SUSTAINABLE POULTRY FARMING IN INDIA

Mainstreaming prevention to reduce antibiotic use and improve sustainability



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A summary

The imperative for prevention and sustainability

The Indian poultry sector's growing intensification relies heavily on the routine use of antibiotics as growth promoters and for mass disease prevention, creating a critical pathway for the spread of antimicrobial resistance (AMR). Transitioning to a prevention-led pathway is highly cost-effective and generates high net returns by reducing disease emergence on farms, lowering bird mortality, and minimising the overall need for chemical interventions. Prevention within the agri-food system secures broader sustainability by keeping antibiotics effective for future generations, reducing zoonotic and food-borne infections, lowering greenhouse gas emissions, and enabling access to safe and diverse food.

At the operational level, disease prevention is anchored across five pillars:

- Implementing biosecurity and farm management
- Quality feed and feed additives
- Alternatives to antibiotic use
- Vaccination
- Resilient breed-led extensive poultry systems

Mainstreaming these prevention pillars enhances the economic and environmental sustainability of the sector by boosting farm productivity and incomes, creating small-holder livelihood opportunities, conserving hardy native breeds, and strengthening global trade access.

Overview of the Indian poultry sector and antibiotic use

Industry structure and production

India's total poultry population reached 851.81 million in 2019, marking a 16.8 per cent growth over the 2012 census. The top five poultry-producing states are Tamil Nadu, Andhra Pradesh, Telangana, West Bengal and Maharashtra. The sector operates in two primary categories:

- **Commercial poultry** accounts for 63 per cent of the total poultry population, encompassing 534.74 million birds. Commercial production contributes 85 per cent of the country's 149.11 billion eggs and the vast majority of its 5.18 million tonne (MT) of meat output.
- **Backyard/rural poultry** accounts for 37 per cent of the total poultry population. This segment showed a rapid 45.8 per cent growth between 2012 and 2019, involving roughly 30 million farmers who rear low-input varieties for family nutrition and supplementary livelihood.

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Antibiotic utilisation and regulatory status

Intensive commercial farming's high stocking densities and confined conditions drive indiscriminate antibiotic reliance to manage disease-prone environments.

A 2021 CSE study reported the use of 22 different antibiotics in the Indian poultry sector, including highest priority critically important antimicrobials (HPCIAs) such as ciprofloxacin, enrofloxacin, norfloxacin and levofloxacin. These antibiotics are routinely used for therapeutic purposes, mass disease prevention and non-therapeutic growth promotion administered through feed.

The Food Safety and Standards Authority of India (FSSAI) has formally prohibited specific antibiotics, including colistin, chloramphenicol and nitrofurans at any stage of poultry production. The Ministry of Health and Family Welfare (MoHFW) has further prohibited the import, manufacture, sale and distribution of 17 antibiotics for animal use to align with trade requirements. However, the Bureau of Indian Standards (BIS) specifications that prohibit mixing medically important antibiotics into chicken feed remain voluntary – meaning feed manufacturers are not legally mandated to comply.

Gaps, challenges, and recommendations across prevention pillars

Pillar 1: Implementing biosecurity and farm management

- **Gaps and challenges:** Adequate biosecurity is not a common practice because thin profit margins prevent small-holders from affording fundamental physical infrastructure. Existing biosecurity guidelines are voluntary, meaning no farms are mandated to comply or undergo audits. Furthermore, government training programmes lack hands-on demonstrations and sufficient funding to effectively scale these practices.
- **Recommendations:** Biosecurity must be mainstreamed as a core preventive methodology. The government should develop a targeted national programme to scale up farm management, supported by a comprehensive database of registered poultry farms. This programme should mandate compliance with base-level biosecurity parameters, enforce standard operating procedures, conduct periodic audits, and offer incentive structures for infrastructure upgrades.

Pillar 2: Quality feed and feed additives

- **Gaps and challenges:** India lacks a national-level legislative framework to control the quality, safety, and labeling of chicken feed and feed additives. Because BIS standards are voluntary, the presence of antibiotics in feed is frequently unlabelled and unchecked. Dedicated state-level legislation to regulate feed remains absent in several high-producing states.

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- **Recommendations:** BIS chicken feed standards should be made mandatory to ensure consistent safety and quality parameters across all states. Antibiotics must be strictly prohibited as growth promoters in feed; any medicated feed required for therapeutic use should be accessible only via veterinary prescription and subjected to strict audits. States without feed legislation must prioritise establishing dedicated Feed Acts.

Pillar 3: Alternatives to antibiotic use

- **Gaps and challenges:** The market for non-antibiotic alternatives (such as probiotics, prebiotics, essential oils, and organic acids) is largely unregulated, leading to significant quality and consistency deficits. Scientific evidence regarding product efficacy, optimal dosage, and administration routes is not adequately consolidated, creating a trust deficit among farmers. Additionally, there are no government incentives provided to offset the perceived financial risk of transitioning away from familiar antibiotics.
- **Recommendations:** Establish a central regulatory framework to ensure the safety, quality, standardisation and transparent labeling of feed additives and alternatives, including emerging therapeutic technologies like bacteriophages. Strengthen the scientific research ecosystem to validate alternatives against actual disease conditions on farms. Leverage ethnoveterinary and herbal preparations to reduce treatment costs, and build veterinary capacity through updated curricula and targeted training.

Pillar 4: Vaccination

- **Gaps and challenges:** Vaccine research and availability are skewed toward viral diseases, leaving bacterial infections to be broadly managed by chemical antibiotics. In rural areas, frequent electricity fluctuations and long transit distances degrade cold-chain integrity, compromising vaccine potency. Broiler farmers are less inclined to vaccinate than layer farmers due to the birds' shorter lifespans and limited biological capacity to respond to multiple vaccines. Backyard farmers exhibit poor adoption due to a lack of awareness, inappropriate commercial pack sizes, and the ease of accessing cheap antibiotics.
- **Recommendations:** Strengthen existing immunisation initiatives in poultry and government-private collaboration to develop and expedite field approvals for newer bacterial vaccines. Plug last-mile cold chain gaps in remote areas by developing community refrigeration systems and training 'Pashusakhis' (women community animal health workers) in vaccine handling and administration. Evaluate and scale advanced technologies, including *in-ovo* hatchery vaccination, thermostable vaccines and autogenous vaccines tailored to specific local strains.

Pillar 5: Resilient breed-led extensive poultry systems

- **Gaps and challenges:** Backyard and rural farmers struggle to access healthy chicks of resilient, improved varieties. High chick mortality frequently occurs during the first six to eight weeks because small farmers lack the resources for adequate brooding infrastructure,

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proper nutrition, and timely initial vaccinations. Furthermore, backyard farmers face a dearth of veterinary guidance, limited training and severe difficulties accessing formal markets for fair pricing.

- **Recommendations:** Establish and heavily support localised 'mother units' capable of collecting day-old chicks, providing necessary brooding, nutrition and vaccination, and only distributing them to small farmers once they are robust at six to eight weeks of age so that early mortality is reduced. Ensure a sustainable supply of resilient breeds through public-private partnerships. Create dedicated Farmer Producer Organisations (FPOs) and cooperatives to provide rural farmers with fair market access, remunerative pricing and centralised veterinary support.

Overarching strategic recommendations

To successfully mainstream prevention and improve the sustainability of the Indian poultry sector, a coordinated response between Central and state governments must focus on the following systemic actions:

- Categorically phase out the routine use of antibiotics for mass prevention across flocks, and enforce the total cessation of antibiotic use as growth promoters in feed.
- Phase out the administration of critically important and highest priority critically important antimicrobials used for human medicine within poultry farming.
- Strictly control the over-the-counter availability of antibiotics to farmers, enforce adherence to veterinary withdrawal periods, and actively monitor compliance with FSSAI and MoHFW prohibitions on antibiotics.
- Mandate that all antibiotic use in poultry be thoroughly traceable and recorded within a centralised state and national level database, which also includes all registered poultry farms.
- Strengthen the veterinary extension system to improve farmer access to professional guidance, field support and cost-effective diagnostic support through laboratories or on farm-testing.
- Enforce effective waste management protocols to ensure poultry litter is rendered AMR-safe and residue-free before agricultural reuse.
- Strategically subsidise and incentivise the adoption of preventive measures and create specific market linkages to economically reward poultry products reared without the use of antibiotics.

Sixteen nation-wide case studies across public, private and civil sectors demonstrate that preventive measures effectively reduce antibiotic use and enhance sustainability. Crucially, they show that scaling these practices is both financially viable and highly feasible.

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Introduction: A 'Prevention-led' Pathway to Sustainability

Food-animal production systems, such as the poultry sector (for chicken meat and eggs), have a potential to significantly impact public health, environment, climate and biodiversity, in addition to food safety and food security in the country. The degree of intensification in poultry rearing systems (intensive, semi-intensive, extensive) largely determines the severity of this impact.

As such, these chemical-dependent intensive systems are unsustainable for multiple reasons, including high-stocking densities, confined conditions, dependence on chemical inputs, use of commercial feed, breeds lacking resilience and inadequate animal husbandry.

Antibiotics play a big role in intensification of food systems. In the case of the poultry sector, easy availability and indiscriminate use of antibiotics enables intensification. More birds crammed into a limited space means disease prone-conditions. More productivity-centric breeds mean less ability to fight diseases. Overall, it leads to more mortality and increased financial liability.

Antibiotics come across as an easy substitute compared to approaches that can offer real prevention by reducing the occurrence of disease and the need for antibiotics. The wider practice of routine use of antibiotics in the entire flock as growth promoters in feed and in the name of prevention is the key problem. With growing intensification, India's big poultry sector is potentially an important pathway of antimicrobial resistance (AMR) that needs to be addressed along with dairy and fisheries sector pathways.

Scaling up real prevention is a critical way forward due to cost effectiveness and high net returns. While infection prevention practices are popular in the human health sector, the concept of prevention in agri-food systems is gaining traction in recent times. For example, the 2024 United Nations Political Declaration of the High Level Meeting on AMR endorsed by Member States highlights the importance of prevention in agri-food systems.[1] India's National Action Plan on AMR 2.0 also emphasises on prevention in agri-food systems.[2] The concept of prevention, however, needs to be deconstructed for a scaled-up change on the ground.

The key 'prevention pillars' are implementing biosecurity and farm management, quality feed and feed additives, alternatives to antibiotic use, vaccination, resilient breed led extensive poultry systems. It can reduce disease and mortality in intensive farms, check antibiotic use/

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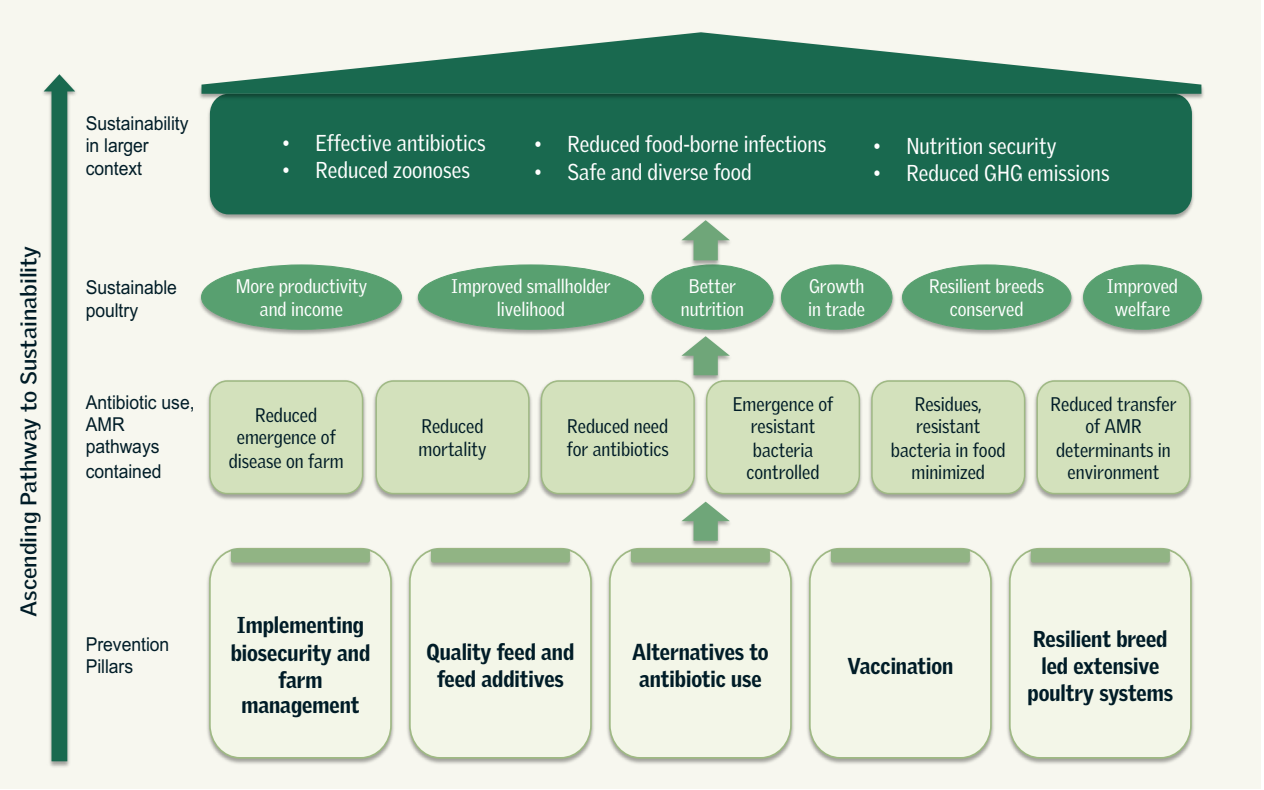
misuse, and control emergence and spread of antimicrobial resistance (AMR). All this can add to sustainability in the intensive farms by improving productivity and incomes, small-holder livelihood opportunities, family nutrition, trade opportunities, conservation of resilient and hardy varieties and welfare.

A sustainable poultry sector will eventually improve upon the sustainability at a larger level. For example, it will keep antibiotics effective for future generations, reduced transmission of zoonotic and food-borne diseases, enable access to safe and diverse food, improve nutrition security and reduce green-house gas (GHG) emissions.

It is this prevention-led pathway to sustainability that the current report attempts to cement, effectively translated into mainstreaming of preventive approaches in intensive systems and scaling up rural and extensive systems. (*see Figure 1: Prevention-led pathway to sustainability in the poultry sector and beyond*).

Specifically, this report highlights the challenges and possibilities across prevention pillars. It also presents case studies from different parts of India to show that such a pathway is feasible and economically viable and that real growth should factor-in sustainability.

Figure 1: Prevention-led pathway to sustainability in the poultry sector and beyond



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The Research Approach

The findings presented are based on extensive primary research and secondary information, and reflects synthesis of information and insights generated and analysed by authors. Insights were developed through interactions with over 50 experts and stakeholders during 2024-26. Research modalities include:

- Field visits in select districts of Telangana, Haryana, Tamil Nadu, Uttar Pradesh
- Engagement with stakeholders from the poultry sector over a day-long national consultation and a three-day workshop organised by CSE
- Engagement with poultry sector experts through in-person/online discussions
- Secondary research for government data and reports, scientific publications.

Inputs were received from experts from the following stakeholder groups:

- **Scientific and academic institutes:**
  - » *ICAR institutes:* Central Avian Research Institute, Directorate of Poultry Research, National Institute of High Security Animal Diseases, Indian Veterinary Research Institute, National Research Centre on Meat
  - » *State universities:* Tamil Nadu Veterinary and Animal Sciences University; Lala Lajpat Rai University of Veterinary & Animal Sciences, Haryana; P.V. Narsimha Rao Telangana Veterinary University, Telangana; Guru Angad Dev Veterinary and Animal Sciences University, Punjab; Kamdhenu University, Gujarat; Kerala Veterinary and Animal Sciences University
  - » *Krishi Vigyan Kendras:* Gautam Budh Nagar, Badaun and Hapur, Uttar Pradesh; Ambala, Haryana
- **Government departments and organisations:** State animal husbandry departments of seven states (Uttar Pradesh, Haryana, Kerala, Rajasthan, Telangana, Madhya Pradesh, Maharashtra), Central Drugs Standard Control Organisation, Central Poultry Development Organisation, National Institute of Agricultural Extension Management
- **Farmers:** Small and large (rearing broilers/layers, indigenous/commercial breeds)
- **Private industry and associations:** Integrated poultry players in Telangana, Tamil Nadu, Haryana; Poultry Federation of India, National Egg Coordination Committee, Broiler Breeder Association (North), alternative and vaccine manufacturers
- **Civil society:** Professional Assistance for Development Action (PRADAN), Watershed Support Services and Activities Network (WASSAN), Aga Khan Rural Support Programme (India)

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SECTION 1

The Indian Poultry Sector and Antibiotic Use

1. An Overview of the Sector

The poultry sector is one of the fastest-growing segments of India's agricultural economy. According to the 20th Livestock Census of 2019, the country's total poultry population reached 851.81 million, representing a 16.8 per cent growth over 2012 census.[3] The five leading states by poultry population were Tamil Nadu (14.17 per cent), Andhra Pradesh (12.6 per cent), Telangana (9.39 per cent), West Bengal (9.07 per cent), and Maharashtra (8.7 per cent). The population encompasses fowls, ducks, turkeys, quails, guinea fowl, ostriches, emus and geese, with fowls (cocks, hens, and chickens under five months) making up 95 per cent of the total.

Rearing is broadly categorised into backyard and commercial systems. The Department of Animal Husbandry and Dairying (DAHD) defines commercial farms as those maintaining over 1,000 birds.[4] In the 2019 census, commercial poultry accounted for 534.74 million birds (63 per cent of total poultry), reflecting a 4.5 per cent growth since 2012, and involved about 20 million farmers as of 2012.[5] In contrast, backyard poultry showed growth of 45.8 per cent, accounting for remaining 37 per cent of total poultry, and involved roughly 30 million farmers.

Poultry production systems

The Indian poultry production of broilers and layers can be categorised as backyard, rural and commercial systems based on the kind of breeds, number of birds reared and commercial, livelihood or nutritional objectives. Clearly, rural and backyard poultry do not just offer livelihood and nutrition advantages, but they are also more sustainable than commercial systems (*see Figure 2: Poultry production systems in India*).

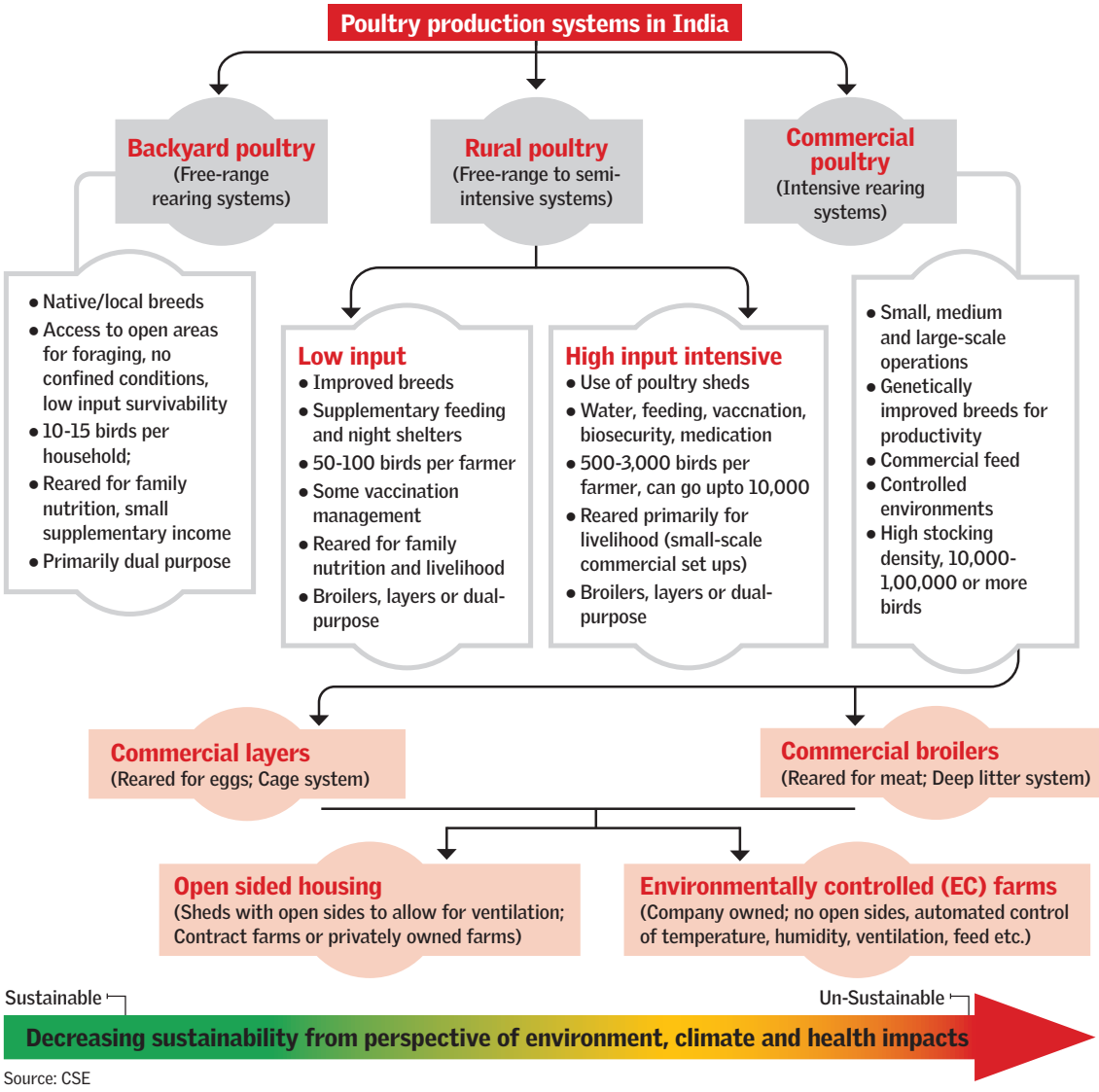
The primary commercial outputs from the poultry sector are meat (from broilers) and eggs (from layers) (*see Table 1: Egg and meat production from poultry in 2024-25*).

Key stakeholders

The Department of Animal Husbandry and Dairying (DAHD) is the apex body that looks into overall development of the poultry sector, while specific institutions under Indian Council of Agricultural Research (ICAR) are leading the research and extension work in India. In addition, there are food, drug and pollution regulators and export promoters (*see Figure 3: Key stakeholders, GoI*).

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Figure 2: Poultry production systems in India



Source: CSE

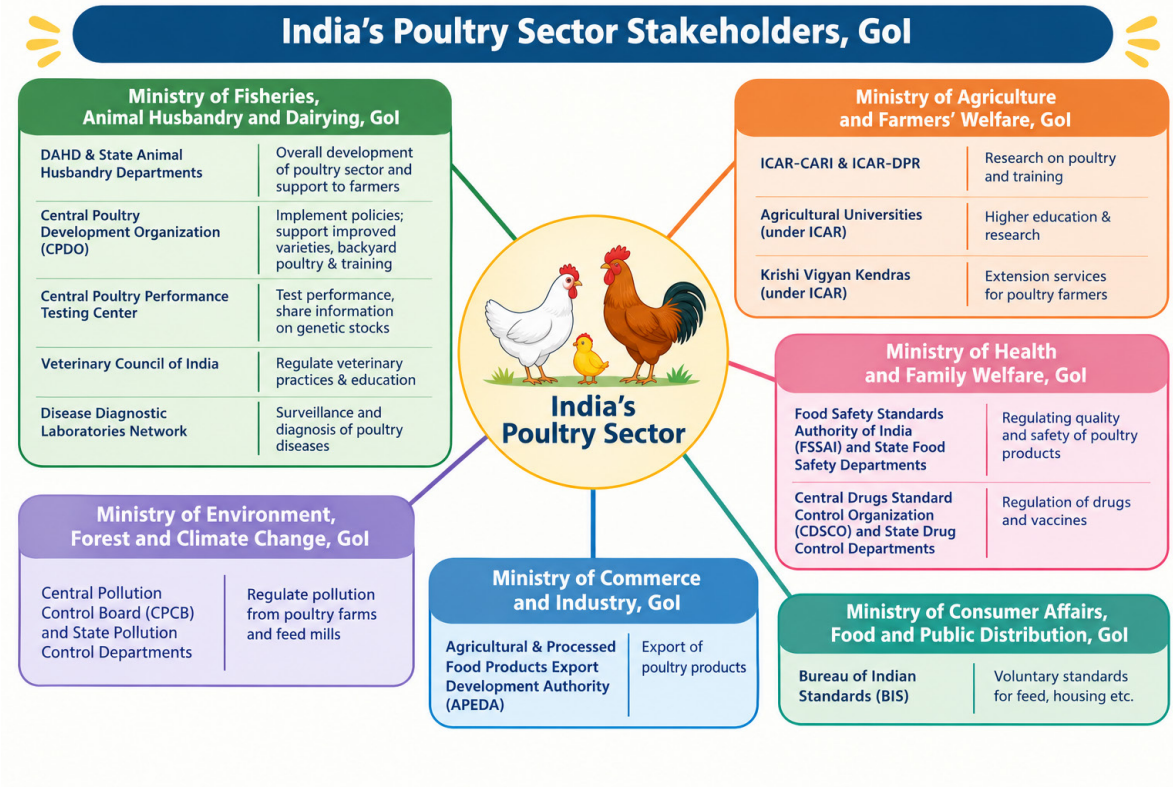
Table 1: Egg and meat production from poultry in 2024-25

	Eggs	Meat
Total production	149.11 billion	5.18 million tonne
Production commercial vs backyard (%)	Commercial: 85 Backyard: 15	-
Growth over previous year (%)	4.4	3.10
Per-capita availability per annum	106 eggs	7.5 kg per annum
Top five states (% of total production in India)	Andhra Pradesh (18.37) Tamil Nadu (15.63) Telangana (12.98) West Bengal (10.72) Karnataka (6.67)	Maharashtra (15.26) West Bengal (13.71) Haryana (13.01) Tamil Nadu (11.59) Telangana (9.46)

Source: Basic Animal Husbandry Statistics 2025, Dept. of Animal Husbandry and Dairying

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Figure 3: Key stakeholders, GoI



Programmes and initiatives

There are three key livestock related national programmes or schemes under DAHD which also include the poultry component:

- **National Livestock Mission**: Focuses on employment generation and increase in productivity and production of meat, goat milk, egg and wool. Under its 'Sub-mission on Breed Development of Livestock and Poultry', it promotes entrepreneurship development and breed improvement in poultry by providing incentives.[6]
- **Livestock Health and Disease Control Program (LHDCP):** Caters to livestock health and disease prevention, including poultry. Specifically, vaccination in poultry (particularly for backyard flocks) is funded under the Livestock Health and Disease Control (LH&DC) scheme of this programme, through its ASCAD (Assistance to States for Control of other economically important, exotic, emergent and zoonotic Animal Diseases) component.[7]
- **Animal Husbandry Infrastructure Development Fund (AHIDF):** Incentivises private investment, MSMEs and cooperatives to set up infrastructure for meat processing, value addition and poultry feed.[8]

In addition, the poultry sector receives support on training, vaccination and distribution of improved breeds of birds through the Rashtriya Krishi Vikas Yojana (RKVY) of the Ministry

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of Agriculture and Farmers' Welfare and the National Rural Livelihood Mission (NRLM) under the Ministry of Rural Development.

ICAR's All India Coordinated Research Project (AICRP) on poultry breeding focuses on developing location-specific chicken varieties and conserving native germplasm.[9] This is led by the Directorate of Poultry Research. Another ICAR-led project is the All India Network Project on Antimicrobial Resistance (AINP-AMR) in Fisheries and Livestock, launched in 2024, which includes more than 30 partners. AMR surveillance has been conducted as part of the Indian Network for Fisheries and Animal Antimicrobial Resistance (INFAAR).

India's National Action Plan on AMR 2.0, released November 2025, highlights strategies to curb AMR emergence including in the food-animal sector, through awareness, surveillance, optimised use and infection prevention as well as research.[10] States like Kerala, Madhya Pradesh, Delhi and Andhra Pradesh have also developed state action plans on AMR along similar lines.

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2. Antibiotic Use in the Sector

In 2021, Centre for Science and Environment (CSE) reported the use of 22 different antibiotics in the Indian poultry sector.[11] As per the World Health Organization's (WHO) List of Medically Important Antimicrobials (2024), four out of these are highest priority critically important antimicrobials (HPCIA), eight are critically important antimicrobials (CIAs), eight are highly important antimicrobials (HIAs) and two are important antimicrobials (IAs).[12] These antibiotics were found to be used for therapeutic and non-therapeutic purposes such as growth promotion through feed, mass disease prevention and control.

In 2024, the Food Safety and Standards Authority of India (FSSAI) prohibited three antibiotic classes — glycopeptides, nitrofurans and nitroimidazoles — and five antibiotics — carbadox, chloramphenicol, colistin, streptomycin and sulfamethoxazole.[13] This list includes only streptomycin, sulfamethoxazole, chloramphenicol and nitrofuran which were found to be used on the ground by CSE.

In 2025 and 2026, the Ministry of Health and Family Welfare (MoHFW) prohibited the import, manufacture, sale and distribution of 17 antibiotics for animal use.[14] This was in line with requirements of trade agreements with the European Union. These are high-end antibiotics which are largely reserved for human use, and are likely not used in the Indian poultry sector. This will safeguard the future misuse of these antibiotics in the poultry sector, but will not impact current use practices. Only one antibiotic class out of the 18 originally listed as per EU requirement, which is not yet prohibited, is the combination of cephalosporins with beta-lactamase inhibitors.

Earlier, the MOHFW prohibited colistin in 2019, chloramphenicol and nitrofurans in 2025, which are found to be used in the Indian poultry.[15,16] This means the enforcement of these prohibitions will be important (*see Table 2: Antibiotics used vs prohibited for Indian poultry sector*).

The Bureau of Indian Standards specification for chicken feeds, updated in 2024, does not permit the incorporation of antibiotics from medically important antimicrobial classes in chicken feed for growth promotion.[17] However, it is a voluntary standard and the feed manufacturers are not mandated to comply with it. Feed is regulated by law in some states like Andhra Pradesh, Karnataka, Odisha and Kerala. These states have dedicated acts for animal feed (including poultry) to ensure feed quality and check feed manufacturing units. Antibiotic use in feed is prohibited in Andhra Pradesh and Karnataka.[18,19]

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Table 2: Antibiotics used vs prohibited for Indian poultry sector

Reported to be used in Indian poultry sector as per CSE report (2021)	Prohibited to be used at any stage of production of poultry and eggs (among others) by FSSSAI (2024)	Prohibited to be used for animal use by MoHFW (2025)
Ciprofloxacin (HPCIA)	Carbadox	Carboxypenicillins**
Enrofloxacin (HPCIA)		Ureidopenicillins
Norfloxacin (HPCIA)	Nitroimidazoles (including dimetridazole; and ronidazole, ipronidazole, metronidazole and their metabolites)	Ceftobiprole
Levofloxacin (HPCIA)		Ceftaroline
Amikacin (CIA)		Siderophore cephalosporins
Gentamicin(CIA)		Carbapenems
Neomycin (CIA)		Penems
Streptomycin (CIA)	Streptomycin and its metabolite, dihydrostreptomycin	Monobactams
Erythromycin(CIA)		Phosphonic acid derivates**
Azithromycin (CIA)	Glycopeptides	Glycopeptides
Tylosin (CIA)		Lipopeptides
Tylvalosin (CIA)		Oxazolidinones
Amoxicillin (HIA)		Fidaxomicin
Ampicillin(HIA)		Plazomicin
Tetracycline (HIA)		Glycylcyclines
Oxytetracycline (HIA)		Eravacycline
Doxycycline (HIA)		Omadacycline
Trimethoprim sulfamethoxazole (HIA)	Sulfamethoxazole	
Cefalexin (HIA)		
Chloramphenicol (HIA)	Chloramphenicol	Chloramphenicol
Tiamulin (IA)	Colistin	Colistin*
Furazolidone (IA)	Nitrofuran	Nitrofuran

*Prohibited in 2019, ** Prohibited in 2026

Note: HPCIA: Highest priority critically important antimicrobials; CIA: Critically important antimicrobials; HIA: Highly important antimicrobials; IA: Important antimicrobials

The Standard Veterinary Treatment Guidelines for Livestock and Poultry released by the Department of Animal Husbandry and Dairying (DAHD) of the Government of India in 2024 recommends antibiotic therapy for certain specific bacterial diseases in poultry as per antibiotic sensitivity test under veterinary supervision and adherence to following of withdrawal period.[20] However, implementation on the ground remains a big challenge.

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SECTION 2

Prevention Pillars–Challenges and Possibilities for Scaling Up

3. Implementing Biosecurity and Farm Management

An overview

Biosecurity includes measures that can minimise the risk of disease introduction, establishment and spread within a flock. Broadly, three types of biosecurity levels exist[21]:

- **Structural biosecurity**: Focuses on location, physical design and farm layout
- **Operational biosecurity**: Encompasses day-to-day farm procedures and practices
- **Managemental biosecurity**: Includes management of farm, bird, personnel and production
- **Personnel biosecurity:** biosecurity measures related to farm personnel

Biosecurity can be implemented at two levels— routine biosecurity procedures and high risk biosecurity procedures.

Farm management includes:

- Housing and shed management (shed measurements, flooring, roofing, shed cleaning, disinfection, temperature and humidity control)
- Chick quality (proper unloading, beak dipping in water, stocking density, brooding space)
- Feed management (feed storage, feeding time, cleaning of feeders)
- Water management (clean drinking water, cleaning of waterers and water tanks)
- Litter and waste management (litter type/use/reuse, dead bird disposal)
- Transport management (transporting conditions, distance to slaughter house)
- Hatchery and breeding management

The Poultry Disease Action Plan 2024, developed by the Department of Animal Husbandry and Dairying (DAHD) of the Government of India provides a framework for preventing, monitoring and controlling diseases across India's poultry sector, covering both commercial and backyard poultry production systems (*see Box: Focus areas under the Poultry Disease Action Plan 2024*). The Plan is advisory in nature, without any legally binding obligations.[22]

Basic tenets of biosecurity are also provided in the 2015 'General Guidelines for Biosecurity at CPDOs'.[23] Meant primarily for farms under Central Poultry Development Organisations, it gives a roadmap to prevent any future outbreaks or disasters. The Poultry Farm Manual of 2015 gives similar guidance, along with a biosecurity score card concept to assess the implementation of biosecurity measures.[24] The 2015 Action Plan for Prevention, Control and Containment of Avian Influenza highlights the need for strict biosecurity measures to control

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FOCUS AREAS UNDER THE POULTRY DISEASE ACTION PLAN 2024

- **Disease identification and control**: Prevention and control of 11 major poultry diseases through disease-specific interventions
- **Surveillance and diagnostics**: Early detection, regular monitoring, diagnostic testing, disease reporting and strengthening laboratory capacity
- **Biosecurity**: Guidelines for both commercial and backyard poultry farms—farm access, fencing, sanitation, disinfection, pest and rodent control, water quality, bird/personnel movement, waste disposal; biosecurity audits
- **Vaccination and treatment**: Disease-specific vaccination protocols, treatment recommendations and guidance on responsible antibiotic use to combat AMR.
- **Outbreak preparedness and response**: Isolation and quarantine, movement restrictions, culling, disinfection, safe disposal of infected birds
- **Capacity building and coordination**: Strengthening veterinary services, farmer training, awareness and coordination among stakeholders
- **Regulatory and international alignment**: Improving disease reporting and aligning disease-control measures with national and international standards

spread of avian influenza.[25] The Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009 provides a legal framework for prevention, control and eradication of infectious and contagious animal diseases, including poultry diseases.[26]

The 2022 Environmental Guidelines for Poultry Farms by the Central Pollution Control Board also address certain biosecurity aspects, focusing on manure and waste management.[27] As per these guidelines, farms with more than 25,000 birds at a single location are required to obtain a 'consent to establish' and a 'consent to operate' from state pollution control boards or committees. The Ministry of Environment, Forest and Climate Change categorizes poultry farms are under the "Green" category based on their pollution-causing potential.

Gaps and challenges

- **Adoption of adequate biosecurity measures is not a common practice.** A small portion of aware, big farmers and integrated players adopt strict biosecurity due to the high investment and stakes involved. Many unaware big farmers and most medium-scale farmers follow limited practices that are affordable and convenient. There are efforts to make aware small farm rural entrepreneurs about the importance of biosecurity, particularly in view of Avian influenza outbreaks. In addition, thin profit margins prevent small-holders from affording basic physical infrastructure. Biosecurity practices are, however, not a priority for backyard farmers in the rural landscape.

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- **Mandatory biosecurity norms are lacking.** All existing biosecurity guidelines at national and state levels are voluntary. This means no farms are expected to mandatorily comply with the biosecurity guidelines. In such a scenario, there is no case for checking or auditing the implementation of these guidelines.
- **No dedicated plan/programme to scale up biosecurity adoption.** Therefore, there are no targeted incentive structures to support infrastructure/equipment for biosecurity adoption scale up.
- **Gaps in capacity building on biosecurity**. Government trainings lack hands-on demonstrations on implementing biosecurity and farm management measures, along with insufficient fund allocation for biosecurity-specific training.

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4. Quality Feed and Feed Additives

An overview

Feed is the primary source of nutrition for poultry birds. In commercial farming, feed is carefully formulated and standardised, and is known as compound feed. A quality feed typically consists of a balanced composition of carbohydrates (such as maize, wheat, sorghum, bajra and ragi as 60-70 per cent of feed), proteins (plant sources like groundnut, soybean, cottonseed, mustard, rapeseed, or animal sources like fish meal, meat-cum-bone meal), and feed additives. Composition of feed can depend on the stage of growth of broilers, layers or breeder birds. Commercial feed is available in different forms (mash, pellets, crumbles). Its market is big in India—as in 2024, there were 372 animal feed plants in India that included poultry as well.[28]

In backyard farming, feed includes largely home-based or locally available food like kitchen scraps, leftover grains, grass etc.

Feed additives can be nutritive or non-nutritive. Nutritive additives could be vitamins, minerals and amino acids. Non-nutritive additives include certain drugs like anticoccidials and antibiotics, and alternatives like probiotics, prebiotics and herbal ingredients, among others.

The Bureau of Indian Standards (BIS) gives specifications for chicken feeds as per IS 1374:2024.[29] It specifies requirements of different types of chicken feed (such as ingredients, permitted, limits of harmful substances, water quality, additives), packing and marking and sampling for tests. On feed additives, it requires the name and quantity to be labelled appropriately. The standards do not permit the incorporation of antibiotics from medically important antimicrobial classes in chicken feed for growth promotion.

At the state level, there are few which regulate feed (*see Table 3: State-level Feed Acts*).

Gaps and challenges

- **No national regulatory framework**. There is no national level feed act or legislation to specify, control and monitor the quality, safety and labelling of chicken feed or feed additives. The existing BIS chicken feed standards are voluntary in nature and feed manufacturers are not required to mandatorily comply with it. On the other hand, neither does feed come under the purview of the FSSAI and the CDSCO.

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Table 3: State-level Feed Acts

State	Feed Act (year)	Specific mention to regulate antibiotics
Andhra Pradesh	Andhra Pradesh Animal Feed (Regulation of Manufacture, Quality Control, Sale and Distribution) Act (2020)[30]	No antibiotic use in feed permitted, appropriate labelling
Kerala	Kerala Livestock Feed, Poultry Feed and Mineral Mixture (Regulation of Manufacture, Storage, Distribution, Sale and Quality Assurance) Act (2023)[31]	-
Odisha	Orissa Cattle and Poultry Feed (Regulation) Act (1979)[32]	-
Sikkim	Sikkim Agricultural, Horticultural Input and Livestock Feed Regulatory Act (2014)[33]	Prohibits addition of synthetic growth stimulants in feed for farm animals
Karnataka	Karnataka Animal Feed (Regulation of Manufacture and Quality Control) Act (2025)[34]	No antibiotic use in feed permitted, appropriate labelling

Note: Examples compiled by authors

In the absence of such a regulatory framework, antibiotics presence in feed is not labelled, not checked and the quality of the feed, including presence/absence of feed additives, contaminants is difficult to ascertain. The feed market and feed promotion remains unregulated. Unlike feed to be used in the coastal aquaculture, feed and additives used in poltry sector remain unregistered.

- **State level legislation missing in several states**. Unlike Andhra Pradesh, Karnataka, Sikkim and few others, there still are several states which do not have specific regulatory mechanism for chicken feed.

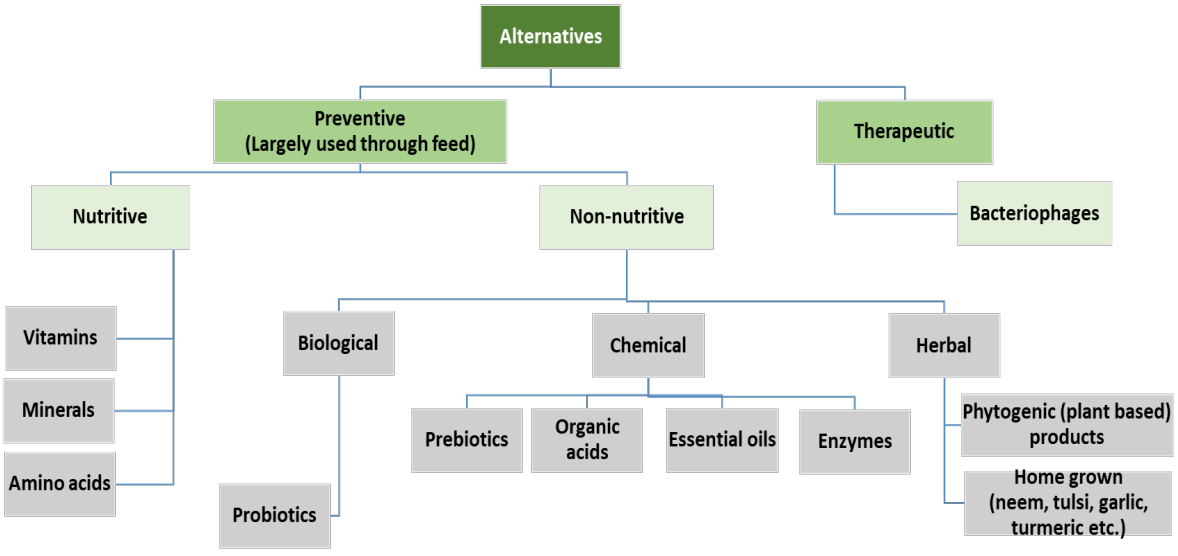
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5. Alternatives to Antibiotic Use

An overview

Alternatives currently used in poultry farming practice are largely used for prevention. Feed is a common route for administration, and most of these prevent the occurrence of the disease or help in managing the disease, thereby reducing the need for antibiotics. This role is performed through improved feed utilisation, immunity, reduced stress and expedited recovery. Many are sold as non-antibiotic growth promoter feed additives or supplements. Bacteriophages are the only alternatives for therapeutic purposes, substituting antibiotic use. These are viruses that target and kill specific bacteria such as *E. coli* or *Salmonella* sp: these are gaining traction (*see Figure 4: Alternative categories used in poultry sector*).

Figure 4: Alternative categories used in poultry sector



Non-nutritive alternatives used through feed are popular in poultry practice. They work through different mechanisms and perform multiple preventive functions, and a huge number of products are sold by several big and small companies across the country. In particular, probiotics and organic acids are considered cost-effective and are commonly used. Essential oils are expensive and are used in limited settings. Home-grown options are most popular amongst small and backyard farmers. Bacteriophages are being recommended by some veterinarians (*see Table 4: Non-nutritive alternatives used for prevention*).

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Table 4: Non-nutritive alternatives used for prevention

Alternative category	Composition/function	Examples
Probiotics*	Consortium of live beneficial bacteria that compete with harmful bacteria for resources; benefit host by establishing a favourable intestinal microbial balance and maintaining proper gut health	Lactobacilli (*L. acidophillus, L. sporogenes*) Saccharomyces (*S. cerevisiae, S. boulardii*) Streptococcus (*S. thermophiles, S. lactis*) Bacillus (*B. cereus, B. subtilis*)
Prebiotics*	Non-digestible carbohydrates derived from plants/cell wall of yeast; feed good bacteria in gut	Mannan oligosaccharides, Xylooligosaccharides, Galactooligosaccharides
Enzymes	Proteins that catalyze chemical reactions, reduce negative effects of anti-nutritional factors, improve feed digestibility	Phytase, Protease, Xylanase, Amylase
Organic acids/ Acidifiers	Helps in maintaining gut pH, reduce pH around pathogenic bacteria, inhibiting their growth	Formic acid, Propionic acid, Butyric acid, Lactic acid
Essential oils	Plant-derived bioactive compounds with antimicrobial activity	Extracts from thyme, oregano, cinnamon
Phytogenic/ herbal additives	Plant-derived natural or bioactive compounds	Growth stimulators, liver tonics, anti-stress factors, immune-modulators
Immunomodulators	Chemical, drug or naturally occurring compounds which stimulate or improve immune system response	Beta-glucans, nucleotides, plant extracts, enzymes

Source: compiled by authors

* Synbiotics are products that combine probiotics and prebiotics to maximize their beneficial effects.

The 2024 Standard Veterinary Treatment Guidelines for Livestock and Poultry by the Department of Animal Husbandry and Dairying (DAHD) recommends use of alternatives in poultry sector, in view of reducing disease severity, mortality or in assisting outbreak management.[35] DAHD also has a Memorandum of Understanding with the Ministry of AYUSH to promote research and education on introducing Ayurveda and related disciplines into veterinary science.

Import of alternatives used in feed (in addition to antibacterials and anticoccidials) is monitored by Animal Quarantine Certification Services under DAHD and their export by the Export Inspection Council.

Gaps and challenges

- **Quality of the alternatives is a concern**. In the absence of an adequate regulatory framework on alternatives, the required consistency and standardidsation of alternatives is missing. This not just impacts the effectiveness but also creates trust deficit among farmers. Often, cheaper products developed by smaller companies are said to lack effectiveness.
- **Scientific evidence not adequately consolidated**. The safety, efficacy, dosage and route of administration of different alternatives, even if scientifically documented, is not adequately consolidated for a better understanding among stakeholders (prescribers and

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REGULATION OF HERBAL PRODUCTS TO BE SOLD FOR THERAPEUTIC PURPOSES

Herbal products which are to be sold as therapeutics/medicines are required to be licensed for manufacturing. The developer applies to the State Licensing Authority (SLA) under the state AYUSH department. After preliminary review, the SLA sends the application to District Ayurveda Officer or Drug Inspector under State AYUSH department who may give a go ahead after satisfactory scrutiny. The application then goes to the SLA or the Director of State AYUSH Department who grants a license, which is valid for five years; such products are mandated to be labelled with the names of ingredients used, their quantity, and licensing details.

users). It is said that this is more so in the case of smaller companies. This reinforces the concern around the unregulated nature of the alternatives market.

- **Awareness and use is largely about probiotics.** The alternatives sector is said to be led by probiotics, which is linked with high awareness about them among farmers and lower cost. However, the large number of manufacturers entering this sector has also raised quality concerns. On the other hand, essential oils etc are not frequently preferred by small farmers because of limited awareness and high cost.
- **No government incentives for transition towards alternatives**. There is a perceived risk in moving away from antibiotics, which gets compounded by lack of clarity on how to best use alternatives (optimal dosages, storage requirements, benefits). While there could be cost efficiencies on the farm, but the absence of an incentive structure by the administration influences the decision to not use antibiotics. Farmers are also found reluctant to make a change towards alternatives, particularly when they do not see quick results or better efficacy compared to antibiotics.

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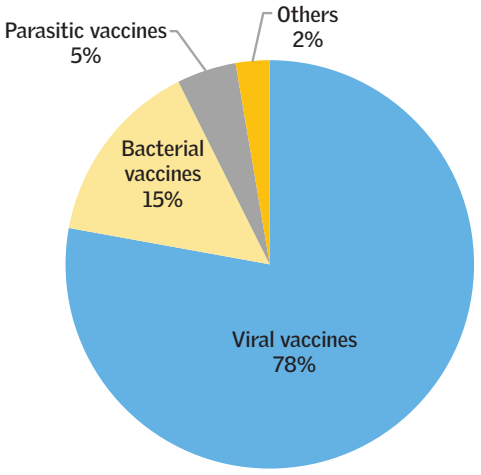
6. Vaccination

An overview

Vaccination is a promising strategy for preventing active infection and reducing the need for antibiotics in the poultry sector, irrespective of broiler and layers. Unlike antibiotics, vaccines do not lead to resistance and specifically target pathogens without affecting the gut microbiome. It is crucial to focus on vaccines for bacterial infections when it is about controlling antibiotic resistance. However, viral vaccines are also important as it can help avoid chances of secondary bacterial infections that need antibiotic administration.

Between 2015 and 2025, 149 vaccines (single or combined form), covering nearly 22 diseases, were approved for poultry by Central Drugs Standard Control Organization (CDSCO). About 78 per cent (116) are for viral diseases (14) and 15 per cent (22) for bacterial diseases (seven). Overall, there were 42 combination vaccines, catering to multiple diseases at one go (*see Figure 5: CDSCO approved vaccines for poultry (2015-25)*).

Figure 5: CDSCO approved vaccines for poultry (2015-25)



Source: Based on information from CDSCO

These vaccines are live attenuated forms and inactivated/killed forms, which can be delivered through multiple routes – in-ovo injection (in embryo), eye or nasal drops, subcutaneous (in skin) or intramuscular (in muscle) injection, through drinking water or sprayed as mist.

Economically important diseases like Highly Pathogenic Avian Influenza (HPAI) is mandated to be addressed through culling, while commercial availability of necrotic enteritis vaccine is yet to begin. Vaccination against H9N2 (Low Pathogenic Avian Influenza) has been permitted by DAHD, and the vaccine is now available commercially.[36] The ICAR-National Institute of High Security Animal Diseases (NIHSAD) has recently developed first of its kind vaccine in India against the H5N1 HPAI virus of Clade 2.3.2.1a.

At the national level, vaccination in backyard or rural poultry for states is carried out under DAHD's ASCAD (Assistance to States for Control of other economically important, exotic,

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emergent and zoonotic Animal Diseases) sub-programme, which involved providing vaccines against economically important diseases as prioritized by states. Common diseases for which states seek vaccination support are Ranikhet disease (Newcastle Disease), Infectious Bursal Disease, Fowl Pox and Infectious Bronchitis and Marek's disease (for day-old-chicks in hatcheries). Few states such as Haryana, Assam and Telangana have their own initiatives for poultry vaccination.

The 2024 Standard Veterinary Treatment Guidelines for Livestock and Poultry provides vaccination schedule for commercial and backyard poultry and notes that depending on the endemicity of infections in different areas, local poultry veterinarians can be consulted for modifications in the schedule.[37] The focus is more on viral diseases compared to bacterial diseases and layers, compared to broilers. The 2024 Poultry Disease Action Plan also highlights the importance of vaccination for disease prevention and control.[38] The 2015 Poultry Farm Manual provides guidance on vaccine preparation, administration, and factors contributing to vaccination failure, among others.[39]

Gaps and challenges

- **Vaccine coverage for limited bacterial diseases**. The focus of scientific community and vaccine manufacturers lies on viral diseases due to their higher prevalence and adverse economic impact. Lack of antiviral drugs for poultry also make vaccination the only preventive solution. Bacterial diseases, however, remain broadly managed with antibiotics, as manufacturing vaccines for them yields lesser economic benefits.
- **Vaccine storage and transport under cold conditions is a challenge in rural/remote areas.** These are aggravated by frequent electricity fluctuations, long rural transit distances, and improper shelf storage that can degrade vaccine potency. Available thermostable vaccines often face adoption challenge due to lack of awareness.
- **Broiler farmers less inclined to vaccinate than layer farmers**. This is due to short lifespan and production cycle of broilers as compared to layers. Moreover, biological capacity up to which a broiler bird can respond to numerous vaccines, within its life span, is also limited.
- **Access disparities**. Vaccine availability varies by state and is linked with demand-supply gap, and distribution favouring ruminants. Procurement from private players due to unavailability has approval challenges in states. High quality imported vaccines are expensive.
- **Limited adoption of vaccination among small/backyard farmers.** Reasons include limited awareness (of benefits, administration schedules or booster dose importance), misperception that vaccines are for outbreaks, limited access to required vaccines, inadequate veterinary support for administration, economic unviability due to large pack sizes, prioritising immediate economic needs and easy availability of cheap antibiotics.

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7. Resilient Breed-led Extensive Poultry Systems

An overview

Backyard and rural poultry production systems in India are led by resilient breeds — indigenous (native/*desi*) poultry breeds or their improved varieties.

Indigenous breeds are known to have evolved and adapted to local environmental conditions through many generations. Native to a particular region or location across different parts of the country, these are often dual-purpose (reared for both meat and eggs) and slow-growing, compared to commercial chicken varieties. These are commonly reared in flocks of 10-15 birds in the backyard. India has 21 such chicken breeds registered under the ICAR-National Bureau of Animal Genetic Resources (NABGR)[40] (*see Table 5: Indigenous breeds in India registered with NABGR*).

Table 5: Indigenous breeds in India registered with NABGR

Breed	Native location	Breed	Native location	Breed	Native location
Ankaleshwar	Gujarat	Nicobari	Andaman and Nicobar	Aravali	Gujarat
Aseel	Chhattisgarh, Odisha, Andhra Pradesh	Punjab Brown	Punjab, Haryana	Harringhata Black	West Bengal
Busra	Gujarat, Maharashtra	Tellichery	Kerala	Kadaknath	Madhya Pradesh
Chittagong	Meghalaya, Tripura	Mewari	Rajasthan	Kalasthi	Andhra Pradesh
Danki	Andhra Pradesh	Kaunayen	Manipur	Kashmir Favorolla	Jammu and Kashmir
Daothigir	Assam	Hansli	Odisha	Miri	Assam
Ghagus	Andhra Pradesh, Karnataka	Uttara	Uttarakhand	Mala	Jharkhand

Source: National Bureau of Animal Genetic Resources; Note: Naked Neck and Frizzle Fowl are other indigenous breeds not registered with NABGR

Improved chicken varieties show improved productivity (weight gain, eggs etc) or select characteristics (better growth rate, heat dissipation etc), while yet retaining the native traits of the parent breed. These are developed by selection of pure lines or crossing of breeds.

A large number of improved varieties have been developed by public sector organisations such as ICAR-Central Avian Research Institute, ICAR-Directorate of Poultry Research, Central Poultry Development Organization, state agricultural universities and diverse private players

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Improved varieties can be:

- Low-input or Low-input Technology (LIT) varieties reared in flocks of 50-100 in free-range settings for providing nutrition and livelihood to small farmers. Sometimes, LIT varieties are considered for backyard farming as well.
- High-input intensive varieties reared in flocks of 500-10,000 in poultry sheds for modest commercial purposes.

Compared to indigenous breeds, improved varieties are a good alternative because of better productivity with respect to number of eggs, weight gain etc; they also have a relatively comparable productivity with commercial poultry varieties (*see Table 6: Productivity of select improved varieties compared to indigenous breeds*).

Table 6: Productivity of select improved varieties compared to indigenous breeds

Improved variety	Purpose	Indigenous breed used in crossing	No. of eggs produced by indigenous breed	No. of eggs produced by improved variety	Avg body weight of indigenous breed (kg)	Avg. body weight of improved variety (Kg)
Krishibro	Broiler	Punjab Brown	-	-	0.65 (8 wks)	2.0 (7 wks)
Indbro Aseel	Broiler	Aseel	50-60 (annual)	160 (annual)	1.5 (22 wks)	1.7 (maturity; ~20 wks)
Thriveni	Layer	Tellicherry	60-80 (annual)	180-200 (annual)	1.6 (M), 1.2 (F)	-
CARI Nirbheek	Dual	Aseel	50-60 (annual)	198 (annual)	1.2 (20 wks)	1.8 (M), 1.3 (F) (20 wks)
CARI Shyama	Dual	Kadaknath	80 (annual)	210 (annual)	0.9 (20 wks)	1.46 (M), 1.12 (F) (20 wks)
Hitcari	Dual	Naked Neck	75-90 (annual)	200 (annual)	1.0 (20 wks)	1.75 (M), 1.32 (F) (20 wks)
Gramasree	Dual	Naked Neck	75-90 (annual)	180-200 (annual)	1.0 (20 wks)	1.8 (M), 1.4 (F) (16 wks)
Chann	Dual	Naked Neck	75-90 (annual)	150-170 (72wks)	1.0 (20 wks)	2.0-2.2 (20 wks)

Source: CSE research; Note: (M)-Male, (F)-Female

ADVANTAGES OF RESILIENT BREEDS (INDIGENOUS BREEDS/IMPROVED VARIETIES):

- **High adaptability and disease resilience:** Resilient breeds are naturally suited for extensive, low-impact farming environments, reducing the need for intensive resource management. They show higher adaptability to local climatic and environmental variations, and exhibit disease resilience.
- **Low-input requirement:** Resilient breeds minimise the investment needed for successful rearing, making the systems economically viable for small-holders. Their requirement for feed, care and housing does not need much investment. Rearing these breeds can be cost-effective and low-risk, and offer good returns on investment.
- **Foundation for small-holder farming and livelihoods:** The small-holder rural poultry systems, particularly backyard systems, are sustainable because they offer livelihood and nutrition to rural masses. Improved varieties address the productivity concerns of native breeds while retaining resilience, boosting sustainability by ensuring better outputs.
- **Market value and quality:** If market access is achieved, the meat and eggs from these resilient breeds can yield a higher market price because they are often chemical free, high in nutritional value, and rich in taste.

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The National Livestock Mission (NLM) promotes the rearing of Low-Input Technology (LIT) birds. It provides a one-time 50 per cent capital subsidy (up to Rs 25 lakh) to entrepreneurs (including SHGs and FPOs) to establish parent farms, hatcheries and brooder-cum-mother units. There are 23 identified LIT chicken varieties for supplying to farmers (*see Table 7: Low-input technology birds popularized under National Livestock Mission*).

Other programmes such as the Rashtriya Krishi Vikas Yojana are associated with establishment of smaller poultry units (10-50 birds) in states. They also coordinate with NLM and other state-level programmes to deliver chicks, vaccination and training. The Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM) of the Ministry of Rural Development, through its Mahila Kisan Shashaktikaran Pariyojana, promotes backyard poultry for the farm livelihoods promotion component under the State Rural Livelihood Missions implementing NRLM.

Many state such as West Bengal, Odisha, Maharashtra, Haryana, Uttar Pradesh and Karnataka have programmes to distribute chicks of improved varieties for promotion of backyard or rural farming among small farmers.

The All India Coordinated Research Project on Poultry Breeding of the ICAR focuses on developing location-specific chicken varieties and conserving native germplasm. In 2024-25, the project distributed about 1.20 million (12.02 lakh) chicken germplasm to over 16,000 farmers.[41]

Table 7: Low-input technology birds popularized under National Livestock Mission

Type of stock	Organisation
	Public sector organisations
Cha Bro, Kalinga Brown, Kaveri, Kadaknath	Central Poultry Development Organisation
Gramapriya, Vanaraja	Project Directorate on Poultry
CARI-Gold, Nirbheek, Hitcari, CARI-Debendra, Upcari	Central Avian Research Institute
Giriraja, Girirani, Swarnadhara	Karnataka Veterinary, Animal and Fisheries Sciences University
Nandanam 99	Poultry Research Station, Nandnam, Chennai Tamil Nadu
Gramalakshmi, Gramashree, Krishipriya	Kerala Veterinary University, Mannuthy
Rajasri	Sri Venkateshwara Veterinary University, Hyderabad
	Private sector organisations
Satpuda-desi	Dr. Yashvant Agritech Pvt. Ltd, Jalgaon, Maharashtra
Rainbow rooster	Indbro Research and Breeding Farm Pvt. Ltd., Hyderabad
Kuroiler	Kegg Farms, New Delhi
Shipra	Shipra Hatcheries, Patna, Bihar

Source: DAHD; Note: This list can be updated as and when required.

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Gaps and challenges

- **Access to right breeds and good quality chicks is a concern**. Farmers in remote areas often rely on local agents and may not receive healthy, quality stock of the right breed or variety. Stock from government sources is cheaper but sometimes perceived as of lower quality than that from private players.
- **Farmers are often unable to provide necessary vaccines to chicks**. Farmers often skip timely vaccination (crucial in the first six to eight weeks) due to lack of awareness, resources, cost and poor access/availability. This leads to high disease prevalence and mortality.
- **Adequate nutrition and brooding infrastructure is not always available**. Small farmers lack the necessary resources and facilities for adequate brooding and nutrition during the initial six to eight critical weeks, which contributes to high mortality. Proper infrastructure for biosecurity is also lacking.
- **New farmers struggle due to paucity of right information and training.** Information on where to source chicks, equipment or support services needed to begin or run a farm successfully is not always available. Government trainings are limited in number and do not cover all aspects. Farmers, therefore, adopt a hit-and-trial approach, and end up losing interest and motivation.
- **There is limited veterinary guidance or follow-up support**. Distribution centers lack adequate follow-up processes, and there is a limited on-the-ground presence of veterinarians to guide farmers or manage diseases like Ranikhet disease.
- **Access to a formal market and fair pricing is a challenge for the backyard farmer.** Backyard farmers often struggle to travel to markets to sell small quantities of birds, and there are limited vendors or agents to collect stock at a fair price.

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8. Recommendations: Mainstreaming Prevention in the Indian Poultry Sector

It is clear that a preventive approach is critical for the sustainable growth of the Indian poultry sector. Our research across preventive pillars also suggest that there are gaps and challenges which, if addressed, can go a long way in bringing sustainability not just in the Indian poultry sector, but also in the larger context such as public health, livelihood and environment.

This chapter provides specific recommendations across each of the preventive pillars which should inform the policy and practice. These specific recommendations should be complemented by a set of high level overarching action points which should be implemented by Central and state governments as a coordinated response:

Overarching action points

- Phase out antibiotic use as growth promoters through feed and routine preventive use in poultry across the flock.
- Phase out antibiotics classified as highest priority critically important and critically important for humans, from use in poultry.
- Do not use antibiotics prohibited by the Ministry of Health and family Welfare (CDSCO and FSSAI) in poultry farming. Check and control over-the-counter availability of antibiotics.
- Ensure adherence to withdrawal periods after antibiotic administration in poultry.
- Make all antibiotic use in poultry traceable; every use should be recorded as part of local, state and national level database/dashboard, which should also include data on registered poultry farms.
- Strengthen veterinary extension systems; they should be informed about preventive approaches; veterinary access to poultry farmers should be improved.
- Ensure access to cost-effective diagnostic support through labs/on-farm testing.
- Ensure effective management of waste from poultry farms. Waste like litter should be made AMR-safe/residue-free before agricultural reuse.
- Create market linkages for poultry products (eggs, meat) sourced from poultry reared without antibiotic use. Leverage FPOs, SHGs and cooperatives.
- Subsidise and incentivise adoption and scaling of preventive measures in the poultry sector.

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Specific recommendations

Prevention Pillar 1: Implementing biosecurity and farm management

- **Mainstream biosecurity as a preventive approach**. The importance of investing in preventing infection on farms through biosecurity and farm management needs to be integrated across all national and state level initiatives. Policy makers, scientific community and industry should be able to appreciate the economic value in implementing biosecurity and farm management.
- **Develop a national programme to scale up biosecurity and farm management.** Weaved around the Poultry Disease Action Plan or similar guidance, such a programme can be implemented in a phased manner supported by state animal husbandry departments. A pre-requisite to the implementation of this programme is a database and dashboard of registered poultry farms and their operations in the country. Another critical aspect of such a programme is implementation of standard operating procedures and a mandatory compliance of a base-level biosecurity and farm management parameters supported by periodic audits and incentive structures. Dedicated extension officials, use of technology (such as score-cards and mobile applications) along with targeted and demonstration-based capacity should support the implementation of the programme.

Prevention Pillar 2: Quality feed and feed additives

- **BIS chicken feed standards should be made mandatory.** In addition to feed Acts by certain states, a national regulatory framework for chicken feed will ensure that feed sold across all states is regulated across a consistent set of quality and safety parameters. Antibiotics must not be allowed in feed to be used as growth promoters. In case, feed is required to be used as a medium for therapeutic use of antibiotics, such medicated feed should only be available and used as per prescription from an authorized veterinarian and strictly monitored and audited. Also, all high poultry producing states should atleast have their own Feed Acts.
- **Feed quality and standardization should be a priority**. This should be achieved through an ecosystem of registration of feed, feed additives, feed manufacturing units and laboratory testing as well as audits and inspections. Necessary guidance, SOPs, and protocols should be developed at the Centre which can then be leveraged by the state authorities.

Prevention Pillar 3: Alternatives to antibiotic use

- **Regulatory framework for all kinds of alternatives is need of the hour**. Most alternatives are currently sold as feed supplements, which are not regulated at the central level, other than herbal products sold as medicines through Ministry of AYUSH. Such a regulatory

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framework should ensure the safety, quality, standardization and labelling of commonly used probiotics, prebiotics, immunostimulants etc. The regulatory compliance will need support of testing of alternatives, and audits/ inspection of manufacturing companies. In particular, the regulatory gap vis-à-vis new technologies such as bacteriophages used for therapeutic purposes needs to be addressed.

- **States which have specific Feed Acts are better positioned to regulate alternatives**. Other states should consider developing a similar regulatory framework for feed and alternatives.
- **Strengthen scientific research ecosystem for alternatives**. Building evidence for all kinds of alternatives in separate scenarios (e.g., against actual disease conditions), along with appropriate documentation, will help build greater trust among prescribers and users. Therapeutic alternatives like bacteriophages clearly need a dedicated research programme. The role of public-private partnerships holds key. In addition, efforts should be made to identify, document and widely disseminate success stories and best practices of alternative use.
- **Leveraging the potential of ethnoveterinary/herbal preparations**. The Indian dairy sector is being benefitted by use of ethnoveterinary/herbal preparations to reduce antibiotic use and cost of treatment while providing safe food. The poultry sector stands a chance of attaining similar benefits through concerted efforts and initiatives by governments, researchers and poultry farmers.
- **Building capacity of veterinarians on alternatives through curriculum and training**. Veterinarians can significantly influence an evidence-backed scale-up of alternatives. Efforts/initiatives through appropriate curriculum and training of veterinarians should be institutionalised. If need be, necessary protocols and SOPs can be developed and used. Use of technology such as through online courses and sharing of videos should be leveraged.

Prevention Pillar 4: Vaccination

- **Strengthen research ecosystem for bacterial vaccines**. The government, in collaboration with the scientific community and the vaccine manufacturing sector, should work to develop newer vaccines of economic and public health importance for bacterial diseases. The uptake of these vaccines will depend upon their cost effectiveness, ease of administration and ease of transport.
- **Strengthen existing disease surveillance efforts**. Expand continued surveillance to track virulent or mutated strains, efficacy of existing and newer vaccines, and prevalence of existing and emerging diseases.
- **Reduce lab-to-field time of vaccines**. Expedite vaccine approval and commercialisation process, so that the lab-to-field time of newly developed vaccines is reduced, particularly in view of emerging, virulent and mutant strains. However, no compromise should be made on evaluation of safety and efficacy data.

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- **Plug the last mile gaps in cold chain maintenance in rural/remote areas**. Poultry farming in rural areas will be benefitted by improved infrastructure for preserving and transferring vaccines while keeping them effective. For example, a community refrigeration system can be managed and run by select few farmers. 'Pashusakhis' or self-help groups from within the community can be trained for vaccine handling, transport and administration.
- **Evaluate and scale-up the adoption of advanced vaccine technologies** such as
  - » In-ovo-vaccination at hatchery level for early immunity
  - » Autogenous vaccines tailored for specific local strains causing an outbreak
  - » Pellet vaccines for oral use
  - » Thermostable vaccines and time-temperature sensitive labels to address cold chain issues
- **Strengthen immunisation initiatives in the sector**. This could be done through a disease-specific national programme, state-level support, and public-private partnerships, local community involvement such as through 'community vaccinators', leveraging social media and educational videos, training of field extension officials and incentives for vaccine adoption among farmers.

Prevention Pillar 5: Resilient breed-led extensive poultry systems

- **Mortality risk reduction for backyard poultry birds via mother units.** The most crucial need is to reduce risk and mortality in the first six to eight weeks. This requires establishing and strengthening mother units that can collect day-old-chicks, provide the necessary brooding, management and vaccination, and keep the chicks until they are stable before distributing them to farmers.
- **Ensuring sustainable supply and availability of resilient breeds**. This can be done through public-private partnerships (PPPs) to ensure a continuous supply of locally relevant resilient breeds, thereby addressing the demand-supply gap that government institutions alone cannot meet. Incentives should be given to select farmers to set up their own breeder farms and small incubators, fostering self-sustainability.
- **Strengthen coordinated support, capacity and veterinary guidance**. State governments should ensure access to at least basic essential vaccines. Community Animal Health Workers (CAHWs) or para-vets should be utilised and trained to provide vaccination, basic veterinary treatment, and guidance in areas where professional veterinary supervision is limited.
- **Creating dedicated markets and formal structures for backyard farmers**. Support is needed for the creation of dedicated Farmer Producer Organisations and cooperatives for backyard and rural poultry. These organisations will ensure appropriate market access, remunerative pricing, and help farmers source essential inputs like vaccines, feed and subsidised veterinary services.

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SECTION 3

Case Studies– Integrating Prevention Pillars in Poultry Farming

An overview

This section presents a set of 16 case studies reflecting adoption of one or more prevention pillars. These case studies include those from the public and private sectors, scientific community and civil society from different parts of the country. Many of these were presented at CSE forums, and researchers visited some sites during the course of the research. Collectively, these show that adoption of preventive measures can reduce antibiotic use and scaling up of such prevention pillars is feasible and economically viable (*see Table 8: Summary of case studies: Integrating prevention pillars in poultry farming*).

Table 8: Summary of case studies: Integrating prevention pillars in poultry farming

	Company/ organisation	Type	State	Broiler/ layer/ dual purpose	Breed (indigenous/ improved/ commercial)	Focus	Antibiotic use status
	Implementing biosecurity and farm management						
1	IndBro Research & Breeding Farms Pvt Ltd	Private	Telangana	Broiler, Layer, Dual purpose	Improved	Biosecurity, farm management, vaccination	No routine use; use only if sudden change in weather
2	Sarvodaya Broiler Breeders & Research Farm	Private	Madhya Pradesh	Broiler	Commercial	Biosecurity, farm management, vaccination	No antibiotics used other than for treatment
3	Jubilant FoodWorks Ltd (JFL)	Private	Pan-India	Broiler	Commercial	Implementation of No Antibiotic Ever (NAE) policy in supply chain	Meat procured from farms rearing poultry without antibiotic use
4	Sneha Farms Pvt Ltd	Private	Telangana	Broiler	Commercial	Farm management, implementing JFL's NAE policy	No antibiotic use, NAE implementation claimed
	Quality feed and feed additives, and alternatives to antibiotic use						
5	Grdt Farmers Agrovet Pvt Ltd	Private	Assam	Dual purpose	Indigenous, Improved	Antibiotic free farming and locally formulated feed	No antibiotics are used in partner farms
6	Happy Hens Farms	Private	Karnataka	Layers	Improved, Commercial	Rearing birds in free-range	No routine antibiotic use; therapeutic use on case by case basis
7	Professional Assistance for Development Action (PRADAN)	Civil society	Odisha	Dual purpose	Indigenous	Study to evaluate effect of EVM and homeopathy in poultry rearing	Not applicable
8	M J Reddy Poultry Farm	Private	Telangana	Layers	Commercial	Herbal diet; no commercial feed	No antibiotics are used
	Vaccination						
9	TANUVAS and SRS Japanese Quail Products	State University, Private	Tamil Nadu	Quail	-	Autogenous vaccination against Fowl Pox	Reduced antibiotic use than earlier

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	Company/ organisation	Type	State	Broiler/ layer/ dual purpose	Breed (indigenous/ improved/ commercial)	Focus	Antibiotic use status
	Resilient breed-led extensive poultry systems						
10	KeggFarms Pvt Ltd	Private	Multiple states	Dual purpose	Improved	Nutrition and livelihood of rural women; creating microentrepreneurs	Antibiotics used sparingly and solely to treat infections
11	Watershed Support Services and Activities Network (WASSAN)	Civil society	Multiple states	Dual purpose	Indigenous	Backyard poultry cluster-based approach, use of ethnoveterinary medicines	Antibiotic use discouraged; local vets may recommend sometimes for diarrhoea
12	Aga Khan Rural Support Programme (India)	Civil society	Madhya Pradesh	Dual purpose	Improved	Community-led backyard poultry initiative	Very little to no antibiotics based on veterinary advice or if there is mortality risk
13	Egger Nurseries	Private	Kerala	Dual purpose	Improved	Mother unit support to farms of state animal husbandry department	Not regular; only in case of disease
14	P V Narsimha Rao Telangana Veterinary University	State university	Telangana	Dual purpose	Improved (Synthetic variety)	Supporting backyard poultry	-
15	ICAR-Central Avian Research Institute (CARI)	Govt. scientific institute	Uttar Pradesh, Uttrakhand	Dual purpose	Improved	Mother unit support for backyard poultry hubs project	No antibiotics are used
16	ICAR-Central Avian Research Institute (CARI)	Govt. scientific institute	Uttar Pradesh	Dual purpose	Improved	Created integrated backyard poultry farming model for farmers	No antibiotics are used

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CASE STUDY 1

IndBro Research & Breeding Farms Pvt Ltd, Telangana

Founded in the year 2000 by veterinarian T Kotaiah, IndBro Research & Breeding Farms develops poultry adapted to hot, humid climates, low-density diets, and low-level pathogen environments. Aiming to enhance rural livelihoods and nutritional security, IndBro bred four proprietary lines: Indbro Rainbow Rooster, Indbro Colored Broiler, Indbro Brown Layer, and Indbro Aseel. The operational model relies on strict biosecurity, effective vaccination and robust farm management to maintain flock health.

'All-in-All-out' rearing system: IndBro enforces an All-in-All-out stocking model across all commercial and parent stock units. Entire sheds are stocked and vacated simultaneously, disrupting disease transmission cycles between consecutive flocks and ensuring consistent growth performance. Following flock removal, and between two production cycles, the facilities undergo thorough cleaning, disinfection and a mandatory 15-day fallow period. To eliminate external disease entry, replacement chicks are sourced exclusively from company-managed hatcheries and health-monitored parent stocks, and transported in clean, disinfected vehicles.



RASHMI MINOCHA/CSE

Indbro Brown Layer breeds at IndBro Research & Breeding Farms, Telangana

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Locational and environmental controls: Located 60 km from Hyderabad and five-six km off main roads, IndBro maintains rigorous spatial separation. Hatchery, brooding, layer, broiler, and breeder sections are isolated by several kilometers. Within the farm, facilities and utility areas (like the office) are situated away from each other, with additional gates between them. Strict separation protocols keep the birds away from entry points. Poultry houses are separated from buffer areas (feed room, egg room, generator and pump rooms), which are also disinfected daily.

Personnel hygiene and decontamination: Personnel undergo strict entry protocols, including decontamination baths, body sprays, and full personal protective equipment (PPE). Farm caretakers reside on-site and are restricted to designated units to prevent cross-contamination. Annual training on biosecurity is mandatory for all staff, with additional training for new hires.

Water and feed management: Drinking water is drawn from deep borewells, purified via reverse osmosis, and passed through automated medicators (having water decontaminant) before reaching birds via sealed nipple drinkers, ensuring zero human contact. Balanced feed is produced at the company's dedicated mill without antibiotics, synthetic growth promoters,



Vehicle dip



Farm fencing



Bleaching powder around shed premises



Filtered water supply; protective clothing

RASHMI MINOCHA/CSE

Biosecurity and farm management practices at IndBro Research & Breeding Farms, Telangana

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or animal by-products like fish or meat meal. Mechanised, closed-tanker feed transport and single-use bags prevent external contamination.

Disease prevention: Antibiotics are not used on a routine basis. While preventive steps are taken to avoid bacterial infections, antibiotics are used as per veterinary advice in case there are infections due to sudden change in weather (such as *E. coli* infection) or vaccine reaction. Before sending birds to the market, withdrawal periods of about a week is followed after a full dose of antibiotics is completed. The chicken is claimed as antibiotic-free.

To ensure no-minimal antibiotic use, IndBro prioritises comprehensive vaccination and proactive health management. A dedicated biosecurity coordinator continuously evaluates, enforces, and updates farm-wide biosecurity protocols across all self-contained breeder and commercial facilities.

Equipment and vehicle protocols: All equipment is cleaned and disinfected before use. Detailed records are maintained for all equipment and personnel entering and exiting the farm. Only dedicated vehicles are used for transportation.

Waste management: Dead birds are discarded on-site without attracting wild birds, rodents or insects. Manure and litter are stored appropriately before being sold. Spent litter and manure are sanitised and stored securely prior to agricultural sale.

CASE STUDY 2

Sarvodaya Broiler Breeders and Research Farm, Madhya Pradesh

Sarvodaya Broiler Breeders and Research Farm, a 2.5-acre facility in Mahuakheda, Bhopal, rears 5,000 broiler birds (Vencobb, Ross) per batch across 6.5 annual cycles. The farm supplies locally to Mommy's Chicken & Foods Pvt Ltd, an online service for raw, ready-to-cook, ready-to-eat meat.

Chick quality: Healthy, uniform chicks are sourced exclusively from certified hatcheries to prevent vertical disease transmission. Early growth, mortality, chick behavior and stocking density are closely monitored during initial brooding phase.

Shed biosecurity: This is enforced through restricted visitor access, mandatory personal protective equipment (PPE) wearing requirement, entry disinfectant footbaths and rigorous control of rodents, insects and wild birds. An All-in-All-out system is followed with deep cleaning and sanitation and a 14-day fallow period between flocks. Labourers with relatives having poultry farm are also carefully managed to avoid disease transmission from one farm to another.

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Water quality: Birds receive clean, potable, temperature-regulated drinking water, which is disinfected using chlorine, UV treatment or organic acids. Water is routinely tested for pH, TDS and bacterial contamination. Pipeline maintenance is done to prevent biofilm build-up in drinker lines with regular cleaning and sanitizer use.

Temperature and environment: Brooding temperature is maintained at 35°C for first week, dropping to 25°C for one-kg broilers. Fans, foggers and cooling pads prevent summer heat. Humidity is maintained at 50-70 per cent.

Feed quality: Flocks receive a balanced, antibiotic-free diet enriched with essential proteins, vitamins and minerals. Probiotics, prebiotics, herbal extracts, essential oils and enzymes stimulate immunity, and toxin binders prevent mycotoxin and aflatoxin contamination.

Ventilation: Tunnel ventilation systems continuously supply fresh air and evacuate excess gases, keeping ammonia levels below 25 ppm to prevent respiratory distress and eye irritation. It is ensured that the airflow does not create cold stress, while keeping barns odor-free and dry.



MAHENDRA SINGH

Brooding arrangement for day-old chicks with blue chick guard, 2 inches of disinfected saw dust, manual chick drinker and feeder (left) and temperature and humidity maintenance in the farm (right)

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Vaccination and health monitoring: Birds are vaccinated against Newcastle Disease (Ranikhet disease), Infectious Bronchitis (IB), Marek's Disease, and Infectious Bursal Disease (IBD). Routine sero-monitoring and necropsies provide early detection. Antibiotics are used for treatment purposes, while strict biosecurity implementation is able to keep away diseases. Driven by good management practices, the farm consistently maintains a low overall mortality rate of 2-3 per cent.

Litter management: Litter is kept dry using food-grade disinfectant and calcium carbonate to inhibit bacterial growth and reduce ammonia release. Spent litter is recycled into compost or biogas.

Record-keeping: There is regular and detailed record keeping of feed intake, weight gain, and mortality for analysis.

CASE STUDY 3

Jubilant FoodWorks Ltd (JFL)

Jubilant FoodWorks Ltd (JFL) is a leading quick-service restaurant operator and a prominent player in the Indian fast-food industry. The company operates Domino's Pizza, Popeyes and Hong's Kitchen in India: JFL's operations span more than 2,600 Domino's Pizza restaurants in India (as on September 30, 2026). Popular chicken-based products from these restaurants include pizzas, chicken wings, chicken wraps, sandwiches, noodles, rice etc.

To source its chicken, JFL collaborates with major poultry suppliers across four states in India. Each supplier operates primarily through contract farming model or environment-controlled (EC) farms. During 2023-24, these suppliers operated 455 farms across India for JFL, with a placement of over 24 million birds. Total chicken sourced by JFL in 2023-24 was about 2,500 metric tonne.

JFL's 'No Antibiotic Ever' (NAE) policy: In 2023, JFL implemented a 'No Antibiotics Ever' policy for the chicken supplied to it. Under this policy, birds supplied to JFL are raised without the use of antibiotics at any stage, including in feed or water and at the hatchery. To achieve this transition, JFL collaborated with supplier hatcheries, farms, feed mills and slaughterhouses. Only JFL-approved processors, holding valid FSSAI licences, can supply chicken products to JFL. These processors source meat only from JFL-approved chicken suppliers, who in turn source them from selected JFL-enlisted farms that are required to follow the NAE policy guidelines.

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JFL interventions to implement NAE policy at three key levels:

1. **Criteria for selecting suppliers**: The major chicken suppliers are carefully selected based on stringent criteria covering multiple aspects such as effectiveness of farm management practices, implementation of biosecurity measures, adherence to vaccination protocols, commitment to adhere to the NAE policy and effective disease control in farms.

2. **Good poultry farming initiatives**: As a major step, JFL emphasised to its suppliers the use of antibiotic alternatives to help in maintaining optimal health and immunity in birds (*see Table 9: Antibiotic alternatives recommended for use by JFL to its suppliers*).

   JFL also worked with these farms to strengthen and ensure implementation of disease control measures through various good farm practices and control initiatives (*see Box: Good farm practices and disease control initiatives required by JFL at its supplier farms*). In addition, JFL focused on ensuring vaccination and robust biosecurity measures at the

Table 9: Antibiotic alternatives recommended for use by JFL to its suppliers

Alternative	Description/example	Alternative	Description/example
Essential oils	Extracted from thyme, oregano, cinnamon etc.	Chemical coccidiostats	Diclazuril, robenidine, clopidol etc.
Prebiotics	Yeast Saccharomyces cell wall, mannan oligosaccharides (MOS), beta glucans etc.	Herbal extracts	Curcumin, garlic, neem etc.
Probiotics	Strains from *Bacillus* sp., *Lactobacillus* sp., etc.	Organic acids	Citric acid, acetic, propionic, sorbic acids and their combinations etc.
Toxin binders	MOS, silicates, bentonites, zeolite etc.	Enzymes	Pectinases, xylanase, protease, phytase etc.

Source: Based on information from JFL

GOOD FARM PRACTICES AND DISEASE CONTROL INITIATIVES REQUIRED BY JFL AT ITS SUPPLIER FARMS

- Thorough cleaning of feed production lines before new batches to prevent cross-contamination
- Prohibiting use of ionophores in feed; use of non-antibiotic chemical alternatives for management of coccidiosis
- Mandatory water sample analysis for each farm
- Improving farm microclimate with fans, foggers, and/or sprinklers
- Maintaining thermometers at all farms to monitor temperature and humidity levels
- Ensuring foot baths, vehicle sprays/tyre dips, no-entry signboards, measures to control entry from wild and migratory birds
- Ensuring all farms are equipped with rodent traps or baits
- Providing raised platforms for feed storage
- Vehicle logs and visitor logs maintained for all farms
- Conducting regular swab tests to verify shed disinfection effectiveness
- Ensuring farms are within 100 km of the processing plant for efficient bird transportation

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farms. In case of illness, birds are isolated from the flock and treated as per a veterinarian's prescription. These treated birds are permanently excluded from JFL's supply chain.

3. **Robust surveillance and monitoring system across its poultry production chain:** *Farm audits:* Supplier veterinarians conduct weekly visits and farm supervisors make daily inspections of JFL-enlisted farms. Qualified veterinarians oversee all farm operations, facilitated through a digitalised system and farms are assigned unique codes for tracking. During inspection, veterinarians assess four key areas—biosecurity, farm management, bird welfare and farmer training. Each area has further sub-parameters. After scoring for each parameter, the veterinarian issues a certificate on the bird's health and whether it is free from infectious or zoonotic diseases. Additionally, cross-verification by another veterinarian affiliated with the farm's employing company is done. Non-compliant farms are removed from JFL's supply chain.

- *Farm traceability:* Each farm is mandated to furnish a farm traceability certificate which confirms that the chickens were raised without antibiotics and in disease-free conditions. It can be back-tracked to check the farm's history, vaccinations and biosecurity measures. Finally, for every batch a health certificate is issued by a designated veterinarian confirming that the birds are healthy and fit for slaughter.
- *Antibiotic testing:* JFL conducts quarterly testing for antibiotic residues in meat samples collected from each supplier at NABL-accredited laboratories, against the limits prescribed under the FSS (Contaminants, Toxins and Residues) Regulations, 2011. In addition, JFL also tests four-six finished products from its partners or convertors and supply chain centres every quarter.
- *Microbiological analysis:* Each batch of processed chicken is tested for common pathogens (*E. coli*, coliforms, *S. aureus*, *Salmonella* sp, yeast and mold). JFL tests these against the microbiological standards for meat and meat products under the FSS (Food Products Standards and Food Additives) Regulations, 2011.
- *Third-party verification:* JFL conducts audits by a third-party agency of international repute.
- *Trainings:* JFL conducts regular training sessions covering crucial areas like antibiotic resistance awareness, vaccinations, biosecurity and animal welfare. In FY 2023-24, JFL conducted a total of 12 training sessions for each vendor.

Challenges of NAE policy implementation

- Convincing farmers to stop using antibiotics—this was achieved gradually and strategically. JFL supply partners such as slaughterhouses and feed mills were persuaded first – they influenced the farmers in turn to bring about changes at the grassroots level.
- Increase in mortality rates by 2-4 per cent—depends on seasonal impacts. Additionally, the Feed Conversion Ratio (FCR) rose around 0.2 which increased production costs.
- Weak birds becoming more prevalent within flocks—though not sick, they grow slower than the rest of the flock.

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- Limited availability of EC farms and adequate number of reliable testing labs.
- Difference in consumer or market understanding between antibiotic-residue-free meat and antibiotic-free meat.
- Industry unpreparedness and disqualification of many farms initially.

Despite the challenges, persistence led to support from some raw chicken suppliers, although the transition incurred increased costs, higher feed conversion ratios, and elevated mortality rates due to antibiotic withdrawal.

CASE STUDY 4

Sneha Farms Pvt Ltd, Telangana

Sneha Farms Pvt Ltd* is a poultry enterprise in Telangana with a fully integrated supply chain spanning hatcheries, feed mills, processing units and retail outlets. As a key supplier to major brands like Jubilant FoodWorks, Sneha Farms is able to effectively prevent diseases in its intensive commercial production through different approaches.

Operational model: A CSE team visited the farm in February 2024. At this time, Sneha Farms operated five environmentally controlled (EC) farms. The facility CSE visited had 20 sheds across 10 double story buildings, with each shed about 16,000 square feet in area and housing 25,000 poultry birds of different age groups. The farms were equipped with advanced infrastructure to provide optimal conditions for birds, such as automated temperature and humidity regulators, feed and drinking water lines/channels, and ventilation systems. These are said to protect birds from external pathogens and allow them to reach target market weights three-four days earlier than open contract farms, reducing overall feed costs.

Biosecurity:

- *Locational:* Farms are strategically located away from the city and spread over a radius of 20-30 km, with a centralised slaughterhouse to minimise transport stress and airborne pathogen transmission.
- *Structural:* Robust perimeter fencing prevents unauthorised access and keeps out stray animals and wild vectors.
- *Operational:* Entry requires mandatory wearing single-use disposable PPE and a declaration confirming zero poultry exposure in the preceding three days. Labourers live on-site, only those vehicles that are designated for specific tasks are allowed in, and there are mandatory disinfectant dips for treating footwear and tyres at all farm access points.

* Based on a story published in Down To Earth, September 2024

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Foot dip



Vehicle dip



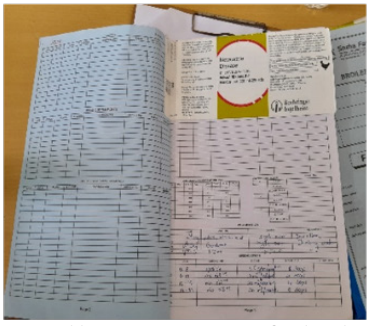
Automated farm controls (temperature, humidity)



Automated fans



Daily veterinarian recommendations



Record keeping-vaccination, feed and alternatives

RASHMI MINOCHA/CSE

Preventive measures followed in Sneha Farms, Telangana

Disease management: Disease is managed through timely vaccination. Hatcheries spray-vaccinate chicks for Infectious Bronchitis and Newcastle Disease. Farms administer follow-up vaccinations for Newcastle (Ranikhet) disease, Infectious Bronchitis (IB), and Infectious Bursal Disease (IBD) through drinking water under veterinary supervision. As a supplier partner to Jubilant Foodworks Ltd, Sneha Farms implements its 'No Antibiotic Ever' policy and claims to not use any antibiotics for growth promotion and disease prevention. However, this has implications as weak birds become more prevalent in the flock: this leads to slower growth and longer recovery time from infections.

Use of alternatives: To enhance gut health and natural immunity, diets are enriched with probiotics, prebiotics, and essential oils (eucalyptus, camphor, mentha, lemongrass and garlic oils). Flocks also receive therapeutic supplements containing essential minerals (calcium, iron, copper, magnesium), malt extract and B-complex vitamins.

Feed and water: Feed is strictly vegetarian – formulated maize, soya, oil, amino acids, vitamin premix, salts and electrolytes – to eliminate bacterial risks associated with animal by-products. Automated lines distribute feed precisely, while nipple drinkers deliver water sanitised with chlorine dioxide and pH-buffered using organic acidifiers.

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Waste management: Each 35-day cycle produces about four tonne of litter per 10,000 square feet; half of this is sold as organic manure at Rs 3,000-5,000 per tonne, and the rest is flame-sterilised with gas burners to destroy pathogens before being reused. Mortalities are buried in deep pits 200 metre away, and daily shed logbooks track feed, health interventions and mortality rates.

CASE STUDY 5

Grdt Farmers Agrovet Pvt Ltd, Assam

Founded in 2022 by Bapan Das and Shamim Choudhary, Grdt Farmers Agrovet Pvt Ltd is an Assam-based agri-enterprise working to make poultry farming more affordable, farmer-centred and responsible. Its model combines locally formulated feed, farmer support, poultry production and market access.

Operational model: Grdt Farmers supports farmers through a contract-farming arrangement that can include chicks, feed, technical guidance and buy-back of mature birds and eggs. It also works with independent farmers who buy subsidised indigenous or improved chicks (such as the Vanaraja variety) and follow the company's antibiotic-free rearing and quality protocols. In a profit-sharing option, participating farmers can sell products themselves and



BAPAN DAS

Vanraja chickens reared in farms owned by Grdt Farmers Agrovet Pvt Ltd

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share 40 per cent of profits with the company, without bearing the company's financial losses. Local rural associates support farmer registration, farm mapping, logistics and monitoring.

Locally sourced feed and nutrition: Grdt Farmers has developed an azolla-based, antibiotic-free poultry-feed formulation using locally available ingredients. Depending on availability and the needs of each formulation, ingredients can include rice, wheat, azolla and duckweed, alongside protein and mineral sources. The approach is intended to reduce dependence on costly commercial inputs and lower feed costs by around 10 per cent compared with conventional alternatives.

The company's feed research also explores ingredients such as Black Soldier Fly (BSF) larvae raised on agricultural waste, and mineral sources including crushed eggshells and snail shells. Herbal ingredients—moringa, turmeric, ginger and garlic—are used in feed formulations as natural additives. The exact mix is adjusted according to formulation requirements, local availability and farmers' access to ingredients.

The azolla-based feed formulation has been patented in January 2025. Grdt Farmers supplies feed and premixed products to farmers and operates a feed-manufacturing facility in Algapur, with a stated capacity of 10 metric tonne per day.



Azolla and herbs



Grounded tulsi leaves solution



Feed premix



Fermenting feed components before use



Raw banana stem

BAPAN DAS

Different feed preparation types and feed premix used for antibiotic-free farming at Grdt Farmers Agrovet Pvt Ltd

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Bird health and antibiotic-free rearing: Grdt Farmers promotes vaccination, hygiene, suitable housing and regular farm checks to support bird health. The vaccination protocol includes Ranikhet vaccination on day seven and IBD vaccination on day 14, with schedules followed under veterinary guidance. A mortality rate of approximately 3-9 per cent has been reported in its farming model. No antibiotics are used in the farm.

Technology and farm support: Grdt Farmers is piloting IoT-based farm monitoring that tracks temperature, humidity and harmful gases such as ammonia, with data shown on a cloud dashboard. The system is designed to help farmers identify stressful conditions earlier. The company has also announced IoT monitoring support for feed customers. A blockchain-based traceability system, including barcode access to farm and product information, remains a development concept.

Reach and growth plans: So far, the company has worked with more than 565 farmers and has helped establish over 100 poultry houses across the Barak Valley. Its current operations cover three districts of Assam, with plans to expand into neighbouring states, including Tripura and Mizoram. It has also expanded access to poultry training through its online learning programmes. Its long-term goal is to empower 10,000 farmers by 2030, develop 100 model farms and build a network of rural hubs and local associates across Assam. In FY 2024-25, its reported turnover was Rs 75 lakh.

CASE STUDY 6

Happy Hens Farms, Karnataka

Founded in 2012 by Manjunath Marappan and Ashok Kannan, Happy Hens Farms is India's pioneer in free-range organic egg production. After initial trials with backyard breeds proved unprofitable, the enterprise pivoted to rearing commercial egg-layer breeds—including BV380, Indbro Brown Layer, and Hyline Brown—on a free range model, relying on their inherent resilience to adapt to different rearing systems.

Operational model: Operational across Karnataka, Tamil Nadu and Andhra Pradesh, the company manages 48,000-50,000 birds and partners with 18 farmers across three core models:

- **Franchise cluster model**: Involves partnering with small farmers in rural/semi-rural areas in the form of clusters. Each cluster operates 300-500 birds per farm within a 10-15 km radius, providing 16-week pullets to pre-trained women's self-help groups and small-holders, along with a 100 per cent buy-back guarantee over a 14-month cycle, and market access. Buy-back price is decided based on factors like mortality, egg breakage, labour,

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electricity and water charges, feed and rearing costs. Net monthly earning of a farmer can go up to Rs 10,000 after all expenses are paid out.

- **Free-range model**: Involves rearing of 1,000-5,000 birds with outdoor foraging access. The model provides brand support, easy market access and enables empowerment of rural and women farmers, yielding monthly net farmer incomes between Rs 45,000-2,000,000, after all expenses are paid out.
- **Cage-free model**: Caters to corporate supply chains, and involves rearing minimum of 10,000 birds in environmentally controlled houses, or a minimum of 5,000 birds in open deep litter houses, with birds having access to flying or perching space and nesting boxes. Monthly farmer incomes can go up to Rs 1,00,000-4,00,000 after all expenses are paid out.

Farming systems: Hens, typically, have a pen/barn for night shelter, access to fresh air, sunshine, trees, nests for egg laying and green pasture to forage. Their wings are not clipped



HyLine breeds being reared in Happy Hens farm



HAPPY HENS FARM

Partner farmers being trained on poultry rearing

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and they are not de-beaked. Birds are rotated through pastures to allow constant access to greens. Comfortable, clean nesting boxes for hens help egg-laying or brooding in privacy.

Feed and nutrition: Happy Hens Farm prepares its own bird feed and shares it with the partner farmers. A balanced diet and fresh water helps the hens stay fit, stress-free and healthy. Free range chickens scavenge naturally in the range, foraging for nutritious greens, seeds and bugs as well as trace minerals from the soil. Seasonal plants and legumes in the range enriches the protein content and carotenoid in the hens' diet.

In addition, birds are fed a unique blend of grains, cereals and herbs formulated in-house. This is aimed to enhance the immunity of the flocks against infections. Herbs with high medicinal value such as brahmi, basil, sweet flag, turmeric, nilavembu, keela nelli, neem and aloevera are added to feed or water. The herbs also enrich the nutritive value of the eggs. In addition probiotics are also given to birds. Birds are fed flax seeds to ensure eggs are omega-3 enriched. No animal by-product is fed. The feed is free from antibiotics, hormones and synthetic growth promoters.

Disease management: Standard breed-specific vaccination protocols are followed. In rare outbreak scenarios or only in a necessary, case to case basis, antibiotics are used therapeutically. Eggs produced over the subsequent three-seven days of antibiotic administration are not sold in open market. Biosecurity, better farm management, bird welfare practices have helped comparatively reduce disease prevalence as well as antibiotic use. Farm health is maintained through regular audits, internal veterinary networks, and diagnostic assistance from state departments.

Market reach and commercials: Producing 40,000-42,000 eggs daily as on 2025-26, Happy Hens distributes them through organic retail chains (e.g., Nature's Basket, BigBasket), direct to consumer subscriptions, and ethical hospitality buyers. Free-range eggs retail at Rs 180-199 for six units, which is because of higher feed overheads and lower laying productivity (60-75 per cent). Per-egg margins yield Rs 2-2.5 profit for the company and Rs 1.7 for farmers under free-range systems, and Rs 1.00-1.20 for the company and Rs 1.10 for farmer under cage-free operations. Egg packages are labelled with 'CERTIFIED HUMANE LOGO'. In 2025-26, the revenue was Rs 13 crore.

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CASE STUDY 7

Professional Assistance for Development Action (PRADAN), Odisha

During August-November 2022, Professional Assistance for Development Action (PRADAN) supported tribal poultry farmers in Sirubali village of Kandhamal district, Odisha, in adopting ethnoveterinary practices to improve backyard poultry health and reduce mortality.

In August 2022, the Integrated Tribal Development Agency (ITDA) and the Animal Resources Development Department of Odisha provided 490 Kadaknath chicks to 21 local families (farmers) in this village; they also constructed night shelters. PRADAN was involved as a technical resource organisation to support poultry farming in this village. It established a structured package of practices (POPs) combining vaccination protocols, ethnoveterinary remedies, and herbal supplementation for a four-month growth cycle (*see Table 10: Schedule for birds during the four-month growing period (Aug-Nov 2022)*).

Implementation and community governance: A village rearer committee monitored monthly progress, supported by a designated Pashusakhi (community women animal health workers), who ensured doorstep delivery of medicines, compliance to POPs, and adequate information to and education of rearers. Families maintained daily dosing logs. Following initial feed support from ITDA, birds transitioned to free-range scavenging supplemented by household grains. Birds were weighed on the third day of every month. To boost immunity without synthetic inputs, farmers also regularly administered *kadha* (a traditional herbal decoction). The monthly input cost remained under Rs 3 per bird, even after purchasing all ingredients.



हर्बल पद्धति से देशी मुर्गी पालन:

उपचार-1: एक हफ्ता छोड़कर एक हफ्ता चिराईता यानि मुईनीम दें (दो हफ्ता में 1 बार)

नीचे दिए गए किसी भी प्रकार (फ्रेश, सुखा/पाउडर) का चिराईता लें । इस के जगह पर महानीम पेड़ का छाल भी ले सकते हैं । बीस मुर्गी केलिए 20ml रस निचोड़ कर, उस में 100 ग्राम चावल को रात भर भिगोएं और अगले सुबह खाली पेट में खिलाएं (प्रति मुर्गी 1ml रस और 5 ग्राम चावल) ।

सुखा मुई तीता / चिराईता

महानीम

••पहला-पहला, मुर्गी अगर न खाए तो, अलग दान मे मिलाकर भी दे सकते हैं । अगर किसी भी तरह का बीमारी का लक्षण हो तो, लगातार 3 दिन खिलाएं । उसकेबाद, दो हफ्ता में 1 बार दे ।

उपचार-2: मुईनीम देने का अगले हफ्ता आलूबेरा+ प्याज + लहसुन दें

बीस मुर्गी केलिए 20ml आलूबेरा रस में 100 ग्राम चावल को रात भर भिगोएं और अगले सुबह उसमें 40 ग्राम प्याज और 40 ग्राम लहसुन का टुकड़ा मिलाकर, खाली पेट में खिलाएं (प्रति मुर्गी 1ml रस, 2 ग्राम प्याज, 2 ग्राम लहसुन और 5 ग्राम चावल) ।

•• अगर किसी भी तरह का बीमारी का लक्षण हो तो, लगातार 3 दिन खिलाएं । उसकेबाद, दो हफ्ता में 1 बार दे । पहला हफ्ता चिराईता, दूसरे हफ्ता आलूबेरा तीसरा हफ्ता चिराईता और चौथा हफ्ता आलूबेरा । ऐसा रोटेशन में चलाइए ।

Patanjali Aloe Vera Juice with Fiber, 1 Litre

उपचार-3: ठंडा, जुकाम (crd बीमारी) केलिए आढ़ा हफ्ता में 1 बार दें

अदरक 100 ग्राम, लहसुन 100 ग्राम पीस लें । अजवाइन 50 ग्राम + लौंग 10 पीस + काली मिर्च 20 पीस को कूट लें । यह सबको, 50 ग्राम गुड और 1 चमच हल्दी और 1 मुठा तुलसी पता के साथ,1 लीटर पानी में डालें । इसे धीमी आंच में, 800 ml होने तक उबालें । इसे हफ्ता में एक बार दें । पहिंट 1 या 2 बाली उपधार जब करें, उसका 3 दिन के बाद इसे दें । प्रति मुर्गी 3 ml, के हिसाब पीने का पानी में मिलाकर दें । अगर किसी भी तरह का ठंड का लक्षण, आवाज में बदलाव हो तो, लगातार 5 दिन खिलाएं । उसकेबाद, हफ्ता में 1 बार दें । 800 ml का खर्च 50 रु है । इसे 1 माह तक इस्तेमाल कर सकते हैं । जब भी इस्तेमाल करें, उतक मात्रा को गरम करलें ।

PRADAN

Package of Practice for herbal preparation use in poultry developed by PRADAN

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Table 10: Schedule for birds during the four-month growing period (Aug-Nov 2022)

Date	Medicine/ vaccine	Dose per bird	Process of use (for 20 birds)	Remarks
06-08-22	Plox (Herbal medicine)	0.4 ml	Oral suspension or mix 8 ml in 200 ml water	Gave to half of households as preventive for fowl pox, repeat every month (total 3 times)
06-08-22	Thuja CH-200 (Homeopathy)	0.4 ml	Oral suspension or mix 8 ml in 200 ml water	Gave to other half of households as preventive for fowl pox, repeat every month (total 3 times)
07-08-22	Chireita (*Andographic paniculata*)	2.0 ml	Mixed 40 ml chireita juice in 100 g rice in night; fed in morning	Once in every two weeks (total 7 times)
08-08-22	Lasota vaccination	1 drop	Occular application	For Ranikhet, repeat on 21st day
14-08-22	Alovera + turmeric + onion + garlic	2.0 ml +1.0 g + 2.0 g +2.0 g	40 ml aloevera juice+ 10 g turmeric + 100 g rice (night); 40 g small chopped onion + 40 g small chopped garlic (day)	Once in every two weeks (total 7 times)
16-08-22	IBD vaccination	1 drop	Occular application	For Gumboro disease one time
16-11-22	R2B		Intramuscular injection	For Ranikhet disease

Note: The intervention began after three days of bird distribution to farmers, from Aug 6, 2022

Mortality, outbreak management and treatment efficacy: In total, 85 bird deaths were recorded across a 490-flock sample—44 due to predation and 41 due to an early Fowl Pox outbreak. Because the chicks were too young for standard vaccination, PRADAN tested two alternative treatments alongside baseline ethnoveterinary remedies (aloe vera and turmeric):

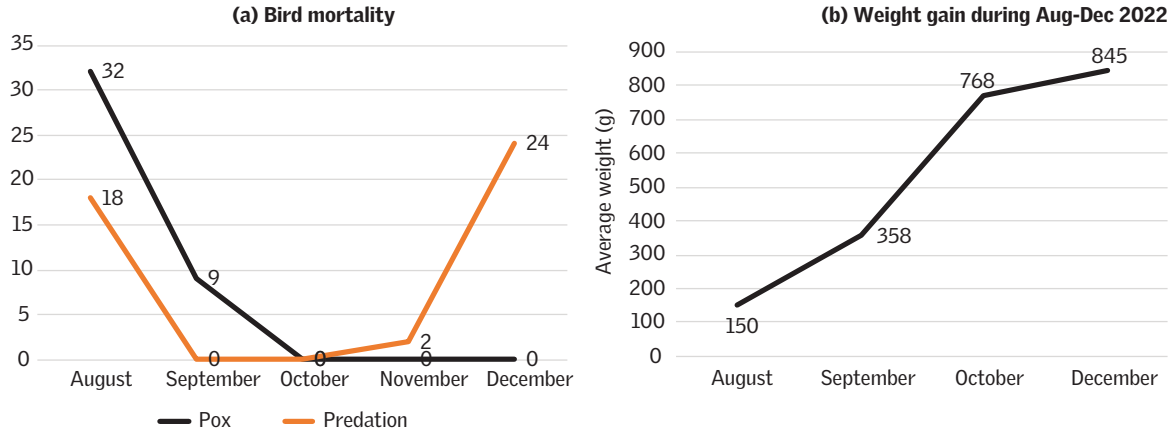
- **Homeopathy (Thuja):** Administered by 10 farmers across 237 birds (supplemented with aloe vera, turmeric after outbreak), resulting in 22 pox deaths (9.28 per cent).
- **Herbal medicine (Plox):** Administered by 11 farmers across 253 birds (did not continue ethnoveterinary steps after outbreak), resulting in 19 pox deaths (7.5 per cent).

Lower mortality among Plox users showed better efficacy of herbal formulation over homeopathy in controlling active outbreaks. No other diseases occurred during the trial.

Growth trends: Chicks achieved steady weight gain, reaching an average 768 g in three months (August-October), stabilising at 900 g by December as commercial feed supplies depleted (*see Figure 6: Trends in (a) bird mortality and (b) weight gain during Aug-Dec 2022*).

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Figure 6: Trends in (a) bird mortality and (b) weight gain during Aug-Dec 2022



Scalability: Ethnoveterinary and herbal management provided a low-cost, effective framework for controlling disease without antibiotic use in rural poultry. The model is being expanded across Chhattisgarh, West Bengal and Jharkhand through civil society networks, Pashusakhi WhatsApp groups and State Rural Livelihood Missions – it is already reaching over 100,000 rearers.

CASE STUDY 8

M J Reddy Poultry Farm, Telangana

Medipally Jayaprada, a layer poultry farmer in Telangana, transformed her farming enterprise after a devastating early setback. Initially investing Rs 1 crore to rear 4,000 Skylark layer chicks, she faced massive flock mortality at 35 weeks due to severe heat stress. Realising that veterinary-prescribed antibiotics offered only a temporary, unsustainable fix, she overhauled her system—purchasing day-old chicks to strictly control their early immunity, vaccination and diet.

She then set up a profitable layer farming business that relies on carefully curated plant-based feed which takes care of both bird health and nutrition.

Nutritional innovation: Jayaprada developed her own farm-grown diet comprising locally sourced grains, natural protein sources and herbal supplements. Her base formulation combined soya (10 per cent), maize (40 per cent), and 60 kg each of grape seed and Dried Distillers Grains per tonne. To maximise nutrient density, she installed a hydroponic system to convert 50 kg of dry maize into 250 kg of nutritious sprouts.

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M JAYAPRADA

M Jayaprada collecting eggs from her farm

She also heavily supplements this diet with natural products up to 40 weeks of age to enhance the birds' production capacity, immunity and overall health—these include mango leaves, sapota leaves, almond leaves, subabul leaves, eclipta leaves, ginger and garlic. Vegetables like cabbage, cauliflower and pumpkin in feed have improved bird's natural immunity. The largest chunk of the monthly expense goes towards this high-quality, organic feed.

Heat-stress management: Dietary cooling mechanisms were introduced—adding lemon and aloe vera to drinking water and feeding moist grass. Environmentally, Jayaprada covered sheds with green foliage to naturally lower temperatures and entirely replaced artificial lighting with natural sunlight.

Disease management: This depended on strict biosecurity, clean water systems, standard and timely vaccinations, and herbal/traditional preparations. For instance, one-month-old chicks are fed neem leaves (50 kg/tonne) and regular jaggery water. Minor ailments are treated purely with natural inputs like bitter gourd, ladyfinger and lemon water. No antibiotics are used.

Financial model and economics: The operational expenditure per bird is higher due to natural/organic feed ingredients, biosecurity controls and extra labour for flock management. The farm sells directly to health-conscious consumers, organic stores or premium retailers at premium pricing (typically 1.5-2.5 times higher than standard commercial eggs). Maintaining

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HERBAL HEALING

Treatment of respiratory distress in poultry[42]:
Shatadal Ghorai and Narugopal Ghorai, traditional herbal healers from West Bengal, have developed an oral herbal formulation for poultry respiratory distress linked to Newcastle (Ranikhet) disease. Medication is given orally twice or thrice in a day depending on the severity of the condition. It is administrated until the affected birds get cured, generally within five days. The National Innovation Foundation (NIF) of India conducted trials, confirming that the medication enhanced immunity and protected birds against respiratory distress and secondary bacterial infection. The mortality also reduced considerably. A patent has been filed and efforts are underway to commercialise the formulation. Their innovation was honored at the 8th National Grassroots Innovation Awards in 2015, organised by the NIF.

Treatment of coccidiosis in poultry[43]
Sudhakarbhai Gauli and Jeevalbhai Gauli, two herbal healers from Dang, Gujarat have developed herbal formulations using local herbs to treat coccidiosis and boost poultry immunity. This was validated at the Veterinary College and Research Institute (VCRI), TANUVAS, Namakkal. Matrix Biosciences Pvt Ltd of Hyderabad further evaluated the formulation and found highly promising results, leading to its commercialisation under the brand name 'Coccicure'.

low flock mortality and high lay-rates yields strong net margins (~20-25 per cent), offsetting the higher cost of natural feed inputs. The farm reportedly generates a consistent monthly gross turnover of Rs 10 lakh, yielding a net profit of Rs 2 lakh per month.

Challenges: Specific hurdles that Jayaprada navigates through are high cost of organic feed ingredients; vulnerability to diseases since farm requires constant vigilance and management in the absence of antibiotic use; and the need for maintaining constant distribution channels connecting to buyers willing to pay a premium.

CASE STUDY 9

Tamil Nadu Veterinary and Animal Sciences University and SRS Japanese Quail Products

Since 2000, the Bacterial Vaccine Unit under the Directorate of Centre for Animal Health Studies (DCAHS) of Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) has been involved in production and supply of autogenous vaccine for Fowl Cholera to various poultry farms across the state. Later, this technology was transferred the technology to M/s Biovet Pvt. Ltd., Bengaluru during the year 2006. Then, in the year 2009, TANUVAS came across respiratory problems with mortality in quail farms reared under deep litter system and the investigation revealed that the presence of *Mannheimia haemolytica* infection where autogenous vaccine was suggested to be used.

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Located in Palladam, Tiruppur in Tamil Nadu, SRS Japanese Quail Products specializes in commercial Japanese quail production. The farm historically struggled with recurring outbreaks of Mannheimiosis and/or Fowl Cholera, a bacterial infection that severely threatened flock health, production efficiency, and overall economic viability despite conventional preventive measures. The endemic nature of Mannheimiosis and/or Fowl Cholera meant standard management strategies could not eradicate the pathogen circulating within the farm environment. To address this, TANUVAS stepped in with a pathogen-specific disease mitigation framework.

Farm-specific vaccination model: The core intervention was the development of customized and scientifically robust solution—autogenous vaccine against Mannheimiosis and/or Fowl Cholera. TANUVAS researchers periodically isolated and characterized active Mannheimiosis and/or Fowl Cholera field strains directly from the farm to produce tailored vaccine batches. Formulated under strict safety, quality, and efficacy standards, TANUVAS supplied the required doses to the quail farmers. Timely administration helped in breaking seasonal disease transmission cycles, and prevents disease recurrence.

The partnership served as a continuous preventive-health program. TANUVAS provided ongoing scientific guidance, regular pathogen characterization, and field support to farm veterinarians, ensuring the auto-vaccine evolved alongside any circulating strain variations.

Outcomes: Following consistent auto-vaccine implementation, the farm saw a sharp decline in mortality, significant reduction in Mannheimiosis and/or Fowl Cholera outbreaks, and a marked reduction in overall antibiotic reliance. Improved flock uniformity, enhanced productivity, and stronger economic returns, were also achieved.

CASE STUDY 10

KeggFarms Pvt Ltd, Haryana

The Kuroiler model aims to improve the nutrition and livelihood status of rural women, as well as create micro-entrepreneurs (dealers, mother units and vendors). Kuroiler is a dual-purpose chicken variety introduced in 1990 by KeggFarms Pvt Ltd, based in Gurugram, Haryana. The variety is resilient to harsh rural conditions, can thrive on household scraps and waste, requires minimal shelter, and is disease-resistant. It has an egg-laying capacity of 150-180 eggs over a 12-16 month period, and exhibits more rapid growth than native breeds.

Farming system: Birds are reared in a deep litter system under semi-free-range conditions. To minimise disease risks, the breeding unit maintains strict biosecurity, distinct locations

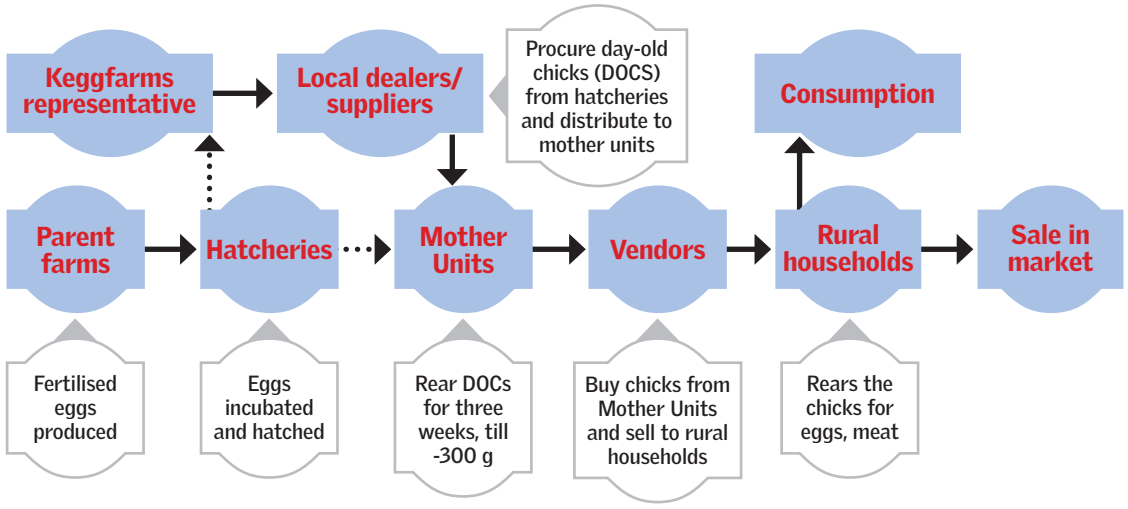
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for hatching, brooding and breeding, and rigorous sanitation protocols. Feed comprises high-quality ingredients, free of antibiotic growth promoters. Poultry waste is repurposed and sold as farm manure.

Disease management and antibiotic use: Strict vaccination protocols are followed to protect birds against Newcastle Disease and Infectious Bursal Disease. The model involves minimal reliance on antibiotics as birds are reared in stress-free environment which keeps them disease-free. Reared in free-range, the birds also contribute to pest control and soil health in village ecosystems.

Multi-tiered distribution model: The distribution model employed by KeggFarms to reach remote villages is multi-tiered (*see Figure 7: Kuroiler distribution model*).

Figure 7: Kuroiler distribution model



Source: Information from KeggFarms Pvt. Ltd.

Fertilised eggs of Kuroiler from parent farms are transferred to hatcheries. Within 24-36 hours of hatching, the day-old chicks (DOCs) are bought by local dealers and customers at Rs 26-30 per chick, depending on the existing rates, and delivered to rural 'mother units'. At the mother units, the chicks are reared for three weeks with adequate nutrition and necessary vaccination until they attain a weight of 300 gram – the total investment amounts to Rs 45-50 per chick, depending on feed rates.

The mother unit owners then sell the chicks to vendors at about Rs 50-60 per chick. With a profit of Rs 5-10 on each, a mother unit with 1,000 DOCs can earn Rs 5,000-10,000 per

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month. Village vendors who buy brooded birds, load baskets with chicks and peddle them on bicycles in small flocks (50-100, depending on size of brooded birds) – they make a profit of Rs 10-15 per chick by selling them at Rs 60-70. Women in villages rear the birds, mainly on household and agricultural waste, for nearly two months. During this time, there is availability of high-quality nutritional food for household consumption. The bird is typically sold after about two months at Rs 250 per kg. Average supplementary household income from Kuroiler is Rs 300-500 per month.

Scale and outreach: The model, as of now, caters to more than 1,500 dealers, over 5,000 mother units, and more than 7,500 village vendors; it services about 1.5 million (15 lakh) rural households. Operational in about 20 Indian states, the model is helping generate an estimated additional income of more than Rs 500 crore and has helped establish over 5,000 micro-entrepreneurs. Kuroiler is also distributed as part of the National Livestock Mission.



Kuroiler variety



Village vendors collect chicks from mother units and transport them to villages for selling



KEGG FARMS

Women buying chicks from village vendors



Women rearing Kuroiler in household

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CASE STUDY 11

Watershed Support Services and Activities Network (WASSAN)

WASSAN began working on promotion of rural desi poultry production systems in 2015-16. Initial pilot interventions and knowledge exchange with support of other NGOs and institutions have later been mainstreamed through government support. The programme is being implemented in 30 districts and 61 blocks across nine states, with major operations in Odisha, Telangana and Andhra Pradesh, ultimately covering 90,000 integrated *desi* backyard households.

Operational model: WASSAN's Backyard Poultry (BYP) Cluster Programme for Small-holders is often managed as a women-led micro-enterprise. This integrated system promotes sustainable livelihoods by pairing *desi* (indigenous) poultry with a multi-layered eco-farm. This involves utilising poultry waste for soil health improvement, composting and vegetable cultivation, creating a circular resource use model. *Desi* breeds such as Aseel are favored because they exhibit more disease resistance and are compatible with natural farming systems, requiring no external commercial feed as they forage and consume raw materials grown on the farm (crops, vegetable waste and fruits).

Economically, the model is highly lucrative for small-holders. A standard unit comprising 50 hens and 10 cocks using up half to one acre of land can generate an annual income ranging from Rs 80,000-Rs 1,20,000. Even smaller units (10-hen units) achieve annual earnings of Rs 35,000-Rs 40,000.

The programme also incorporates decentralised infrastructure, including a decentralised breeding farm established on 0.5 acre of fenced land, designed to serve 50-100 households. Another component is the decentralised healthcare service supported by a pre-paid Poultry Service Fund. This Fund, managed by common interest groups, ensures scheduled vaccination services are delivered by trained para-workers linked to the state's animal husbandry department (*see Figure 8: Components of Backyard Poultry Cluster Programme for Small-holders*).

Disease management and integration of traditional knowledge: Antibiotics are never encouraged to be used in this model. Disease is managed through vaccinations, ethnoveterinary medicines and deworming (allopathic and local herbal medicines on rotational basis). However, local veterinarians can suggest the farmers to use a three-day tetracycline course to control bacterial diarrhea. Ethnoveterinary practices include turmeric for respiratory problems, preparations from herbs like *Pergularia daemia* and *Momordica charantia* (bitter gourd) for colds, and sun-dried papaya seed powder or *Andrographis paniculata* (green chiretta) for intestinal worms. Smoke from *Annona squamosa* (custard apple) and *Nicotiana*

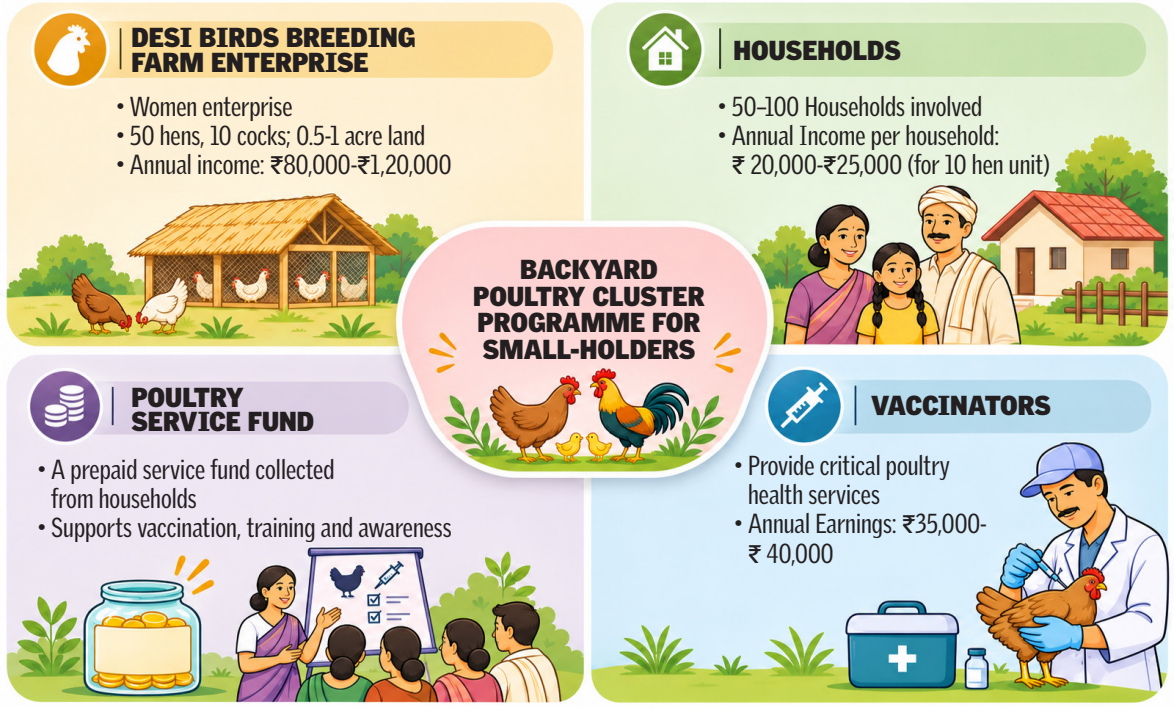
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tabacum (tobacco) leaves is used as a mosquito and poultry lice repellent. *Acorus calamus* (Vasa) is traditionally used as an external application to repel ticks and lice. Red onions and garlic are used seasonally as growth promoters and immunity builders.



Aseel

Figure 8: Components of Backyard Poultry Cluster Programme for Small-holders



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CASE STUDY 12

Aga Khan Rural Support Programme (India), Madhya Pradesh

Since 2020, the Aga Khan Rural Support Programme (India) (AKRSP (I)) has been promoting poultry farming to improve the livelihoods of landless farmers and reduce distress migration in Khandwa district, Madhya Pradesh.

Formation of farmer clusters: The initiative began by bringing together a cluster of 10-15 enthusiastic farmers and providing them with training in poultry farming. Over time, the initiative has expanded significantly, and the cluster now comprises approximately 1,200 farmers.

Developing a cadre of Community Animal Health Workers: The programme has developed a cadre of approximately 240 Pashu Sakhis (women community animal health workers). These women were identified and trained in various aspects of poultry farming, including bird health, farm management and breed selection. Following their training, the Pashu Sakhis have been equipped to independently provide essential services to poultry farmers. These include vaccination, deworming, poultry shed design, first aid and the preparation of azolla-based feed. Each Pashu Sakhi receives a one-time support kit containing vaccines, herbal medicines, medical equipment, training manuals and other essential supplies. They can also seek technical guidance from the district animal husbandry department whenever required.

Engagement of Farmer Producer Organisations: Two Farmer Producer Organisations (FPOs) in the district operate hatcheries and feed mills to support farmers by providing access to day-old chicks (DOCs) and poultry feed. The commonly distributed poultry breeds include CARI Sonali and Vanaraja. In some cases, private companies also supply chicks directly to farmers.

AKRSP (I) facilitates direct linkages between FPOs and vaccine manufacturers to ensure the timely availability of vaccines in accordance with pre-planned procurement and vaccination schedules. Pashu Sakhis collect vaccines from FPOs ensuring that the cold chain is maintained throughout the process.

Establishment of community-owned mother units for rearing day-old chicks: To address high mortality DOCs, the programme has supported selected well-performing farmers in establishing community-owned mother units. These units procure DOCs from FPOs and rear them for 15-20 days before supplying them to other farmers. This improves chick survival and ensures that farmers receive healthier, stronger chicks. AKRSP (I) provides one-time capital assistance and support for development of basic infrastructure to establish these units. The cost of rearing a chick for 15 days is approximately Rs 42-45. Mother unit operators can

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subsequently sell chicks at around Rs 50 per chick, generating a margin of approximately Rs 5-8 per chick.

FPO facilitated market access: The FPOs also play an important role in providing market access to poultry farmers. They procure birds directly from farmers at mutually agreed,



Low cost poultry-shed model



Sonali birds



Training of Pashusakhis at Pashusakhi Development Centre



Vaccination of chicks by a Pashusakhi



Pashusakhi preparing ethnoveterinary medicine



Azolla cultivation

AGA KHAN RURAL SUPPORT PROGRAMME (INDIA)

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predetermined prices and facilitate their sale in the market. Through this arrangement, farmers can earn an additional annual income of approximately Rs 25,000-30,000, contributing to improved household livelihoods and financial stability.

Promoting traditional ethnoveterinary medicine and herbal remedies: The programme also promotes use of traditional ethnoveterinary medicines (EVM) and herbal remedies for poultry healthcare under scientific expert guidance. Their preparation, dosages and administration practices are being demonstrated and standardised with technical supervision. Since the preparation methods are simple and can be easily replicated, Pashu Sakhis are able to prepare and promote these remedies at the community level.

EVM and herbal remedies, along with regular vaccination and better farm management, have helped improve poultry health and manage diseases. There is very little to almost no antibiotics usage on farms. If the birds do not recover with traditional and herbal methods (first preference), or if there is a serious bacterial infection and there is a risk of increased mortality, antibiotics are used based on veterinary advice and a 10-15 day withdrawal period is followed. Unnecessary use of antibiotics is otherwise avoided. This has led to a significant reduction in diseases as well as in antibiotic use on farms, in addition to encouraging more sustainable and responsible poultry farming and production of healthier eggs and meat.

Replication and expansion of the cluster-based poultry farming model: Similar initiatives are being introduced in other states, including Gujarat and Bihar, with an aim to replicate and adapt the cluster-based poultry farming model to local contexts, focus on strengthening community-level support systems, improve poultry health management and enhance farmers' livelihoods. It is expected to create a sustainable and scalable framework for promoting improved backyard poultry farming in different regions.

CASE STUDY 13

Egger Nurseries, Kerala

Egger Nurseries* are run by private farmers in Kerala who have tied up with regional poultry farms under the state's animal husbandry department. They procure day-old chicks of improved varieties like Gramasree and Thriveni from regional farms and rear them for about eight weeks—serving as mother units. During this period, necessary brooding practices are followed and all vaccinations are given to the chicks, including for Newcastle disease which often causes chick mortality.

* Published in 2025 CSE report on Upscaling backyard and rural poultry in India

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Through these Egger Nurseries, farmers are also able to generate some income. Once stable, the two-month old chicks are sold to small farmers through veterinary dispensaries at a price of about Rs 150 per chick. Small farmers, who buy about five-10 chicks at one go, are ready to pay this price since they get fully vaccinated chicks which have been raised to a certain age with necessary nutrition and environment. Farmers are assured of the chick's longer survivability and prefer buying from Egger Nurseries, instead of buying them at cheaper rate (Rs 30-40) and suffering major losses.

The district animal husbandry officer registers the Egger Nurseries. There are more than 200 nurseries in Kerala. These nurseries even supply to the state government schemes at the same fixed price.

CASE STUDY 14

P V Narsimha Rao Telangana Veterinary University, Telangana

Particularly Vulnerable Tribal Groups (PVTGs) are a less developed category among tribal communities in India. One of the major challenges faced by PVTGs in Hyderabad (Telangana) has been high malnutrition, particularly among pregnant women, nursing mothers and growing children. There was also high mortality in children.

In the last few years, poultry farming with Rajasri, an improved variety developed by the P V Narsimha Rao Telangana Veterinary University, has helped PVTGs to overcome the challenge of malnutrition. Rajasri is a dual-purpose synthetic variety that thrives well under backyard conditions and in a low-input or scavenging system. The birds can be fed on kitchen waste, animal dung, faecal matter, worms, agricultural waste, insects etc. They are hardy, known for disease resistance and survivability, and can lay up to 170 eggs a year under intensive systems or 110-120 under free range.

The birds are reared until five weeks in nurseries, vaccinated and then supplied primarily in tribal areas through state-supported programmes and cost-basis sales. Besides small scale farmers, the day-old chicks are also supplied to young entrepreneurs. Some of the schemes under which these supplies are done include the high impact programme of ICAR-Agricultural Technology Application Research Institute Zone X, the ICAR-Scheduled Caste Sub-Plan, and the ICAR-Tribal Sub-Plan.

Farmers are given about 20 birds which can produce 10 eggs daily. After consumption in the household, the remaining eggs can be sold for about Rs 15 per egg. The meat is sold at a rate of Rs 350-400 per kg. Since the variety has been introduced in the market, there is now

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an increased consumer preference for Rajasri over the commercial broiler meat. Overall, the breed has helped augment the market, generate incomes and has provided nutritional security as well as better taste for poor poultry farmers.*

CASE STUDY 15

ICAR-Central Avian Research Institute, Uttar Pradesh

The Backyard Poultry Hubs Project being implemented by ICAR-CARI focuses on developing and disseminating climate-resilient backyard poultry varieties to improve nutrition and livelihoods of farmers from the SC/ST community. Operational in select districts of Uttar Pradesh and Uttarakhand, CARI provides training, day-old chicks (DOCs), bamboo huts, feed and utensils (water, feeder) to the farmers.

To address initial challenges of brooding DOCs and subsequent chick mortality, CARI selected certain passionate and innovative farmers from the community and signed an MoU with them, under which they were trained for brooding and other poultry management and positioned as mother unit in-charges.

The MoU in-charge buys 8,000-10,000 DOCs from CARI at the price at which they were being sold to farmers (~Rs 35/DOC) and broods them. After 30-40 days of brooding, CARI buys back these chicks at a pre-decided price (Rs 95-110), based on an evaluation criterion (body weight and health of chicks etc). The birds are then sold to farmers or state animal husbandry departments by CARI.

The model addresses concerns with respect to limited infrastructure and humanpower for brooding. It also provides an additional source of income to the mother unit in-charge, who is able to make a profit of Rs 10-20 per bird, and who also gets a direct and guaranteed buy-back. Currently, there are eight mother unit in-charges associated with CARI. The farmer, in turn, is able to receive good quality 40-day old brooded chicks with no additional effort or investment for brooding.

CASE STUDY 16

ICAR-Central Avian Research Institute, Uttar Pradesh

The Giri Gram Takniki Park is an integrated backyard poultry farming initiative of the ICAR-Central Avian Research Institute (CARI), with an aim to increase farmers' incomes with

* Published in 2025 CSE report on Upscaling backyard and rural poultry in India

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low-cost housing. Spread over an acre of land in Bareilly (Uttar Pradesh), the model rears dual-purpose improved poultry breeds of Kadaknath, Aseel Peela, CARI-Shyama and CARI-Nirbheek. The current capacity of birds under this initiative stands at 1,200.

Farming model: The model employs a free-range set-up where birds roam during the day and return to designated housing at evening. Biosecurity is ensured through appropriate hygiene protocols and controlled access, while birds are vaccinated primarily against Newcastle disease and infectious bursal disease.

Feed: Natural feed is mixed with compound feed and includes seasonal green fodder and moringa, earthworms and maggots (larvae of the Black Soldier Fly). These are either grown or sourced from within the farm itself. For instance, moringa trees have been planted around the model farm. Seasonal fodder is grown by rotational cropping of berseem (winter) or cowpea



Kadaknath



CARI Nirbheek



CARI Shyama

RASHMI MINOCHA/CSE AND CARI



CARI-Shyama birds at Giri Gram Takniki Park



Vermiculture as feed



Birds perching inside huts

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(summer). Maggots are produced by creating a suitable environment for rearing BSF in old water tanks.

The birds feed two times a day. Overall, the cost of feed is 40 per cent lower than that of commercial feed. The model also has vermi-beds for decomposition of organic matter with earthworms to produce nutrient-rich vermicompost that serves as a fertiliser for plants and crops. Presently, there are five vermicomposting pits, four maggot production units (four bins) and about half an acre of land dedicated for fodder production. The model houses six low-cost huts (20 feet x 15 feet) which can be easily built with available resources—bamboo, thatch, polythene or fiber sheets.

Disease management: Since birds being reared are dual-purpose breeds, there is not much production stress. No antibiotics used are used. Diseases are typically managed by following strict biosecurity protocols.

Economics: The model can be profitable for farmers who are innovative and willing to adopt the system. The overall benefit-cost ratio is 2.2:1. The cost of setting up such a farm—a one-time investment—is also quite low. Farmers can easily propagate a specific breed using low-cost infrastructure as well as readily available feed like rice, vegetable waste, fish skeletons or kitchen waste. Land requirement is flexible, allowing farmers to adjust based on the available space.

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India's growing poultry sector faces sustainability challenges from antibiotic-dependent intensive production systems which are disease prone. This report provides a prevention-led pathway to sustainability in the sector and beyond. The pathway is based on five 'prevention pillars' — biosecurity and farm management, quality feed and feed additives, alternatives to antibiotics, vaccination, and resilient breed-led extensive poultry systems.

The report highlights the gaps and challenges in mainstreaming prevention and recommends necessary change in policy, systems and practice. It also presents several best practice case studies from different states to demonstrate that mainstreaming prevention is feasible and profitable.

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