	100.00
Literacy rate (%)		80.56	76.15	78.47

Note: Figures in parentheses indicate percentages to the total in each category

4.2.4 Occupational pattern

The household income is directly associated with the type of occupation of family members. The distribution of family members as per their main and subsidiary occupations of the sample household is depicted in Table 4.17. The table shows that about 40 per cent of the sample population was engaged in agriculture as their main occupation whereas 32.04 per cent of the population practiced agriculture as their subsidiary occupation. As far as subsidiary occupation was concerned, 42.72 per cent of the population was engaged in poultry farming and 18.10 per cent of

population had undertaken poultry farming as their main occupation. About 9.05 and 4.76 per cent of population were enrolled in private services and government services, respectively as their main occupation. The table also reveals that 8.57 and 2.91 per cent of the population earned their own livelihood through daily paid labourer as main and subsidiary occupation, respectively. Dairy farming, government, private service and business were also the major occupations of about 10.48, 4.76, 9.05 and 8.57 per cent of sample population. The table further indicates that backyard poultry is an important activity as about 18 per cent of the sample population has adopted it as major occupation, while about 43 per cent were practicing it as subsidiary occupation.

Table 4.17 Occupational pattern of family members on sample farms of study area (Number)

Sr. No.	Occupation	Main occupation	Subsidiary occupation
1	Agriculture	84 (40.00)	66 (32.04)
2	Dairy	22 (10.48)	18 (8.74)
3	Daily paid labourer	18 (8.57)	6 (2.91)
4	Government service	10 (4.76)	3 (1.46)
5	Pension	1 (0.48)	4 (1.94)
6	Private Service	19 (9.05)	9 (4.37)
7	Business	18 (8.57)	12 (5.83)
8	Poultry	38 (18.10)	88 (42.72)
Total		210 100.00	206 100.00

Note: Figures in parentheses indicate percentages to the total in each category

4.2.5 Availability of major infra- structure facilities

The availability of basic facilities like schooling, health care, roads and market etc. to the rural households are of great importance and play a key role in improving their socio-economic status. The distribution of sample households with respect to availability of key facilities was analyzed and depicted in Table 4.18. The table clearly indicates that the schooling facilities were present either in the village itself at a distance of 2 or 4 km in the adjoining villages. The higher

education facilities i.e. colleges were found to be relatively far from the farmers' house i.e. more than 4 km for 90 per cent of sample population. Health centres, veterinary hospitals, cooperatives societies, link roads, and flour mills were observed to be present at the distance of 2 or 4 km. Agricultural institutions were observed to be quite far from farmers' house i.e. more than 4 km. SMS agriculture, KVK were found to be present at the distance of 2 or 4 km whereas the BDO office was located in the range of 14-16 km from the farmer's village. On an average the main market, was available within the range of 10-15 km distance from the farmer's house. The table clearly indicates the facility of primary schooling, middle/high schooling, senior secondary to majority of house was available within 1 km, 1-2 km and 2-4 km, respectively from their residences.

4.3 Inventory of sample households

4.3.1 Land inventory and utilization pattern

Land plays an important role in the farming as it is the basic natural resource available with the farmers for undertaking crop production as well as management of other farm enterprises. The size of land holding is an important factor for the adoption of different farm enterprises mainly crops and fruits. The farmers who are having relatively large land holdings have the more opportunities for increasing crop production as compared to the farmers with small land holdings. The Table 4.19 clearly indicates that the size of land holding of the sample households was quite low i.e. 0.2200 ha, which is quite low as compared to the average land holding of district and state. Thus, it is due to their small land holdings, the respondents opted for backyard poultry as potential enterprise for increasing their household income. The proportion of total land holding put under cultivation of crops was found to be highest i.e. 86.36 per cent of total land holding. The area under the fruit crops was observed to be 13.63 per cent of the total land holding.

**Table 4.18 Availability of major infrastructure facilities on sample farms of study area
(Per cent)**

Sr. No.	Particulars Km →	Distance range (km)			
		<1	1 to 2	2 to 4	>4
1	Primary school	56.44	31.68	9.90	1.98
2	Middle school	28.00	48.00	22.00	2.00
3	High school	11.88	51.49	34.65	1.98
4	Secondary school	5.00	40.00	48.00	7.00
5	College	1.98	1.98	4.95	91.09
6	Health centre	8.08	55.56	28.28	8.08
7	Vet. Hospital	15.63	50.00	31.25	3.13
8	Co-operative	-	3.17	44.44	52.38
9	KVK	-	-	26.04	67.71
10	BDO office	-	-	-	100.00
11	SMS agriculture	-	-	27.78	72.22
12	Bank	1.98	14.85	41.58	41.58
13	Link road	36.27	39.22	21.57	2.94
14	Market	2.00	7.00	58.00	33
15	Flour mill	55.00	37.00	8.00	-
16	Revenue office	-	-	-	100.00

The table further indicates that no area was allotted to the other land use like cultivated wasteland, land under miscellaneous and grassland by sample households. The interaction with the respondents reveals that due to small (0.22 ha) size of holding, they have tried to utilize the available land holding for agricultural and fruit crops.

Table 4.19 Land inventory and its utilization pattern on sample farms of study area

(ha/farm)				
Sr. No.	Particulars	IR	UR	Total
1	Owned land	0.0400	0.2000	0.2400
2	Leased-in	0.0000	0.0000	0.0000
3	Leased out	0.0000	0.0200	0.0200
4	Total land holding	0.0400	0.1800	0.2200
i	Cultivated land	0.0100	0.1800	0.1900
		(25.00)	(100.00)	(86.36)
ii	Orchard	0.0300		0.0300
		(75.00)		(13.63)
iii	Fallow	-	-	-
iv	cultivated wasteland	-	-	-
v	land under miscellaneous	-	-	-
vi	Grassland	-	-	-
Total		0.0400	0.1800	0.2200
		100.00	100.00	100.00

4.3.2 Farm buildings inventory

Investment on residential buildings and associated assets reflects the social as well as economic status of a farming family in the society. The investment pattern on farm buildings has been analyzed and is presented in the Table 4.20. The table indicates that, an average household have 1 residential, 0.9 cattle shed, and 1 poultry house. It can be observed from the table that the average inventory of buildings on sample households was 2.9 which comprises 1 residential house, 0.9 cattle shed and 1 poultry house. The building was found to be *kuchcha*, *pucca* or mixed material. In case of the cattle shed, about 97 per cent of farmers were having *kuchcha* cattle shed while only 3.33 per cent of sample households were having *pucca* cattle shed. Similarly, majority of households (88%) had used *kuchcha* material for the construction of poultry house. As far as residential building was concerned, about 35 per cent of the farmers were living in *pucca* buildings while 20 per cent of households were living in mixed type of residential buildings i.e. *kuchcha* and

pucca. The total value of building on an average sample household was estimated to be Rs 1,91,916. During the survey, it was found that the status of building (with respect to size and quality) was very poor. In the total value of buildings, there share of residential building was quite high i.e. about 73 per cent of the total value. The investment on poultry house was to the tune of 13.16 per cent. The total investment in case of residential building, cattle shed and poultry shed were found to be (Rs. 1,39,166), (Rs. 27,500) and (Rs. 25,250).

Table 4.20 Inventory of farm building on sample farms of study area

				(per farm)
Sr. No.	Particulars	Number	Value (Rs.)	
1	Residential	1	139166	
		(34.48)	(72.51)	
i	<i>Kuchcha</i>	0.45	40833	
		(45.00)	(29.34)	
ii	<i>Pucca</i>	0.35	63333	
		(35.00)	(45.51)	
iii	Mixed	0.2	35000	
		(20.00)	(25.15)	
2	Cattle Shed	0.9	27500	
		(31.03)	(14.33)	
i	<i>Kuchcha</i>	0.87	26000	
		(96.67)	(94.55)	
ii	<i>Pucca</i>	0.03	1500	
		(3.33)	(5.45)	
iii	Mixed	-	-	
		-	-	
3	Poultry house	1	25250	
		(34.48)	(13.16)	
i	<i>Kuchcha</i>	0.88	21083	
		(88.00)	(83.50)	
ii	<i>Pucca</i>	0.12	4166	
		(12.00)	(16.50)	
iii	Mixed	-	-	
		-	-	
Total		2.9	191916	
		100.00	100.00	

Note: Figures in parentheses indicate percentages to the total in each category

4.3.3 Farm machinery and implements

Farm machinery plays a major role in agriculture in accomplishing different farm operations. The farm tools, implements significantly reduces time to do a particular farm task and also decreases physical effort. Agricultural equipments help the farming household to carry out agricultural operations timely and efficiently as compared to farmers who do not possess the farm implements.

Table 4.21 depicts the inventory and investment to farm machinery and implements on the sampled farms. The table reveals that the inventory was found to be about 16.28 on sample farms. The total number of major farm implements were quite low (0.38) whereas the number of the minor farm implements/tools were as high as 15.90, which accounted for about 97.67 per cent of the total number of farm machinery on average sample households. It was mainly due to the fact that land holding was small (0.22 ha) and it was not economically feasible to own major farm machinery and implements. But on the other hand, small implements like hoe, rake, sickle, axe, etc. which were frequently used by the respondents on the farm were relatively cheaper and kept by respondents for day-to-day farm operations. The share of minor implements like sickle, hoe, feeders, and waterers was found to be high i.e. 24.09, 12.58, 10.88 and 11.01 per cent.

The total investment on major and minor implements was found to be Rs.1342 and Rs. 5733 which shows that about 81 per cent of investments was made on minor farm machinery/tools. Among the minor implements the highest investment was made on wooden plough followed by waterers and feeders viz., about 34, 7.63 and 7.56 per cent respectively.

The table further reveals that total investment was mainly made on the minor farm implements as these implements were relatively cheaper and also due to hilly terrain, poor road network, poor financial conditions and small land holding rendered the farm machinery, like tractors, power tillers, threshers etc., useless. It is clear from the above discussion that farmers have the tendency to purchase those farm implements which are in frequent use on the farm and also has less initial and maintenance cost.

Table 4.21 Inventory of farm machinery and tools on sample farms of study area
(per farm)

Sr. No.	Particulars	Number	Value (Rs)
1	Major implements		
i	Chaff cutter	0.38 (2.33)	1342 (18.96)
	Sub total	0.38	1342
2	Minor implements	15.90 (97.67)	5733 (81.04)
i	Wooden plough	0.97 (6.10)	1935 (33.75)
ii	MB plough		
iii	Spade/Belcha	0.93 (5.85)	264 (4.61)
iv	Hoe	2 (12.58)	373 (6.51)
v	Rake	0.93 (5.85)	166 (2.91)
vi	Sickle	3.83 (24.09)	445 (7.77)
vii	Axe	1.02 (6.42)	367 (6.40)
viii	Planker	–	–
ix	Kudali	1.97 (12.39)	171 (3.00)
x	Plastic pipe	0.52 (3.27)	621 (10.84)
xi	Water tank	0.25 (1.57)	516 (9.01)
xii	Feeders	1.73 (10.88)	433 (7.56)
xiii	Waterers	1.75 (11.01)	437 (7.63)
	Sub total	15.90 (97.67)	5733 (81.04)
Total		16.28	7075
		100	100

Note: Figures in parentheses indicate percentages to the total in each category

4.3.4 Livestock inventory

The size of the livestock on the farm depends on the availability of fodder, household and farm needs. Livestock unit mainly comprise of 2 to 3 animals in order to meet the household requirement for milk, milk products, meat etc. A few households also keep sheep and goat in order to increase their farm income. This component of farming provides income and employment round the year to the farmers' families. The livestock and crop components of a farming system have a symbiotic relationship with each other as the by-products of crop components are used as fodder for livestock, which in turn supply valuable FYM for crop production. The livestock inventory on sample farms has been analyzed and presented in Table 4.22. The table depicts that the average size of livestock unit was 5.79 animals which comprised of cattle, bullocks, sheep and goat. Among the different categories of livestock, the population of goats was found to be highest, followed by cows, bullocks and sheep. The population of the small ruminants i.e. sheep and goat were found to be highest. The interaction with the respondents revealed that the fodder requirement of the sheep and goat was quite low as compared to cattle. Moreover, they have a tradition to rear sheep and goats. The interaction with the veterinary officers and respondents further revealed that poultry birds were the new introduction in the recent years mainly to supplement the household income of the poor farmers. The average size of poultry units of the sample households was about 47 birds. The total value of livestock unit of sample household was estimated to be Rs. 57,548 per farm. Among the different units of livestock, major portion comprised of sheep and goat (6.45% and 47.05%) followed by cows (local and improved), accounting for 35 per cent of the total value of livestock. During the interaction with the respondents, majority of respondents revealed that among milch animals, improved cow was preferred on the account of its higher milk yield. The table further indicates that on an average, the value of poultry birds was to the tune of Rs. 26,531 per farm.

The population of local cow was found to be about 0.45 whereas the improved cow population was estimated to be about 0.79, which shows that the sample households preferred improved cow over local cow. The population of bullock was estimated to be 0.72. During the survey it was found that the ploughing and threshing operations of crop production are mainly performed by bullocks and none of the farmers were using tractor and threshers for these operations.

**Table 4.22 Inventory and investment pattern of livestock on sample farms of study area
(per farm)**

Sr. No.	Particulars	Number	Value (Rs.)
1	Local cow	0.45 (7.77)	4649 (8.08)
i	Milking	0.43	4532
ii	Dry	0.02	117
2	Improved cow	0.79 (13.64)	15457 (26.86)
i	Milking	0.72	14782
ii	Dry	0.07	675
3	Bullock	0.72 (12.44)	5512 (9.58)
4	Young stock local	0.13 (2.25)	411 (0.71)
5	Young stock improved	0.23 (3.97)	728 (1.27)
6	Goat	3.02 (52.16)	27077 (47.05)
7	Sheep	0.45 (7.77)	3714 (6.45)
Total		5.79	57548
Total poultry birds		46.91	26531

Note: Figures in parentheses indicate percentages to the total in each category

4.4 Income from livestock

Livestock component of farming system plays a vital role in the economy of rural household especially small, marginal and even landless families. It has the potential of generating round the year income as well as employment to the farming families. The major sources of the income from the livestock component includes sale of main products like milk, meat, eggs, wool etc. The by-

products of the livestock are also of great importance to the farm families as it also provides dung and urine which are critical inputs for the sustainability of crop production. The pattern of income from livestock component has been analyzed and is depicted in Table 4.23. The table reveals that the annual per farm household income from sale of livestock products was estimated to be Rs. 1,28,099 out of which, the income derived from the sale of stock was observed to be Rs. 17,522. Out of the total income, around 45.85 and 36.22 per cent of the total income was generated from the sale of milk and eggs.

Table 4.23 Income from livestock products on sample farm of study area

(Rs. /farm)

Sr. No.	Particulars	Quantity	Annual Income (Rs.)
1	Milk (l)	1678	58730 (45.85)
3	Eggs (No.)	4640	46400 (36.22)
4	Wool (kg)	0.9	63 (0.049)
5	FYM (q)	35.89	5384 (4.20)
6	Sale of stock (No.)	12.27	17522 (13.68)
i	Local cow	0.08	388
ii	Improved cow	0.1	1231
iii	Bullocks	0.02	136
iv	Sheep & Goat	1.6	11213
v	Poultry birds	10.47	4554
Total			128099 100.00

Note: Figures in parentheses indicate percentages to the total in each category

4.5 Cropping pattern

4.5.1 Cropping pattern of sample household

Cropping pattern indicates the proportion of area under different crops in particular agricultural year. The cropping pattern of the region indicates the preference of farmers for a particular crop or group of crops. The cropping pattern followed by sample households in the study area has been analyzed and is depicted in Table 4.24. The table indicates that among the different crops, more than 42.63 per cent of total cropped area has been allocated for the production of maize in *kharif* season. The area under the maize was estimated to be about 0.1600 ha. The area under the mash and rajmash on the sample farm was quite low i.e. 0.0100 and 0.0043 ha, respectively.

The table indicates that the maize, mash, green gram, rajmash, chari, bajra were grown during the *kharif* season. Among these crops, the highest area was allocated for maize (0.1600 ha). During the *rabi* season, the highest area i.e. 0.1800 ha was allocated for the cultivation of wheat. The area under vegetables, oats and berseem was quite low i.e. 0.004 ha, 0.003 ha and 0.002 ha, respectively. The analysis of cropping pattern indicates that major portion of total cropped area was occupied by wheat and maize accounting for 46.71 and 42.63 per cent of total cropped area, respectively. The proportion of pulses and vegetable in the total cropped area was to the tune of 4 per cent. The overall cropping intensity on the sample household was about 198 per cent, which indicates that the sample household were taking about 2 crops in agriculture year. During the survey it was found that the farmers were not able to allocate more area under fodder and pulses crops due to their small size of holding.

4.5.2 Production and productivity of different crops

The production and productivity levels of different crops on the sample household has been estimated and is depicted in Table 4.25. The production of above crops was entirely utilized for meeting the domestic requirements and there was no saleable surplus of these crops. The table clearly shows that the production of wheat and maize was found to be more in study area as compared to other crops. The productivity of field crops is the production per unit area and is calculated as the ratio of the total production to the area under particular crop. It can be observed from the table that among the cereals the productivity of maize was found to be highest i.e. 23.06 q/ha followed by wheat (13.17 q/ha). Among the pulse crops, the productivity of mash, rajmash

and green gram was estimated to be 4, 6.92 and 12.16 q/ha. The productivity of fodder crops varies from 202 q/ha in bajra to 388 q/ha in case of chari.

Table 4.24 Cropping Pattern on sample farms of study area

		(ha/farm)
Sr. No.	Particulars	Area (ha)
A		
<i>Kharif</i>		
1	Maize	0.1600 (42.63)
2	Mash	0.0100 (2.66)
3	Green gram	0.002 (0.66)
4	Rajmash	0.0043 (1.15)
5	Chari	0.0023 (0.60)
6	Bajra	0.001 (0.36)
7	Vegetables	0.0100 (2.66)
	Sub total	0.1904 (50.73)
B		
<i>Rabi</i>		
1	Wheat	0.1800 (46.71)
2	Oats	0.003 (0.89)
3	Berseem	0.002 (0.53)
4	Vegetables	0.004 (1.14)
	Sub total	0.1849 (49.27)
Total cropped area		0.3753
Net sown area		0.19
Cropping intensity		197.54

Note: Figures in parentheses indicate percentages to the total in each category.

Table 4.25 Production and yield of different crops on sample farms of study area
(per farm)

Sr. No.	Particulars	Production (q)	Productivity (q/ha)
A	<i>Kharif</i>		
1	Maize	3.69	23.06
2	Mash	0.04	4.00
3	Green gram	0.03	12.16
4	Rajmash	0.03	6.92
5	Chari	0.88	388.24
6	Bajra	0.27	202.5
7	Vegetables	0.91	91.00
B	<i>Rabi</i>		
1	Wheat	2.31	13.17
2	Oats	1.28	384.00
3	Berseem	0.93	465.00
4	Vegetables	0.36	85.00

4.6 Pattern of household income

The total annual income of a household was derived from different sources like crops, dairy, poultry, private services, daily paid labour etc. The analysis of different sources of household income is important to know the role of different components of income for the livelihood of a family. Thus, the pattern of household income of respondents in the study area has been analyzed and is depicted in Table 4.26. The table reveals that, the annual per farm income was estimated to be Rs. 3,52,868. Among the different sources of income, non-farm component was significant as the government, private service and pension contribute about 19.37, 18.80 and 1.89 per cent to the total household income. Private, business and daily paid labour also generated income to the tune of Rs. 66,333, Rs. 32,500 and Rs. 43,716 per farm contributing for about 18.80, 9.21 and 12.39 per cent of the total income, respectively. The proportion of agricultural income i.e. from field crops and livestock was 4.95 and 16.64 per cent of the total annual household income. The farmers in the study were not able to derive more income from agriculture as they had less land holdings, so they

were also engaged in activities like dairy and backyard poultry. The annual per household contribution of worth Rs. 59,114 was contributed by backyard poultry which accounted for 16.75 per cent of total annual household income. It can be concluded from the above discussion that the gross income from off-farm activities was comparatively higher than the gross income from farm activities.

Table 4.26 Pattern of household income on sample farms of study area

(Rs. /farm)

Sr. No.	Particular	Annual Income
1	Agriculture	17474 (4.95)
2	Dairy	58730 (16.64)
3	Daily paid labour	43716 (12.39)
4	Government service	68333 (19.37)
5	Private service	66333 (18.80)
6	Pension	6666 (1.89)
7	Business	32500 (9.21)
8	Poultry	59114 (16.75)
Total		352868 100.00

Note: Figures in parentheses indicate percentages to the total in each category.

4.7 Status of backyard poultry

In order to improve the socio-economic status of farming community, introduction of allied farm enterprises in traditional household production system were recommended by the line department scientists, veterinary officers and agricultural specialists to supplement the income. Backyard poultry is one of such enterprise suitable for the marginal, small and landless farmers/households. Rearing of poultry birds does not requires much and waste materials like fallen grains, green grass, kitchen waste, vegetable waste etc. can be efficiently converted in to eggs, chicken meat for human consumption and in turn, provides additional income to the rural household. The backyard poultry farming with improved birds provide a better livelihood security to the poor farmers. Backyard poultry is an important part of livelihood and social needs of rural families in study area. Families in the study area had small flocks of chickens under backyard system. Through the rearing of backyard poultry, village people in the study area were fulfilling their food needs as well as getting additional profit by selling eggs and meat.

4.7.1 Backyard poultry experience

The information regarding the experience of sample households in rearing backyard poultry is depicted in Table 4.27. It can be observed from the table that backyard poultry enterprise was not an old practice among the respondents of the study area. The majority of backyard poultry farmers have adopted this activity after 2016 and were having experience of less than 3 years. Only 5 per cent and 8 per cent of the respondents have the experience of 10-12 years and 7-9 years in backyard poultry, respectively. The above discussion reveals that backyard poultry has become more popular during last 5-7 years. This can be attributed to the government schemes and incentives as well as efforts of the officers of Department of Animal Husbandry and Department of Animal Breeding and Genetics CSK HPKV, Palampur.

4.7.2 Source of motivation for backyard poultry

For the adoption of new enterprise in the farm, there must be source of motivation. Table 4.28 depicts the various source of motivation of respondents for adoption of backyard poultry. It can be observed from the table that out of the total respondents, majority of the respondents were inspired by veterinary officers followed by relatives accounting for about 57 and 20 per cent,

respectively. However, about 15 per cent of the respondents were self-motivated for the adoption of poultry enterprise.

Table 4.27 Experience of sample household in rearing backyard poultry

Sr. No.	Particulars	Number	Percentage	Experience (years)
1	2007-09	3	5	10-12
2	2010-12	5	8.33	7-9
3	2013-15	22	36.67	4-6
4	After 2016	30	50	3
Total		60	100	

Table 4.28 Distribution of respondents according source of motivation for adoption of backyard poultry

(per cent)			
Sr. No.	Particulars	Number	Percentage
1	Self	9	15
2	Neighbour	5	8.33
3	Relative	12	20
4	Veterinary officer	34	56.67
Total		60	100

4.7.3 Awareness about government schemes

Many of the government schemes could not be adopted by the needy due to lack of proper awareness and incentive of the schemes. Keeping this factor into consideration, sufficient representation is being given to the general public (farmers) in planning and implementation of schemes. The major schemes being implemented in the state includes implementation of ITD component of NATP by ATMA, irrigation and diversification schemes in JICA and so on. With this background, the respondents were also enquired about their awareness levels about the schemes of backyard poultry and benefits availed therein and their response is depicted in Table

4.29. It was found that majority of the farmers i.e. 88 per cent of the farmers were aware about the different schemes related to the backyard poultry whereas only 12 per cent of the framers in the study area were still not aware about the schemes. The Department of Animal Husbandry was providing the great help to the farmers under the various schemes of backyard poultry. The farmers in the study area were getting chicks of good quality @ Rs 21/bird. Feed was provided free of cost for initial days in order to provide good nourishment to the chicks. The equipments used for feeding purpose, were also provided free of cost by Department of Animal Husbandry to the farmers in the study area.

Table 4.29 Awareness and benefits under government scheme for backyard poultry

Sr. No.	Particular	Unit	Number
1	Awareness about govt. schemes	per cent	88.33
2	Benefits under schemes		
i)	Financial	Rupees	
ii)	Chicks (one-week age)	Number	76.67
iii)	Poultry Feed	Kilogram	60
iv)	Utensils		
a)	Waterers	Number	3.52
b)	Feeders	Number	3.6

4.7.4 Size of backyard poultry unit

In backyard system, farmers in the study area usually did not maintain the ratio of male-female poultry rather they preferred to keep single or multiple numbers of cocks in their flock at their own choice. During the survey it was found that some of the farmers had kept only 2-3 male birds for the purpose of breeding. Average flock size was found to be 46.91 (Table 4.30) which comprised of 15.98 of male birds and 30.93 of female birds. The farmers in the study area mostly bought chicks from Animal Husbandry Department as they got healthy chicks at less price i.e. about 52 per cent. 71 per cent of the farmers consider above mentioned sources of chicks for the reason of healthy birds whereas 43.33 per cent for cost and 28.33 per cent for purpose of breed.

Among the different source of chicks, 29 per cent of population preferred to buy chicks from local market. About 16.53 per cent of surveyed population belonged to that group who received chicks from CSK HPV Palampur university.

4.7.5 Capacity building of respondents

Training enhances the knowledge and skill of farmers for the adoption of new enterprises with improved technologies. The success and performance of new enterprise to a greater extent depends upon the knowledge and training in the concerned field. Keeping this fact into consideration, the Department of Animal Husbandry organized training for the beneficial farmers prior to adoption of the enterprise.

Table 4.30 Major consideration for selecting the particular source

Sr. No.	Particulars	Number	Percentage
a	Size		
i	Male birds	15.98	34.07
ii	Female birds	30.93	65.93
	Total	46.91	100.00
b	Source of chicks		
i	Local market	21	28.93
ii	Self-brooding	2	2.48
iii	University	12	16.53
iv	Through Veterinary Officers	38	52.07
	Total	73	
c	Consideration for selecting source (multiple response)		
i)	Breed	17	28.33
ii)	Cost	26	43.33
iii)	Health of chicks	43	71.67
	Total	86	

It was gathered from the discussion with respondents that the trainings are being organized by the State Bank of India at Rural Self Employment Training Institute (RSETI), Balu Chamba in collaboration with concerned department. The details about training status and training requirement

of the respondents were enquired and presented in Table 4.31. The table clearly indicates that about 37 per cent of the sample respondents got training on poultry farming. With knowledge regarding feeding and proper management, 30 per cent of the farmers found training to be useful and were taking care of poultry birds in the same manner as instructed by the officials in training. The trained farmers were also enquired about the effectiveness of the training programmes. It was revealed by the majority of trained farmers (30%) that the training programme was quite useful for poultry farm management.

The views of the farmers with respect of need of training were drawn and it was found that majority (82%) were in favour of training. It was suggested that the venue of training should be at farm so that farmers are able to acquire practical knowledge also.

Table 4.31 Training and training needs of sample farms

Sr. No.	Particulars	Unit	Percentage	Duration	Venue
1	Status of training in rearing of poultry				
i)	Trained	22	36.67	10	RSETI, Balu Chamba
ii)	Untrained	38	63.33		
	Total	60	100		
2	Effectiveness of training				
i)	Useful	18	30.00		
ii)	Not useful	4	6.67		
3	Need training on poultry				
i)	Required	49	81.67		On farm
ii)	No need	11	18.33		
	Total	60	100		

4.8 Existing pattern of management of backyard poultry

(A) Housing

Housing is the foremost and basic requirement for the establishment of backyard poultry unit. The poultry shed is a structure for the protection of birds. These poultry shed differ from one another with respect to type of construction, floor and roof material used, litter material, ventilation availability of feeders and waterers, etc. Preference for any enterprise is influenced by basic infrastructural facilities and management practices. In general, the infrastructural facilities of modern poultry farm were capital intensive and automatic. But on the other hand, the backyard poultry is based on low capital investment and basic infrastructural facilities. However, minimal level of basic infrastructure is a prerequisite. Therefore, an attempt has been made to study the pattern of infrastructure associated with management practices of backyard poultry units of the respondents. The information has been compiled in Table 4.32 and discussed as under;

It can be observed from the table that 90 per cent of respondents were having *kuchcha* type of poultry house whereas only 10 per cent of the respondents were having *pucca* type of house. About 95 per cent of the respondents were having single storied poultry house. The flooring and roofing material on the majority of the sheds was *kuchcha* (62.38%) and iron (51.49%), respectively. Some of the farmers in the study area had knowledge about the floor space requirement per bird i.e. for adult the floor space was 2.5 sq. ft whereas for chicks it was found to be 0.4 sq. ft. During the survey it was found that the respondents were aware of the litter material and 90 per cent of the respondents were using saw dust as the litter material, however about 22.33 and 3.33 per cent also used rice husk and straw, respectively. Similarly, the majority of respondents i.e. 100 and 93 per cent had made proper arrangements for proper ventilation and power supply in the poultry houses. During winter season, the farmers were using 2-3 florescent bulbs during night in order to maintain the temperature whereas during summer, some of the farmers were using wet gunny bags near the windows. Windows were provided in the poultry house for the purpose of ventilation.

The walls of the poultry house in the study area were mainly wooden (56.67%) and cemented (42.16%). Poultry farmers in the study area were using mainly plastic and metallic feeding equipment, about 54 per cent of the respondents were using plastic feeding equipment

whereas 44 per cent of respondent were using metallic feeders. The same was case with the watering equipments in which 62 per cent of respondent had used plastic water equipment while and 38 per cent had used the metallic equipments

(B) Feeding and watering

Balanced feeding and clean drinking water are necessary for proper growth and development of birds as well as production of eggs. The respondents were given one-week old chicks by the department. After 42 days, the chicks attained the weight of 650-750 gm and were ready to be kept in free range system. The backyard poultry owner in the study area had requisite knowledge about the supply of feed three times in a day and had proper knowledge about the essentiality of clean drinking water to the poultry birds. The birds can be let out under backyard free range conditions (30-40 birds/household) depending upon the housing area. As far as availability of scavenging was concerned, it was reported by 51.67 per cent of the farmers had sufficient area for the purpose of scavenging. Majority of the respondents were allowing birds for foraging twice for 2 hours i.e. morning and evening hours. The male birds were sold when it attained marketable weight of 2-2.5 kg and female were raised for egg production. Although respondents had sufficient scavenging area but still about 76 per cent of the respondents were practicing supplementary feeding. The birds in the study area were mostly provided with locally available cereals like maize, wheat, broken rice. Some of the farmers in the study area were also giving calcium as additional supplement. Further, it was indicated by all the respondents that they provided clean drinking water to birds.

(C) Poultry breed

The farmers in the study area were not aware of the improved breeds of the poultry birds, as most of the farmers had taken chicks from the veterinary hospital, so it was informed by the veterinary officers that they have distributed Chabero breed of poultry birds among the farmers under scheme named 200 chick scheme, 50 chick scheme and *Angadwadi* poultry development scheme. It was found that about 87 per cent of the respondents in the study area were rearing Chabero variety of poultry birds whereas 12 per cent of farmers were rearing desi poultry birds.

(D) Sources of chicks

It can be observed from the Table 4.32 that majority of respondent (100%) had purchased chicks from the veterinary officials under the government schemes implemented by the Department of animal husbandry. Under these schemes, the farmers were getting chicks, feed and feeding equipments at subsidized rates. The farmers in the study area had taken benefits under the schemes like 50 chick scheme, 200 chick scheme, *Angadwadi* poultry development scheme etc.

(E) Health care

The backyard poultry owners in the study area had good knowledge about the health care of poultry birds which was ensured by management practices like cleaning of poultry houses, deworming etc. The farmers were actively taking the help of the veterinarian for curing of the poultry birds in case of any incidence of diseases. The awareness about the vaccination of birds lacking in majority of respondents as only 28.33 per cent of the respondents had knowledge about the regular vaccination of birds. The majority of the farmers i.e. 100 per cent were visiting veterinary hospital when they were observing some disease in the birds. The farmers were also aware about the isolation diseased birds and they were removing the diseased birds in order to prevent the spread of diseases to other birds.

Table 4.32 Pattern of adoption of backyard poultry management practices on sample farms

Sr. No.	Particulars	Number	Per cent adoption
A	Housing		
1	House		
i	<i>Kuchcha</i>	54	90
ii	<i>Pucca</i>	6	10
2	Type		
i	Single storied	57	95
ii	Multistoried	3	5
3	Floor material used		
i	Concrete	23	38.33
ii	<i>Kuchcha</i>	38	62.38
4	Roof material used		
i	Cemented	7	11.88
ii	Iron	31	51.49
iii	Wooden	22	36.63

5	Litter material		
i	Saw dust	54	90
ii	Rice husk	14	23.33
iii	Straw	14	23.33
iv	Thread	2	3.33
6	Power		
i	Yes	54	93
ii	No	6	7
7	Ventilation		
i	Window	60	100
8	Wall material used		
i	Cement	26	42.16
ii	Wooden	34	56.67
9	Type of feeders		
i	Plastic	33	53.92
ii	Metallic	27	44.12
iii	Hanging	1	1.96
10	Type of waterers		
i	Metallic	23	38.00
ii	Plastic	37	62.00
B	Feeding and Watering		
1	Scavenging		
i	Sufficient	31	51.67
ii	Not sufficient	29	48.33
2	Supplementary feed		
i	Yes	46	76.67
ii	No	11	18.33
3	Clean drinking water		
i	Yes	60	100
ii	No		
C	Poultry variety		
i	Desi	8	12.04
ii	Improved	57	87.96
D	Sources of chicks		
i	Hatching at home	2	3.33
ii	Local market	23	38.3
iii	Animal Husbandry Dept.	60	100
E	Health care		

1	Control of ticks		
i	Yes	13	21.67
ii	No	47	78.33
2	Regular vaccination		
i	Yes	17	28.33
ii	No	43	71.67
3	Deworming		
i	Yes	3	5
ii	No	56	93.33
4	Disease		
i	Yes	52	86.67
ii	No	8	13.33
6	Treatment		
i	Self	0	
ii	Veterinary	60	100
iii	Local	0	
7	Isolation		
i	Yes	60	100
ii	No	0	
8	Replacement		
i	All in out	37	61.67
ii	Regular	23	38.33

4.9 Economics of backyard poultry

In general, backyard poultry is a practice of rearing of poultry birds in the rural settings with minimal or without fixed and working capital investment except purchase of birds. The birds mainly depend upon the scavenging, which is feasible if the size of the backyard poultry unit is very small (1-5 birds). But, as per the definition, the poultry unit up to 200 poultry birds comes under the preview of backyard poultry. When the number of birds increases, increasing the need for the proper shelter (housing) and supplementary feeding etc. arises. In order to promote the scientific management of backyard poultry, the state government has initiated schemes for the different size of unit i.e. 25, 50, 200 birds under which subsidy for chicks, feed, equipments etc. is given to the beneficiaries. Thus, in this section an attempt has been made to analyze fixed (initial) and working capital utilization on the existing poultry units, economics of backyard poultry units and disposal pattern of eggs and meat.

4.9.1 Capital investment

In agriculture/allied farm enterprises like poultry farming, the magnitude of capital investment was determined by size and level of technology used. Depending on the nature of infrastructure as discussed earlier there will be two requirements of fixed as well as working capital.

i) Fixed investment

In order to start a backyard poultry unit there will be requirement of poultry shed, feeders, waterers, chicks. The level of fixed investment by the sample respondents has been assessed and is presented in Table 4.33. It can be observed from the table that the major chunk of capital investment was utilized for construction of poultry sheds. The total initial investment on poultry shed was to the tune of Rs. 21,417 which alone contributes 89.62 per cent of total capital invested on backyard poultry. The total initial investment in backyard poultry was worked to be Rs. 23,898. Apart from poultry shed, on an average, 5.33 feeders, 5.27 waterers and about 77 chicks were purchased by the respondents. The table further indicates that except poultry shed, the major portion of the feeders, waterers, chicks i.e. 67.54, 66.79 and 100 per cent of the total were obtained under the schemes of the department.

Table 4.33 Initial investment on backyard poultry by sample farms

Sr. No.	Particulars	Quantity (No.)			Amount (Rs. /farm)
		Obtained under schemes	Own purchases from market	Total	
1	Poultry shed		1 (100)	1 (1.13)	21417 (89.62)
2	Feeders	3.6 (67.54)	1.73 (32.45)	5.33 (6.04)	433 (1.81)
4	Waterers	3.52 (66.79)	1.75 (33.20)	5.27 (5.97)	438 (1.83)
5	Purchase of chicks	76.67 (100)	- -	76.67 (86.86)	1610 (6.74)
Total		83.79	4.48	88.27	23898

Note: Figures in parentheses indicate percentages to the total in each category

Table 4.34 Use of working capital in backyard poultry on sample farms

Sr. No.	Particulars	Unit	Quantity/Annum	Amount (Rs. /annum)
1	Feed	Kg	1208.90	24178 (58.90)
2	Litter	Bags (40 kg)	10	500 (1.22)
3	Electricity charges			495 (1.21)
4	Health			475 (1.16)
5	Egg trays	Number	91.02	455 (1.11)
6	Marketing expenses			827 (2.01)
7	Purchase of chicks		23.5	681 (1.66)
8	Other expenses			600 (1.46)
8	Family labour	Number	51.35	12837 (31.27)
Total			1361.27	41048 100.00

Note: Figures in parentheses indicate percentages to the total in each category

ii) Working capital

Under backyard poultry system, items under working capital consist of feed, health care, labour, marketing expenses, litter and lighting. Investment pattern on working capital on sample farm is depicted in Table 4.34. It can be seen from the table that the feed cost accounted for 58.90

per cent of total variable cost followed by labour cost (31.27%), marketing expenses (2.01%) litter cost (1.22%), and electricity charges (1.21%). Other working cost in backyard poultry includes cost of health and packaging cost (egg trays).

4.10 Cost and returns from backyard poultry

4.10.1 Economics of backyard poultry unit on sample households

The economics of backyard poultry unit has been worked out by estimating the costs and returns of the backyard poultry unit (Table 4.35). The total cost of maintaining a poultry unit is composed of fixed and variable cost components, which were estimated on the basis of fixed and variable capital investment by the sample households of the study area. It can be observed from the table that the total cost of backyard poultry unit of 46.91 birds was estimated at Rs. 44,596/annum which comprised Rs. 3548 and Rs. 41,048 as total fixed and total variable cost, respectively. Under backyard poultry system, both eggs and meat were considered as source of income. The eggs and birds in the study area were sold directly to the consumer, wholesaler and retailer at the prevailing market rates. The production and returns structure of backyard poultry is depicted in Table 4.35. The table reveals that the major portion of income of the backyard poultry unit has been derived from the production of eggs i.e. Rs. 46,400/annum. The total gross income from backyard poultry farming was estimated at Rs. 59114/annum from the sale of eggs, meat and poultry manure. The annual net returns or the profit of backyard poultry unit was calculated by deducting the total cost of production from the gross returns of the unit. The total net returns from backyard poultry farming were estimated at Rs. 14518 and net returns per bird were estimated to be Rs. 309. It can be concluded from above discussion that backyard poultry was profitable. The above discussion concluded that backyard poultry was observed to be highly profitable over sale of egg and birds for meat.

4.10.2 Break- even analysis

As discussed earlier that the major product of backyard poultry in the study area were eggs, sale of birds for meat. In addition to this, the returns to the tune of Rs 2055/annum from the sale of poultry manure. Because of the variety of products and variation in price of three products, it was not possible to work out the break-even output level by taking into consideration single product. Hence, the breakeven analysis was carried for two situations *viz.*,

- i. By taking into account egg production and adjusting the income received meat and manure in variable cost
- ii. By taking into consideration the composite value of returns from different products

It was clear from the Table 4.36 that break-even point for first situation in which we consider level of egg production (912) and number of birds to be reared was estimated to be 6.08. Break even point in case of second situation in which we include both eggs and sale of birds was estimated to be 9.21. The average variable cost per poultry bird and per egg was estimated to Rs. 875 and Rs. 6.11. The average gross returns per bird was Rs. 1260.

Table 4.35 Economics of backyard poultry unit on sample households

		(per farm)
Sr. No.	Particulars	Rs. /annum
1	Production costs	
i	Total investment on poultry house	23898
2	Fixed cost	
i	Interest on investment on poultry house	2390
ii	Depreciation cost (equipments+ poultry shed)	1158
iii	Total fixed cost (TFC)	3548
3	Total variable cost (TVC)/ Working capital	41048
4	Total cost (TFC+TVC)	44596
5	Production of eggs	4640
6	Sale of eggs@10/egg	46400
7	Sale of Male birds	8789
8	Sale of female birds	1870
9	Sale of poultry manure	2055
10	Gross income (6+7+8+9)	59114
11	Net return (10-4)	14518
12	Size of poultry unit	46.92
13	Net returns per bird (10/11)	309.42
14	Benefit Cost Ratio (BCR)	1:1.33

Table 4.36 Break even output

Sr. No.	Particulars	Unit	Value
1.	Size of poultry unit	Number	46.92
2.	No. of eggs produced during the year	Number	4640
3.	Average sale price of egg	Rupees	10
4.	Birds sold for meat	Number	19.72
5.	Average sale price of bird	Rupees	540.52
6.	Vale of poultry manure	Rupees	2055
7.	Gross returns	Rupees	59114
8.	Average gross returns per bird	Rupees	1260
9.	Total fixed cost	Rupees	3548
10.	Total variable cost	Rupees	41048
11.	Average variable cost	Rupees	
a)	Per poultry bird	Rupees	875
b)	Per egg (when value of meat and manure accounted for adjustment of variable cost)	Rupees	6.11
12	Break even size of the unit		
a)	Value of composite output (egg, meat & compost)	Rupees	11604
		Poultry birds	9.21
	Egg production (when value of meat and manure accounted for adjustment of variable cost)	Rupees	9120
b)		Poultry birds	6.08
		Eggs	912

4.11 Production and utilization pattern of backyard poultry products

4.11.1 Pattern of production and marketed surplus of backyard poultry products

The major products of backyard poultry were reported to be egg, stock for sale. In addition to this, chick manure is also a by-product of the unit. The pattern of production and marketed surplus of backyard poultry products was analyzed and is depicted in Table 4.37. It can be depicted from the table that the total annual production of backyard poultry unit comprises of 4640 eggs, 19.72 saleable birds (male + female) of 2.5 kg average weight and 1027 kg of chick manure. The quantity kept for own consumption in case of eggs was 12.18 per cent out of total production whereas losses estimated to 1.57 and 10.14 per cent in case of eggs and birds. The marketed surplus

observed to be 86.26 per cent in case of eggs and about whereas in case of sale of birds it was observed to be 89.86 per cent this means that the male birds were only kept for selling purposes not for their own consumption.

4.11.2 Marketing channel

Table 4.38 depicts the different marketing channels adopted by the farmers in the study area for the purpose of selling backyard poultry products which mainly consist of eggs and sale of birds. It can be observed from the table that 68 per cent of the total eggs were sold to local village consumers followed by 19 per cent were sold to retailers and rest 12 per cent were to wholesaler in local market. The birds mainly sold to retailer i.e. 74.49 per cent for the reason that they fetch good price from retailer as compared to local village consumer. Only 25.51 per cent of birds were sold to local village consumer.

Table 4.37 Pattern of production and marketed surplus of backyard poultry products

(per farm)				
Sr. No.	Particulars	Eggs (No.)	Birds (No.)	Chick manure (kg)
1	Production	4640	19.72	1027.55
2	Own consumption	565.00	-	1027.55
		(12.18)	-	(100)
3	Marketable surplus	4075.00	19.72	-
		(87.82)	(100)	-
4	Losses	72.65	2	-
		(1.57)	(10.14)	-
5	Marketed surplus	4002.35	17.72	-
		(86.26)	(89.86)	

Note: Figures in parentheses indicate percentages to the total in each category

4.11.2 Marketing channel

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Table 4.38 Marketing channel for marketed surplus

Sr. No.	Particulars	Quantity sold (No.)	Percentage of quantity sold
A	Eggs (No.)		
i)	Retailer	785.83	19.28
ii)	Wholesale at local market	519.17	12.74
iii)	Local village consumer	2770	67.98
	Total	4075	
B	Meat (No.)		
i)	Retailer	14.69	74.49
ii)	Local village consumer	5.03	25.51
	Total	19.72	

4.12 Problems and constraints

The problems faced by farmers were analyzed and ranked by using total weighted score (Table 4.39). Among the different problems associated with backyard poultry, the problem of loss by predators was highly ranked by the farmers (Rank 1). During the survey it was found that predators like dogs and cats were the main reason for losses in the study area. The farmers were providing shelter during the night but during day, poultry birds were more prone to the predators. Losses due to insect pests and diseases was the second problem (Rank 2) found in the study area

as majority of the farmers had not vaccinated their birds resulting in high incidence of disease. The farmers were provided with all the facilities in the study area, almost all the villages had veterinary hospital at the distance of 3-4 km but the farmers did not want to avail the facilities. The third rank was given to problem high mortality by most of the farmers (Rank 3), the farmers revealed that high mortality was seen more at chick stage. The problems like costly feed, damage to field crops, lack of credit facilities and vaccination were also found in the study area.

Table 4.39 Ranking of problems faced by farmers on sample farms

(per cent)			
Sr. No.	Particulars	Average score	Rank
1	Damage to field crops	47.98	5
2	Loss by predators	63.72	1
3	Problematic to neighbors	35.15	7
4	Costly feed	51.33	4
5	Lack of credit facilities	35.82	6
6	Losses due to insect pest and diseases	57.15	2
7	High mortality	54.85	3
8	Vaccination difficult	25.00	8

5. SUMMARY AND CONCLUSIONS

5.1 Introduction

Agriculture is a land-based activity. The farmers with sufficient land resources has more opportunities for increasing their farm income by increasing the scale of production compared to the farmers having limited level resources. Under this situation of limited land resources, higher level of farm income is only possible through the adoption of high value crops and (or) adoption of allied farm enterprises like mushroom, bee keeping, protected cultivation of high value crops, backyard poultry etc., where the land requirement is quite low compared to crop enterprises. In India, poultry farming occupies a pivotal position for acceleration of rapid economic growth. India is one of the world's largest and fastest growing poultry industries, ranking 3rd in egg production with annual production of 66.4 billion eggs (Anonymous 2010). Backyard poultry is an important source for generating an additional income, especially among poor strata of the population *vis-a-vis* an imperative factor for improving the nutritional security of rural poor (Pathak and Nath 2013). Most of the backyard poultry production units are rearing indigenous birds, capable of producing only 40-50 eggs per year. With rearing improved varieties in backyard poultry, birds will increase the production of eggs as well as meat, thereby resulting an increase in the income.

The backyard poultry farming may emerge as a potential tool for poverty alleviation, which can be adopted as a major as well as subsidiary occupation depending on the number of birds in the unit. It requires low input and can be managed easily with other household activities (Rath et al. 2015). Through the rearing of backyard poultry, poor households can fulfil their food demand as well as can get additional profits (Conan et al. 2012). Traditional family- based poultry production system still contributes more than 80 per cent of the global poultry population (Mack et al. 2005). Small scale poultry helps in achieving food security through its contribution to mixed farming practices, women empowerment and enabling access to health care and education (Wong et al. 2017). Pulses used to be a major source of protein for majority of population but unfortunately, the per capital availability of pulses in the country has come down in last few years. This gap in the diet of common man has to be bridged and eggs provide an affordable alternative source of protein. The per capita availability eggs in the country has increased from 5

eggs/person/year to the level of 41 eggs in present scenario. Besides this, meat is another nutritious product of poultry bird which is also a source of high-quality proteins. Therefore, increase in the production of eggs and meat will also lead in strengthening the economic base of the rural farmers.

Himachal Pradesh has a varied type of agro-climatic conditions which are suitable for undertaking wide range of crops and allied farm enterprises. In the recent past, the state has shown a remarkable progress in field of agriculture especially in fruit and off-season vegetable production. The proportion of cropped area in the state is quite low *i.e.* about 10 per cent of the total geographical area of the state mainly due to hilly topography. Thus, the majority of land holdings in the state are small and marginal (84.5%). The average size of land in the state is around 1 hectare of which about 80 per cent is rainfed. Due the non-availability of assured irrigation, the productivity levels of different crops are low compared to irrigated areas. In order to improve the socio-economic status of farming community, the line departments of the state are promoting the adoption of allied farm enterprises. Among the potential allied farm enterprises, backyard poultry is being popularized by the Department of Animal Husbandry and CSK HPKV, Palampur under different schemes and projects in the state. The backyard poultry act as supplementary farm enterprise and does not compete potentially with other farm enterprises, especially for land, labour and other farm resources. To start with, the farmers of the state are being provided with chicks and critical inputs as per the provisions of schemes/projects. During the period of last few years, a good number of back yard poultry units have been promoted in different parts of the state. Therefore, it is imperative to analyze the role of backyard poultry in the farm economy of Chamba district of the state, so as to assess the impact of aforesaid intervention, especially with respect to change in socio-economic status of farmers, economics of backyard poultry, related issues and constraints faced.

In the total egg production, the share of unorganized poultry production is around 20 per cent of the total egg production. Organized or commercial poultry production in small areas of local vicinities is not possible on account of lack of desired demand and space.

Keeping these aforesaid points in view the present study has been carried out with following outstanding objectives.

5.2 Objectives

- i. To study the socio-economic status of sample household.
- ii. To work out the economics of Backyard Poultry and analyze factor affecting its adoption.

5.3 Methodology

The proposed study was carried out in Chamba district of Himachal Pradesh, as it is the most backward district of the state. Many programmes for improving the socio-economic status of rural household are being implemented in the district. Back yard poultry is one of the allied enterprises being promoted in the district by the state Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur. Two stage random sampling technique was used for the selection of respondents. In first stage out of seven development blocks of the district, two blocks were selected randomly. At the second stage of sampling the list of beneficiaries' farmers adopted by the Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSKHPKV Palampur was prepared for selected blocks in consultation with the officials of departments. From the list so prepared a sample of 60 farmers (33 and 27 from Chamba and Mehla blocks, respectively) was selected through proportional allocation method.

In order to meet out the requirements of the specific objectives of the study, both primary as well as secondary data were collected. The secondary data with respect to backyard poultry will be collected from the various reports of the state Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur. The primary data were collected from beneficiary farmers of the schemes/projects, on specifically designed survey schedule through personal survey method. The detailed information about demographic features of household (size and composition of family, educational status of the sample population, sources of income and employment, farm inventories etc., of backyard poultry) land utilization pattern, cropping pattern, size of backyard poultry, management practices, schemes to which it is associated, market of egg/meat/birds, problems associated with management of backyard poultry etc. The data so collected were analyzed by using simple tabular method. The results have presented by using standard mathematical and statistical tools like averages, percentages, indices ratios, etc.

5.4 Major findings

1. The average family size of the sample households was relatively small (4.97 members) which may be due to the fact that about 53 per cent of the sample households were having nuclear family system.
2. The proportion of male population in the total population was relatively higher compared to female as the sex ratio for the sample population was to the tune of 986.
3. The analysis of age wise distribution of population is important to judge the active workforce and proportion of dependent population. The age-wise distribution of head of the families indicated that the majority of the head of the families were in the age group of 41 to 60 years (55%), while major proportion of total sample population was in age group of 26-40 years (about 28%).
4. Education is one of the key factors the adoption of improved technologies and high-income generating enterprises on the farm. The analysis of the educational status of the head of the families indicated that the educational status of the head of the families was low as about 36.67 per cent were illiterate. Moreover, among the literate highest proportion of was educated up primary level.
5. As far as literacy among male and female counterparts was concerned it was relatively higher in favour of males while the overall literacy was around 78 per cent.
6. The level of income of households depends on the occupational pattern of family members. It was found that, the main occupation of majority of the sample population was agriculture (40 %). Backyard poultry was also the major occupation of about 18 per cent of total sample population.
7. The per household average income was estimated at Rs. 3,52,868 per annum in which share of government services was around 19.37 per cent, followed by dairy (16.64%) and poultry (16.75%)
8. On an average, the total inventory of buildings was estimated at 2.9 comprising 1 residential, 0.9 cattle sheds and 1 poultry shed. The total investment on buildings was about Rs 1,91,916 in which the share of residential buildings was around 72 per cent.
9. As far as farm machinery and implements were concerned, the total number of major farm machinery was only 0.38 which indicated very low investment towards farm

mechanization. The number of minor farm implements were estimated at 15.9 which accounted for about 97 per cent of total farm machinery on sample farms.

10. The average investment on implements, tools and machinery was estimated to be Rs.7075. The minor implements contribute about 81 per cent of total value on sample farms.
11. Livestock rearing was also practiced and cattle (local & improved), buffaloes, sheep, goat and poultry were the major livestock reared in the study area. The average size of livestock unit was 5.79. Among the different categories of livestock, the population of goats was highest (52.16%). The average size of the poultry birds was 46.91 out of which 65.93 per cent were female birds (hens) and 34.07 were male birds.
12. The average size of land holding with the sample households was quite low i.e. 0.2200 ha in which 86 per cent of the area was under cultivation of crops. Maize, wheat, oats, green gram, rajmash were the major crops grown by the sample households.
13. The analysis of cropping pattern revealed that maize and wheat were the major crops as their share in total cropped area was to the tune 42.63 and 46.71 per cent, respectively on sample farms.
14. Among the cereal crop the productivity of maize was found to be about 23 q/ha, while it was about 13 q/ha in case of wheat. Mash, green gram and rajmash were the major pulses grown, in which the productivity of green gram (about 12q/ha) followed by rajmash (about 7q/ha).
15. The cropping intensity on sample farms was estimated at about 197 which means that farmers have taken about 2 crops during the agriculture year.
16. Source of inspiration plays an important role in the adoption of any new enterprise. Backyard poultry was one of the important activities being promoted/introduced in the district for the supplementation of household income by the Department of Animal Husbandry and Department of Animal Breeding and Genetics, College of Veterinary and Animal Sciences, CSK HPKV Palampur for the adoption of new enterprise, motivation plays a crucial role. It was found that, majority of the respondents were inspired by veterinary officers in the study area i.e. about 56.67 per cent for starting backyard poultry while about 20 per cent respondents were inspired by their relatives.

17. It was found that 5-8 per cent of the respondents were keeping backyard poultry since last 8-12 years. But with efforts of Department of Animal Husbandry, about 50 per cent of respondents adopted it during last 3 years.
18. Most of the farmers in the study area bought chicks from Department of Animal husbandry i.e. about 52 per cent followed by 28.93 per cent were taking chicks from local market, however, a few respondents (2.48%) were also doing self-brooding. About 71.67 per cent of farmers were preferring these for source of chicks as they were getting healthy chicks.
19. Majority of the respondents were aware about the undergoing government schemes regarding backyard poultry and were quite satisfied with the benefits under schemes. Under the schemes on an average they have purchased 76.67 chicks. They were also provided with feed (60 kg) free of cost for initial days in order to provide good nourishment to the chicks. The equipment's used for feeding and watering i.e. 3.52 waterers and 3.6 feeders were also provided free of cost by Department of Animal Husbandry to the farmers in the study area.
20. The average size of backyard poultry unit was 47 birds comprising about 31 hens and 16 cock (broiler).
21. As far as technical knowledge regarding poultry and management was concerned, it was found that they have fairly good knowledge as about 36.67 per cent of the respondents travel by bank at Rural Self Employment Training Institute at Balu, Chamba. However, 81.67 per cent of the respondents were of the view that there was need of on farm training to backyard poultry owners.
22. About 51 per cent of farmers were using iron sheet as a roofing material and 90 per cent of farmers were providing saw dust as litter material to poultry birds. different management practices in backyard poultry. About 90 per cent of the respondents were having *kuchcha* type of poultry house and 62.38 per cent of them were using *kuchcha* floor material. Mostly farmers in the study rea using improved strains of poultry birds i.e. about 87 per cent.
23. The average total initial investment on backyard poultry was around Rs. 23898 out of which investment on poultry shed was higher (89.62 %) followed by cost of chicks (6.74%).
24. The average use of working capital in the backyard poultry was Rs. 41048 out of which 58.90 per cent was accounted by the poultry feed followed by cost of family labour (31.27%).

25. During the period of one year the average per farm production of eggs was 4640, in addition to this about 20 birds (about 15 males and 5 females) were sold and 10.28 q of chick manure was produced. The total annual cost of maintenance of backyard poultry unit was Rs 44596 comprising Rs 3548 and 41048 fixed and variable costs, respectively. The total annual gross returns from different products of backyard poultry unit were estimated at Rs. 59,114 and net returns was observed to be Rs. 14,518 which clearly shows that backyard poultry was profitable venture on sample farms. The input output ratio was quite encouraging as investment of Rs. 1 in backyard poultry will earn Rs. 1.33.
26. The major portion of total production of main products of poultry i.e. eggs (86.26%) and birds for meat (100%) was marketed. The by-product i.e. chick manure was used at home in crop production.
27. About 68 per cent of total eggs were disposed in nearby village directly to consumers whereas 19.28 per cent was disposed to retailer and rest 12.74 per cent were given in wholesale.
28. Damage to field crops, loss by predators, losses due to the insect pest & diseases and costly feed were some of the main constraints listed by the farmers.

5.5 Suggestions

1. The average size of the holding was quite low and the scope for increasing the farm income from crops are very less. The contribution of backyard poultry in the total household income is about 16 per cent. Therefore, it is suggested that the efforts should be made to increase the size of the backyard poultry unit i.e. from 46 birds to 100 birds. It will improve socio-economic status of the farmers and will be a desired step for doubling the farmers' income.
2. The problem of insect-pests and diseases was reported to be the major key issue for the sustainability of the units. Therefore, it is suggested that proper arrangements for the training of farmers especially women should be made. Moreover, regular vaccination of the birds be ensured the concerned Vet. Officers/ Vet. Pharmacists.
3. In addition to this the expenditure on supplementary feeding was also quite high. Keeping in view the poor economic status of the backyard poultry owners, the feed may also be made available on subsidized rates on the pattern of subsidy given for inputs in crop production.

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Where, I- Illiterate, P- Primary, M- Middle, H- High, S- Senior Secondary, D- Diploma, G- Graduation and PG- Post Graduation

3. Infra- Structural Facilities

Sr. No	Particulars	Distance (Km)	Sr. No	Particulars	Distance (Km)
1.	Primary School		11	Market committee	
2.	Middle School		12	BDO office	
3.	High School		13	SMS agriculture	
4.	Secondary School		14	Bank	
5.	College		15	Link road	
6.	Health Care		16	Market	
7.	Vety. Hospital		17	Flour mill	
8.	Co-operative society		18	Revenue office	
9	Krishi Vigyan Kendra		19	Milk Pasteurizing unit	
10	Primary Agriculture Cooperative Society		20	NGO	

4. Occupational Pattern of family members

Sr. No	Occupation	Main			Subsidiary		
		No. of family members	Time devotion per annum (%)	Annual income (Rs)	No. of family members	Time devotion per annum (%)	Annual income (Rs)
	Farm Enterprises						
1.	Field crops						
2.	Dairy						

3.	Horticulture						
4.	Allied activities						
Off farm activities							
5.	Govt. Service						
6.	Private sector						
7.	Business/trade						
8.	Rural Artisan						
9.	Labourer						
10.	Other(specify)						

5. Inventory of farm buildings

Sr. No	Particulars	Type of building (No)			Year of Purchase/ Construction	Present value (Rs.)	Remarks
		<i>Kuchcha</i>	<i>Pucca</i>	Mixed			
1.	Residential Building						
2.	Cattle Shed						
3.	Store House						
4.	Poultry House						

6. Inventory and land utilization

Sr. No	Particulars	Area (kanal/bigha)			Source of irrigation	Remarks
		IR	UIR	Total		
1.	Owned land					
2.	Leased-in land					
3.	Leased-out land					
4.	Total holdings (1+2-3)					
Land utilization						
1.	Cultivated land					
2.	Orchard Land					

3.	Fallow Land					
4.	Cultivable wasteland					
5.	Land under Misc. Trees/grasses/forest					
6.	Permanent Pastures					
7.	Any other (grassland)					
8.	Total holding					

Note: IR- Irrigated, UR- Unirrigated

7. Inventory of farm implements, tools & machinery

Sr. No	Particulars	No.	Year of purchase	Value (Rs)	Source of funds	Remarks
A	Major Farm Machinery					
1.	Tractor					
2.	Power Tiller					
3.	Chaff cutter					
4.	Thresher					
5.	Sprayer/Duster					
6.	Sprinklers					
B	Minor implements:					
1.	Wooden Plough					
2.	M.B. Plough					
3.	Spade/ <i>Belcha</i>					
4.	Hoe					
5.	Rake					
6.	Sickle					
7.	Axe					
8.	Planker					
9.	Kudali					
10.	Plastic pipe for irrigation (length)					
11.	Water storage structure (if any)					

12.	Water tank (plastic)					
13.	Feeding and watering troughs for poultry					

8. Livestock Inventory

Sr. No	Particulars	No.	Breed	Milk Yield (L per day)	Present Value (Rs.)
1.	Cow local				
a.	In milk				
b.	Dry				
2.	Cow improved				
a.	In milk				
b.	Dry				
3.	Buffalo				
4.	Bullocks				
5.	Young stock				
a.	Cow				
b.	Buffalo				
6	Sheep & Goat				
7	Poultry				
8	Others				

9. Income from Livestock product and services

Sr. No	Particulars	Sold (Number)		Purchased (Number)		Remarks
		Number	Price (Rs/unit)	Number	Price (Rs/unit)	
1.	Milk					
2.	Curd					
3.	Ghee					
4.	Khoya					
5.	Sale of stock					
a)	Local Cow/heifer					
b)	Improved cow/heifer					

c)	Bullock					
d)	Sheep & goats					
e)	Wool					
f)	Poultry birds					
6.	FYM/Compost					
7.	Others (if any)					

10. Cropping Pattern

Sr. No	Crop	Area (kanal/bigha)	Production	Source of irrigation
	KHARIF SEASON			
1	Cereals			
	Maize			
	Paddy			
2	Pulses			
	Mash			
	Green gram			
	Rajmash			
3	Oilseeds			
	Sesamum			
	Soybean			
4	Fodder			
	Chari			
	Bajra			
5	Vegetable and Spice crop			
	i)			
	ii)			
	iii)			
	iv)			
	RABI SEASON			
1	Cereals			
	Wheat			
	Barley			
2	Pulses			
	Gram			
3	Oilseeds			
	Rapeseed and Mustard			
	Linseed			
4	Fodder			
	Oats			
	Berseem			
5	Vegetable and Spice crop			
	i)			

	ii)			
	iii)			
	iv)			

11. Inventory and production of different fruits

Sr. No	Particulars		Orchard			Scattered plantations	
			Area (Kanal)	No. of Plants	Production (q)	No. of Plants	Production (q)
1.	Apple	Bearing					
		Non-bearing					
2.	Citrus	Bearing					
		Non-bearing					
3.	Mango	Bearing					
		Non-bearing					
4.	Litchi	Bearing					
		Non-bearing					
5.	Kiwi	Bearing					
		Non-bearing					
6.	Guava	Bearing					
		Non-bearing					
7.	Peach	Bearing					
		Non-bearing					
8.	Pear	Bearing					
		Non-bearing					
9.	Plum	Bearing					
		Non-bearing					

12. Do you sell miscellaneous farm commodities?

Yes/No

If yes, give the following details:

Sr. No	Particulars	Unit	Quantity	Price (Rs/unit)	Remarks
--------	-------------	------	----------	-----------------	---------

1.	Grasses				
2.	Fuel wood				
3.	Tree litre				
4.	Timber				
5.	Medicinal herbs				
6.	Any other (specify)				

13. When did you started poultry enterprise?

14. Do you have sufficient space for scavenging of poultry birds? Yes/No

15. Is rearing of poultry birds objectionable to the neighbors? Yes/No

16. Who motivated you for the adoption of backyard poultry (tick)?

a) Self b) Neighbored c) Relative d) Veterinary officer e) Other (specify)

17. Are you aware about the government schemes about the promotion of poultry/backyard poultry? Yes/No

18. If yes, have you got any incentive (s) for the establishment of backyard poultry? Yes/No

If yes, give the following details:

Sr. No	Particulars	Amount/quantity	Unit	Remarks
1.	Financial			
2.	Chicks			
3.	Feed			
4.	Marketing linkage			
5.	Housing infra-structure			

19. Under which scheme you have got the above benefits?

.....
20. Size and composition of poultry unit

Sr. No	Size of layers unit			Size of broilers unit		
	Name of breed	Male	Female	Name of breed	Male	Female
1.						
2.						
3.						
4.						

5.						
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21. From where you purchase the chicks/poultry birds?

- a) University b) KVK c) Local market d) Self-brooding e) Through agents f) Any other

22. What are major consideration for selecting the particular source?

- a) Reliability b) Breed c) Healthy birds d) cost

23. Do you think there is a need of training for maintain a backyard poultry unit?

Yes/No

24. Have you got any training for poultry farming?

Yes/no

If yes, give the following details

Sr. No	Name of training	Duration	Venue	Impact (E/UE)	Remarks
1.					
2.					
3.					

Note: E: Effective and UE: Un-effective

25. If yes, which of the following source you use?

Sr. No	Extension Agency	Always	Frequently	Often	Never	Remarks
1.	Dept. of A.H.					
2.	Gram panchayat member					
3.	Mass contact					
4.	Print media					
5.	Electronic media					
6.	Social media					
7.	University/KVK					

24. Management practices followed in backyard poultry

Sr. No	Particulars	Tick the appropriate
A	Housing	
1	Type of construction	Concrete/ <i>kuchcha</i>
2	Available floor space (sq. ft per bird)	Chick: Adult:
3	Type of floor	Concrete/ <i>kuchcha</i>
4	Provision of ventilation (Windows)	Yes/No
5	Site of house	Shady/sunny/partially sunny
6	Roofing material	Cement asbestos sheet/Corrugated iron sheet /Wooden/Thatch
7	Provision of electricity for light/fan	Yes/No
8	Supplementary feed	
9	Provision for clean drinking water	Yes/No
B	Health care	
10	Control of ticks, lice, fleas, mites, etc.	Yes/No
11	Regular vaccination of the birds	Yes/No
12	Use of feed supplements	Yes/No
13	Cleaning of poultry house (interval in days)	
14	<i>Ranikhet</i> disease/IBD/Fowl Pox	Yes/No

25. Investment on housing

Sr. No	Particulars	Unit	Rate (Rs/unit)	Amount (Rs)	Source of funds
A	Fixed/non-recurring				
1	Poultry sheds (no.)				
2	Cages (no.)				
3	Feeding troughs				
4	Watering troughs				
5	Equipments, tools, etc.				
6	Total				
B.	Working capital				
7	Birds				
8	Feed				
9	Medicines				
10	Electricity				
11	Water charges				

12	Human labour				
13	Marketing expenses				
14	Others				

26. Feed type

Sr. No	Name of feed	Source	Qty. Kg	Rate Kg/Rs	Value (Rs)
1	Chick Mash				
2	Grower's Mash				
3	Layer's Mash				
4	Broiler's Mash				
5	Concentrates				
6	Self-made feed				
7	By products				
8	Others(specify)				

27. Production and gross income from backyard poultry unit

Sr. No	Particulars	Value
A	Broiler unit	
1.	No. of birds kept during the year	
2.	Average live weight of the bird	
3.	Rate (Rs/kg)	
4.	Gross income from sale of birds	
B	Layers unit	
5.	No. of birds maintained during the year	
6.	Average egg laying/bird during the year	
7.	Total egg production (numbers)	
8.	Sale price of egg (Rs/egg)	
9.	Number of birds culled	
10.	Average live weight of layers	
11.	Average sale price of layers	
12.	Income from sale of eggs	
13.	Income from sale of layers	
14.	Gross income (4+12+13)	

10	Are the prices of Broilers remunerative?								
11	Is the demand for your products seasonal?								
12	Is labour available when required?								
13	Is your farm running profitably?								
14	Do you grade the eggs before selling?								
15	Spoilage during storage?								
16	Insect Pest/diseases?								

Brief Bio data of Student

Name : Nitika Kapoor
 Father's Name : Shri Paras Ram Kapoor
 Mother's Name : Smt. Raj Kumari
 Date of Birth : 10.10.1994
 Permanent Address : Vill.- Bundla, P.O.- Nachhir
 Teh.- Palampur Distt.- Kangra
 H.P. (176061)



Academic Qualification:

Qualification	Year	School/Board/University	Marks (%)	Division	Major subjects
10 th	2011	ICSE Board	74.57	First	English, Mathematics, Science, Environmental Science, Hindi, History Civics and Geography, Computer Applications.
10+2	2013	CBSE Board	71.8	First	Biology, Physics, Chemistry, English, Physical Education
B.Sc. (Hons.) Agriculture	2017	Lovely Professional University, Jalandhar	83.61	First	All agricultural courses
M.Sc. (Agricultural Economics)	2019	CSKHPKV, Palampur	71.8	First	Agricultural Economics
Fellowships/ Scholarships/ Gold Medals/ Awards/ any Other Distinction:	Merit scholarship at the rate of Rs. 2,000 per month for the year 2017, awarded by CSKHPKV, Palampur, H.P. Financial assistance at the rate of Rs 750 per month for year 2018-19 from CSKHPKV, Palampur, H.P. Award of NABARD Summer Internship Scheme (SIS) with effect from July 2018 to September 2018				
Seminar/symposia	Participation in Conference on "Doubling Farmers Income: Challenges and Strategies", organized by Agri vision- Himachal Pradesh (April 23-24, 2018)				