



## Backyard poultry farming: A step towards doubling tribal farmer's income in mid-hill region of Meghalaya

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### ABSTRACT

Tribal people of Meghalaya are mostly non-vegetarian and prefer meat of local poultry birds. But the gap between demand and availability of local poultry meat and eggs is very high due to low production potential of the indigenous birds. To increase the productivity of the indigenous backyard poultry, improved breeds of backyard poultry chicks (Vanaraja/Srinidhi) were introduced, knowledge disseminated regarding feeding and health care management, organized training programs and health camps. Ten villages i.e. Nalapara, Purangang, Borgang, Lalumpam, Umtham, Mawphrew, Mawtnum, Borkhatsari, Lalumpam, Purangang of Ri-Bhoi district, Meghalaya were adopted under the Farmers' FIRST Programme (FFP), ICAR Research Complex for NEH Region, Umiam, Meghalaya. A total of 5272 nos. of poultry chicks were distributed among 150 nos. of beneficiaries. Body weight of 2.3-3.7kg and 1.1-1.7kg were attained within 60 weeks by the improved breeds and local birds, respectively. Annual egg production (nos.) was 130-155 and 43-60 in improved breeds and local birds, respectively. The egg weight was also higher in improved breeds (46-52g) than the local indigenous birds (28-32g). Mortality (9.93-15.31%) was recorded in the poultry birds due to diseases, predator and stress. Successful poultry farmers managed to sell on an average 8990 nos. of eggs @ Rs.10.00 per egg and earned about Rs.89,900.00 by selling eggs. Live male birds (3.5-4 kg) were sold @ Rs.250-300/- per kg live body weight and net income of about Rs.875-1200/- per bird was earned by the farmers after 8-10 months. It can be concluded that the interventions made under this project created a significant impact in improving the livelihood of backyard poultry farmers of the region by increasing their income.

### 1. Introduction

Agriculture is the major source of employment and livelihood for around 70 percent of the population in this region (Feroze *et al.*, 2010). India's modern commercial poultry production is barely 50 years old but backyard poultry farming is an age old practice among rural India and North Eastern (NE) Region of India including Meghalaya (Chakrabarti *et al.*, 2014). The people of this region are confined to their traditional food habits with meat as an integral part and the meat consumption

pattern and expenditure in this region are 2-3 folds higher when compared to the National level (Mahajan *et al.*, 2015; Kadirvel *et al.*, 2018). But the gap between the demand and supply of meat in the North East region is very high which may be due to traditional backyard poultry farming with indigenous birds having low production potential. The total poultry population of the country is 851.81 million (backyard poultry: 317.07 million; commercial poultry: 317.07 million), Meghalaya have 5.38 million i.e. 0.63% of the total poultry population (Livestock census, 2019).

All the NE states except Manipur and Sikkim have deficit in chicken production, thus poultry farming will be one of the most lucrative opportunities in most of the NE states (Mahajan *et al.*, 2015). Moreover, the preference for local poultry meat/egg is very high in comparison to the other breeds of poultry birds. Colored birds also fetch a higher price in comparison to the white broilers. But the farmers usually rear local indigenous birds which generally have low production potential in terms of eggs (40-50 nos. per year) and meat production (Islam *et al.*, 2015; Singh *et al.*, 2017; Pathak and Nath, 2013). Moreover, the gap between demand and supply of meat/egg are very high which may be due to traditional backyard poultry farming with low production potential. Thus, the present work has been undertaken to promote the scientific backyard poultry farming, improve the livelihood and nutritional security of tribal farmers of the mid-hill region of Meghalaya.

## 2. Materials and Methods

### 2.1 Study area

The present study was conducted in the Marngar village cluster, Ri Bhoi district, Meghalaya (Fig.1). The cluster is divided into two clusters, Marngar cluster (Borgang, Purangang, Lalumpam, Borkhatsari, Nalapara-Joigang) and Sarikhusi cluster (Umtham, Nongagang, Sarikhusi, Mawtnum, Mawphrew).



Fig.1

Marngar, Ri Bhoi, Meghalaya  
(25.914144°N, 91.916781°E)

### 2.2 Study period

The present study reports the work done during 2018-2020 under the Farmer FIRST Programme (FFP), ICAR Research Complex for NEH Region, Umiam, Meghalaya.

### 2.3 Scientific interventions

To increase the productivity of the indigenous backyard poultry in FFP adopted villages, improved breeds (Vanaraja/Srinidhi) of backyard poultry chicks (3 weeks) were introduced, knowledge disseminated regarding feeding and health care management,

organized training programs and health camps. Inputs in the form of veterinary medicines such as anthelmintics, vitamins and mineral supplements, anticoccidials, antibiotics etc. were also distributed among farmers. Extension folders having information on 'backyard poultry farming, common poultry diseases and its control, deworming and vaccination in livestock and poultry, red mite of poultry' in both English and Khasi language were distributed to the farmers. To prevent the birds from Ranikhet disease and fowl pox, vaccination was done. Regular fecal sample examination was done to ascertain the intensity of parasitic load in the poultry birds. A total of 5272 nos. of Vanaraja/Srinidhi poultry chicks were distributed among 150 nos. of beneficiaries in ten adopted villages (Borgang, Sarikhusi, Lalumpam, Purangang, Umtham, Borkhatsari, Nalapara-Joigang, Nongagang, Mawphrew, Mawtnum) of Ri-Bhoi district, Meghalaya. Comparative productive and reproductive performance of the improved and local poultry birds in each cluster was also studied.



Lalumpam village



Umtham village

Fig.2: Distribution of poultry chicks in FFP adopted villages

## 3. Results and Discussion

The poultry beneficiaries of the Marngar cluster, Ri-Bhoi, Meghalaya under the present study are mentioned in Table 1. A total of 119 nos. of male and 31 nos. of female were benefited.

**Table 1.** Poultry beneficiaries of Marngar cluster, Ri-Bhoi, Meghalaya

Cluster	Village	Beneficiaries		Poultry chicks (No.)
		Male	Female	
I. Marngar	Borgang	10	--	462
	Lalumpam	19	7	850
	Purangang	16	3	611
	Borkhatsari	6	4	640
	Nalapara	7	--	349
II. Sarikhusi	Nongagang	8	2	245
	Mawnum	9	7	585
	Mawphrew	7	5	272
	Sarikhusi	14	--	558
	Umtham	23	3	700
<b>Total</b>	<b>10</b>	<b>119</b>	<b>31</b>	<b>5272</b>

The performance of the improved breeds and local poultry birds with respect to the body weight, age at first egg, annual egg production, egg color and egg weight was recorded (Table 2, Fig.4). It was observed that body weight of 2.3-3.7 kg and 1.1-1.7 kg was attained within 60 weeks by the improved breeds and local birds, respectively. Annual egg production (nos.) was 130-155 and 43-60 in improved and local birds, respectively. The egg weight was also higher in improved breeds (46-52g) than the local indigenous birds (28-32g). Mortality rate was observed higher in the local

birds (14.27-15.31) than improved breeds (9.93-10.02). Prevalence of gastrointestinal (G.I.) parasitic disease was recorded highest in the improved breeds followed by infectious coryza, bacillary white diarrhea and fowl pox. In local birds, G.I. parasitic infections, Ranikhet disease and fowl pox observed. Different species of G.I. parasites such as *Eimeria* sp. (37.62%), *Ascaridia galli* (24.86%), *Strongyloides avium* (17.26%), *Heterakis gallinarum* (8.4%), *Capillaria* sp. (6.08%), *Choanotaenia infundibulum* (3.03%) and *Raillietina echinobothrida* (2.75%) were also recorded.

**Table 2.** Comparative performance of improved breed vs. local poultry birds

Cluster	Poultry breed (nos.)	Traits							B:C ratio	Mortality (%)	Disease prevalent (%)
		Body weight (10 weeks)	Body weight (40 weeks)	Body weight (60 weeks)	Age at first egg (Days)	Annual egg production (nos.)	Egg weight (g)	Egg colour			
I. Marngar	Improved breeds (100)	750-850g	1.7-2.2kg	3.7 kg (male) 2.5 kg (female)	185	138-155	47-52	Brown/ Light brown	2.87	10.02	Infectious coryza: 7.6 Bacillary white diarrhea: 6 Fowl pox: 2 G.I. parasites: 84.4
	Local birds (100)	450-500g	850-900 g	1.7 kg (male) 1.3 kg (female)	197	45-60	28-32	Creamy white	1.69	14.27	G.I. parasites: 53 Ranikhet disease: 36 Fowl pox: 11

II. Sarikhusi	Improved breeds (100)	740-810g	1.6-2.1kg	3.4 kg (male) 2.3 kg (female)	187	130-140	46-50	Brown/Light brown	2.83	9.93	Infectious coryza: 9.2 Bacillary white diarrhea: 10.6 Fowl pox: 7 G.I. parasites: 73.2
	Local birds (100)	380-480g	750-860 g	1.5 kg (male) 1.1 kg (female)	198	43-57	30-32	Creamy white	1.71	15.31	G.I. parasites: 57 Ranikhet disease: 34 Fowl pox: 9

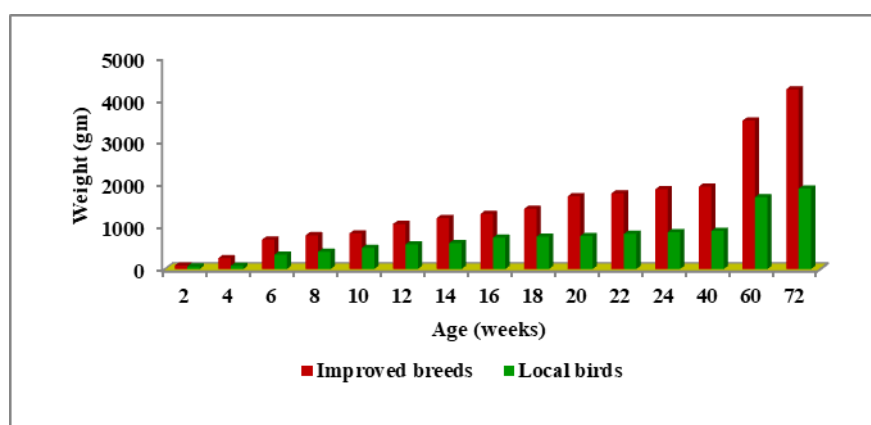


Fig.4 Comparison of body weight (improved breeds vs. local birds)

#### Impact on net income of poultry farmer

Successful poultry farmers from both the clusters managed to sell on an average 8990 nos. of eggs @ Rs.10.00 per egg and earned about Rs. 89,900.00 by selling eggs. Live male birds (3.5-4 kg) were sold @ Rs.250-300/- per kg live body weight and net income of about Rs.875-1200/- per bird was earned by the farmers after 8-10 months of rearing. Feed cost of the birds was reduced by

feeding the birds with locally available feed ingredients, broken rice, maize, vegetable waste etc. They are also allowed to scavenge outside in the field during day time. Concentrate feed is given once a day @ 25-30g per bird/day during egg laying period. Few successful farmers from FFP adopted villages are listed in Table 3.

**Table 3.** Net income of few successful poultry farmers in village

Sl. No.	Village	Income before FFP Intervention (Rs.)	Income after FFP Intervention (Rs.)							
			Poultry chicks (No.)	Live birds	Eggs	Total gross Income (Rs.)	Total cost of production (Rs.)	Net Income (Rs.)	Net Income per bird (Rs.)	B:C ratio
1.	Borkhatsari	15,000.00	100	64,600.00	--	64,600.00	22,500.00	42,100.00	421.00	2.87
2.	Nalapara	5,000.00	100	33,492.00	6,000.00	39,492.00	15,000.00	24,492.00	244.92	2.63
3.	Mawtnum	--	100	13,398.00	--	13,398.00	5,000.00	8,398.00	83.98	2.68
4.	Umtham	--	100	58,750.00	6,000.00	64,750.00	22,540.00	42,210.00	422.10	2.87
5.	Lalumpam	--	50	58,800.00	6,000.00	64,800.00	23,300.00	41,500.00	830.00	2.78
6.	Sarikhusi	--	43	21,600.00	3,520.00	25,120.00	8,950.00	16,170.00	376.05	2.81



Saila Maharana,  
Borkhatsari



Bipul Lyngdoh, Umtham



Robert Maring, Mawtnum



M. Raja, Nalapara

**Fig.5** Successful poultry farmers in FFP adopted village

In the present study, productive and reproductive traits *viz.* body weight, age at first egg, annual egg production etc was observed higher in the improved breeds in comparison to the local birds. It might be due to the improved germplasm, supplemental feeding and health care management. Earlier, Islam *et al.* (2014) and Deka *et al.* (2014) also reported higher growth rates in the improved breeds of poultry. It has been observed that the age at first egg was lower and the egg production was higher in the improved breeds than the local birds which are in agreement with the findings of Singh *et al.* (2015) and Kalita *et al.* (2012). In the present finding, the egg weight of the improved breeds (46-52g) was observed higher than the local bird (28-32g) which was in agreement with the findings of Sarma *et al.* (2018) and Islam *et al.* (2014). Earlier, Deka *et al.* (2014) observed egg weight of 51.08g (40 weeks) and 59.09g (72 weeks) in vanaraja birds in Assam. Similarly, Singh *et al.* (2018) from Nagaland reported egg weight (40 weeks) of about 60g and 55g in vanaraja and srinidhi birds, respectively.

The variations in the egg weight from the present study might be due to difference in the feed and managerial practices adopted by the farmers of different states. Niranjan *et al.* (2008) observed that the egg shell colour of vanaraja/ srinidhi bird was brown and have large yellow colour yolk, which is also observed in the present findings. Mortality was also observed in the poultry birds due to various diseases, predator and stress. It was observed higher in the local birds (14.27-15.31) than the improved breeds (9.93-10.02). Earlier, Gondwe and Wollny (2007) and Kumaresen *et al.* (2008) reported 43.9% and 10.5% mortality in the rural poultry, respectively. The variations in the mortality rate from the present study might be due to frequent monitoring, treatment, vaccination in the birds as well as good management practices adopted by the farmers.

Higher profitability and benefit: cost (B:C) ratio was observed in the present study which might be due to implementation of various scientific interventions by the farmers in the adopted villages.

In congruence with the present study, Singh *et al.* (2018) from Nagaland revealed that the farmers have sold Vanaraja and Srinidhi birds (2.5-3.0 kg) at 3-4 months of age with net income of Rs. 71,31,525/-, B:C ratio of 2.93 and Rs.302.00/- per bird. Higher B:C ratio of 4.41, 2.62, 2.60 and 5.57 in the improved breeds of backyard poultry was also observed by Singh *et al.* (2019), Baruah *et al.* (2018), Islam *et al.* (2015) and Uddin *et al.* (2013), respectively. Nath *et al.* (2013) from Sikkim reported B:C ratio of 1.73 in scientific backyard poultry farming. Besides income generation, backyard poultry helps in alleviation of malnutrition of the rural people through the production of valuable animal protein and empowers rural women (Deka *et al.*, 2014). Moreover, backyard poultry farming is advantageous as it provides supplementary income in shortest possible time with little minimum capital investment, simple in operation and ensures availability of eggs and meat throughout the year. Thus, scientific backyard poultry farming in FFP adopted villages proved to be one of the most lucrative opportunities for increasing the income of the farmers.

#### 4. Conclusions

Scientific interventions made under the Farmer FIRST Programme (FFP), ICAR, Umiam have created significant impact in improving the productivity and livelihood of the backyard poultry farmers of the Marngar cluster, Ri Bhoi, Meghalaya by increasing their income with minimum input cost. Thus, poultry farming can be an alternative income source for educated unemployed rural youths, women, school dropouts etc. for generating income throughout the year.

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#### 6. References

- Baruah M S, Raghav CS and H Kalita (2018). Effect of Technological Intervention on the Economics of Vanaraja Chicken Rearing in West Siang District of Arunachal Pradesh, India. *Journal of World's Poultry Research*. 8(2): 44-49.
- Chakravarthy PV, Mohan B and K Senthilkumar (2014). Performance of CARI Nirbheek (Aseel Cross) birds reared under intensive and semi intensive system in Namakkal District. *Indian Veterinary Journal*. 91(11): 85-87.
- Deka P, Sarma M, Nath P J, Borgohain R, Mahanta JD, Deka B and M Phukon. (2014). Production performance of Vanaraja bird under traditional system of rearing in Assam. *International Journal of Livestock Research*. 4(2): 81-85.
- Feroze SM, Raju VT, Singh R and AK Tripathi (2010). Status of Livestock Sector: A Micro Study of North Eastern India. *Indian Journal of Hill Farming*. 23(2):43-51.
- Gondwe TN and CBA Wollny (2007). Local chicken production system in Malawi: Household flock structure, dynamics, management and health. *Tropical Animal Health and Production*. 39:103-113.
- Islam R, Kalita N and P Nath (2014). Comparative performance of Vanaraja and Indigenous chicken under backyard system of rearing. *Journal of Poultry Science and Technology*. 2(1): 22-25.
- Islam R, Nath P, Bharali A and R Borah (2015). Analysis of benefit-cost (B:C) ratio of Vanaraja and Local chicken of Assam under backyard system of rearing. *Journal of Research in Agriculture and Animal Science*. 3(7):7-10.
- Kadirvel G, Banerjee B, Meitei S, Doley S, Sen A and M Muthukumar (2018). Market potential and opportunities for commercialization of traditional meat products in North East Hill Region of India. *Veterinary World*. 11(2):118-124.
- Kalita N, Islam R, Pathak N and H Chutia (2012). Hatchability and mortality of indigenous chicken of Assam. *Indian Veterinary Journal*. 89: 35-36.
- Kumaresan A, Bujarbaruah KM, Pathak KA., Chhetri B, Ahmed SK and S Haunshi (2008). Analysis of a village chicken production system and performance of improved dual purpose chickens under a subtropical hill agro-ecosystem in India. *Tropical Animal Health and Production*. 40: 395-402.
- Livestock Census (2019). 20<sup>th</sup> Livestock Census. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India.
- Mahajan S, Papang JS and KK Datta (2015). Meat consumption in North-East India: Pattern, Opportunities and Implications. *Journal of Animal Research*. 5(1): 37-45.

- Niranjan M, Sharma RP, Rajkumar U, Chatterjee RN, Reddy BL and TK Bhattacharya (2008). Comparative evaluation of production performance in improved chicken varieties for backyard farming. *International Journal of Poultry Science*. 7(11):1122-1127.
- Nath BG, Pathak PK and AK Mohanty (2013). Scientific backyard poultry rearing technology: an approach to awareness and adoption of technology for livelihood development of rural farmers in Sikkim, India. *Russian Journal of Agriculture and Socio Economic Science*. 22 (3): 38-43.
- Pathak PK and BG Nath (2013). Rural Poultry Farming with Improved Breed of Backyard Chicken. *Journal of World's Poultry Research*. 3(1): 24-27.
- Singh NK, Pande K, Sahu RP, Shobha and NA Avinashilingam (2015). Success story of backyard poultry farming in Bageshwar district. *Indian Farmers Digest*. 48(4): 19-21.
- Singh M, Islam R and RK Avasthe (2017). Production performance of Vanaraja Birds under traditional tribal production system of Sikkim Himalayan Region. *International Journal of Livestock Research*. 7(7): 153-157.
- Singh M, Talimoa M, Rajesha R, Nguillie G, Rajkhowa AM, Rajkumar DJ, Paswan C and RN Chatterjee (2018). Backyard poultry farming with Vanaraja and Srinidhi : proven technology for doubling the tribal farmers' income in Nagaland. *Indian Farming*. 68(01): 80-82.
- Sarma M, Islam R, Borah MK, Sharma P, Mahanta JD, Kalita N and BN Bhattacharyya (2018). Comparative performance of Vanaraja, Srinidhi and Desi chicken under traditional system among tribal community of Assam. *Indian Journal of Animal Research*. 52(10): 1518-1520.
- Singh M, Islam R and R Avasthe (2019). Socioeconomic impact of vanaraja backyard poultry farming in Sikkim Himalayas. *International Journal of Livestock Research*. 9(3): 243-248.
- Uddin M T, Islam M M, Salam S and S Yasmin (2013). Economics of native poultry rearing in the coastal regions of Bangladesh. *Bangladesh Journal of Animal Science*. 42(1): 49-56.