

Economic empowerment of tribal women through backyard poultry farming in the eastern Himalayan region

A. Roy, N.U. Singh, S. Das, S. Deori, A. Yumnam, P. Paul, C. Gowda, K.P. Biam, Thameridus B. Marak*, L. Dkhar and W. Dkhar and B.P. Singh

ICAR Research Complex for NEH Region, Umiam-793103, Meghalaya INDIA

*Corresponding author email: thameri.marak@gmail.com

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Abstract

The study was conducted in five villages of Marngar cluster, Ri-Bhoi district of Meghalaya to identify the role of backyard poultry farming in livelihood improvement of the rural women and the constraints perceived by the women in backyard poultry farming. A total of 100 numbers of female respondents were selected from the villages and they were provided with 20 numbers of Vanaraja chicks in the first year. Prior training on backyard poultry rearing was imparted to the beneficiaries. Data were collected on the socio-economic profile of the respondents; financial gain received by the beneficiaries as well as the constraints faced by them to rear backyard poultry birds. The cost benefit ratio was found 1.78:1. A total of 10 constraints under the five major categories were identified. Financial constraints followed by the space constraints were found to be the greatest barrier for this backyard poultry farming. Targeted credit facility such as micro finance for women, timely supply of critical inputs such as feed and medicine, vaccination, localized market facilities may help in establishing sustainable livelihood for the women farmers in the study area.

Keywords: Backyard poultry; Constraints; Vanaraja; Women empowerment

Introduction

India, with an abundant resource of livestock and poultry, plays a vital role in improving the socio-economic conditions of the rural population. In the past 8 years, livestock sector in the country has taken a sharp rise with a Compound Annual Growth Rate (CAGR) of 13.4%. The contribution of livestock in total agriculture and allied sector Gross Value Added (GVA) has increased from 24.4 per cent (2014-15) to 30.2 per cent (2021-22). During 2021–2022, the livestock sector has provided 5.7% of the total GVA. According to Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) production data (2021), India ranks 2nd in Egg Production and 5th in meat production in the world. Over the past 9 years, egg production in the country has increased from 78.5 billion (2014-15) to 138.4 billion numbers (2022-23) with a CAGR of 7.4% (PIB, 2023). Similarly, meat production in the country has increased from 6.7 million tones (2014-15) to 9.8 million tones (2022-23) over the past 9 years. Considering the agricultural development challenges in North East India, the livestock sector is likely to provide the needed growth opportunity to accelerate and sustain agricultural development in the region. Poultry sector plays a vital and crucial role for providing supplementary income to the rural population. Backyard poultry in India has started way back when people become a social entity (Rajkumar *et al.*, 2021). As a developing country, 66% of India's population lives in rural regions, and about 89% of those individuals have a backyard poultry farm providing an additional source of income (Pal *et al.*, 2020). Backyard poultry has become a convenient and promising venture with high economic return and less investment, helping an individual to upscale their socioeconomic and nutritional status (Chakrabarti *et al.*, 2020). Being one of the modern-day blessings for Indian economy, most of the poultry farms are located in urban and semi urban areas for supplying to nearby cities making it unavailable to the rural population. These populations depend on their own backyard poultry farms to meet the requirement of meat and eggs (Singh *et al.*, 2021). Poultry products having high Biological Value (BV) and can play a major role in tackling the malnutrition in the country. Backyard poultry farming is often a low input enterprise which is characterized by a traditional shelter house and a scavenging system with fewer amounts of supplementary feeding and local marketing (Khawaja *et al.*, 2012; Singh *et al.*, 2025). Backyard poultry farming with improved technologies such as rearing suitable breed, healthy chicks, proper vaccination schedule, and appropriate management can result in better economic return and guaranteeing an improved livelihood in the rural areas. Apart from employment generation, it also plays an important role in reducing environmental pollutions by usage of kitchen and vegetable waste, utilization of agricultural by-feeds and leftovers (Kumar *et al.*, 2021). Backyard poultry can be a promising route in terms of empowering rural women by giving them the opportunity of financial, social and nutritional security, decision-making capability, and mobility (Singh and Jadoun, 2014). Backyard poultry in India contributes to about 15 % of the total poultry production (Pal *et al.*, 2020). Over the past few years, 45.8 % increase has been recorded in the total backyard poultry production as compared to the previous census in 2019. Commercialization of backyard poultry farming holds the potential to fight against poverty, hunger, poor health, gender inequality which will create an opportunity in achieving the UN Sustainable Development Goals. Keeping this in mind, a study was conducted in Marngar Cluster consisting of Five (5) villages in Ri-Bhoi district of Meghalaya with the objectives to assess the role of backyard poultry farming in livelihood improvement of the rural tribal women and the constraints perceived by the women poultry farmers.

Materials and Methods

Ri-Bhoi is a predominantly hilly district with an area of 2448 sq. km lying between E 91°20'30" and E 92°17'00" Longitude and N 25°40' to N 26°20' Latitude. The district has a forest area of 2448 sq. km. i.e., about 36% of the total area. The net area sown constitutes 9% of the total geographical area and 6% of area remains under fallow. The average annual rainfall in the district is 2935 mm with temperature ranging from 10°C in December to 35.2°C in the month of July and August. It is possible to discern that the majority of the soil in the district is composed of lime silt and patches of black loamy soil. This soil is perfect for growing both native and improved varieties of crop. Marngar Cluster consisting of Five (5) villages namely Borgang, Nongagang, Purangang and Lalumpang and Nalapara were selected for this study (Figure 1). This cluster is located 10 KM towards East from Nongpoh (Ri-Bhoi district headquarters). The total populations of this cluster are 3009 out of which 1523 male and 1486 female are there who resides in more than 600 household (Census 2011, GOI). The main cropping system of the villager in this cluster is paddy (in Kharif) - fallow (in Rabi) for low land. The literacy rate of the selected cluster is 66.93% which is lower than the district average of 75.7% literacy rate. Twenty women of 20 different families from each village belonging to the ST community were selected randomly, thus, a total of 100 women were selected for this study. Each woman has been provided with 20 numbers of 28 days old vanaraja chicks. Figure 2 (a & b) shows a poultry birds reared in backyard. Trainings were imparted to them for basic poultry rearing as well as

monitoring methods. Relevant data were collected from the women beneficiaries after two months of providing the chicks. Data regarding the economics of backyard poultry farming were obtained through structured schedule. Basic data on socio-economic profile of the selected beneficiaries were also collected through household survey method. Data related to constraints were obtained through personal interaction at an individual level and also by using semi-structured interview schedules.

The net profitability of backyard poultry rearing was calculated using the following relationship:

$$NI = GI - C$$

Where, NI = Net Income over variable cost

$$GI = \text{Gross Income} = Y_m \times P_m$$

Where, Y_m = Total production of product.; P_m = Price per unit of the product; C = Cost of inputs.

The various inputs selected were housing, feed materials such as broken rice, household wastes, medicines, family labour for poultry bird production.

Supplementarily, Benefit – Cost Analysis was used to provide the level of financial profitability of backyard poultry rearing. Constraints perceived in the production of backyard poultry suggested by the sample farmers were prioritized by using Garrett's ranking technique by using the following formula:

$$\text{Percent Position} = 100 (R_{ij} - 0.50) / N_{ij}$$

Where, R_{ij} is the rank given to the i^{th} item by the j^{th} individual, and N_{ij} is the number of item ranked by the j^{th} individual.

The percentage position of each rank was converted into score using Garrett's table. For each constraint, score of individual respondents were added together and were divided by the total number of respondents for whom scores were added. Thus, mean score for each constraint was ranked by arranging them in descending order.

Results and Discussion

Socio economic characteristics of sample farm households:

Socio economic characteristics of the sample farms showed that majority of the farmers in the study domain were small and marginal farmers (Table 1). Marginal category (0-1 hectare) included 57 per cent of the farmers with average family size of 11 with more than two-third educated up to primary level. Small category included 24 per cent of sample farmers with average 9 members in the family. Education-wise there was not much difference between marginal and small farmers. On the other hand, farmers with more than two hectares of land had family size of 12 and had better education spread. As usual, distribution of land holding was highly skewed towards large farmers. All the farmers are rearing poultry birds as a subsidiary income.

Women have been considered to be the major proprietor of poultry farming in rural India. Poultry farming is also considered as major subsidiary income source as it helps in fetching cash in the households. In the present study 100 women were provided with 20 numbers of 28 days- old Vanaraja chicks. The performance of the vanaraja poultry birds in backyard farming system is given in Table 2. Vanaraja birds are highly preferred by the farmers due to its colour pattern, taste of meat, high growth rate and production of more eggs compared to local poultry. Further, the mortality after brooding phase is low in the farmer's field as compared to desi or local poultry birds. The similar result was also reported by Singh *et al.* (2019) during the socioeconomic impact assessment of vanaraja backyard poultry farming in Sikkim.

Growth performance of Vanaraja chicken under backyard system

The average body weight of vanaraja birds under backyard system at 8, 10 and 12 weeks of age are given in Table 3. The average daily growth rate of Vanaraja birds under backyard conditions from 6 to 12 weeks of age was 12.03 g/day in the present study, with the highest growth observed during 6–8 weeks (12.96 g/day and lowest in 8-10 weeks of age (10.11g/day). Similar findings have been reported by Sheikh *et al.* (2021), who observed superior body weight gain in Vanaraja birds compared with indigenous chickens under backyard rearing conditions. Rajkumar *et al.* (2020) also reported rapid juvenile growth in Vanaraja lines, while Baruah *et al.* (2024) demonstrated that Vanaraja birds maintained excellent growth performance under improved backyard management practices in rural areas of Northeast India. These findings indicate that Vanaraja birds possess high growth potential and are well suited for low-input backyard production systems.

Table 1. Socio-economic characteristics of sample farm households

Particulars	Marginal (0-1 ha)	Small (1-2 ha)	Others (> 2 ha)
No. of farmers	57	24	19
Average size of family (No)	11	9	12
Education of head of household (% of total)			
Primary to secondary (10 th)	37.5	34.3	31.6
Secondary to Higher Secondary (10+2)	58.9	59.6	57.9
Degree & Higher	3.6	6.1	10.5
Average size of land holding (ha)	0.54	1.47	4.22
Average annual income of households	<50000	65000	>100000
Average size of each fragment of land (ha)	0.21	1.14	2.54
Source: From field survey, 2023			

Table 2: Performance of Vanaraja birds compared to desi/local breed in the study area

Economic traits	Vanaraja	Desi /local breed
Average body weight in six weeks	521 gm	400 gm
Average age at first laying	19–23 weeks	28- 30 weeks
Average no of eggs in a year	171	60
Mortality rate (%)	20	70

Table 3. Performance of Vanaraja chicken in backyard system in Meghalaya

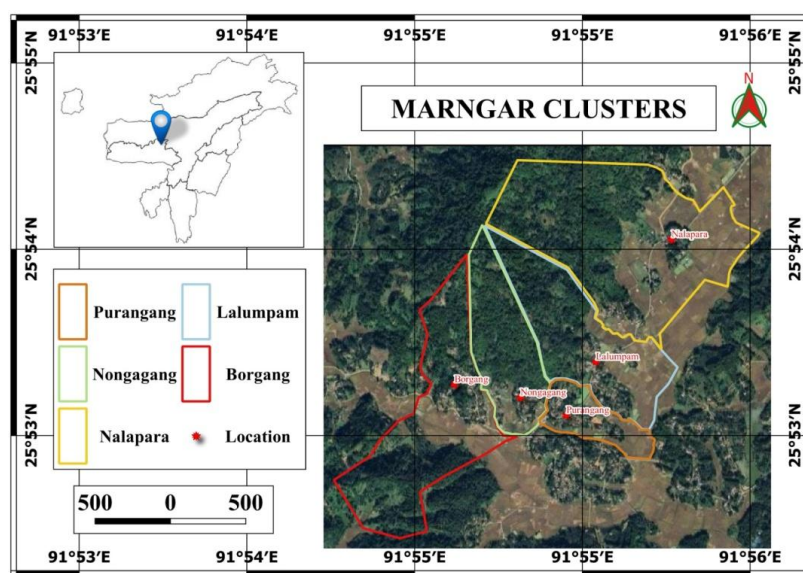
Parameters	Backyard system (Farmers field)
8 th week body weight (gm)	792.74
10 th week body weight (gm)	934.18
12 th week body weight (gm)	1116.37
Weight gain (6 – 8 weeks) gm	182.38
Weight gain (8 – 10 weeks) gm	141.41
Weight gain (10 – 12 weeks) gm	182.19
Weight gain (6 – 12 weeks) gm	504.98
Daily GR (6 – 8 weeks) gm	12.96
Daily GR (8 – 10 weeks) gm	10.11
Daily GR (10 – 12 weeks) gm	13.01
Daily GR (6 – 12 weeks) gm	12.03
Mortality % (6 – 12 weeks)	5.00%

Table 4: Economics of a single unit back yard farm (20 birds) in first year

ITEMS	DETAILS
No of birds (Dual purpose breed)	20
Mortality	2
Production period	1 Year
FIXED COST	
Construction of housing for birds	Rs. 1800/-
VARIABLE COST	
Cost of chicks	Rs. 2400/-
Cost of feeds	Rs. 900/-
Medicine	Rs. 543/-
Electricity	Rs. 120/-
Family labour	Rs. 6720/-
Depreciation	Rs. 350/-
Total cost of production	Rs. 12833/-
Total Cost of production excluding labour	Rs. 6113/-
No. of eggs sold	1449
Consumed	90
Return from the eggs @Rs.10/egg	Rs.15390/-
Return from selling the birds for meat	Rs.7500/-
Gross Return	Rs.22890/-
Net Return	Rs. 10057/-
Net return excluding labour	Rs. 16777/-
B:C Ratio	1.78: 1
B: C Ratio excluding labour	3.7: 1

Table 5. Constraints faced by farmers in backyard poultry farming.

Sl. No.	Constraints	Mean Garret Scores	Garret ranking
1.	Lack of capital	79.81	I
2.	Inadequate knowledge of vaccine schedule	69.11	II
3.	High cost of electricity	68.44	III
4.	Attack by predators	64.03	IV
5.	Inability to pay constant attention	62.25	V
6.	Chicks are costly	59.57	VI
7.	Irregular payment of sale of eggs	56.19	VII
8.	Lack of technical advice on time	55.19	VIII
9.	Inadequate knowledge of balanced feeding	53.45	IX
10.	Lack of adequate scavenging area	46.51	X

**Figure 1:** Geographical map of Marngar Cluster consisting of Five (5) villages

(a)



(b)

Figure 2 (a & b): Poultry birds reared in backyard

Economics of backyard poultry was calculated considering the improved management practices. Supplementary feed and medicine cost were also taken into account. The benefit cost ratio (Table 4) of a single unit backyard poultry farm in first year is 1.78:1. Excluding the family labour the B: C ratio went up to 3.7:1 (Table 4). So, the women involved in backyard poultry farming can get a net economic benefit of Rs. 16777/- (excluding family

labour) in a year. Similarly, Roy *et al.* (2023) has conducted the study in four villages surrounding the Khalsi Wetland of Nadia district of West Bengal where the benefit cost ratio (B: C) of a single unit (20 birds) backyard poultry farm in first year was found to be 1.6: 1 while excluding the family labour the B: C ratio went up to 7.6:1.

Since the women are rearing the poultry birds in their leisure time, the opportunity cost is almost zero, hence, the net return was also calculated without taking into account their labour cost. Thus, the women beneficiaries could earn Rs. 16,777/- in a year, which directly contributed to their household income. The eggs and meat produced were also used by the households which would help to meet the nutritional demand of the households. Moreover, about 25 per cent of the beneficiaries had successfully hatched the eggs, which could make the venture self-sustaining.

Constraints in Production and Marketing

Present study recorded a total of 10 major constraints faced by the farmers. The ranking of each constraint was presented in the Table 5. Among these problems lack of capital or lack of finance was the most severe constraints reported by the respondents with 79.81 average score in garret ranking followed by inadequate knowledge of vaccine schedule, high cost of electricity, attack by predators and inability to pay constant attention. All the constraints were categorized into five major constraints such as financial constraint, physical constraint, technical constraints, marketing constraint and constraint related to extension services and it was found that financial constraint was the major constraint to start the backyard poultry farming. On the contrary, constraints study of backyard poultry farming by Roy *et al.* (2023) found that Spatial constraints were the major constraints followed by technical constraints, personal constraints, financial constraints, constraints related to selling of product and constraints related to extension services.

Future Course of Action

Based on the findings of the study conducted in the Marngar cluster of Ri-Bhoi district, Meghalaya, backyard poultry farming has emerged as a viable livelihood option for rural women, evidenced by a favorable cost–benefit ratio of 1.78:1. However, the sustainability and expansion of this enterprise depend on addressing the key constraints identified, particularly financial limitations and inadequate space. Hence, the following future course of action is being recommended:

1. Strengthening Financial Support Mechanisms: Since financial constraints were identified as the most significant barrier, targeted credit and subsidy support should be prioritized. Establishing women-centric microfinance schemes, self-help group (SHG) linked credit facilities, and low-interest livestock loans can enable women farmers to expand their poultry units, improve housing, and purchase quality inputs.

2. Improving Access to Critical Inputs: Regular and timely supply of quality chicks, balanced feed, medicines, and vaccines is essential for reducing mortality and improving productivity. Developing decentralized input supply centers or village level poultry resource hubs can ensure easy accessibility for rural women.

3. Enhancing Veterinary and Extension Services: Continuous technical guidance is necessary to sustain the gains achieved through initial training. Regular vaccination drives, disease surveillance, and doorstep veterinary support should be organized through collaboration between the Department of Animal Husbandry, ICAR institutions, and local extension agencies.

4. Developing Low-Cost Housing Solutions: Space constraints can be addressed by promoting scientific, low-cost, and space-efficient poultry housing models suitable for the hilly terrain of Meghalaya. Demonstration units and hands-on training can help women adopt improved housing practices that enhance bird health and productivity.

5. Creating Localized Market Linkages: The establishment of village-level or cluster-based poultry markets and aggregation centers can improve market access and ensure better prices for eggs and birds. Linking producers with local retailers, hotels, and institutional buyers will enhance income stability and reduce dependence on middlemen.

6. Promoting Collective Action and SHG-Based Enterprises: Encouraging women to organize into producer groups or SHGs will enable collective marketing and enhance access to government schemes and financial institutions.

7. Encouraging Research and Monitoring: Further research should focus on improving locally adapted poultry breeds, optimizing feeding strategies using locally available resources, and assessing long-term socio-economic impacts. Periodic monitoring and impact evaluation will help refine interventions and ensure sustainable outcomes.

Conclusion

The study highlights that backyard poultry farming has significant potential to improve the livelihoods of rural women in Meghalaya. With focused interventions in finance, input delivery, training, veterinary care, housing, and market development, backyard poultry can evolve from a supplementary activity into a sustainable women-led rural enterprise contributing to income generation, empowerment, and nutritional security.

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