

Poultry farming for livelihood and nutritional security in northeast India

S. Doley*, Lalhruaipui and B. Sailo

ICAR Research Complex for North Eastern Hill Region, Mizoram Centre, Kolasib, Mizoram 796 081

Poultry farming is rapidly expanding in India, playing a crucial role in the national economy and food security. India ranks fifth in chicken meat and second in egg production globally, with both commercial and backyard poultry systems playing vital roles. In the northeastern region, which holds over 69 million poultry, backyard farming predominates, supporting rural livelihoods, nutritional security, and women's empowerment. The region's varied agro-climatic conditions, availability of local breeds, and reliance on traditional agricultural practices offer both unique opportunities and challenges. Different range of poultry farming systems from traditional backyard to commercial intensive practices coexist, with newer initiatives like improved backyard poultry farming with Low Input Technology (LIT) birds and native chicken like Kadaknath farming are becoming popular. Notwithstanding the sector's potential, there are challenges like disease outbreaks, high feed cost, insufficient infrastructure, market restrictions, lack of adequate government assistance, etc. Tackling these challenges with focused strategies like region specific breed improvement or developments, provisioning financial support, imparting training and capacity building along with improved market connections can unleash the potential of poultry farming in the region. Through strategic interventions, policy backing, and community involvement, the sector has the capacity to evolve into a fundamental element of rural economic advancement and nutritional security within the region.

Keywords: Capacity building, Market restrictions, Rural economic advancement

POULTRY has emerged as one of the most rapidly growing segments in the Indian agricultural sector, with an annual growth rate exceeding 6 percent. The total poultry population of India is 851.81 million, producing about 4.99 MMT of chicken meat (5th largest in the world) and 138.38 billion eggs (2nd position in the world) contributing ₹2.3 lakh crores to the national economy during 2022–23. The poultry industry in India can be mainly divided into two main sub-sectors: A well-structured commercial sector and unorganized rural or traditional backyard sector. During 2022–23, backyard poultry contributed around 37.22% of the total poultry population with a production of 20.2 billion eggs, which was 14.6% of the total production. Rest of the eggs and major proportion of chicken meat came from the commercial poultry sector. Due to increasing urbanization, and changing dietary habits, the per capita consumption of poultry and poultry products has been steadily rising. The sector is largely driven by private investments and integrates modern technology in breeding, feeding, and disease management. The

sector is providing direct and indirect employment to over 6 million people, including farmers, traders, feed manufacturers, veterinarians, and transporters.

The total poultry population of the north eastern region of India is 69.22 million which accounts for 8.13% of country's total poultry. 94% of the total poultry accounts for the indigenous or native birds which are located mostly in the rural areas in the region. The poultry sector in the region is largely dominated by backyard and small-scale intensive poultry farming due to traditional farming practices and land constraints. Although the backyard poultry farming has low productivity, it still plays an important role in the food and nutritional security of rural people living in fragile ecosystems of the region. Village or backyard poultry production can effectively be promoted in rural areas, as large-scale commercial poultry operations remain predominantly located in urban and semi-urban areas. The backyard poultry farming has proven to be a significant mechanism for reducing rural poverty, eliminating malnutrition, and generating meaningful

employment opportunities in rural households.

Poultry raised in backyards is seen as a practical way to empower women, combat poverty, and provide food and nutrition security for rural poor people. Assam is the north eastern state with the highest population of poultry, followed by Manipur, Meghalaya, Tripura, Nagaland, Mizoram, Arunachal Pradesh, and Sikkim, according to the 20th Livestock Census. Chicken is reared in all the states, while ducks, swan, and goose are predominantly found in Assam, Manipur and Tripura. Many improved chicken varieties, including Vanaraja, Gramapriya, Giriraja, Srinidhi, Kalinga brown, Rainbow Rooster, and Kuroiler, are introduced and mostly raised in low input systems in the region.

Importance of poultry farming in northeast India

Poultry farming plays a crucial role in the socio-economic development of northeast India. With its diverse agro-climatic conditions, rich biodiversity, and availability of indigenous poultry breeds or varieties, the region has significant potential for poultry production. It serves as an essential livelihood resource for rural communities, delivering both income and nutritional security. The key aspects of the poultry farming in northeast India have been highlighted below:

Source of livelihood and rural employment: Poultry farming provides direct employment to thousands of farmers, especially small and marginal landholders in rural areas in the region. It is a major income generating activity for tribal communities, self-help groups (SHGs), and women entrepreneurs. Moreover, the low capital investment with quick returns makes it an affordable business opportunity for unemployed youth. Therefore, many individuals and cooperatives are venturing into poultry farming, leading to business growth and rural development.

Enhancing nutritional security: Poultry meat and eggs provide abundant high-quality protein, vitamins (B12, D), and essential minerals (iron, zinc), which are vital in addressing malnutrition and protein deficiency, especially in children and pregnant women. Furthermore, eggs and chicken meat are cost-effective compared to other animal protein options, making them a key dietary element for low-income households. The improved backyard poultry contributed significantly to the food and nutritional security of tribal farmers in mountainous regions of northeast India.

Low investment and high returns: Poultry farming requires minimal land and can be started with a small flock in a backyard system. Fast growth rate of broiler chicken ensures quick income generation in just 5–6 weeks of rearing. Layer farming offers a steady income through the production of eggs. Profitability can be increased with value-added products like processed meat and organic eggs.

Support for women empowerment and self-help groups (SHGs): It is largely managed by women in rural areas, making it an important tool for women's empowerment. In rural areas of low and middle-income countries, it is primarily women who manage and own backyard poultry operations (FAO and IFAD 2022). Enhancing women's empowerment through backyard

poultry farming can play a crucial role in alleviating poverty, boosting food security, and promoting gender equality. Many government and NGO-led SHGs are involved in backyard poultry farming, generating economic independence for women. Women's engagement in poultry farming plays a significant role in improving nutrition, education, and the general welfare of households.

Utilization of locally available resources: The native breeds of poultry like Miri and Daothigir in Assam, Chittagong in Meghalaya and Tripura, Kaunayen in Manipur are found in the north eastern region. Apart from these, improved chicken varieties like Vanaraja, Gramapriya, Srinidhi, Kalinga Brown, Kamrupa, Kuroiler, Rainbow Roster, etc. are suitable and popular in the regions which are well-adapted to the climate with minimal healthcare. Using local grains and kitchen waste as feed in backyard farming helps lessen dependence on expensive commercial feeds. Poultry manure serves as a valuable organic fertilizer, enhancing soil fertility and benefiting small-scale farmers engaged in agriculture.

Entrepreneurship and small-scale enterprises promotion: The region is witnessing a rise in small and medium-scale poultry farming, which is aiding the growth of local entrepreneurship. There are business prospects in hatcheries, feed manufacturing, poultry processing, and egg distribution. The demand for poultry meat and eggs remains consistent in urban and semi-urban markets, guaranteeing continuous revenue generation.

Climate resilience and adaptability: Poultry farming is less vulnerable to climate risks compared to crop farming, which is often affected by floods and erratic weather in northeast India. The north eastern area have climatic advantage for poultry farming, thereby minimizing the necessity for costly temperature regulation systems. Indigenous and crossbred poultry varieties such as Vanaraja and Gramapriya, are well-suited to local conditions. Indigenous poultry breeds are naturally adapted to the local climate, requiring only minimal healthcare assistance. Small-scale backyard farming can continue even during adverse weather conditions, ensuring food and income security.

Contribution to the regional economy: Poultry farming contributes significantly to the agriculture and livestock sector of northeast India. It helps in reducing dependency on poultry imports from other states, leading to self-sufficiency in egg and meat production. It also generates revenue for local traders, feed manufacturers, and veterinary service providers.

Poultry farming systems in northeast India

The majority of the farmers in the region are practicing traditional poultry farming systems which is basically a backyard poultry production. However, commercial poultry farming has been expanding in recent years in the region. Backyard poultry production can be classified into several systems, such as small-scale extensive scavenging, scavenging, semi-intensive, and small-scale intensive (FAO 2014). The backyard poultry production system in India has been classified into

traditional backyard system (<20 birds with little or no input), semi-intensive farming (50–200 birds under semi-scavenging conditions), small-scale intensive farming (200 or more birds with improved birds under a high-input system), and native chicken farming (indigenous birds with a run area and complete ration). The type of backyard poultry production system is based on the availability of poultry germplasm, marketing avenues, availability of natural food base resources, food habits of the population, etc. Generally, the following different poultry farming systems are found in the region.

Traditional backyard system: Traditional backyard poultry farming is an age-old practice prevalent in rural and tribal villages of the region with few numbers of native birds either chicken or ducks (less than 20) with nominal or no inputs. In this system, birds are not confined and can scavenge for feed over a wide open area in and around home. The fertile eggs are hatched to provide replacements and the birds feed by scavenging or are provided with kitchen wastes, and crop by-products. The number of birds may go up to 50 birds in this system, provided there are enough scavenging areas and supplementary feeding. The surplus males are used for self-consumption or sold at about 3–4 months of age for meat purposes and the females are retained for egg production.

Semi-intensive system: The birds are reared under semi-scavenging conditions i.e. a limited free-range area for scavenging during day time with supplementation of 30–40% of feed requirements. In the semi-intensive system of backyard poultry farming, flock size should be 50–200 or more. Supplementary feed is offered generally in the evening hours based on the availability of the natural food base in the specific area and season. This type of system can be practiced in orchards and gardens with a poultry house as night shelter and shade during sunny days. The surplus males are sold at about 3–4 months of age and females are retained for egg production.

Small-scale intensive system: It comprises more than 200 to a few thousands of birds, which are reared by providing all the inputs till they attain about 1.5 kg of body weight. This kind of farming is usually practiced for meat purpose using fast-growing breeds like Vanaraja, Krishibro, Srinidhi, Kuroiler, and Rainbow Rooster and also for small scale broiler and layer farming. The low cost poultry house is constructed using locally available materials like wood, bamboo, thatches, etc. and materials like saw dust, wood shaving, paddy husk, etc. are used as bedding materials.

Commercial intensive system: In this system, birds are fully confined in houses under deep litter or battery systems. These systems are followed by the medium or large scale commercial layer or broiler farms under optimum housing, feeding and proper healthcare with high input and high output. Under commercial intensive farming system, the capital expenditure is higher and the production is also higher.

Native chicken farming: Backyard poultry with indigenous/native chicken for meat purposes is the recently adopted business model, which has huge scope

and potential in the coming years. Demand for meat and eggs from the native chicken breeds are increasing considerably both in urban and rural areas. The native chickens are slow growers and poor egg producer with intermittent brooding phases. However, they are ideal mothers and good sitters, excellent foragers, hardy, and naturally tolerant to common diseases. The birds are reared up to 3–5 months under intensive farming with a run area and complete ration. The birds fetch a premium price based on the season and the quality of meat e.g. Kadaknath, the most popular native chicken in recent times.

Challenges and strategies of poultry farming in northeast India

Despite the immense potential of poultry farming in northeast India, several challenges hinder its growth and sustainability. These challenges include disease outbreaks, high feed costs, poor infrastructure, and market-related issues. Addressing these obstacles is crucial for improving poultry productivity, farmer income, and the overall poultry sector in the region.

Disease outbreaks and poor veterinary care: Common poultry diseases like *Avian influenza* (Bird Flu), Newcastle disease, Fowl pox, and Salmonellosis frequently affect poultry populations, causing high mortality rates. The veterinary services in rural areas of the region is limited due to lack of trained veterinarians, proper vaccination programmes, and diagnostic facilities. Moreover, small-scale farmers face losses due to high mortality in backyard poultry birds because of lack of awareness about disease prevention, biosecurity, and vaccination.

Strategies:

- Establishing more veterinary clinics in rural areas.
- Government-supported vaccination and disease surveillance programmes.
- Training farmers on biosecurity and hygiene practices.

High cost and shortage of poultry feed: Feed costs make up 60–70% of production expenses in commercial poultry farming. Maize and soybean serve as the primary ingredients for poultry feed; however, they are either costly or insufficiently available in the region. Therefore, poultry feed is often sourced from other states outside the region which creates a supply bottleneck and increasing transportation costs and overall expenses for farmers.

Strategies:

- Encouraging local production of maize and soybean to reduce dependency on external markets.
- Government subsidies on poultry feed to support small-scale farmers.
- Establishing more poultry feed processing units in northeast India.

Poor market linkages and low profit margins: Due to lack of organized poultry market linkages in the region, the farmers rely on middlemen who take a significant share of profits. The small farmers often sell their products at lower prices due to the absence of direct wholesale and retail market linkages. Moreover, mismatches of seasonal demand and supply lead to price fluctuations which affect the income stability of

the farmers. The non existence of structured poultry cooperatives weakens the negotiating power of farmers.

Strategies:

- Developing poultry cooperatives to help farmers get better prices.
- Government support for direct farmer-to-market linkages through e-commerce and wholesale markets.
- Strengthening local poultry processing industries to add value to products.

Lack of proper infrastructure and technology: Many small-scale farmers use traditional shelters that do not provide proper ventilation, temperature control, or predator protection. Majority of farmers of the region lack knowledge of modern poultry farming techniques like disease control, and improved breed management. Poor electricity supply also affects incubators, brooding systems, and storage of poultry products in the region.

Strategies:

- Providing affordable and improved poultry housing models.
- Organizing farmer training programmes on modern poultry farming techniques.
- Investing in solar-powered poultry equipment and storage facilities.

Climate and environmental challenges: The challenging terrain and climate conditions in some north eastern states affect poultry production, especially in remote areas where transportation of feed and other inputs is difficult. In Assam, Meghalaya, and other north eastern states, high humidity, heavy rainfall, and flooding adversely impact poultry health and the quality of feed. Seasonal variations leading to heat and cold stress additionally impede poultry development, egg yield, and overall farm efficiency. Poultry waste disposal is often unregulated in the region, leading to water and soil pollution.

Strategies:

- Promoting climate-resilient poultry farming practices.
- Encouraging controlled-environment poultry housing systems.
- Using poultry manure for organic farming to manage waste sustainably.

Poor availability of improved breeds: Due to poor availability of quality chicks of improved breeds or varieties, the farmers rear the local birds which are poor egg and meat producers compared to commercial breeds although hardy and disease-resistant with broodiness characters. Therefore, poultry farmers of the region struggle to access high-yield broilers and layers while depending on hatcheries from other states. Moreover, research on local breeds of the region is still in its early stages.

Strategies:

- Strengthening local hatcheries and breed improvement programmes.
- Promoting cross-breeding programmes to improve indigenous poultry productivity.
- Encouraging conservation of disease-resistant local breeds while enhancing productivity.

Financial limitations and insufficient credit availability: The majority of poultry farmers in the area are small-scale and marginal producers. Therefore, establishing a modern commercial poultry farm requires a significant financial commitment to housing, equipment, and feed. Many rural poultry farmers lack access to institutional credit, relying on high-interest loans from informal lenders due to limited bank loans available for small and marginal farmers. Moreover, poultry farmers rarely have insurance, making them vulnerable to losses due to disease outbreaks or natural disasters.

Strategies:

- Government-supported microfinance and low-interest loans for poultry producers.
- Promoting banks and financial institutions to offer accessible credit options.
- Establishing poultry insurance plans to shield farmers from unexpected financial setbacks.

Competition from poultry imports: The poultry eggs and broilers originating from states like West Bengal and Andhra Pradesh are prevalent in the northeast Indian markets, which diminishes the demand for locally produced poultry.

Strategies:

- Promoting branding and certification of local poultry products (e.g. organic, free-range).
- Implementing government policies to encourage local poultry consumption.
- Strengthening local poultry farming industries to meet market demand.

Lack of government support and policy implementation: Many government poultry development schemes initiatives take time to reach farmers due to bureaucratic delays. Moreover due to insufficient extension services, farmers of the region are not aware about available subsidies, training, and support programmes.

Strategies:

- Enhancing government poultry assistance programmes to facilitate easier access for farmers.
- Expanding awareness initiatives regarding the financial and technical support that is available.
- Fortifying veterinary and poultry extension services.

SUMMARY

Poultry farming in northeast India has immense potential to enhance rural livelihood and nutritional security. Nonetheless, obstacles such as disease outbreaks, elevated feed expenses, inadequate infrastructure, and restricted market access impede its development. Addressing these issues requires a multi-pronged approach, including government intervention, technological advancements, improved breeds, financial support, and better market linkages. By tackling these challenges and improving productivity, the poultry industry can greatly enhance the economic and nutritional well-being of the population in the region.

*Corresponding author email: doleysunil@yahoo.com