



SUSTAINABLE FOOD SYSTEMS

An Agenda for Climate-risked Times

Upscaling backyard and rural poultry systems in India

*Exploring opportunities to reduce antibiotic use in food-animal
production, while ensuring co-benefits of improved livelihoods,
nutrition and biodiversity conservation*

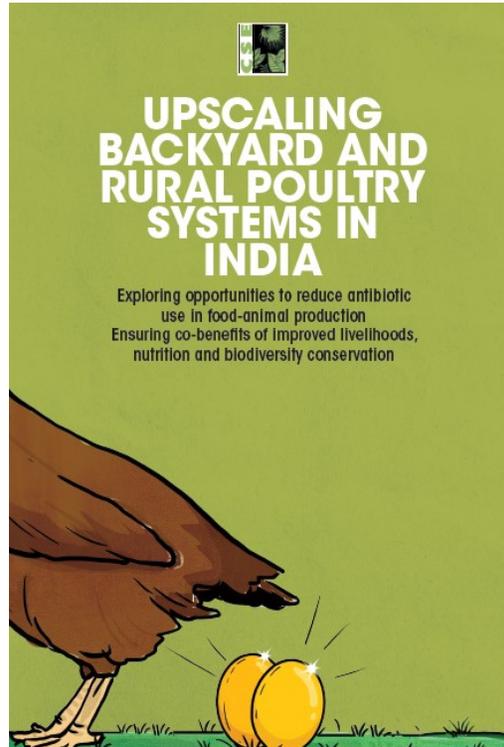
Rajeshwari Sinha
CSE





Presentation overview

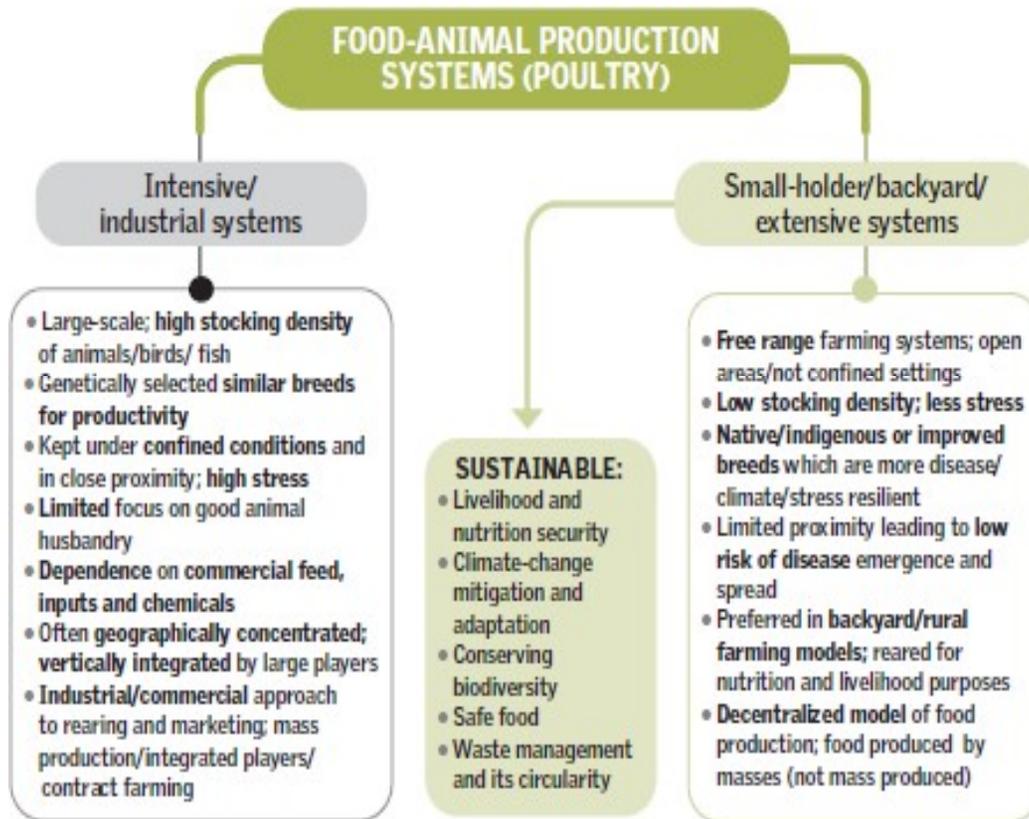
- Backyard and rural poultry systems
- Resilient breeds
- Government programmes to promote backyard and rural poultry
- Challenges
- Possibilities
- Case studies



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Sustainability of backyard and rural farming systems

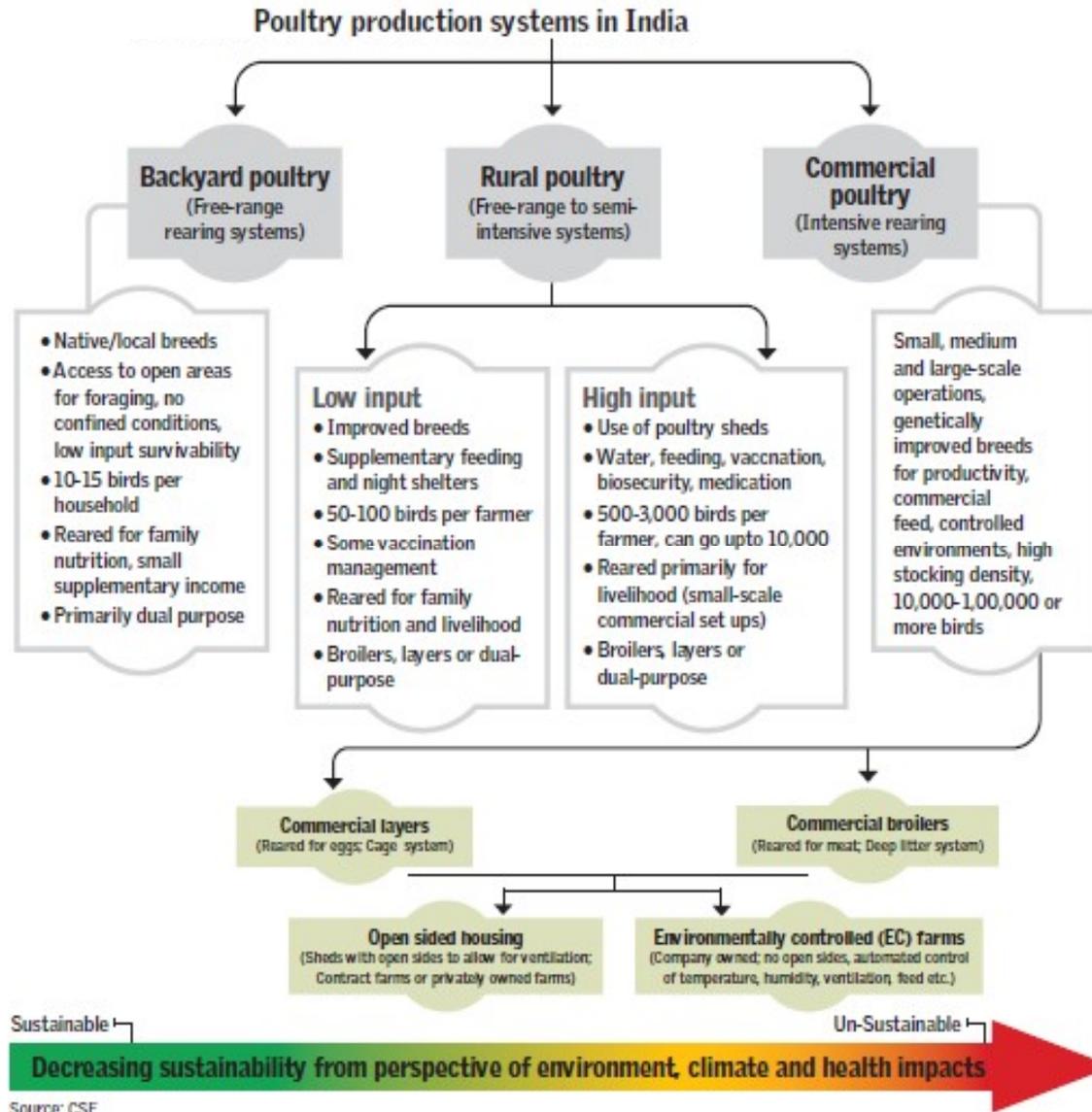


Backyard and rural farming systems more sustainable than commercial systems





Indian poultry production system

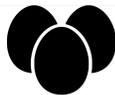




Indian poultry sector



- **851.8 million** (2019)
- Top producers: Tamil Nadu, AP, Telangana, WB, Maharashtra



- **~5 million tonnes** (2023-24)
 - **51%** of total meat produced
- Per capita availability: 103/annum

- **142.77 billion eggs** (2023-24); **3rd** largest producer globally
 - Commercial (**85.4%**)
- Per capita availability: 7.39 kg/annum

Commercial poultry (63%)

- 4.5% growth over last census
- ~20 million farmers involved

Backyard poultry sector (37%)

- 45% growth over last census
- ~30 million farmers involved

- **80% percent** of India's poultry output from commercial farms
- **Intensification** a major way to produce poultry meat and eggs
- Sector is important for **livelihood, nutrition, economy**
- **Backyard poultry sector growing.** Percentage growth rate about 10 times more than commercial sector

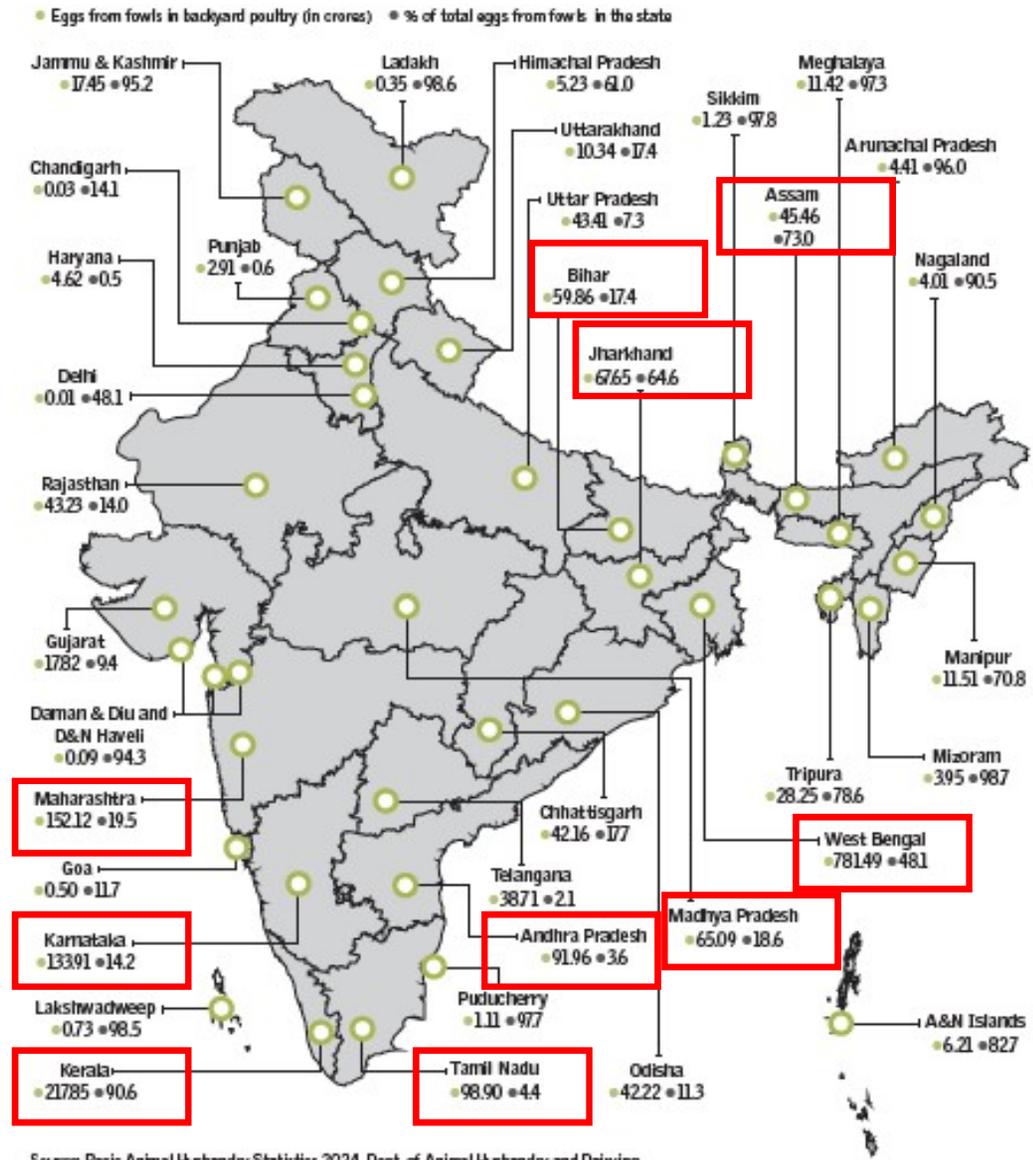
Source: DAHD





Egg production from backyard poultry (fowls) in states/UTs

- In 2023-24, >22 billion eggs (15.4% of total egg produced; 142.77 billion)
- 93% (20.56 billion) were from fowls (including chickens)
 - *desi* (native) fowls (68%)
 - improved fowls (25%)
- 10 states collectively produced > 83% of eggs from backyard poultry (fowls)
- Other than these ten, J&K, some northeastern states, Puducherry also produce majorly from backyard systems



Source: Basic Animal Husbandry Statistics 2024, Dept. of Animal Husbandry and Dairying

Resilient breeds



Resilient breeds crucial to backyard and rural poultry production

- **Survival** and **growth** of backyard and rural poultry production systems
- Rearing: **cost-effective**, **low risk**, **good returns on investment**
- Eggs and meat: **chemical-free**, **high in nutrition**, rich in taste; **higher market price**
- **Improved livelihood** and **nutrition** of rural households and small-holder farmers
- Led by **indigenous/native/desi** poultry breeds and **improved** varieties
 - **High adaptability** to harsher conditions and local climate
 - **Disease resilience**
 - **Low-input survivability**



Native breeds in India



Aseel



Kadaknath



Ghagus



Nicobari



Naked neck

Location-specific breeds

- **Native** to a particular region or location
- Evolved and adapted to **local environmental conditions** through many generations
- Often **dual-purpose** and **slow-growing**
- Commonly reared in flocks of 10-15 in backyard



Image source: DPR, TANUVAS



Native 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 varieties in India



Vanaraja



Srinidhi



Gramapriya



Janapriya



Aslibro



Vanashree

Low-input technology (LIT) birds

- Developed for **improved productivity** (weight gain, eggs etc) or **better characteristics** (growth rate, heat dissipation etc); retaining native traits of parent breed
- Done by **selection of pure lines** or **crossing** of breeds
- Rearing
 - flocks of 50-100 in free range; farmer nutrition and livelihood
 - flocks of 500-1000 in poultry sheds; modest commercial purposes



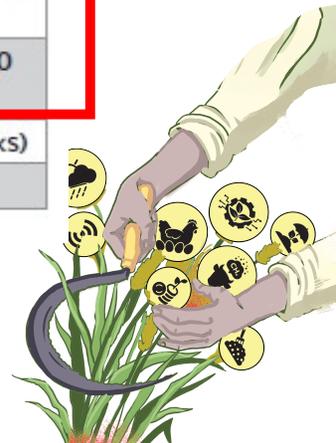
Image source: DPR



Productivity of select improved varieties compared to native breeds

Improved variety	Purpose	Native breed used in crossing	No. of eggs produced by native breed	No. of eggs produced by improved variety	Avg body weight of native 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





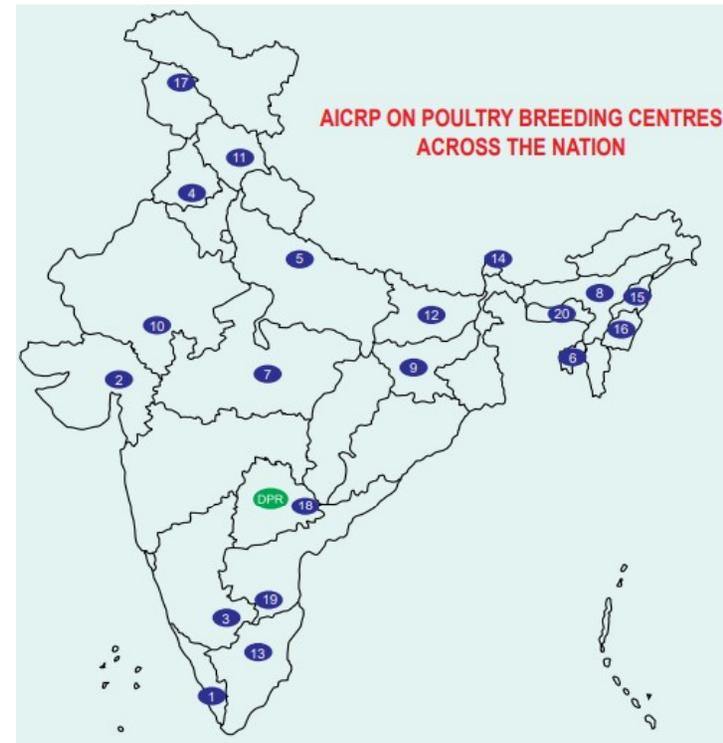
Government programmes to promote backyard and rural poultry





All India Coordinated Research Project (AICRP) on Poultry Breeding

- Led by the **ICAR-Directorate of Poultry Research**
- Broad aim
 - Develop **location-specific chicken breed varieties**; disseminate them for village poultry farming
 - Conservation, improvement, characterization, application of germplasm of local native breeds
- About **1.18 million (11.8 lakh)** chicken germplasm distributed to **over 16,000** farmers in 2024
- Farmers are provided germplasm free or at a minimal price, after necessary vaccination



1	KVASU, Mannuthy	11	CSKHPKV, Palampur
2	KU, Anand	12	BASU, Patna
3	KVAFSU, Bengaluru	13	TANUVAS, Hosur
4	GADVASU, Ludhiana	14	ICAR-RC NEH, Gangtok
5	ICAR-CARI, Izatnagar	15	ICAR-RC NEH, Jhamaipani
6	ICAR-RC NEH, Agartala	16	ICAR-RC NEH, Imphal
7	NDVSU, Jabalpur	17	SKUAST, Srinagar
8	AAU Guwahati	18	PVNRTVU, Warangal
9	BAU, Ranchi	19	SVVU, Tirupati
10	MPUAT Udaipur	20	ICAR-RC for NEHR, Barapani





Sub-Mission on Breed Development of Livestock and Poultry

TYPE OF STOCK	ORGANIZATION
	Public sector organizations
Cha Bro, Kalinga Brown, Kaveri, Kadaknath	Central Poultry Development Organization
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 organizations
Satpuda-desi	Dr. Yashwant 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.

- Led by the **Department of Animal Husbandry and Dairying**, under **National Livestock Mission**
- Broad aim is for **breed improvement** and providing support to farmer's nutrition and livelihood
- Centre provides **incentives to potential entrepreneurs** to establish farms, rural hatcheries, mother units
- 23 LIT chicken varieties





Other programmes promoting backyard poultry farming

- **Rashtriya Krishi Vikas Yojana**
 - Associated with **establishment of smaller poultry units** (10-50 birds) in states
 - Coordinate with NLM and other state-level programmes to deliver chicks, vaccination and training
- **Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM)**
 - Focus on better nutrition, women's empowerment and livelihood generation
 - **Community-led delivery of services** through self-help groups; **capacity building**
 - Both native breeds and improved varieties promoted
 - Backyard poultry models in states like Bihar, Rajasthan and Jharkhand supported





State Level Initiatives

West Bengal

Special Backyard Poultry Farming Programme through Distribution of Chicks and Ducklings among Individual Beneficiaries under State Plan 2021-2022

- Animal Resources Development Department
- Planned to distribute 1.5 crore **28-day old birds** and mother **brooding units** among 25 lakh beneficiaries during 2023-24

Maharashtra

Integrated Poultry Development Program under District Annual scheme

- Department of Animal Husbandry
- Distribution of 100 **day-old-chicks** or about 25 pullets to **farmers who are below poverty line, landless agricultural labourers, belonging to backward classes, or are marginal land holders.**
- Fifty per cent **subsidy** for all categories

Haryana

Scheme for the Establishment of Backyard Poultry Units (2025-26)

- Department of Animal Husbandry and Dairying
- Targets setting up 1,500 **backyard poultry units.**
- Each beneficiary availing this scheme is to get 50 (10-day old) chicks, **free** of cost along with **two drinkers and two feeders**





State Level Initiatives

Uttar Pradesh

Backyard Poultry Farming Scheme

- Animal Husbandry Department
- Establish **poultry units** for its beneficiaries, with a price of Rs 3,000 fixed for each.
- Fifty day-old chicks of LIT birds are given to each beneficiary, particularly **SC women**.
- Overall 15,000 beneficiaries were to be benefitted in 2022–23.17

Odisha

The Livelihood Support to Farmers through Rural Backyard Poultry Rearing under State Plan (2023–24)

- Directorate of Animal Husbandry and Veterinary Services
- Assist 31,377 individual farmers by providing 50 unsexed LIT **poultry birds** each, with **100% subsidy**
- Farmers can be from **SC/ST community, transgenders, poor or differently-abled**

Karnataka

Scheme on Distribution of Poultry Birds (2023-24)

- Karnataka Cooperative Poultry Federation
- Plans to distribute 20 **local poultry birds** reared for five weeks to each **rural farmer women/members of Mahila SHGs**





Challenges

1. Inadequate support to backyard farmers in rearing birds

- Farmers are often **unable to provide required vaccines** to the chicks/birds due to lack of awareness or resources
 - Overall vaccination coverage patchy
- Necessary **nutrition and infrastructure** to rear birds is not always available
- Farmers lack **right information and training**; loss of interest
- There is struggle to **access** chicks of right breeds and **good quality**
- There is **limited access to veterinarians** and veterinary advise
 - no follow-up process by the distribution centers after chicks supplied
- Access to **formal market** and **fair pricing**

2. Inadequate infrastructure at the level of developers/distributors

- Some distribution centers lack infrastructure, funds and man power to keep chicks for longer duration and hence are required to sell DOCs.





Possibilities

Need to create a favourable ecosystem so that backyard farming is successfully adopted and scaled up by augmenting and strengthening the programmes

1. Reduce risk and mortality by effective bird management in first 6-8 weeks

- Establishing mother units
- Promoting and incentivizing development of breeder farms at the farm level

2. Support developer of LIT birds by

- PPP models to ensure availability of cost-effective, locally relevant, resilient breeds
- Strengthening in-house infrastructure and capacity building
- Support in terms of funding and technology (laboratories, diagnostics)

3. Generate a coordinated responses to challenges faced by backyard farmers

4. Create local/distant market opportunities if needed





Case studies: scaling up backyard poultry for improved livelihood and nutrition





KeggFarms Kuroiler model, Haryana

- **Kuroiler: dual-purpose chicken variety**
 - Resilient to harsh rural conditions; disease resistant
 - Thrive on household scraps and waste
 - Requires minimal shelter
 - Prolific egg-laying capacity (220-230 eggs over a 12-16 month period); rapid growth
- **Broad aim**
 - Improve the nutrition and livelihood status of rural women
 - Create micro-entrepreneurs (dealers, mother units and vendors)

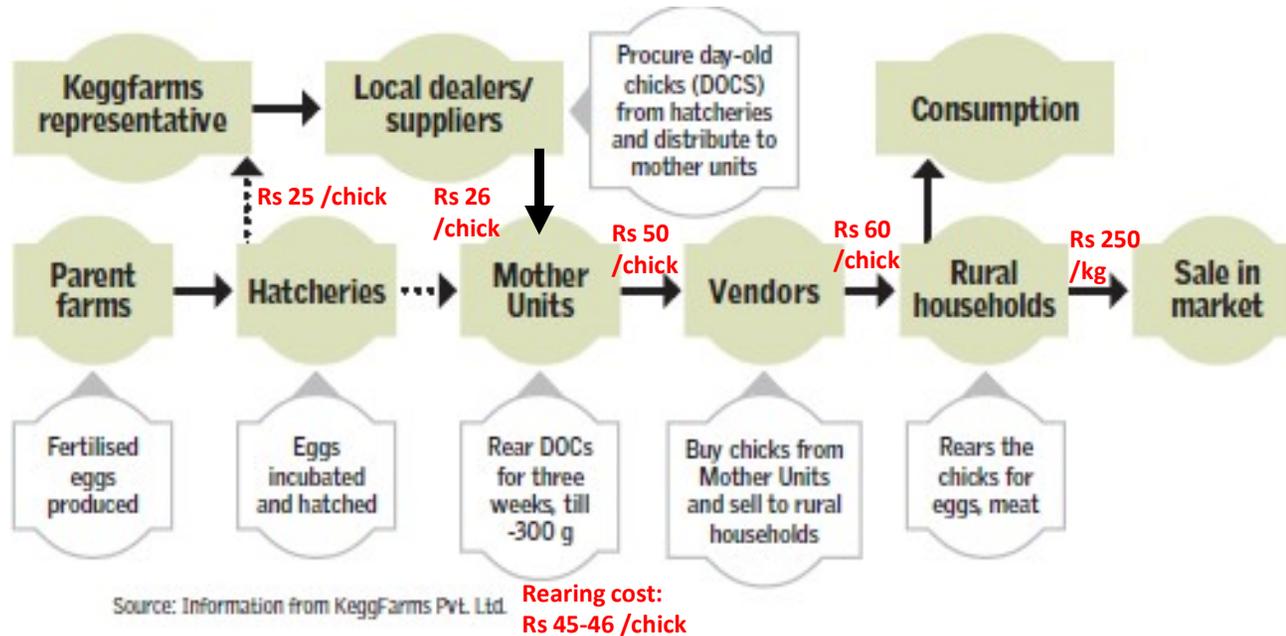


Kuroiler variety



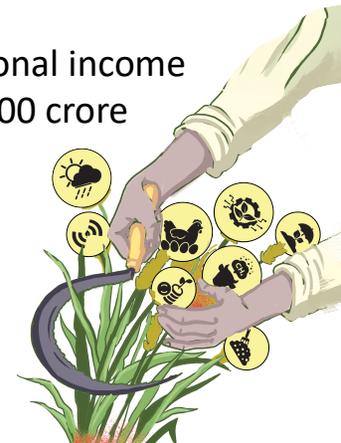


KeggFarms Kuroiler model, Haryana



Scale

- Operational in ~20 Indian states
- Catering to >1,500 dealers, >5000 mother units, and >7,500 village vendors; established >5000 micro-entrepreneurs
- Servicing ~1.5 million (15 lakh) rural households
- Estimated additional income generated > Rs 500 crore





KeggFarms Kuroiler model, Haryana





Community-led backyard poultry farming initiative, Madhya Pradesh

Supported by Aga Khan Rural Support Programme (India); cluster based initiative in Khandwa district, Madhya Pradesh

Cadre of 235 women animal health workers (Pashusakhis) developed

- Identified, trained on different poultry farming aspects
- One-time kit : vaccines, medicines, equipment, manuals
- Tie up with district animal husbandry depts

Two Farmer Producer Organizations

- Have own hatcheries/feed mills to support farmers
- Connected to vaccine manufacturers for timely supply
- Market access to farmers

Mother unit owners to address DOC mortality

- To keep and rear DOCs for 15-20 days
- AGRSP (I) gives a one-time capital support, infrastructural help to owners
- Cost invested Rs 42-45/chick for 15-day rearing, sold at Rs 50/chick

Farmer can earn in the range of Rs 25,000-30,000 per annum



CARI Sonali



Vanaraja





Community-led backyard poultry farming initiative, Madhya Pradesh



Training of Pashusakhis at Pashusakhi Development Centre



Vaccination of chicks by a Pashusakhi



Azolla culture in a poultry Farmer household

Pashusakhis trained to deliver on different poultry farming aspects: vaccination, deworming, shed design, first aid, azolla-based feed preparation





CARI supported mother units for farmer's livelihood

- **Backyard Poultry Hubs Project being implemented by ICAR-Central Avian Research Institute**
 - Develop and disseminate backyard poultry varieties to improve nutrition and livelihoods of farmers from SC/ST community
- **Select farmers trained and positioned as Mother unit in-charges to address DOC mortality**
 - In-charge buys 2,000-3,000 DOCs from CARI at ~Rs 20-22/DOC, broods them
 - After 40 days, CARI buys back these chicks at a pre-decided price (Rs 95-110), based on an evaluation criteria (body weight etc)
 - Birds are sold to farmers or state animal husbandry depts by CARI
- **Benefits**
 - Reduced DOC mortality, good bird health
 - Addresses concerns wrt limited infrastructure and human resource at the end of CARI
 - Additional income of mother unit in-charge (profit of Rs 10-20/bird); guaranteed buy-back
 - Farmer gets good quality 40-day old brooded chicks





Egger Nurseries

Egger Nurseries (Mother units) providing mother unit support to regional government farms, Kerala

- Private farmers who have tied up with regional poultry farms under animal husbandry department
- Procure day-old chicks from the regional farms; rear for 8 weeks
- Registered by district animal husbandry officer.
- More than 200 nurseries in Kerala — about 15-20 in each district.
- Supply brooded, vaccinated chicks to farmers, state government schemes

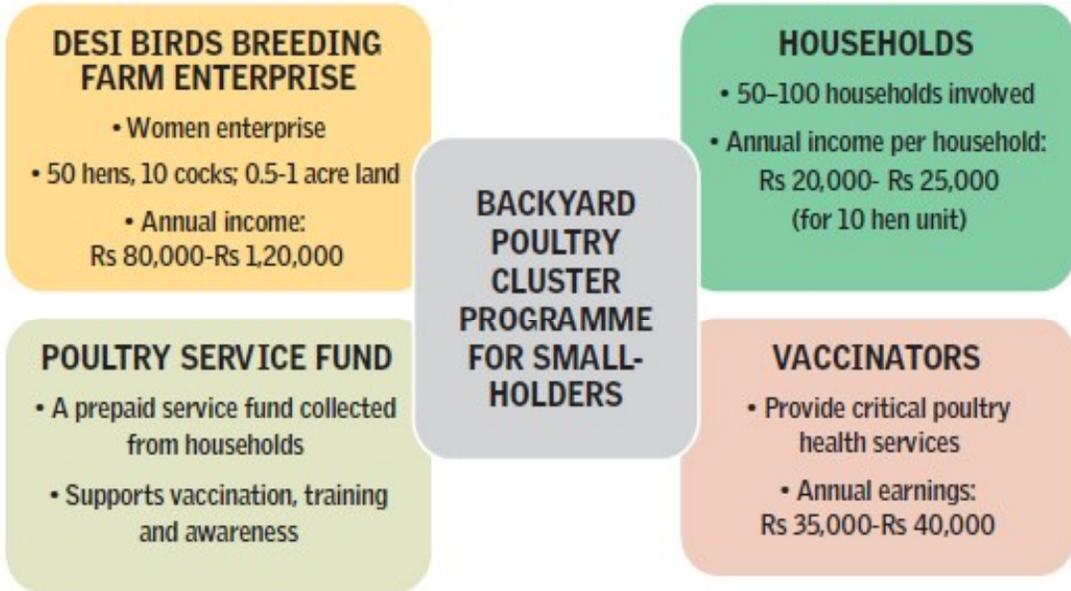
Source of farmer income

- Two month old chicks sold to small farmers through veterinary dispensaries at Rs 150 per chick
- Farmers assured of chick's longer survivability and prefer buying from Egger Nurseries





WASSAN's Backyard Poultry Cluster Programme



Aseel



Rencha Koodi

- Implemented in 30 districts; 61 blocks; 9 states
- Women-led micro-enterprise
- *Desi* poultry paired with a multi-layered eco-farm
- Economically highly lucrative
- Ethnoveterinary practices for flock health/immunity



Source: WASSAN



Giri Gram Takniki Park: Integrated backyard poultry model



CARI-Shyama birds at Giri Gram Takniki Park



Vermiculture being used as feed component

- Aim to increase farmers' incomes
- Dual-purpose breeds reared
- Free range farming set up
- Biosecurity and vaccination ensured
- **Natural and compound feed mixed (grown in park)**
 - Seasonal green fodder (*berseem*, cowpea)
 - *Moringa*
 - Earthworms, maggots (BSF larva)
- Feed cost lower by 30-40% than commercial



Kadaknath



CARI Nirbheek



CARI Shyama





Thank you

For more information contact:

Amit Khurana
Director, Sustainable Food Systems Programme
Centre for Science and Environment
k_amit@cseindia.org

Rajeshwari Sinha
Sr. Programme Manager
Sustainable Food Systems Programme
Centre for Science and Environment
s_rajeshwari@cseindia.org

