Original Research

Socioeconomic Impact of Vanaraja Backyard Poultry Farming in Sikkim Himalayas

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Abstract

Backyard poultry production is a traditional livelihood option among rural tribal people of Sikkim with rearing of indigenous birds of poor production performances. Backyard poultry farming with improved bird like Vanaraja is a potent tool for livelihood promotion and nutritional security of the rural people of Sikkim in a sustainable way under organic farming. The Vanaraja bird is hardy and has better immunocompetence due to which it is successfully adapted under backyard poultry farming system in Sikkim. In the present study the benefit-cost (B: C) ratio in Vanaraja and local chicken is recorded as 4.41 and 1.57, respectively. The net income per bird is significantly higher (Rs.995.97 only) in Vanaraja than local bird (Rs.287.22 only).The higher B:C ratio and higher net return per bird in case of Vanaraja indicates that Vanaraja rearing is much more profitable than the local poultry bird.

Key words: Backyard Poultry, Sikkim Himalayas, Socioeconomic, Vanaraja

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Introduction

Rural tribal people of North-Eastern Region of India including Sikkim have been practicing traditional backyard poultry farming as an option for their livelihood (Singh *et al.*, 2018). Most of the backyard poultry production comprises rearing of indigenous birds of poor production performances. The potential of indigenous birds in terms of egg production is only 40 to 50 eggs/ Bird/ Year and meat production is also very less (Islam *et al.*, 2015; Singh *et al.*, 2017). Vanaraja poultry farming in backyard condition has tremendous scope for livelihood promotion and nutritional security of the rural people of Sikkim in sustainable way particularly under organic farming condition. Commercial layer farming is practically non-

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existent in Sikkim due to inherent deficiency of organized layer poultry farming. Backyard poultry farming by and large is a low input or no input venture. Besides income generation, backyard poultry helps in alleviation of malnutrition of the rural people through production of valuable animal protein and empowers rural women. In spite of low productivity, the contribution of backyard poultry towards Indian egg production is about 30 to 40 per cent (Nath *et al.*, 2012). Vanaraja birds, a dual purpose variety for free range farming in rural and tribal areas is developed by ICAR- Directorate of Poultry Research, Hyderabad. The male of Vanaraja birds weigh about 1.5 to 2.0 kg at 10-15 weeks and females lays about 130-150 eggs in a laying year. The bird is hardy and has better immunocompetence due to which it is successfully adaptable under backyard farming system (Niranjan *et al.*, 2008a). Due to its multicoloured plumage, brown eggs and meat taste similarity with desi birds, it is well accepted by the rural people including tribals across the Sikkim state.

The present study was conducted among the farmers of all the four districts of Sikkim to know the cost of rearing of such small scale backyard poultry with Vanaraja and local chicken and there comparison thereof.

Materials and Methods

The study was conducted in all the four districts of Sikkim from an altitude of 1300 m ft to 2700 m amsl. Total ten villages on random basis were selected from East and South districts and five villages were selected from North and West districts due to the hard terrain and harsh weather of North and West district. Ten numbers of tribal farmers from each village, thus a total of 300 numbers of farmers from various self-help groups (SHGs) were selected on the basis of their early experience in keeping indigenous *viz.* Dumsi (frizzled feathers) and naked neck as well as Vanaraja birds in their households. The Vanaraja birds (25 nos.) were supplied to the tribal farmers by ICAR Sikkim Centre, under Tribal Sub Plan of Poultry Seed Project. Farmers maintaining minimum of 10 numbers of indigenous chicken and 25 numbers of Vanaraja birds were considered for the study.

The birds were kept under traditional backyard system. The birds were vaccinated with Ranikhet and Gumboro disease vaccines as per standard vaccination schedule. Farm advisory services, monitoring and data collection was done in the fields at regular intervals. Labour and feed cost under backyard poultry farming was calculated as per Islam *et al.* (2015). Under backyard system both egg and meat were considered as source of income and all the eggs produced were considered as table eggs. The eggs and birds were sold directly to the consumer at the prevailing market rates. Items of cost included fixed cost *viz.*, land and building, equipments and variable costs *viz.*, cost of day-old chick, feed, vaccine, medicine, labour *etc.* Return items included egg, live cocks and spent hens. The net return was calculated by deducting the net cost of production from the return from eggs and or birds. The cost-benefit ratio was calculated by dividing the total gross return by net cost of production. The mortality rate was found to be around 10% for both

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Vanaraja and local chicken, during the whole experimental period. The data on various expenses and returns thus collected tabulated and were subjected to statistical analysis as Snedecor and Cochran (1994).

Results and Discussion

The economy of production of Vanaraja for 25 birds and local poultry for 10 birds in Sikkim are shown in the Table 1.

Table 1: Production cost of backyard Vanaraja and local poultry

Particulars	Vanaraja	Amount (Rs.)	Local Poultry	Amount (Rs.)
A. Fixed cost				
a) Land	Existing	---	Existing	---
b) Poultry shed made of locally available wood		1000 (13.69)		500 (9.06)
c) Equipments	Nil		Nil	
B. Variable cost				
a) Cost of day old chicks	@ Rs.35/- per chicks	875 (11.98)	@ Rs.40/- per chicks	400 (7.24)
b) Cost of feed up to 30 days of age	@ Rs. 30/- per kg of broken rice, crushed maize and commercial feed	750 (10.27)	@ Rs. 20/- per kg of broken rice and crushed maize	100 (1.81)
i) Broken rice along with crushed maize for local (5 kg for 10 birds)				
ii) Broken rice along with crushed maize and commercial feed for Vanaraja (1 kg for one bird)				
c) Vaccine	@ Rs.1.78 per chick	44.5 (0.6)	@ Rs.1.78 per chick	17.8 (0.32)
d) Medicine and feed supplements	@ Rs.3.25 per chick	81.25 (1.11)	Nil	
e) Labour @ 10 hrs per month= 1.25 man days, total man days: 22.5 for the both flock	@ Rs. 200 per man day	4500 (61.63)	@ Rs. 200 per man day	4500 (81.55)
f) Miscellaneous cost		50 (0.68)		nil
Total variable cost		6300.75		5017.8
Total cost of production		7300.75		5517.8
Cost of production per bird		**292.03**		**551.78**

Figures in parentheses indicate per cent of total cost of production

The less number of local poultry in current study in comparison to Vanaraja birds is due to lack of source of germplasm. Vanaraja birds are highly preferred by the farmers due to its colour pattern, meat taste, 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. However, the farmers preferred Vanaraja for meat purpose particularly in the remote areas because of non-availability of feed and also due to its high growth rate. The labour cost accounted for 61.63 percent of the total cost of production in case of Vanaraja followed by poultry shed (13.69 %), cost of day old chicks (11.98 %) and feed (10.27%). However, labour cost accounted for 81.55 percent in case of local poultry, followed by poultry shed (9.06), chick cost (7.24 %) and feed cost (1.81 %). Labour cost comprised the highest percentage of total cost of production (Oladunni and Fatuase, 2014). The feed cost alone contributed 90.95 % of the total cost of production in backyard poultry farming in Sikkim (Pathak and Nath, 2013) which may be due to the inclusion of feed cost for entire duration of 18

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months which is not the case in backyard poultry. Higher labour cost may also be due to the engagement of disguised labour in the backyard poultry production, therefore, providing gainful employment particularly to the tribal women.

The cost of vaccine accounted for only 0.60 % and 0. 32 % of the total cost of production in case of Vanaraja and local chicken, respectively. However, the tribal farmers generally did not vaccinate local poultry birds. Similarly, cost of medicine and feed supplements shared only 1.11 % of the total cost of production in Vanaraja birds. The cost of medication was only 0.81 % of the total cost in backyard poultry in Nigeria (Saha, 2003). The lower cost of medicines and other feed supplements in local chicken as compared to Vanaraja chicken might be due to the higher immunity to disease and higher adaptability in local poultry. In the present study, the total cost of production up to 72 weeks of age was found to be higher in Vanaraja (Rs. 7300.75) than its local counterpart (Rs. 5517.8) but the cost of production per bird is higher in local poultry which is mainly due to the higher labour cost for smaller local poultry unit. The cost of production per bird is estimated as Rs. 292.03 for Vanaraja and Rs.551.78 in local poultry which is due to higher number of birds in Vanaraja group for the same amount of labour. In contrast to the present findings, (Pathak and Nath, 2013) reported higher cost of production per bird as Rs. 729.50 under scientific backyard rearing of high yielding chicken in Sikkim.

In case of income generation, it was found that maximum amount of income was contributed by sale of eggs (40.37 %) followed by cocks (30.27 %) and spent hens (29.34 %) in case of Vanaraja (Table 2). In case of local poultry, maximum income was contributed by sale of spent hen (42.37%), cock (33.79%) and eggs (23.83%). The highest amount of income in backyard poultry farming was derived from sale of eggs (65.96 %) in Sikkim (Pathak and Nath, 2013). The income from Vanaraja chicken by sale of eggs was much higher than its local counterparts, which was due to production of more numbers of eggs by Vanaraja birds (Uddin *et al*, 2013). The total gross income in Vanaraja chicken was also more than the local poultry under backyard rearing. Similarly, the net income from Vanaraja birds was also higher than local poultry. The benefit: cost (B:C) ratio in Vanaraja and local chicken is recorded as 4.41 and 1.57, respectively. The higher benefit: cost ratio in Vanaraja is due to more egg production and attainment of better body weight in the given period of time as compared to local chicken. Much higher benefit cost ratio (5.57) in native poultry reared in the coastal regions of Bangladesh (Oladunni and Fatuase, 2014).

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Table 2: Returns from various components

Particulars	Vanaraja	Amount (Rs.)	Local poultry	Amount (Rs.)
Sale of eggs (10 no. of Vanaraja and 5 no. of local hen)	Average annual egg production: 130 ± 7.89 eggs/hen, Total egg production: 1300 nos. @ Rs. 10/egg	13000 (40.37)	Average annual egg production: 40 ± 4.45 eggs/hen, Total egg production: 200 nos. @ Rs. 10/egg	2000 (23.83)
Sale of cocks (10 nos of Vanaraja and 5 nos. of local cocks)	Average weight: 3.25 ± 0.87 Kg, Total weight: 32.5 Kg @ 300/Kg	9750 (30.27)	Average weight: 1.89 ± 0.48 Kg, Total weight: 9.45 Kg @ 300/Kg	2835 (33.79)
Sale of spent hen (10 nos of Vanaraja and 5 nos. of local hen)	Average weight: 3.12 ± 0.94 Kg, Total weight: 31.5 Kg @ 300/Kg	9450 (**29.34**)	Average weight: 2.37 ± 0.68 Kg, Total weight: 11.85 Kg @ 300/Kg	3555 (**42.37**)
Total gross income		32200		8390
Net income		**24899.25**		**2872.2**
Net income per bird		**995.97**		287.22
Benefit: cost ratio		4.41		1.52

Figures in parentheses indicate per cent of total return

However, much lower benefit: cost (B:C) ratio of 1.73 in Rhode Island Red chicken rearing in backyard system in West Bengal (11). The benefit cost ratio as 1.73 in scientific backyard poultry farming in Sikkim (Pathak and Nath, 2013) whereas (Niranjan *et al.*, 2008b) reported higher benefit: cost ratio for Vanaraja (2.60) as compared to local poultry (2.27) in Assam. The average benefit: cost ratios of layer and broiler farms were 1.15 and 1.10, respectively under intensive system of management in Bangladesh (Masud and Real, 2013). The higher B:C ratio in case of Vanaraja chicken indicates that Vanaraja rearing is much more profitable in the study areas than local chicken mainly due to more number of eggs and higher body weight at a given age.

Conclusion

Backyard poultry production is a traditional livelihood option in Sikkim. Most of the backyard poultry production comprises rearing of indigenous birds with poor production performances. The potential of indigenous birds in terms of egg production is only 40 to 50 eggs/ bird/year and meat production is also very less. However, the backyard poultry production can be easily enhanced with improved varieties of chicken (Vanaraja) and can promise better production of meat and egg. To improve the socio-economic status of the traditional farmers, backyard poultry is a handy enterprise with low initial cost investment, but high economic return along with the guarantee for improving protein deficiency among the poor. The backyard poultry farming is a sustainable livelihood option under organic farming as it promotes animal's natural behavior and animal's welfare. Moreover, under organic farming there is emphasis on use of locally

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available feed resources which ultimately reduce the reliability on commercial poultry feed. There are huge opportunities ahead to harness the full potential of Vanaraja poultry under organic and backyard condition.

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