

Role of Vanaraja as Backyard Poultry in Rural Economy of Tribal Farmers of East District of Sikkim

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ABSTRACT

Intervention of backyard poultry with improved dual purpose bird (Vanaraja) for economic upliftment of the rural economy was taken up by Krishi Vigyan Kendra, East Sikkim as a viable alternative practice in Sikkim, keeping pace with the booming tourism industry. Initially farmers were apprised of the new poultry variety, their housing, brooding, feeding, health care and profitability. The farmers were identified as first-line beneficiaries and a peer pressure oriented group dynamics methodology was followed for self-sustenance of the activity by utilizing the best resourceful persons from the group at the initial stage. The present study was conducted to determine the contribution of Vanaraja poultry towards socio-economic upliftment of the tribal farmer. In the present study, two hundred tribal farmers were selected randomly from the East district of Sikkim. Data was recorded on socio-economic status of farmers (gender, occupation, educational status and poultry farming experience), management practices and occurrence of disease and economics of poultry farming. The study recorded that the average land holding of the farmers was 1.1 ha and the number of poultry birds per family was 2 cocks and 10-12 hens. Ninety per cent of the respondents practiced the semi-intensive system of rearing, whereby kitchen waste and spoilt grains were used to feed their birds. The observations showed a significant increase in the performance of the Vanaraja bird over the indigenous ones; in respect of average body weight of Vanaraja and indigenous at 4 months were 2.8 kg and 0.7 kg, age at first laying 176 and 198 days, average annual egg production 154 and 44 and the benefit: cost ratio per unit of 25 birds 2.47 and 1.74, respectively. Thus, the technology could make an excellent impact in improving the livelihood status and ensuring sustainable food security for the tribal farmers of the East district of Sikkim.

Keywords: Backyard poultry, economic upliftment, indigenous chicken, sikkim, vanaraja

INTRODUCTION

Backyard poultry is an important source of additional income generation for the rural household, especially among poor strata of the population. Pathak and Nath (2013) stated that livestock and poultry rearing is an imperative factor for improving the nutritional security of rural poor in India. It has also been an effective tool for poverty alleviation in the rural area. The supplemental earning through this increases income of the farmers; thereby, enhances rural livelihoods. Most of the backyard poultry production comprises rearing of indigenous birds with poor production performances. However, the indigenous birds are capable of producing only 40 to 50 eggs per year and meat production is also very less. It is necessary to introduce improved varieties of chicken to increase the production, which can promise better production of meat and eggs.

Sikkim, the 22nd state and the second smallest in the country, in the lap of Eastern Himalayas has the maximum

scope for high value and low volume crops like vegetables, spices, medicinal and aromatic plants, flowers as well as livestock and poultry production. But in Sikkim, chicken reared in backyard are mostly of indigenous variety with low egg and meat production and there is need for introduction of improved dual purpose bird having capacity to lay more eggs and gain higher body weight than the local birds. In order to increase backyard poultry production in the state, the ICAR-National Organic Farming Research Institute, Tadong introduced Vanaraja birds in Sikkim, which was tested and propagated by KVK, East Sikkim through its On Farm Trial (OFT) and Front Line Demonstration (FLD) programme.

The present study had been undertaken to generate scientific data on the performance of Vanaraja birds at farmer's field as well as its contribution in the upliftment of the economic status of the tribal farmers of East district of Sikkim.

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METHODOLOGY

The present study was conducted in East district of Sikkim. Sikkim is one of the North-eastern states of India situated in the Eastern Himalaya region bordering China in its north and east, Bhutan on its east, Nepal on the west and the Indian state of West Bengal on its south. A part of Eastern Himalayas, Sikkim is notable for its biodiversity, including alpine to sub-tropical climate. Sikkim, administratively is divided into four districts, viz. North, South, West and East district. The experimental area (East district) situated at an altitude of 3000 ft above MSL and falls under Mid Altitude Humid Zone (2600-5200 ft). The district is characterized by heavy rainfall during summer and cold during the winter months. In East Sikkim district, average temperature during summer and winter is 28°C and 3°C, respectively. The annual average rainfall is 2950 mm. The average annual relative humidity is maximum 95 per cent and minimum 48 per cent. The major livestock resources in the district are cattle, pig, goat, yak and poultry (chicken), which act as important sources of livelihood of the rural poor.

The present study was based on the On Farm Testing (OFT) and Front Line Demonstration (FLD) activity conducted in East district of Sikkim for popularization of Vanaraja bird as backyard poultry, and the respondents of the study were the tribal farmers involved in the OFT and FLD programme on backyard poultry. The primary data as collected from the participating tribal farmers and secondary data pertaining to the demonstration was collected from the Annual Reports of KVK. Data was collected from 200 nos. of tribal farmers of 10 adopted villages comprised from six blocks through a pre-tested structured interview schedule and simple percentage analysis was used to interpret the findings. The data from the study was analyzed in 2017 based on the studies conducted from 2011-12 to 2016-17.

RESULTS AND DISCUSSION

In the present study, 67 per cent respondents were female. The educational background of the interviewed farmers revealed, 36.5 per cent of respondents were passed 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 (Table 1). 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 nos., respectively.

Table 1: Distribution of gender and occupational, educational, and poultry farming experience of 200 tribal farmers responding to a questionnaire

Characteristics	% of respondents
Gender	
Male	33
Female	67
Educational qualification	
Illiterate	09
Class I-class IV	24
Class IV- class VII	16.5
Class VIII- class X	36.5
Higher Secondary and above	14
Farmer's experience	
1 year	13
1-3 years	21
3-5 years	38.5
>5 years	27.5
Family size	
	5.7
Land holding (ha)	
	1.1
Flock size of poultry	
	13

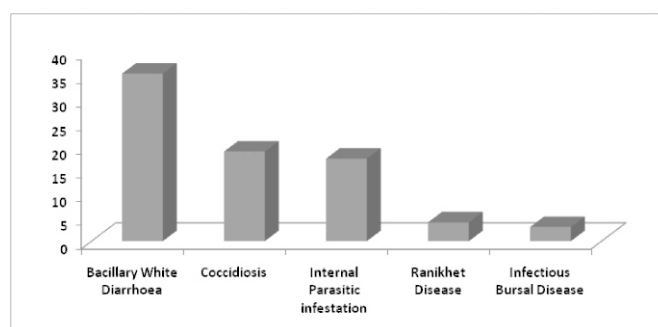


Fig. 1 Percentage of occurrence of major disease infestation in Vanaraja birds at farmer's field

The study revealed that the highest number of poultry farmers (43 %) preferred to sell their surplus Vanaraja male birds at the age of 4 months followed by 34 per cent farmers at the age of 5 months, 13 per cent farmers at the age of 3 months and 8 per cent farmers at the age of 6 months. Moreover, 12 per cent farmers showed interest in raising Vanaraja poultry as broiler birds and generally sold their birds (both male and female) from the age of 3 months and finished the sale process by the age of 4 months. These farmers reared the Vanaraja birds in intensive system of management under commercial broiler feed only.

Table 2: Farmers wise preferred marketable age of Vanaraja birds

Preferred marketable age	% of respondents
1 month	-
2 months	2
3 months	13
4 months	43
5 months	34
6 months	8

The average mortality rate of Vanaraja poultry as compared to indigenous chicken is presented in the Table 3. The study revealed that survivability of Vanaraja birds in backyard system was found to be little less as compared to the native strain. The mortality of Vanaraja and indigenous chicken was 8 per cent during the initial first month, which might be due to cold stress, as the temperature in Sikkim is as low as 3°C during peak winter season. During the whole experimental period of 18 months, the average mortality rate of Vanaraja bird was recorded as 15 per cent when compared with indigenous birds (11 %). Islam *et al.* (2015) recorded 20 and 10 per cent mortality rate in case of Vanaraja and indigenous chicken in climatic condition of Assam during the whole experimental period of 18 months. The recorded mortality rate of Vanaraja birds was lower in Sikkim as compared to Assam, indicating that the Vanaraja bird is more adaptable in hilly climatic condition. From the study, it has been observed that the average annual survival rate of Vanaraja and indigenous chicken variety was 85 and 89 per cent, respectively. The study also revealed that the highest mortality percent was due to disease (59 and 43 %) followed by cold stress (34 and 53 %) and predator (7 and 4 %) in Vanaraja and indigenous chicken, respectively.

Table 3: Mortality rate of Vanaraja as compared to indigenous chicken variety

Strain	Periodic mortality %					Annual mortality (%)	Annual survival (%)	Cause of mortality %		
	Age in months							Predator	Disease	Cold
	1 st	2 nd	3-5 th	6-7 th	>12 th					
Vanaraja	8	4	2	1	Nil	15	85	7	59	34
Indigenous chicken	8	2	1	Nil	Nil	11	89	4	43	53

The performance of Vanaraja and indigenous chicken during the experimental period is shown in Table 4. The average body weight of the birds at 4 months of age and average age of the birds at first laying was observed at 2.80 and 0.70 kg and 176 and 198 days in Vanaraja and

indigenous chicken, respectively. The average annual egg production of Vanaraja birds was much higher (154 nos.) as compared to native chicken variety (44 nos.).

Table 4: Performance of Vanaraja as compared to indigenous chicken at farmers field

Strain	Average body weight at 4 months	Age at first lay	Average annual egg production	Colour of the egg	Starting unit size
Vanaraja	2.80 kg	176	154	Tinted	25
Indigenous chicken	0.70kg	198	44	Tinted	25

The study revealed that the average B:C ratio recorded during 2011-17 for Vanaraja birds was 2.47 as compared to the indigenous chicken variety (1.74). Sumy *et al.* (2010) also reported profit margin of rearing indigenous chicken strain under backyard system had B:C ratio of 1.60 and 1.61 in two different study areas. Islam *et al.* (2015) reported that higher B:C ratio recorded in case of Vanaraja birds might be due to higher production of egg as well as faster body weight gain as compared to the indigenous chicken variety. The result indicated that Vanaraja is the best improved chicken strain which has been well adapted to the climatic conditions of Sikkim as majority of the farmers of the adopted villages preferred this strain due to its natural and attractive multi colour feather pattern, faster growth and higher laying capacity, which resembles like indigenous chicken.

Table 5: Economic analysis of Vanaraja as compared to indigenous strain

Year	Unit size	Gross cost		Gross return		B:C ratio	
		Vanaraja	Native birds	Vanaraja	Native birds	Vanaraja	Native birds
2011-17	25 nos.	16,105.00	8,933.00	39,810.00	15,534.00	2.47	1.74

In nurseries (up to 42 days old), the chicks were reared on standard starter ration. For the grower birds in the second phase, besides the feed material available from free range and kitchen wastes other kinds of grain or bran were provided in small quantities. Vanaraja can easily pick up its food from backyard once it learns to scavenge and therefore, supplemental feed requirement is much less than those reared under intensive poultry farming (Kumar *et al.*, 2014). The supplemental feed was generally given in the evening hours (40-60 g/bird/day) to develop the habit of returning to their shed for night shelter as well as for egg laying. In Sikkim, the different locally available feed resources for poultry in backyard are fallen grains (paddy, maize, buckwheat, millet *etc.*), insects, vegetable waste, kitchen waste, grasses and medicinal plants. The month-wise availability of local poultry feed resources in Sikkim is given in Table 6.

The need for additional supplementation to backyard reared chicken depends on the free area available in homestead, intensity of vegetation, availability of waste grains, insects and grass seeds (Pathak *et.al.*, 2013). Vanaraja pullets were also provided with supplemental calcium sources (*i.e.* lime stone powder, shell grit) mixed with feed or grain during laying phase @ 4-5 g/bird/day. This approach yields successful results with high rate of survivability and good egg production.

Some of the common diseases encounter in Sikkim includes: bacillary white diarrhoea, coccidiosis, internal parasites, Infectious Bursal Disease (IBD) and Ranikhet Disease (RD). The diseases against which the vaccines are currently in use are Ranikhet (F strain and Lasota) and IBD. The incidence of vaccine failure in Sikkim is reported occasionally, which can be attributed to faulty handling of vaccines *e.g.*, inadequate cold chain maintenance. The highest incidence of major poultry diseases recorded in the adopted villages is bacillary white diarrhoea followed by coccidiosis and internal parasitic infestation. In rare cases, incidence of RD and IBD was also recorded due to vaccination failure or sometimes because of to not giving timely vaccination.

Table 6: Month-wise availability of local poultry feed resources in East Sikkim

Month	Locally available major feed resources
January	Fallen paddy grains, vegetable waste of cole crops and kitchen waste
February	Buckwheat, vegetable waste of cole crops and kitchen waste
March	Buckwheat, vegetable waste of cole crops and kitchen waste
April	Fallen grains, vegetable waste of cole crops and kitchen waste
May	Insects, kitchen waste, grasses, medicinal plants
June	Insects, kitchen waste, grasses, medicinal plants
July	Maize grains, insects, kitchen waste, grasses, medicinal plants
August	Maize grains, insects, kitchen waste, grasses, medicinal plants
September	Maize grains, insects, kitchen waste, grasses, medicinal plants
October	Broken rice, insects, kitchen waste, grasses, medicinal plants
November	Fallen paddy grains, buckwheat, millet, insects, kitchen waste
December	Fallen paddy grains, buckwheat, millet, insects, kitchen waste

CONCLUSION

The backyard poultry farming with Vanaraja birds is gaining momentum as a potential practice for agri-preneurship development among the rural tribal youths and farm women leading to sustainable livelihood security in Sikkim. Thus, KVK East Sikkim could make an excellent impact on empowerment of tribal farmers through backyard poultry farming with Vanaraja birds. This enterprise not only provides economic stability but also nutritional security to the rural tribal population of Sikkim. The rearing of backyard poultry through the application of scientific technology will greatly

contribute to improve the socio-economic condition of the tribal people by making poultry farming more productive and remunerative.

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