

HOW TO ENGAGE SMALLHOLDER PRODUCERS IN SCALING THE DAIRY AND POULTRY SECTORS

Lessons from India

India is a land of smallholders and its dairy and poultry sectors are no exception. The average herd size of the dairy sector is less than four animals per household. Nevertheless, India is the largest milk producer in the world (230 million tons in 2022-23), followed by the US at 103 million tons. The country has come a long way from being a milk-deficit country in the 1950s and 60s to a self-sufficient one with some surplus. Milk is not only the biggest agri-commodity (bigger than paddy, wheat, pulses and sugarcane put together), but the sector also employs 80 million rural households. Of the total workers engaged in milk production, more than 70 percent are women. On the other hand, the poultry sector has been the fastest-growing agriculture sector over the last two decades. Between 2000 and 2020, India's poultry meat and egg production grew at an annual average rate of growth of 9 and 7 percent, respectively. India is now the third-largest producer of eggs in the world and the fifth-largest producer of broilers. In 2020, almost 80 percent of poultry production (in value terms) came from the organized contract farming segment and almost 70 percent of poultry farmers engaged through contract farming are smallholder farmers with a flock size of 3,000-10,000 birds. This policy brief sheds light on the factors that have contributed to the growth of the two livestock sectors as well as challenges that remain to be addressed.

The White Revolution

The seeds for the “White Revolution” were sown during Operation Flood in the 1970s. Operation Flood boosted milk production and brought in technologies in the industry to enhance the productivity of the large bovine population, and created a “National Milk Grid” which connected states with surplus milk to areas with milk deficit and low production. The private sector, despite a late start in the race, has been quick in adopting new technologies that aid in improving the productivity of dairy herds and increasing the quality of milk collected.

However, dairy farmers continue to face some serious challenges that need to be addressed for the sustainable and efficient growth of India's dairy sector. The smallholder nature of the industry and the limited incentive for farmers to make investments have hindered productivity growth and global competitiveness of the sector. Despite having the largest dairy herd in the world, yields are low due to a

lack of adequate nutrition arising out of a shortage of feed and fodder in the country as well as low potential genetic material of indigenous cows. The large herd is also a contributor to greenhouse gas (GHG) emissions in the form of methane (CH₄) and nitrous oxide (N₂O), which are byproducts of their digestive process.

Moreover, raw milk procurement in India remains highly unorganized and fragmented, with limited technological information and traceability. The complexities of thousands of farmers pouring milk in a single bulk milk cooler pose challenges for milk quality and composition. The perishable nature of milk and value-added milk products makes supply chain management essential to ensure that the quality of milk is maintained from the farmer to the consumer. Also, despite decades of monopoly and government support, the success of dairy cooperatives has remained highly uneven and geographically concentrated in some states.

POLICY RECOMMENDATIONS

- **Create a level playing field** where both cooperatives and private companies can formulate a fair price discovery system and offer remunerative prices to farmers without any external aid from the government.
- **Improve the availability of green fodder** to improve milk yields and the digestion process of cows and buffaloes, which also helps in curtailing GHG emissions.
- **Leverage biotechnology** to improve generic feed and fodder.
- **Use sex sorted semen technology for Artificial Insemination** to minimize the male bovine population that is not needed anymore on farm fields due to increasing farm mechanization and often cannot be culled due to religious reasons.
- **Integrate modern digital technologies in managing the value chain** to collect data and improve sustainability.
- **Improve the delivery systems of innovations** and ensure that they are accessible to farmers, even in remote areas of the country.



The poultry revolution

The rapid growth of India's commercial poultry sector was driven by two main factors: (1) the government policy of liberalizing imports of grandparent poultry stock; and (2) the emergence of a vertical integration model between large integrators/hatcheries and small farmers through a contract farming approach, purely driven by the private sector. Today, India produces both eggs and poultry meat at internationally competitive prices, particularly due to the availability of local supplies of feed, such as maize and soybean meal.

Private companies have played a crucial role in helping smallholder producers overcome marketing challenges. In a coordinated approach, integrators on the one hand cover market risks for small producers and ensure remunerative income by keeping producer-retail margins relatively low. On the other hand, they help in compressing the average cost of production through improved technology and management practices.

Despite the impressive growth of the poultry sector, India's participation in the global egg and poultry meat trade has so far been negligible. Poorly developed infrastructure for freezing poultry meat all along the value chain raises hygiene and food safety concerns and producers are often unable to meet the standards of major trading partners.

Access to capital and credit plays a major role in scaling up a production unit. While some segments of livestock (e.g. dairy) can be kick-started or scaled up with a small amount of capital, others (e.g. poultry) are capital-intensive. In particular, the small-scale producers in the business who lack private investments require a regular flow of finance to meet their working capital needs, bear high transaction and marketing costs, and protect their flock from the vagaries of nature and diseases.

Moreover, intensification of poultry production in India is constrained by a lack of capital investment

in processing capacity and underdeveloped value chains. Due to consumer preferences, the live market sales of broiler meat still constitutes more than 90 percent of the total volume of sales and the processed chicken meat segment comprises only about 5 percent of total production.

Another key factor underpinning India's poultry industry is the availability of maize for feed. The broiler industry is expected to grow at a rate of 8-10 percent per annum during the next 5-10 years. An additional 1-3 MMT of maize would be required to cater to this growing demand. While maize production in India has doubled over the past 15 years, questions remain about whether sufficiently large quantities can be produced.

Finally, poultry intensification has potential environmental externalities that will need to be addressed, including the generation of waste (including slaughter waste, hatchery waste, poultry droppings and litter manure) and of ammonia (NH₃) and Hydrogen Sulphide (H₂S) gases.

POLICY RECOMMENDATIONS

- **Engage small-scale producers in contract farming** to be integrated into high-value chains.
- **Invest in adequate infrastructure**, in particular for the transportation of birds, cooling, processing, and food safety.
- **Address the environmental footprint** of the rapidly growing sector, including effective waste management.
- **Improve access to agricultural credit**, with a particular focus on better credit flow to the poultry sector.

The policy brief is based on the studies:

Gulati and Juneja (2023) Poultry Revolution in India: Lessons for smallholder production systems. ZEF Working Paper No. 225; Gulati and Juneja (2023) White Revolution in India: What smallholders can do given the right ecosystem, ZEF Working Paper No. 224.

The studies are available at www.r4ai.org.

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Center for Development Research (ZEF)
Genscherallee 3 | 53113 Bonn | Germany
E-Mail: presse.zef@uni-bonn.de
Phone: +49-(0)228 - 73 18 46
Brief prepared by: Khadeja Akter Konok
Layout: Yesim Pacal (ZEF PR)



zef
Center for
Development Research
University of Bonn