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Backyard poultry farming with Vanaraja and Srinidhi:

proven technology for doubling the tribal farmers' income in Nagaland

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The North-Eastern Hills Region of India in general and Nagaland in particular is characterized by inaccessibility, marginality, fragility, cultural heterogeneity, rich biodiversity, low livestock and crop productivity. In Nagaland, there are 16 recognized tribes besides numerous minor tribes which are mostly non-vegetarian. Also, the per caput consumption of animal protein is highest in Nagaland. Meat of any kind of animal is acceptable without any religion consideration. Tribal farmers of the State evolve a zero to negligible input based livestock and poultry production system. This system aims to get medium output from nearly zero input and mostly depends on the locally available resources. However, there are major constainsts like non-availability of good poultry germplasm, lack of scientific knowledge of improved production practices and higher feed cost deters the tribal farmers for going for commercial poultry farming. The State is almost 40% deficient in animal meat and products.

Key words: Backyard poultry, Farmers, Income, Tribes

IN north-eastern hills (NEH) region, the scenario of poultry production is by and large a rural activity and consist of 28.5 million of poultry birds, of which Nagaland share is about 17.7 %. The annual egg production is 790 million numbers as against the stipulated requirement of 7,020 million eggs/ year for NEH region. In Nagaland backyard poultry farming covers about 97.56% of total poultry population, and mostly consists of *desi* (60.27%) birds. The per caput availability of egg in Nagaland is only 23, lower than the national average. About 49.39% households in rural areas and 9.07% in urban areas of the State are engaged in backyard poultry production. The status of organized poultry sector in Nagaland is too little, consists of only 1.64% broiler and 0.80% layer to meet the demand of egg and meat required for almost 100 % non-vegetarian people inhabited in the State.

Challenges in rural poultry farming in tribal areas

The native chicken varieties adopted in the free range backyard conditions in tribal areas have low productivity and their contribution to the total egg output is almost static for the last few decades. Therefore, the consumption of eggs in the tribal areas is far below the national average across the country. Increasing the genetic potential of the local chicken varieties greatly helps in increasing the availability of poultry products in tribal areas. The chicken varieties being used in the intensive poultry farming can not survive in free-range, where the disease challenge is high, climatic variations are harse and adverse and vary greatly from place to place and season to season. Adapting the intensive poultry farming in small-scale in tribal areas may not be economically viable due to limitations in management, high input cost and non-availability of inputs in rural/ tribal areas. However, due to non-availability of poultry products, the prices are up to double in tribal areas compared to those prevailing in the other part of the country. Therefore, it is necessary to popularize suitable chicken varieties, which can thrive in backyard free-range conditions without expensive inputs like commercial feed, supplement and medicine etc. Predator menace, harse and diversified climatic conditions, diseases, consumer preferences, lack of commercial feed etc. are some of the major issues, which need attention while popularizing birds suitable for free range backyard farming. Adapting rural poultry farming in backyards of household

can ensure the the availability of eggs and meat in rural and under developed areas; which will heil in alleviating the incidence of protein deficiency particularly in tribal areas.

ICAR Nagaland Centre intervention in collaboration with DPR

The backyard poultry production is dealt by resource poor tribal farmers. Therefore, to transform the rural poultry production scenario the main focus would be to provide appropriate support in the form of making availability of quality genetic stock, improved technologies, scientific advice, extension/awareness, particularly on biosecurity measures and finally financial assistance and market linkages. Conservation of indigenous poultry breed is also necessary for developing suitable poultry varieties for backyard farming. In this gesture, to ensure the availability of improved germplasm at farmers' doorstep Indian Council of Agricultural Research has introduced 'Poultry Seed Project' in 2009 with the objectives of supply of day-old chicks of Vanaraja, Gramapryia and Srinidhi bird along with capacity building, medicinal and other inputs to the farmers particularly tribal for augmenting rural poultry production, socio-economic indexing of the target groups and linking small-scale poultry producers with organized market. Vanaraja and Srinidhi poultry is dual purpose poultry birds developed by Directorate of Poultry Research, Hyderabad for backyard poultry farming in rural and tribal areas for meat and egg purpose, respectively.

Vanaraja birds: A dual purpose variety for free range farming in rural and tribal areas. The male of Vanaraja birds weigh about 1.5 to 2.0 kg between 10 and 15 weeks and females lays about 130-150 eggs in a laying year (Table 1).

Srinidhi birds: A egg purpose variety for free range farming in rural and tribal areas. The male of Srinidhi birds weigh about 2.0 to 2.5 kg between 20 and 24 weeks and females lays about 180 to 200 eggs in a laying year in the farmers field. Due to its relatively light weight and long shanks these birds are able to protect themselves from predators, which is otherwise a major threat to the birds in backyards (Table 1).

Table 1. Production performance of Vanaraja and Srinidhi birds at ICAR RC for NEH Region, Nagaland Centre

SI No.	Economic trait	Vanaraja		Srinidhi	
		Male	Female	Male	Female
1.	Body weight, g				
	Day old chick	32.1±0.62	29.83±1.37	37.15±0.87	32.9±0.57
	Eight weeks	672.4±15.67	542.5±11.84	1211.1±29.30	496.06±17.10
	20 weeks	1652.55±46.73	1242.3±33.51	2291.85±59.75	981.43±27.41
2.	Age at First Egg		140-156		150-162
3.	Egg production no. (up to 72 weeks)	140		195	
4.	Egg weight, g				
	28 weeks		45		45
	40 weeks		60		55
5.	Fertility, %		85-90		80-85
6.	Hatchability, %		75-85		75-85
7.	Survivability, % (up to eight weeks)		95		95

Advantages of improved backyard varieties

Due to the similarity in phenotypical appearance of these birds with *desi* birds particularly multi-coloured plumage, it is well taken by the tribal farmers of the Nagaland. Moreover, these birds have higher growth rate, therefore, produce more meat and egg than the native chicken, eg. Hardy and better liveability, higher disease tolerance, brown egg, produces higher egg mass per egg than the indigenous chicken and highly suitable for backyard free range farming.

Management

Backyard germplasm can scavenge well for its feed in the fields (Table 2). During the process of scavenging on grass fields these birds will have an access to insects, white ants, green grass, grass seeds, waste grains etc, thereby the supplemental feed requirement is lesser than those reared under intensive poultry farming.

Feed supplementation in the form of scratch usually given in the morning/evening to develop habit to reach owner's place for laying eggs and for night shelter. Depending on the availability of free range area and also the intensity of vegetative growth, the requirement of supplemental feed varies between 25 and 50 g/bird/day. These birds can also perform well on whole grain feeding under scavenging conditions.

Impact assessment of the technology

To fulfill the deficiency and providing the improved germplasm of poultry ICAR Nagaland Centre initiated the production of quality germplasm of Vanaraja and Srinidhi under 'Poultry Seed Project' in collaboration with Directorate of Poultry Research (DPR), Hyderabad. In 2016-17, ICAR Nagaland centre has supplied 82,647 chicks day old and grown up chicks to the 1,354 farmers' of Nagaland, Asom, Manipur, Meghalaya and Arunachal Pradesh in collaboration with various line departments, which is the highest ever germplasm supply in a year since the inception of the project. ICAR RC for NEH Region, Nagaland Centre imparted various on farm and off farm trainings to sensitize the farmers about the scientific backyard poultry farming. During 2016-17, with the help of Tribal Sub-Plan (TSP) component of the project as well as TSP institute fund, ICAR RC for NEH Region, Nagaland Centre has adopted 17 villages throughout the Nagaland after conducting the participatory rural appraisal for their development as poultry model village. A total of 25,319 chicks were supplied to 17 villages comprising of 738 tribal beneficiaries.

The farmers were trained on poultry housing, feeding and health management before distribution of chicks so that the birds can be reared

Table 2. Germplasm production and supply details of ICAR Research Centre for NEH Region, Nagaland Centre.

Years	Total egg produced	Fertility (%)	HTES (%)	HFES (%)	Total chicks produced	Chicks supplied	No. of beneficiary
2010-11	62,788	85.91	71.65	82.12	18,950	12,839	254
2011-12	79,097	83.42	64.19	76.96	38,401	26,177	196
2012-13	101,061	86.34	69.52	80.52	53,776	45,150	305
2013-14	159,279	84.32	64.89	76.95	77,009	54,644	154
2014-15	180,474	80.22	54.12	67.46	76,147	63,210	166
2015-16	82,440	77.72	58.32	67.83	40,245	39,061	173
2016-17	134,854	86.02	65.68	77.25	18,965	82,901	1,354
2017-18 (Up to September)	124,647	87.25	75.23	84.25	83,567	82,647	1,213
Total	92,4640	83.9	65.45	76.6675	407,060	406,629	3,815

to attain their full genetic potential. The farmers were encouraged to vaccinate their flock and linked to veterinary pharmacies supplying poultry vaccines. The birds were reared in intensive condition for initial four weeks after which they were reared either on backyard or semi-intensive system. The birds were fed with a mixture of compound concentrate feed and locally available feed materials like tapioca, broken rice, maize and kitchen waste. Depending on vicinity to Asom the price of feed varied from district to district; compound feed ranged from ₹ 30 to 35/kg and price of maize from ₹ 12 to 23/kg. The total amount of money spent for purchasing feed and medicine was ₹ 4,255,545/- aprroximately. Most of the farmers sold their birds after attaining 2.5 kg to 3.0 kg at three to four months of age. The total live weight of the birds was around 59,620 kg. Several farmers decided to retain some of their female birds for egg laying purpose also. The farmers of remote areas like Kiphri, Tuensang, Phek and Zunheboto district preferred to keep the Srinidhi birds mainly for the egg purpose as eggs are available in these areas at high prices. The price of poultry meat in Phek and Kiphire districts was ₹ 250/kg whereas ₹ 200/kg in the remaining districts. Therefore the gross income generated after sale of birds was ₹ 1,25,79,250/- after deduction of expenses incurred on feed, vaccine and medicines the net income earned was ₹ 71,31,525/- with a B:C ratio of 2.93. The success of these villages has motivated more farmers and educated unemployed youth in Nagaland to undergo training on poultry farming at ICAR, Nagaland Centre and take up poultry farming on commercial basis.

FUTURE PLANS

Supply of Vanaraja day-old-chick to the farmers along with establishment of model poultry houses in tribal areas of Nagaland. Emphasis would be given on to transform the traditional backyard poultry farming to scientific backyard poultry farming to attract the farmers.

SUMMARY

The eggs and meat of birds reared in the backyard farming fetches higher premium due to high consumer acceptability even in the urban sectors where plenty of eggs and poultry meat from commercial units are available. Besides stable supply of high-quality animal food, backyard poultry production promotes income opportunities particularly for the weaker sections in the tribal areas. The backyard farming will certainly improve the economic status of a majority of rural/tribal families from lower socio-economic groups in the rural/tribal areas. Backyard farming fulfill a wide range of functions e.g. the provision of meat and eggs, food for special festivals, chicken for traditional ceremonies, pest control and petty cash, utilizing minimum inputs, minimum human attention, and causing less environmental pollution. It can be concluded that backyard poultry farming with Vanaraja and Srinidhi varieties is a proven technology for doubling the farming income in tribal areas particularly in Nagaland.

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ICAR Data Centre and Unified Communication portals to secure institute information and information transmission.

- ICAR-Enterprise resource planning (ERP) System to this manage the human resource in information of the council including pay roll, finance and budgeting.
- KVK Knowledge Network Portal (http://kvk.icar.gov.in) to share basic information and facilities of KVKs with contingency plans, demonstration schedule, and advisories.
- Management System for Post-Graduate Education (MSPGE) enabling academic and e-learning modules while also being a repository of academic records
- E-*Samvad,* an online interface of the Council to answer citizens queries.
- KRISHI –A knowledge repository portal of digital information pertaining to research experiments, outputs, publications, etc.
- E-*Krishi Manch*, a dedicated portal for farmer-scientist interaction.