Promotion of nutritional, economic and livelihood security through small-scale Giriraja backyard poultry farming

M.Semmaran[1] & P.V.K. Sasidhar[2]

ABSTRACT

The paper analyzed small-scale Giriraja variety backyard poultry farming by 120 farmers in Mysore and Mandya districts of India's Karnataka state by considering economic, nutritional and livelihood securities. Data collected from 120 farmers on livelihood security with respect to income generation and increased dietary intake through backyard poultry farming. The majority of respondents were selling Giriraja backyard birds at 10-15 weeks age with an average body weight of 2.035 kg. Mean selling price of live birds and eggs was Rs. 58.4/kg and Rs. 3.29/egg, respectively. The respondents on average produced and sold 662 and 652 birds and 2108 and 2006 eggs, respectively. The average income earned was Rs.1385/month with a wide income range of Rs.220 to 6500/month. The average cost-benefit ratio of Giriraja poultry farming was 5.45. They were using the income for daily household expenses, increasing flock size, and children's education. Regarding nutritional benefits, each respondent's family was consuming 16.08 kg of chicken and 117 eggs per year. Considering the average family size of 4 members, each household's consumption amounts to 4.02 kg of chicken and 29 eggs per year. Overall, backyard poultry farming helped the respondents as a tool in income generation and nutritional security, besides empowering them economically.

Keywords: Giriraja, backyard poultry, livelihood security, nutritional security

Introduction

Backyard poultry production is a simple and low-cost way to provide nutritious food, especially eggs and chicken meat. These foods are good sources of protein that people can afford. Rural women mostly manage this farming system. It helps improve food security, reduce poverty, and empower communities (Dinesh, 2025). The Indian government and the Indian Council of Agriculture Research (ICAR) have prioritized boosting meat and egg production through backyard

1. Conservator of Forest, Sohelwa Wildlife Sanctuary, Balrampur, Uttar Pradesh
2. Professor, School of Extension and Development Studies, Indira Gandhi National Open University, New Delhi -110068

Corresponding author: pvksasidhar@ignou.ac.in

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poultry to enhance food security and rural livelihoods, and supported various programmes. This has resulted in the release of some important backyard poultry varieties viz., Vanaraja and Gramapriya (Ayyagari, 2001), Debendra and CARI-Gold (Kataria and Johari, 2001), Krishna-J (Khan, 2001) and Giriraja (Ramappa, 2001). The Giriraja, a hybrid colored chicken variety developed for backyard rearing by the College of Veterinary Science in Bangalore, demonstrates high egg production and improved growth compared to local breeds. It is well-suited for both mixed and backyard farming systems.

Specific Objectives of the Study

- To investigate how Giriraja backyard poultry farming enhances dietary intake by providing a sustainable source of nutritious eggs and meat, as well as how it contributes to income generation for families involved.
- To provide a comprehensive understanding of the benefits associated with Giriraja backyard poultry farming and its potential role in improving overall well-being and economic stability within communities.

Methodology

Following an exploratory research design and survey method, this study aims to explore how Giriraja backyard poultry farming contributes to enhancing livelihood security through improved dietary intake and increased income generation. In Mysore ($11^{o}45^{1}$ N and $75^{o}57^{1}$E) and Mandya ($12^{o}52^{1}$ N and $76^{o}9^{1}$ E) districts of India's Karnataka state, a total of 120 farmers were selected randomly from six villages in each district, with ten farmers from each village. The key survey questions were on personal and socio-economic characteristics, uses and functions, marketing body weight and price, number of birds produced and sold, cost-benefit ratio, distributional benefits of income, and nutritional security in the form of egg and chicken consumption per year by the family. The 120 respondents were personally interviewed using a standardized structured interview schedule. The researchers also employed general observation on aspects related to the study to cross-check the information collected. The data obtained from the interviews were coded, entered into the computer spreadsheet, and analyzed using descriptive analysis procedures (SPSS, 2006). Frequency tables and percentages were generated as the summaries of the data for analysis.

Results and Discussion

Table 1 provides key information about the respondents. Most (67.5%) were middle-aged, with an average age of 44.6 years. About 16.7% were young (under

35), and 15.8% were older (over 55). Just over half (51.7%) were male, while 48.3% were female, involved in backyard poultry farming. Most had a high school education (31.7%), followed by primary (29.2%) and middle-level education (15.8%). Only 10.8% were illiterate. About 80% lived in nuclear families, with 53.3% having four members, 22.5% five, and 21.7% three, averaging 3.99 members. About 63.3% respondents were from Other Backward Classes (OBC), 60% lived in kachha (temporary) houses, 23.4% in pucca (permanent) houses, and 10.8% in mixed houses. Regarding land, 36.7% owned up to 0.5 acres, 32.5% one acre, 14.1% 1.5 acres, and 15% more than 1.5 acres. Only 1.7% were landless poultry farmers. Most (48.4%) worked in agriculture, followed by animal husbandry (48.8%) and poultry (10.8%). For 50% of the respondents, animal husbandry was a secondary occupation, and for 44.1%, poultry was also part of their income. Most had one to four years of experience in Giriraja poultry farming (56.7%). About 30% had five to eight years, and 8.3% had over eight years, with an average of 4.46 years.

Table: 1 Personal and socio - economic profile of the respondents (N=120)

S.no	Variable	Frequency	Percentage	Mean	SD	Range
1	***Age (years)***					
	Young (Mean-SD)	20	16.7	44.6	9.85	21-72
	Less than 35 years					
	Middle aged (Mean±SD)	81	67.5			
	36 to 54 years					
	Old (Mean-SD)	19	15.8			
	More than 55 years)					
2	***Sex***					
	Male	62	51.7			
	Female	58	48.3			
3	***Education***					
	Illiterate	13	10.8			
	Can read	6	5.0			
	Can read and write	1	0.8			
	Primary education	35	29.2			
	Middle level education	19	15.0			

	High school	38	31.7			
	Above High school	8	6.7			
4	***Family Type***					
	Nuclear	96	80.0			
	Joint	24	20.0			
5	***Family size (No.)***					
	2.00	2	1.7	3.99	-	2-6
	3.00	26	21.7			
	4.00	64	53.3			
	5.00	27	22.5			
	6.00	1	0.8			
6	***Caste***					
	General	6	5.0			
	Scheduled caste	37	30.8			
	Scheduled Tribe	1	0.8			
	Other backward caste	76	63.4			
7	***Type of house***					
	Hut	7	5.8			
	Kaccha	72	60.0			
	Pucca	28	23.3			
	Mixed	13	10.8			
8	***Land possession***					
	Landless	2	1.7	2.04	1.08	
	Up to 0.5 Acre	44	36.7			
	Up to 1 Acre	39	32.5			
	Up to 1.5 Acre	17	14.1			
	More than 1.5 Acre	18	15.0			
9	***Main occupation***					
	Agriculture	58	48.4			
	Animal Husbandry	49	40.8			
	Poultry	13	10.8			

10	***Subsidiary occupation***					
	Animal Husbandry	60	50.0			
	Poultry	53	44.1			
	Business	2	1.7			
	None	5	4.2			
11	***Experience of the respondents (years)***					
	Freshly started	6	5.0	4.46	2.88	0-15
	1-4	68	56.7			
	5-8	36	30.0			
	More than 8	10	8.3			

About 90.8, 58.3, and 62.5 percent of respondents gave first rank to backyard poultry as a source of income, a source of food, and for social functions, respectively (Table 2). Indicating backyard poultry as a source of income with first rank clearly reveals the commercial value of backyard poultry for the respondents. The study highlighted the significant role of backyard poultry eggs and meat as sources of food, as evidenced by consumption patterns. Use of backyard poultry for social functions also signifies the cultural factor behind their farming.

Table 2. Uses and functions of backyard poultry and ranking (N=120)

Rank	Source of income		Source of food		Social function	
	F	%	F	%	F	%
Rank I	109	90.8	70	58.3	75	62.5
Rank II	11	9.2	45	37.5	45	37.5
Rank III	0	0	5	4.2	0	0
Total	120	100	120	100	120	100

The majority (43.3%) of farmers were selling the birds at the age of 10-15 weeks, and nearly half (50.8%) of respondents sold their birds with a body weight range of one to two kg (Table 3). The majority (48.3%) of respondents sold the eggs @ Rs. 3.50/egg, and the majority (78.3%) of respondents sold birds at the price range of Rs. 50-70 per kg live weight. The meat and eggs of Giriraja backyard poultry are highly valued with prices being 50–100% higher than industrially produced eggs and birds.

Table 3. Marketing age, body weight, and price of backyard poultry (N=120)

Marketing age (weeks)	Frequency	Percentage
Not selling chicken	4	3.4
3-3.5	13	10.8
7-9.5	41	34.2
10-15	52	43.3
40-72	10	8.3
Marketing body weight of birds (Kg)		
< 1	16	13.3
1-2	61	50.8
2-3	32	26.7
3-5	11	9.2
Marketing price of egg (Rs/egg)		
3.00	12	10.0
3.50	58	48.3
4.00	28	23.3
4.50	14	11.7
5.00	8	6.7
Marketing price of live birds (Rs/Kg)		
< 50	13	10.8
50-70	94	78.3
70-80	9	7.5

Note: Mean marketing body weight: 2.035 kg; Mean egg price: Rs. 3.29; Mean live bird price: Rs. 58.4 / kg.

The majority of respondents (65.8%) sold between 1-100 birds annually, with an average production and sale of around 662 and 652 birds, respectively (Table 4). Additionally, about 32.5% sold between 1000-2000 eggs per year, with average egg production and sales of 2108 and 2006 eggs, respectively (Table 5).

Table 4. Average number of birds sold and produced per year (N=120)

Distribution	Average Birds sold		Average birds produced	
	Frequency	Percentage	Frequency	Percentage
1-100	79	65.8	66	55
101-200	23	19.2	25	20.8
201-400	2	1.6	7	5.8
Above 1000	12	10	12	10
Mean	652		662	

Table 5. Eggs sold and produced per year (N=120)

Distribution	Eggs sold		Total eggs produced	
	Frequency	Percentage	Frequency	Percentage
Nil	9	7.5	9	7.50
1-1000	27	22.5	21	17.50
1000-2000	39	32.5	40	33.33
2001-3000	21	17.5	18	15.00
3001-4000	15	12.5	19	15.83
4001 and above	9	7.5	13	10.84
Mean	2006		2108	
Range	0 to 8000		0 to 8250	

The majority of respondents (33.4%) were earning Rs. 1001 to 1500 per month through backyard poultry alone (Table 6). The average income was Rs. 1385 with a widespread range of Rs. 220 to 6500. The cost-benefit ratios for the majority of respondents (70.8%) varied between 3.35 and 7.55, with an average ratio of 5.45 (as shown in Table 7). This average is notably higher than that of most agricultural and livestock farming activities, highlighting the potential for profitability in this sector. The strong cost-benefit ratios can likely be attributed to effective low-input scavenging or semi-scavenging backyard production systems, along with favorable market prices for backyard poultry products. These findings suggest that there is a significant opportunity for growth and development in backyard poultry farming.

Table 6. Income earned per month through Giriraja poultry (N=120)

Categorization (In Rupees)	Frequency	Percentage	Mean	Range
Up to 500	15	12.5		
Between 501 to 1000	34	28.3		
Between 1001 to 1500	40	33.4	1385	220-6500
Between 1501 to 2000	12	10.0		
Between 2001 to 2500	12	10.0		
Above 2500	07	5.8		

Table 7. Cost: benefit ratio in Giriraja poultry farming (N=120)

Categorization	Frequency	Percentage	Mean	SD	Range
Low CB ratio (Mean-SD : < 3.35)	18	15			
Medium CB ratio (Mean±SD: 3.35 to 7.55)	85	70.8	5.45	2.10	1.55-12.30
High CB ratio (Mean+SD: > 7.55)	17	14.2			

Approximately 71.67% of respondents used about 51.74% of their income from Giriraja backyard poultry for household expenses, while 54.17% and 41.67% allocated income—29.38% and 27.8%, respectively—for increasing flock size and for children's education (Table 8). The distributional benefits of income are clear-cut examples of the capacity of backyard poultry to substitute a substantial amount of income in the livelihood security of farmers.

Table 8. Distributional benefits of income earned through Giriraja poultry farming

Purpose	Frequency (Percentage)	Average income utilization (Percentage)
Household activities	86 (71.67)	51.74
Increase flock size	65 (54.17)	29.38

Children education	50 (41.67)	27.8
Medicine	13 (10.83)	15.00
Recreation	9 (7.5)	10.00
Livestock purchasing	9 (7.5)	39.40
Agriculture	8 (6.67)	28.15
Gold purchasing	5 (4.17)	37.00

The majority (41.6) of the respondents' families were consuming 1-5 birds/year, followed by 29.5 percent consuming 6-10 birds/year, with a mean consumption of 7.9 birds/year. With an average body weight of 2.035 kg, each respondent's family was consuming 16.08 kg chicken/year (Table 9). The majority (40%) of respondents' families were consuming 1-100 eggs per year, followed by 39.2 percent consuming 101 to 200 eggs per year, with a mean consumption of 117 eggs /year (Table 10).

Table 9. Number of birds consumed per family per year (N=120)

Number of Giriraja birds Consumed	Frequency	Percentage	Mean (Range)
Nil	15	12.5	
1-5	50	41.6	
6-10	35	29.2	7.9*
11-15	5	4.2	(0-50)
16-20	8	6.7	
21 and above	7	5.8	

Table 10. Eggs consumed per family per year (N=120)

Distribution	Frequency	Percentage	Mean (Range)
Nil	11	9.1	
1-100	48	40	117
101-200	47	39.2	(0-275)
201-300	14	11.7	

It is clear from the findings that each respondent's family is consuming 16.08 kg of chicken and 117 eggs per year. With a mean family size of four members, each family member is consuming 4.02 kg of chicken and 29 eggs per year. The Indian Council of Medical Research (ICMR) has set beneficial guidelines recommending a per capita consumption of 180 eggs and 11 kg of meat (Mehta

et al., 2003; Marmat et al., 2024). However, in 2023-2024, the actual availability in India reached only 103 eggs and 7.39 kg of meat per person annually (BAHS, 2024; PIB, 2024). This indicates an opportunity for improvement in nutritional intake across the population. Notably, the study found that engaging in Giriraja backyard poultry farming can significantly enhance nutrition by providing an additional 4.02 kg of chicken and 29 eggs per household. Encouraging such practices could play a pivotal role in meeting dietary recommendations and improving overall health.

In India's northeastern region, which holds over 69 million poultry, backyard farming predominates, supporting rural livelihoods, nutritional security, and women's empowerment (Doley et al., 2025). Backyard poultry farming presents a feasible, economical method for supplying nutritious food, particularly eggs and chicken meat, which serve as affordable and accessible protein sources (Singh et al., 2017; Sonkar et al., 2020; Sree et al., 2025).

Experiences in several developing and under developed countries also suggest that increased backyard chicken farming would contribute positively on livelihood security in terms of household food security, improved nutritional intake and in income generation (Bhurtel, 1996; Kumtakar, 1999; Rangnekar and Rangnekar, 1996; Panda and Nanda, 2000; Dessie and Ogle, 2001; Mandal et al., 2002, Rajini and Narahari, 2002; and Conroy et al. 2004 and 2005).

Conclusion

This study investigated the impact of small-scale Giriraja backyard poultry farming on improving nutrition, fostering economic stability, and enhancing livelihoods in rural communities. The research highlights the numerous nutritional benefits associated with cultivating this particular breed of poultry at home, as well as the economic advantages that arise from egg and meat production, which can significantly contribute to the financial well-being of rural households.

In light of the emphasis placed by the Government of India and the Indian Council of Agricultural Research on backyard poultry as a vital strategy for ensuring livelihood security in rural areas, the study provides compelling evidence of the positive outcomes experienced by farmers who engage in backyard poultry farming. Understanding the motivations behind farmers' decisions to rear backyard poultry is critical; these factors can greatly influence the planning, execution, and sequencing of intervention strategies aimed at enhancing the sector.

In particular, in regions such as Mandya and Mysore, where approximately 90 percent of produced eggs and birds are sold in local markets, farmers may

be more inclined to adopt a commercial approach to family poultry farming. This inclination underscores the importance of providing targeted institutional support to assist these farmers in scaling their operations effectively.

The data collected revealed that the average income derived solely from backyard poultry farming amounts to Rs. 1,385, which underscores its significant role in alleviating poverty within these communities. Furthermore, the average cost-benefit ratio of 5.45 is notably higher in comparison to many other agricultural and livestock farming practices, indicating a favorable economic return on investment.

The economic contributions of backyard poultry farming are further illustrated through its impact on various household expenditures, including those related to food, healthcare, and children's education. These benefits collectively indicate the positive economic repercussions experienced by the respondents involved in this study.

From a nutritional standpoint, the benefits of Giriraja backyard poultry farming are multifaceted and significant. The study reported that respondents consumed an average of 4.02 kg of chicken and 29.32 eggs directly sourced from their backyard operations. This represents a substantial contribution to their overall nutritional intake, enhancing food security within the household.

Based on these findings, the study strongly recommends the large-scale distribution of Giriraja poultry within social frameworks to extend these benefits to a wider array of rural communities, thereby promoting improved nutrition and economic upliftment across the region.

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