

Horti-Poultry model

– A novel way for raising farmer's income

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The J&K has 2.45 lakh ha of land under orchards, which has by and large remained underutilized. The utilization of these orchards under the integrated farming system, particularly through backyard poultry rearing under the innovative concept of Horti-Poultry model can tremendously raise the farmers' income, ensure optimum land and labour utilization, cause women empowerment, animal welfare, green agriculture, food security and disease management. Under the model it is envisaged to introduce backyard poultry birds of elite germplasm in phased manner to cover the available orchard land. A successful trial of rearing Vanraja (popular backyard bird strain) has been already conducted.

Key words: Horti, Innovative, Orchard, Poultry, Vanraja

BACKYARD poultry farming is not new and has been in practice since the time immemorial. However most of the backyard poultry production comprises rearing of indigenous birds with poor production performances. The potentiality of indigenous birds in terms of egg production is only 60 to 80 eggs/bird/year and meat production is also very less. However, the backyard poultry production can be easily boost up with improved varieties of chicken and can promise a better production of meat and egg (160-200 eggs/year).

With the introduction of newly developed bird strains, backyard poultry farming is considered as the sure tool to improve the socio-economic status of the traditional farmers. Birds have certain inherent attributes and are a promising source of rural income like low input, short gestation period, and efficient production, better and quicker returns. J&K in general and Kashmir valley in particular with predominantly being non vegetarian society has a huge demand for chicken and eggs. Unlike other states

of the country poultry sector failed to pickup in Kashmir due to multiple reasons. In J&K there is 69% shortfall in poultry meat production and 97% shortfall in poultry egg production. The gap between production and requirement is partially fulfilled by purchase of huge quantities of live broilers and eggs from neighboring states thus draining the state exchequer. According to a recent report J&K's import bill for meat, poultry and eggs is approximately ₹ 2,000 crore/annum. While there has been some progress in commercial broiler production, commercial layer industry is virtually non-existent and there is limited egg production from backyard poultry which has witnessed some revival after the popularization of strains like Vanraja and other high technology birds. These birds particularly Vanraja has shown tremendous performance in Valley fields and has raised hope of transforming the economy of rural Kashmir.

In Jammu and Kashmir horticultural sector has received tremendous attention and there are about 4.5 lakh families engaged in it

with around 20% area of the state under horticultural crops. If this land is exploited doubly by introducing backyard poultry birds alongside horticulture under the concept of Horti-Poultry Model, there will be a tremendous revenue generation vis-à-vis organic farming and soil health management.

Concept of Horti-Poultry Model

Integrating poultry with horticulture (fruit crops) following a standard procedure is Horti-Poultry Model. According to one estimate in Kashmir valley alone 161,682 ha of land is under fresh fruits and 58,041 ha of land is under dry fruits. The land if exploited for integrated farming will yield better profitability. Under integrated farming concepts, the existing concepts of having cattle, sheep/goat and vegetables integrated with horticulture has not received much interest as large animals' damage fruit crops and vegetables fail to grow satisfactorily under the shade of fruit trees. With this backdrop the rearing of high technology birds in orchards was thought of. To start with and to give concept a practical



Innovative horti-poultry model at KVK-Ganderbal, Srinagar, J&K

shape KVK-Ganderbal under the technical guidance of Centre for Research on Poultry, Division of LPM, SKUAST-K purchased 300 Vanraja birds of one month of age to implement the concept. Under the concept/model birds are being given free access to the KVK orchard during day and confined to shelter during night. Birds are allowed to feed on herbage, insects and other scavenging resources during the day and in the evening hours are offered kitchen waste comprising leftover rice, vegetable waste, egg shells, leftover pulses etc. collected from the hostels of F.V.Sc & AH, Shuhama that are in the close vicinity of the Kendra. Small amount of supplemental feeding is also offered during the night. Thus dependence on concentrate market feed has been reduced by 85%.

Benefits of Horti-Poultry Model

Following are the major benefits of the model.

- *Optimization of resource utilization:* The model ensures to exploit the existing orchard, labour, shed optimally and therefore no additional land and material is required to implement the model.
- *Natural deweeding of the orchard:* The model helps in natural deweeding of the orchard as birds feed upon the herbage grown wild in the orchard.
- *Natural sanitation of the orchard:* Insects, herbage and seeds form the feed ingredients of the birds therefore birds that feed upon it cause natural sanitation of the orchards consequent to which insects, several of whom form the intermediate hosts of various disease causing organisms are removed by the birds. Removal of snails etc deserves a special mention. Snails, sludges and flea beetles on account of climate change have emerged as a new potential pests of various horticultural crops. Birds act as scavengers of these important pests and protect horticultural crops from economic damages.
- *Organic fertilization of the orchard:* Presently there is a much focus on the organic farming and droppings from birds reared in orchards ensures organic fertilization of the orchards.
- *Hoeing and pulverization of orchard:* Birds while scavenging cause natural hoeing and pulverization of the orchards that in turn ensures aeration, mixing up of surface litter material and exposure of under soil organisms and therefore ensures soil health of the orchard.
- *Revival of backyard poultry farming:*

Owing to the countless advantages of such a type of backyard poultry farming the model will ensure the revival of backyard poultry farming that has received a setback in the last two decades.

- *Production of organic products:* Probably Kashmir is the only region where local/desi product costs higher. Eggs and meat produced organically in backyards under the model will fetch higher returns and there will be an all-time market, as there is a higher demand for organic products pertinently when there have been complaints of excessive use of drugs in commercial broilers and therefore human health issues upon their consumption.
- *Food security:* The cost of quality animal proteins is increasing on an alarming rate and due to poor purchasing power of farmers their families suffer malnutrition particularly of animal proteins, the model will ensure proper nourishment of farm families besides income generation
- *Women empowerment:* The rearing of birds under backyards is traditionally in the hands of women, the model will therefore ensure women empowerment and make them financially independent.
- *Employment generation:* In absence of industries in Kashmir valley the private jobs are scanty and the state has over five lakh registered as unemployed educated youth, the model will definitely lead to generation of employment for many.
- *Animal welfare:* Constant confinement of livestock for harvesting eggs and meat causes great discomfort for birds. Under the concept of Horti-Poultry model the birds besides performing better enjoy outings during the day time and there the model ensures better animal welfare.

Adoption of Model at Field Level

As is said, 'seeing is believing', KVK, Ganderbal, is having the model and the different procedures are being standardized under the technical guidance of C.R.P, SKUAST-K, any farmer interested to adopt the model can visit the KVK to get the first hand information of the concept/



Horti poultry model at field

model. It is very easy to adopt the model what you need is a piece of land that may range from just half a kanal. Let us suppose a farmer has a land holding of 1 ha (20 kanals) growing apple in the orchard having a pack house and a tribal family guarding the orchard as is mostly in practice. He can rear 400 birds in the orchard as each 0.4 ha (5 kanals) of land has the carrying capacity of 100 backyard birds. If a farmer wants to spare just half of 01 ha (20) for backyard bird rearing he can still rear 200-250 birds. Interested farmers in the model can drop their application at KVK Ganderbal to receive the short training programme to get acquainted with the model/concept.

Case Study of the Model at the Farmer's Field

A progressive farmer Asrullah Habib from Argam, Bandipore owning a 100 kanal apple orchard was advised by Center of Research on Poultry (CRP), LPM Division, SKUAST-K in 2014 to go for free-range layer farming after failing to get impressed from other models of

integrated farming systems. He was guided to procure day-old chicks (DOCs) of commercial layer stock (Keystone-Golden), their intensive brooding for 4-weeks and subsequent shift to free-range-rearing; 70% of the birds reared by him came into lay at 6-months of age. As the eggs are of a free range origin and having attractive off-white egg shell colour, hence farmer is getting premium prices for the eggs. He sells eggs @ ₹ 90-100 a dozen. He has been able to sell some laying hens as well @ ₹ 600-700/hen. Farmer is quite satisfied with the enterprise and plans to increase the size of operations from present 400 layers to 600. In absence of Animal Science Scientist at KVK-Bandipore, a team of scientists from KVK-Ganderbal along with incharge C.R.P visited the farm and found him doing well.

Economics of Horti-Poultry Model (per hectare of orchard)

A. Assumptions

1. Carrying capacity of 1 ha of land is 400 birds

2. The birds are to be put on rotational scavenging and to be shifted from one patch to another after every three months
3. Birds are to be reared inside a shed for first one month
4. Birds are to be left for scavenging in the orchards after 4 weeks of age
5. Besides scavenging birds are to be offered kitchen waste and small amount of concentrate feed in the evening
6. A bird takes 3 kg of concentrate feed in 6 months
7. Mortality percentage of the birds is 7%
8. Maximum (around 5%) mortality of birds occurs in the first 6 weeks of age
9. Vanraja are preferred under the model for being dual purpose and hardy
10. Flock composition is 50% male and 50% female
11. Male birds acquire a body weight of 2.5 kg in 6 months
12. Egg laying percentage of birds at 6 months of age is 60%

Control of broadleaved weeds in wheat

This trial was conducted in all the five wheat growing zones to identify effective herbicides for control of broad leaved weeds in wheat. The trial was conducted at twenty one locations in various zones, i.e. four locations (Almora, Bajaura, Khudwani and Malan) in NHZ, eight locations (Bikaner, Durgapura, Gurdaspur, Hisar, Jammu, Karnal, Ludhiana and Pantnagar) in NWPZ, five locations (Coochbehar, Faizabad, Kalyani, Sabour and Varanasi) in NEPZ, three locations (Bilaspur, Indore and Udaipur) in CZ and one location (Dharwad) in PZ. In all the zones weed free treatment produced the highest grain yield which was closely followed by the treatment having combination of Halauxifenmethyl + florasulam + carfentrazone + surfactant. Among broad leaved herbicides, Halauxifen methyl + florasulam + carfentrazone + surfactant (10.21 + 20 g a.i. + 750 ml/ha) was found as the best treatment in controlling broad leaf weeds density and dry weight in all the zones.

B. Input cost (Approximate)

1. Cost of day old chicks @ ₹ 30/ Chick = $30 \times 400 = ₹ 12,000$
2. Feeding of chicks for the first month = $0.5 \text{ kg/bird/month} (0.5 \times 400 \times 35 = ₹ 7,000)$
3. Total no. of birds after one month = $400 - 5\% \text{ mortality} = 380 \text{ birds}$
4. Cost incurred on vaccines and medicines = ₹ 10/bird/year ($10 \times 380 = ₹ 3,800$)
5. Feeding cost of birds after 6 months of age per year = $380 \times 3 \times 35 = ₹ 39,900.00$
6. Feeding cost of egg laying birds (pullets/hens) from 6 months onwards (up to one year) = $190 \times 3 \times 35 = ₹ 19,950.00$
7. Total input cost = $12,000 + 7,000 + 3,800 + 39,900 + 19,950 = ₹ 82,650/-$ (Eighty two thousand six hundred fifty only)

C. Returns (Approximate)

1. Mortality at 6 months of age = 2%
2. Total no. of birds available = 380-

2% = 372 birds

3. Sale of male birds at 6 months of age = $2.5 \times 100 \times (372 \div 2 = 186) = ₹ 46,500.00$
4. Egg production (60% of 186 hens = 112) and Sale of eggs @ ₹ 5/egg = $5 \times 112 = ₹ 560/\text{day}$ ($560 \times 180 \text{ days} = ₹ 100,800/\text{year}$)
5. Sale of hens at one year of age with avg body weight of 2 kg = $2 \times 100 \times 186 = ₹ 37,200$

Total returns = $46,500 + 100,800 + 37,200 = ₹ 184,500/-$ (one lakh eighty four thousand five hundred only)

Net profit/ha/year = Total returns minus total input cost = $184,500 - 82,650 = ₹ 101,850/-$ (One lakh eighteen thousand and fifty only)

SUMMARY

In the temperate climatic conditions of Kashmir Valley the model as was expected did well while establishing at the KVK level and has attracted scores of orchardists to

adopt the model. The model being farmer friendly easy and economical to adopt is being spread on pilot basis in district Ganderbal of the J&K state. The integration of horticulture with poultry has given a new direction to the policy makers assigned to look for the ways and means of enhancing the farmers' income. The model though in its initial stage and still under exhaustive trial at the KVK-Ganderbal has till given desired results in terms of weed control, supplementary income generation from KVK apple orchard, revolving fund generation, and other benefits. The model needs to be spread to the knock and corner of the country orchards through KVKs.

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Success Story

Self employment through pig farming

With the increasing pressure on land, pig rearing could offer economic, food and social security to the resource poor families. Piggery is the most potential source of meat production and more efficient feed converter after the broiler. Apart from providing meat, pig is also a source of bristles and manure.

Shri Ranjod Singh, 28 years old, from Lauhgarh village of district Ambala, Haryana is a graduate in B. Tech. He contacted KVK Ambala, for training on commercial pig farming in 2016. KVK Ambala provided 10 pure Large White Yorkshire piglets for his farm. Presently, he is maintaining 25 sows, 20 gilts and 2 boars along with piglets at his farm. He also developed an IFS unit Pig-cum-fish farming at his farm. The cost of fish feed reduced by the use of pig dung in the pond. Due to high cost of feed, the pigs are being maintained on kitchen waste, vegetable (cauliflower, carrot, potato etc.) and sugarcane press mud (Maili/jugary) during the seasons.



Shri Ranjod Singh earned a net profit of ₹ 5.15 lakh in year 2016–17, and ₹ 45,000 and ₹ 5,000 from sale fish and pig manure, respectively. This success achieved distinctly over a short period of time. Mr. Singh has also developed and loaded a video of his farm on youtube. The development of the pig farming system model by Shri Ranjod Singh has not only been beneficial to him in terms of productivity but it has also influenced other unemployed rural youths of the neighbouring areas to establish such venture. His ventures promoted economic stability and sustainability and are an example for locals to emulate.