



Rabbit Farming in India: Production Status, Sustainability and Growth Opportunities

Gopi R. , Mukilan M., Naresh Kumar V., Subin K. Mohan and Senthilkumar R.

Dept. of Veterinary and Animal Husbandry Extension, College of Veterinary and Animal Sciences, Mannuthy, Kerala Veterinary and Animal Sciences University, Kerala (680 651), India



Corresponding  drgopiext@gmail.com

 0000-0002-6203-7445

ABSTRACT

Rabbit farming has gained importance as a micro-livestock enterprise, with considerable potential to improve nutritional security, generate income, and sustain rural livelihoods. Rabbits possessed several biological advantages, such as early sexual maturity, high reproductive rate, short gestation period, and efficient feed conversion, which made them suitable for small-scale and backyard farming systems. In India, rabbit production remained at a nascent stage compared to other livestock sectors, although several research and development initiatives had been undertaken to promote the enterprise. Rabbit meat was recognised for its high nutritional value, containing high-quality protein, low fat and cholesterol and a favourable fatty acid composition. Despite these advantages, the rabbit sector in India faced several challenges, including limited consumer awareness of the nutritional benefits of rabbit meat, inadequate marketing infrastructure, lack of organised value chains, shortage of quality breeding stock and limited extension support. However, increasing demand for alternative protein sources, growing interest among educated youth and the potential for utilisation of rabbit by-products such as wool, fur and manure created opportunities for expansion of the sector. The review also highlighted the need to strengthen institutional support, capacity building and policy interventions to promote scientific rabbit farming in India. In this context, the present review examined the production status of rabbit farming in India, its role in sustainable livestock production and the emerging opportunities for growth and development of the rabbit industry.

KEYWORDS: Rabbit production, rabbit meat, sustainability, value chain, India

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1. INTRODUCTION

India possesses one of the largest livestock populations in the world and the livestock sector plays a crucial role in the national economy. According to the 20th Livestock Census, the country has a livestock population of 536.76 million along with poultry and rabbit populations of about 851.81 million and 0.55 million, respectively (Anonymous, 2019a). The contribution of the livestock sector to the total agriculture and allied sector Gross Value Added (GVA) has increased from 24.32% in 2014–15 to 30.73% in 2023–24 (Anonymous, 2025), highlighting its growing importance in ensuring food and nutritional security for the increasing population. As per the 2011 Census, India's human population was 1210.90 million, reflecting an increase of more than 181 million over the previous census. The population is projected to reach about 1522.0 million by 2036, representing an increase of around 25.7% over 25 years, with an average annual growth rate of about 1% (Anonymous, 2019b). The total meat production in the country increased from 7.39 mt in 2016–17 to 10.50 mt in 2024–25 (Anonymous, 2025). Poultry contributed 49.27% to total meat production, followed by 18.42% from buffalo, 15.06% from goat, 11.29% from sheep, 3.65% from pig and 2.30% from cattle (Anonymous, 2025). India is the world's largest exporter of buffalo meat (Anonymous, 2020) and ranks fourth in global meat production (Anonymous, 2025). Although global per capita meat consumption is projected to reach approximately 35.4 kg person⁻¹ year⁻¹ by 2030 (Anonymous, 2021), per capita meat consumption in India remains significantly lower, at less than 6.5 kg person⁻¹ year⁻¹ (Naveena et al., 2018), indicating a substantial gap between demand and supply of animal protein. The increasing population and rising demand for animal protein have placed considerable pressure on conventional livestock production systems. Traditional livestock species such as cattle, sheep and goats require substantial land, feed and management resources. Small livestock species such as rabbits, quails and backyard poultry have gained attention due to their low resource requirements, short production cycles and suitability for smallholder farming systems. In this context, rabbits have gained particular attention due to their ability to efficiently utilise forages and agricultural by-products that are not suitable for human consumption, with minimal competition for human food resources (Cheeke, 1986; Lebas et al., 1987; Nistor et al., 2013). Moreover, rabbits are considered a promising alternative for meat production owing to their small body size, low space requirement, rapid growth rate and high reproductive efficiency (Ghosh et al., 2018). Additionally, rabbits produce several valuable by-products such as wool, fur and manure, thereby enhancing the economic benefits of rural households (Tabaro et al., 2013; Adekiya et al., 2020;

Bharathy et al., 2022). Furthermore, rabbit production significantly improves rural household income, livelihoods, and overall well-being (Ayeni et al., 2023). The domestic rabbit (*Oryctolagus cuniculus*) is thus considered a promising micro-livestock species due to its unique biological and productive characteristics, including early sexual maturity, short gestation period and rapid generation turnover (Lebas et al., 1997; Bhagathsingh et al., 2021; Sastry and Thomas, 2021). Despite these advantages, rabbit farming in India remains relatively underdeveloped. There is a growing need to strengthen scientific management practices, improve market linkages and enhance awareness to realise the full potential of rabbit farming in India. Therefore, the present review aims to examine the production status of rabbit farming in India, along with its sustainability dimensions and growth opportunities for strengthening the rabbit industry.

2. ADVANTAGES OF RABBIT FARMING

Rabbit farming offers several advantages and is particularly suitable for landless, smallholder and resource-poor farmers due to its low initial investment, minimal space requirement and high reproductive efficiency. These characteristics make rabbit production a viable micro-livestock enterprise for improving the socio-economic status and nutritional security of rural households (Hassan et al., 2012).

Rabbit meat is widely recognised for its superior nutritional quality. It is high in protein and contains lower levels of fat and cholesterol than many other meats. For example, rabbit meat has higher levels of calcium (21.4 mg 100 g⁻¹) and phosphorus (347 mg 100 g⁻¹), while having less fat (9.2 g 100 g⁻¹) and cholesterol (56.4 mg 100 g⁻¹) compared to beef and pork (Beal et al., 2004; Nistor et al., 2013; Petracci and Cavani, 2013; Kumar et al., 2023). These nutritional properties make rabbit meat particularly suitable for children, adolescents, pregnant women, athletes and elderly individuals (Zotte, 2014; Siddiqui et al., 2023). Additionally, it is recommended for individuals with cardiovascular diseases (Para et al., 2015). Besides meat production, rabbits are also raised for wool, particularly Angora rabbits (Gupta et al., 2000). They are also used as laboratory animals in biomedical and pharmaceutical research (Mapara et al., 2012) and are occasionally kept as pets. Furthermore, vermicompost prepared from rabbit manure can serve as an effective alternative to urea (Cabanillas et al., 2013).

3. GLOBAL RABBIT MEAT PRODUCTION

Global rabbit meat production has increased substantially over the past several decades, rising from about 397.06 thousand tonnes in 1961 to around 1.39 mt in 2018, with a

steady growth rate (Wu, 2022). Earlier, Europe dominated global production; however, since the 1990s, production has shifted significantly towards Asia, which now accounts for the major share of global output, while the contribution of Europe has declined (Wu, 2022). In 2020, the top two rabbit-producing countries were China and the Democratic People's Republic of Korea (Siddiqui et al., 2023).

4. RABBIT BREEDING RESEARCH IN INDIA

Rabbit production in India is relatively recent compared to many other livestock enterprises. Rabbits are believed to have originated in Africa and were later domesticated and utilised as a food source in several parts of Asia. Organised efforts to introduce rabbit farming in India began in the late twentieth century. The Central Sheep and Wool Research Institute (CSWRI), Avikanagar, Rajasthan, first introduced rabbits into the country in 1977 and later extended them to the North-Eastern Hill (NEH) region in 1985 primarily as a meat-producing species (Das et al., 2005). During this period, exotic breeds such as New Zealand White were imported from the United Kingdom by CSWRI, Avikanagar. Subsequently, Soviet Chinchilla, Grey Giant and White Giant rabbits were imported under the Indo-USSR agricultural development protocol. These rabbits were initially reared at NTRS, Garsa and later shifted to Avikanagar and Mannavanur to study their adaptability and performance under different agro-climatic conditions of India (Sastry and Thomas, 2021).

Institutional initiatives also played an important role in promoting rabbit production in India. Kerala Agricultural University initiated an Indian Council of Agricultural Research (ICAR)-supported project on rabbit breeding in 1984. Subsequently, commercial rabbit rearing began to develop in both the private and public sectors in Kerala. Development programmes for rabbit farming were implemented in several districts of the state, including Thiruvananthapuram, Idukki, Kollam and Pathanamthitta. Rabbit development schemes were later expanded to other parts of the country (Muralidharareddy et al., 2013). In addition, a rabbit breeding research programme focusing on meat production was initiated at Ranchi Veterinary College, Kanke, Jharkhand.

Rabbit farming in India is practised for both wool and meat production, depending on the climatic conditions of different regions. Wool-producing rabbits are mainly reared in Himachal Pradesh, Uttarakhand and other colder regions (Gupta et al., 2000; Anonymous, 2013). In contrast, broiler rabbit production is practised in temperate and subtropical regions such as Kerala, Tamil Nadu and Karnataka for meat production (Anonymous, 2013).

Improved germplasm of meat breeds such as Soviet Chinchilla, Grey Giant, White Giant and New Zealand White has been distributed to different parts of the country to promote rabbit production. These broiler rabbits have performed well under sub-temperate climatic conditions in Kodai Hills at SRRC, Mannavanur and have been adopted by farmers in Kerala, Tamil Nadu and Karnataka for meat production (Anonymous, 2013). Among the Angora strains used for wool production, French, Russian and German Angora are commonly reported. Studies conducted at Palampur indicated that New Zealand White rabbits have a superior growth rate and combining ability compared to other breeds (Muralidharareddy et al., 2013).

5. RABBIT PRODUCTION IN INDIA

According to the 20th Livestock Census, the rabbit population in India was estimated at 5.50 lakh, showing a decline of 7.1% compared to the previous census. Among the states, Kerala recorded the highest rabbit population, followed by West Bengal, Nagaland and Uttar Pradesh (Anonymous, 2019a). However, a notable decline in rabbit numbers has also been observed in Kerala, where the population decreased from 230,550 in 2012 to 92,693 in 2019.

In India, apart from organized farms, rabbits are commonly reared under backyard production systems, which provide meat for household consumption and opportunities for self-employment. Most rabbit farmers operate at a small scale with limited resources, which restricts the expansion of the enterprise. There is increasing interest among unemployed educated youth to take up rabbit farming as an alternative source of income and entrepreneurship (Bharathy et al., 2022). Despite this potential as a small livestock enterprise, rabbit production in India remains relatively underdeveloped.

Rabbit meat consumption in India is still limited and has not yet become a regular dietary component for most consumers. Nevertheless, rabbit meat is relatively popular in the North-Eastern and Eastern regions of the country. In some states, such as Kerala, Karnataka, Andhra Pradesh, Uttar Pradesh and Himachal Pradesh, rabbit meat is occasionally available in restaurants and dhabas (Muralidharareddy et al., 2013). Policy changes have also influenced rabbit meat production and consumption in the country. In 2014, the Food Safety and Standards Authority of India did not include leporids in the list of animal species permitted for human consumption, which restricted the slaughter of rabbits and led to a decline in the supply and demand for rabbit meat. Later, in April 2016, rabbit meat was reinstated under the Food Safety and Standards (Food Products Standards and Food Additives Regulations, 2011), thereby permitting its use for human consumption (Bhagathsingh et al., 2021).

6. RABBIT BY-PRODUCTS: WOOL, FUR AND MANURE

Rabbits produce several valuable by-products, including wool, fur and manure, which enhance the economic potential of rabbit farming. Angora rabbits are an important source of high-quality wool used in the textile industry. China is the leading producer of Angora wool, accounting for nearly 80% of global output, with an annual production of approximately 4000 metric tonnes (Lukefahr, 2022). In India, total wool production is estimated at 34.57 million kg (Anonymous, 2025), with sheep contributing the major share. In contrast, Angora wool production remains very low; it was reported to be about 30 t in 2000. However, the domestic demand for Angora wool is projected to increase to around 150 t by 2050 (Anonymous, 2013), indicating significant scope for the expansion of Angora rabbit farming in the country.

In addition to wool, rabbit fur is another important by-product with considerable demand in the international market. In India, the fur industry is particularly active in Jammu and Kashmir, where a domestic fur trade is well established. It is estimated that the Indian fur industry utilises nearly five lakh rabbit skins annually, many of which are imported to meet domestic demand (Bharathy et al., 2022). Globally, rabbit skins account for nearly 50% of the total fur trade, highlighting their economic significance.

Rabbit manure is also a valuable by-product due to its high nutrient content, particularly nitrogen. It can be effectively used as an organic fertiliser in crop production. Studies have demonstrated the beneficial effects of rabbit manure in vegetable cultivation and aquaculture systems, improving soil fertility and enhancing crop productivity (Tabaro et al., 2013; Adekiya et al., 2020).

7. SUSTAINABILITY OF RABBIT FARMING

The concept of sustainable development emerged in 1987 from the report of the World Commission on Environment and Development. Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Anonymous, 1987). Sustainability is commonly described through three main dimensions: environmental, economic and social (Bathaei and Streimikiene, 2023). These dimensions are often referred to as the three pillars of sustainability. The economic dimension focuses on the profitability of farming systems, while the environmental dimension emphasises the efficient use and conservation of natural resources. The social dimension includes aspects such as working conditions and community welfare. The sustainability of rabbit farming systems can therefore be understood through these three major dimensions, which are discussed below.

7.1. Economic sustainability

Rabbit farming has been reported as a profitable small-scale enterprise in several regions. In Karnataka, the benefit–cost ratio (BCR) of rabbit production was greater than one, indicating economic viability, with higher profitability observed in the second production batch compared to the first (Padmanabha, 2018). Studies from Nigeria and Ghana have also reported that rabbit production is economically viable, with a favourable benefit–cost ratio and internal rate of return (IRR) (Mukaila, 2022; Wongnaa et al., 2023). Factors such as stock size, education, farming experience, association membership and labour availability positively influenced profitability, whereas mortality, disease outbreaks and high feeding costs were identified as major constraints (Mukaila, 2023).

7.2. Environmental sustainability

Rabbit production is considered environmentally sustainable compared to several other livestock species. Rabbits contribute only a small fraction of enteric methane emissions (2.3%) compared to beef suckling (65.5%), beef fattening (40.1%), dairy (26.2%) and pork (6.1%) (Vayssieres et al., 2010). The environmental impact of rabbit meat production is generally considered intermediate between poultry and pig meat production systems (Bordignon et al., 2025). Cesari et al. (2018) reported that a strong relationship exists between the ability to convert feed into meat and the environmental sustainability of meat production, including in rabbit production systems. Rabbits are capable of converting about 20% of the consumed protein into meat, a value comparable to poultry (22%) and higher than that of beef (8–12%) and pigs (16–18%) (Lebas et al., 1997; Jiang et al., 2020).

Rabbits can efficiently utilise proteins present in cellulose-rich plants, whereas it is not economical to feed these to chickens and turkeys, which have higher energy and protein requirements. The traditional grain and soy cakes fed to these domestic poultry put them in direct competition with humans for food. For countries with no cereal surpluses, rabbit meat production is thus especially interesting (Lebas et al., 1997). Feed efficiency, commonly expressed as feed conversion ratio (FCR), is an important indicator for evaluating both the economic and environmental performance of livestock production systems. Farmers continuously attempt to improve production efficiency in order to maintain or enhance profitability (Gidenne et al., 2017). Rabbits can efficiently utilise high-forage diets with a favourable feed conversion ratio of around 4:1 (Das et al., 2005). They are also capable of utilising fibrous feed materials such as grasses, vegetable residues, kitchen waste and other agro-industrial by-products, thereby minimising competition with human food resources (Cheeke, 1986; Sanah et al., 2022).

In addition, due to their small body size and minimal space requirement, rabbits are well-suited for backyard and small-scale farming systems. Their ability to convert forages and agro-industrial by-products into meat more efficiently than many other livestock species makes them particularly suitable for regions facing feed and food shortages, especially in tropical countries (Owen and Amakiri, 2010). However, despite these advantages, rabbit production has not yet received adequate attention as an alternative source of animal protein in many regions (Nina et al., 2020).

7.3. Social sustainability

Rabbit farming in India is mostly practised by small-scale farmers as a subsidiary source of income (George et al., 2012). The initial investment required for establishing a rabbit farm is relatively low compared to many other livestock enterprises (Hassan et al., 2012). Rabbit rearing is also often managed by women farmers at the household level, making it a suitable livelihood activity for rural families. In many developing countries, rabbit farming also supports rural livelihoods by generating employment, providing opportunities for small-scale entrepreneurship and contributing to poverty reduction due to its low investment requirement and ease of management (Wu, 2022). Rabbit farming can contribute to achieving Sustainable Development Goals 1 (No Poverty), 2 (Zero Hunger), 5 (Gender Equality), 8 (Decent Work and Economic Growth) and 10 (Reduced Inequalities) through improved food and nutritional security and enhanced livelihood opportunities.

8. RABBIT MEAT VALUE CHAIN

According to Kaplinsky and Morris (2001), the value chain describes the full range of activities required to bring a product or service from conception, through the different phases of production, to delivery to final consumers and disposal after use. It includes various actors such as input suppliers, producers, processors, traders and consumers.

Studies have shown that in many developing countries, rabbit farmers often market their animals directly to consumers, while others depend on intermediaries such as wholesalers and retailers. For instance, a study conducted in Nigeria reported that rabbits are predominantly sold as live animals, with only a small proportion processed into meat and some farmers also market by-products such as manure (Okpakpork et al., 2021). Similarly, a study from Spain indicated that the rabbit meat value chain involves multiple actors, including input suppliers, producers, slaughterhouses and distribution channels, operating through both traditional and large-scale retail systems. The study also highlighted that producers and slaughterhouses face strong price competition from large retailers, emphasising the need

for value addition and product differentiation (Baviera-Puig et al., 2017). In addition, rabbit meat production is less competitive in the southern regions of Benin, whereas improved marketing and processing enhance the competitiveness of the rabbit value chain (Adanguidi, 2020). These findings indicate that the rabbit meat value chain in many countries remains relatively informal and fragmented. Therefore, similar studies are needed in different parts of India to better understand the structure and functioning of the rabbit meat value chain.

9. ADOPTION OF RABBIT FARMING PRACTICES

The adoption of scientific rabbit farming practices varies across regions. A study conducted in the Darjeeling Himalayas of West Bengal reported that the majority of farmers partially adopted scientific breeding, feeding and management practices, while adoption of healthcare practices remained low (Roy, 2015). Similarly, a study in Meghalaya revealed that a considerable proportion of farmers showed a high level of adoption of rabbit production technologies, mainly due to the low cost of production and high demand for rabbit meat in the region (Das, 2012).

10. CONSUMER DEMAND AND PREFERENCES FOR RABBIT MEAT

Global per capita meat consumption is projected to reach around 35.4 kg year⁻¹ by 2030, comprising approximately 14.51 kg poultry, 12.03 kg pork, 7.08 kg beef and 1.77 kg sheep meat per person annually. This growth is mainly driven by increasing demand for poultry and pig meat, while beef consumption per capita is expected to stagnate or decline in many high-income countries (Anonymous, 2021). In contrast, rabbit meat consumption remains very low globally and contributes only marginally to total meat intake. Studies have reported that rabbit rearers often begin rearing rabbits as pets or for leisure purposes and gradually shift towards production for sale and household consumption as they gain experience and awareness (Lopez, 2022). A considerable proportion of consumers do not consume rabbit meat, while those who do generally consume it only occasionally, typically one to two times per year (Szendro, 2024; Goli et al., 2025).

The low level of consumption is mainly attributed to factors such as emotional attachment to rabbits as pets, limited consumer awareness about the nutritional benefits of rabbit meat and lack of convenient value-added products (Redondo et al., 2010; Li et al., 2018; Kumar et al., 2023; Goli et al., 2025). Studies in India have also reported gender differences in rabbit meat consumption, with men showing a higher preference for rabbit meat compared to women (Saipriya et al., 2025). Similarly, a study among

university students in Spain reported higher consumption among men than women and consumption was positively associated with hunting practices or rearing rabbits for self-consumption. Some respondents who previously consumed rabbit meat later discontinued its consumption due to undesirable organoleptic characteristics and lack of habitual consumption (Redondo et al., 2010). The main barrier to rabbit meat consumption appears to be its emotional appeal, as rabbits are often perceived as companion animals, particularly in Western urban societies where there is little tradition of consuming rabbit meat (Leroy and Petracci, 2021).

11. CONSTRAINTS IN RABBIT FARMING

Several studies have reported multiple constraints affecting rabbit production and marketing. Major production problems include access to pasture, lack of quality breeding stock, frequent disease outbreaks leading to high mortality, unavailability of commercial rabbit feed, limited access to credit, poor housing and sanitation and inadequate veterinary services (Kumar et al., 2010; Bharathy et al., 2022; Roy, 2015; Ayeni et al., 2023; Mukaila, 2023). Diseases such as coccidiosis and parasitic infestations are commonly reported health problems in rabbit farms (Chakrabarti, 2021). In addition, rabbits are highly susceptible to heat stress due to their limited ability to regulate body temperature (Cheeke et al., 1986). Marketing-related challenges include limited availability of rabbit meat in markets, relatively high production and selling prices and inadequate consumer awareness (Sanah et al., 2020; Sanah et al., 2022). Furthermore, the perception of rabbit meat as relatively expensive compared to commonly consumed meats such as chicken and pork acts as a significant barrier to its wider acceptance and consumption (Petrescu and Petrescu-Mag, 2018).

Rabbits are often viewed as pets rather than as meat animals, which restricts consumer acceptance. In addition, the presence of numerous small bones in rabbit meat may also discourage some consumers from preferring it. Therefore, government institutions, educational organisations and extension agencies need to create greater awareness about the nutritional and economic benefits of rabbit meat through training programmes, awareness campaigns and public promotional activities. In addition to production challenges, the marketing of rabbit meat in India remains poorly organised. The absence of an organised market, irregular market supply and limited cold chain infrastructure restrict the development of a structured rabbit meat market. These constraints collectively indicate that both production and marketing challenges limit the expansion of the rabbit farming sector.

12. OPPORTUNITIES AND STRATEGIES FOR PROMOTING RABBIT FARMING

Several studies have highlighted considerable opportunities for the development of rabbit farming. The introduction of improved rabbit breeds, genetic improvement programmes and better utilisation of by-products such as fur, wool and manure can further enhance the economic potential of the sector. Rabbit manure can be effectively utilised as a biofertilizer, improving soil fertility and crop productivity (Islas-Valdez et al., 2017). A study conducted in the Wayanad district of Kerala reported that small broiler rabbit units serve as an important source of subsidiary income and employment for rural women, although successful rabbit rearing requires adequate training and technical skills (George et al., 2012).

Institutional support and capacity-building programmes are crucial for strengthening the rabbit farming sector. Veterinary universities and extension agencies can play an important role in providing training on scientific rabbit production, hygienic meat processing and value addition practices. For instance, the Southern Regional Research Centre (SRRC), Mannavanur regularly conducts training programmes on rabbit farming, while the Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) organises livestock training programmes through its Veterinary University Training and Research Centres (VUTRCs), Farmers Training Centres (FTCs) and Krishi Vigyan Kendras (KVKs) across different districts of Tamil Nadu.

Strengthening marketing systems is also essential for the expansion of rabbit farming. The formation of Farmer-Producer Organisations (FPOs), farmer cooperatives and rabbit farmers' associations could help organise production, improve market linkages and ensure a regular supply of rabbit meat throughout the year. Such collective efforts may also facilitate farmers' access to institutional credit, government subsidies and technical support, thereby improving the sustainability and profitability of rabbit farming.

Production-related improvements are equally important for enhancing farm profitability. Feed cost constitutes the major component of variable costs in rabbit farming, accounting for about 66.7% of the total variable costs (Mondin et al., 2021). Therefore, promotion of fodder cultivation at the farm level and provision of fodder seeds at subsidised rates through government departments could help reduce production costs. In addition, the shortage of quality germplasm remains a major constraint in rabbit farming (Sastry and Thomas, 2021), and therefore, government breeding centres should strengthen the supply of improved rabbit breeds across different regions of the country.

Consumer awareness and market promotion are also necessary to increase the demand for rabbit meat. Promotional activities such as awareness campaigns, food festivals and marketing initiatives in tourist destinations and metropolitan cities could help familiarise consumers with the nutritional benefits and taste of rabbit meat. In addition, farmers may benefit from focusing more on meat production rather than limiting rabbit farming primarily to breeding or pet purposes or other purposes, which could further promote consumer acceptance and market expansion. Overall, strengthening research efforts, extension support, genetic improvement programmes and organised marketing systems will be essential for enhancing the sustainability of rabbit farming in India.

13. CONCLUSION

Rabbit farming had considerable potential as a sustainable micro-livestock enterprise, particularly for small and marginal farmers in developing countries such as India. Owing to favourable biological and production characteristics, rabbits contributed to improving household income and nutritional security. However, the sector was constrained by low consumer awareness, a lack of organised marketing systems and limited technical support. Strengthening extension services, improving market linkages and promoting value addition were identified as essential for enhancing the adoption of rabbit farming.

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