

Rural poultry integration in mango orchard ecosystem for augmenting farmer's income

Mango (*Mangifera indica* L.) is one of the most important commercial crops. Mango orchards are the main source of income for the farmers who raise it. The integration of rural poultry in mango orchard ecosystems can help enhance farmer's income which has been discussed in this article. The article highlights the main details concerned with mango orchard based poultry.

Why mango orchard based poultry farming?

Majority of mango orchards are raised as mono crop. The livelihood of mango growers depends solely on sale of mango fruits. Increasing production cost due to indiscriminate use of pesticide has led to distress particularly for small and marginal farmers. Failure of mango crop severely affects the livelihood options for farmers. There is need for diversification in mango orchards. Mango orchard ecosystem suits for rearing of poultry birds. Not only this gives farmers much needed income throughout year but it also reduces the pest load and reduces the need for pesticide which eventually reduces the cost of production

How to start mango based poultry farming?

Housing in mango orchards:

Housing is important for the birds as it protects them from extremities of temperature, rain, wind and predators. Shelters should be constructed in mango orchards in the dimensions of 4×3.5×8 or 12 ft (H×W×L) and can be extended as per the need using mud for wall, polythene sheet for roof and a small door made of wire mesh and waste materials.

Suitable poultry strains for mango ecosystem: Four poultry strains viz. CARI-Devendra, Nirbheek, Shyama and Kadaknath, used in mango orchards, CARI-Nirbheek and CARI-Shyama gave maximum eggs (175-185) and egg laying starts from 5th month onwards. CARI Devendra attains body weight of 1.5 kg in 4 months times. CARI Devendra and

Shyama strains gain body weight faster and fetches ₹ 300-400 per bird. Kadaknath attains 1.5 kg in 7-8 months but fetches ₹ 800-1000 per bird in the market. Kadaknath was found to be very agile and controls mango pests from upper canopy.

Feed for mango orchard based poultry : Strains identified for mango-based poultry farming can scavenge /graze well for its feed in the mango orchard. During the process of grazing in the mango orchard these birds will feed on insects, green weeds, grass seed, etc. Feed supplementation in the form of scratches usually given in morning/evening. *Azolla* is also provided to birds as supplemented feed because it contains nearly 24% crude protein (with digestibility around 50%), besides being rich in minerals and vitamins. Depending on the availability of orchard area the requirement of supplemented feed varies 30-45 gm/bird/day.

Age of orchard

In young plantations, the sunlight availability is more. This makes ideal situation for *azolla* cultivation but comparatively poor situation for insect population. Use of dung and manure will invite more insects which may be a source for poultry. Therefore, space requirement will vary among new and old plantations. Generally 5-10 m²/bird space is sufficient if supplementary feeding is not done but if *azolla* is supplemented the space requirement will be drastically reduced. Furthermore, the agro-climate will also influence



Night shelter for poultry



Mango orchard based poultry

the space requirement. In young plantations, if manuring and *Azolla* is practiced, the space requirement will be much lower and about 2-3 m²/bird space (grown) is sufficient.

Improvement in orchard ecosystem

The birds derived their food from the pupa, larvae, maggot and borers underneath the mango canopy, as a result the technology reduced the mango pest population and requirement for pesticide sprays. Certain bird strains such as Kadaknath exhibited high flight and fed on mango hoppers and leaf webber insect situated on upper canopy. Reduced weed population in mango orchards was observed owing to integration of rural poultry. Each bird in a mango orchard supplemented 45 kg manure in the form of droppings in its entire life cycle. Orchard having flock size of 500 birds gets around 225 quintal of poultry manure. Birds while scavenging, pulverized the soil and ensured better aeration. The mango orchards which integrated rural poultry were found to have improved orchard ecosystem requiring lesser pesticide which results in reduced cost of production.

Sustainability of the system

Many profitable models developed by researchers disappeared once the interventions dependent on outside input or lack of expertise stopped. Keeping in view the facts, this model was developed to have simplicity, easy adaptability and cost effectiveness. The shelters are sustainable for 3-5 years except replacing the polysheds, bamboo structures, etc. The capital investment is around ₹5,000-10,000 and thus can be easily adapted by resource poor farmers. Marketability is also not a problem as raw chicken or its products or produce have wide market acceptance everywhere. The only remaining input are chicks and *Azolla*. *Azolla* in north Indian climate can propagate itself in 2 seasons extending upto 8-9 months. Therefore, saving seed in extreme cold and hot situations, supportive techniques/ measures developed need incorporation in the system. It is discussed under feeding practices.

The main input is continuous chick supply in the system and it is still a major challenge. The lower egg production by parental stock and thus lesser chicks per

hen limits the profitability of the commercial ventures. This is reason why private hatcheries are not producing the chicks needed for such system. Another factor is demand of chicks which can create interest of private entrepreneurs. The hatcheries in Government sector neither have the capacity nor the will to do so. As the demand will increase the local youth will come forward for entrepreneurship. Private hatcheries with established infrastructures and operational facilities will be compelling to participate and share the market demand as soon as the model adoptability will increase. In such scenario, following interventions are being recommended/ adopted locally wherever, the models are being practiced by farmers.

Constraints in integrating rural poultry with mango orchards

1. Low productivity
2. High mortality rates in tropical conditions
3. Presence of common predators such as dogs, cats, snakes, eagles, hawks and thieves
4. Lack of veterinary healthcare and extension services
5. Unavailability of small hatchery units to cater the need of chicks.

Augmenting income through mango based poultry farming

Farmers realized the net returns of ₹ 1,71,828 per acre by integrating rural poultry in mango orchard which was higher in comparison to non integrated orchards (₹12,223 per acre). The returns per rupee of expenditure of mango orchard-based poultry farming was significantly higher (1.96) as compared to mono-crop of mango production which registered lower returns per rupee of expenditure (1.21).

For further interaction, please write to:

Maneesh Mishra (Principal Scientist), ICAR-Central Institute for Subtropical Horticulture, Lucknow, Uttar Pradesh 226 101.

*Corresponding author e-mail: maneesh.mishra@icar.gov.in