

International Journal of Agriculture Extension and Social Development

Volume 9; SP-Issue 1; January 2026; Page No. 61-65

Received: 18-11-2025
Accepted: 27-12-2025

Indexed Journal
Peer Reviewed Journal

Role of livestock advisory services for awareness of farmers in India: A review

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DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i1Sa.2896>

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Abstract

The livestock sector is a vital pillar of India's economy, ensuring rural livelihoods, nutritional security, and agricultural growth. With one of the largest livestock populations globally, the need for effective advisory and extension services has grown rapidly. Livestock advisory services enhance farmers' awareness, animal health, productivity, and adoption of scientific practices. Institutions such as KVKs, ICAR, ATMA, DADF, EEs, ATIC, Farmer FIRST Programme, etc. provide structured support. These agencies strengthen capacity building, veterinary care, input supply, and market linkages. ICT tools such as mobile apps, WhatsApp, Facebook, and Kisan Call Centres further widen access to timely information. NGOs complement these services with localized, community-based interventions. Despite these efforts, challenges persist, including high feed costs, weak market access, limited credit, lack of training, and gender-specific barriers. Women farmers, in particular, face constraints in awareness and participation. Addressing these issues requires inclusive, farmer-centric strategies and wider ICT integration. By combining traditional practices with modern technologies, livestock advisory services can become more sustainable and impactful. This review emphasizes their crucial role in improving productivity, income, and rural development in India.

Keywords: BAHS, extension services, ICAR, ICT, KVKs, livestock services

Introduction

The livestock sector is a key contributor to the Indian economy, providing a source of livelihood for nearly 20.5 million people. India ranks among the top countries in terms of livestock numbers, with a total population of 535.78 million livestock and 851.81 million poultry, as reported in the 20th Livestock Census (DAHDF, 2019). In 2022–2023, India produced a total of 230.58 million tonnes of milk, with a per capita availability of 459 grams per day (Basic Animal Husbandry Statistics, 2023).

Providing livestock-related services is becoming increasingly vital for enhancing and streamlining livestock production and management. With recent developments in animal husbandry, there is a growing demand for a range of services such as breeding, healthcare, feed production, marketing, and extension activities. Among these, livestock extension services are particularly important, as they equip farmers with the necessary technical knowledge and skills through education and training programs (Rathod *et al.*, 2012) [31]. The primary aim of livestock advisory services is to improve farming practices, boost productivity and income, enhance living standards, and raise the educational and behavioral levels of rural communities by offering technical and educational support to livestock producers (Chander *et al.*, 2010) [10].

Major Livestock Advisory Services

Krishi Vigyan Kendra (KVK)

Krishi Vigyan Kendra (KVK) is one of the flagship initiatives of the Indian Council of Agricultural Research (ICAR) designed to facilitate the transfer of agricultural technologies to the field. As per ICAR's mandate, KVKs operate under the administrative control of the respective State Agricultural Universities (SAUs) or Central Institutes in the region. Their main objective is to build a skilled and motivated workforce capable of promoting agricultural and livestock development throughout the country (Chauhan, 2016) [12]. A major focus of KVKs is to improve farmers' knowledge and understanding of modern farming technologies, as knowledge is a key mental component that shapes both overt and hidden aspects of human behavior. To achieve this, KVKs conduct a range of extension activities such as frontline demonstrations, animal health camps, field trials, farmers' fairs (melas), and advisory services within their jurisdiction.

Indian Council of Agricultural Research (ICAR)

The Indian Council of Agricultural Research (ICAR) serves as the principal national organization responsible for planning, coordinating, and promoting agricultural research and education across the country. At the state level, this role

is carried out by State Agricultural Universities (SAUs). Following India's independence, significant attention was directed toward strengthening agricultural research, which played a crucial role in boosting agricultural productivity and achieving near self-sufficiency in foodgrain production (Borthakur & Singh, 2013)^[7]

The importance placed on agricultural research is evident from the extensive network under ICAR's guidance, which currently comprises 65 ICAR institutes, 15 national research centres. Additionally, ICAR oversees 731 Krishi Vigyan Kendras (KVKs), 74 State Agricultural Universities, 4 Central Agricultural University, with faculties of agriculture, collectively contributing to agricultural education, research, and extension activities across India.

Department of Animal Husbandry, Dairying & Fisheries (DADF)

The Department of Animal Husbandry, Dairying & Fisheries (DADF), functioning under the Ministry of Fisheries, Animal Husbandry & Dairying, works to boost livestock productivity, safeguard animal health, modernize dairy infrastructure, and promote growth of the dairy industry in India. Created in 1991 by separating the Animal Husbandry and Dairy Development divisions from the Department of Agriculture & Cooperation, it was later expanded to include the Fisheries Division in 1997^[1]. The department assists State Governments and Union Territories in shaping policies and programs for the sector. Its core focus areas include controlling livestock diseases, conserving and improving animal genetic resources, strengthening veterinary services, advancing dairy development, and protecting animal health. Additionally, DADF plays a key role in operating national livestock disease surveillance and reporting platforms such as the National Animal Disease Reporting System (NADRS) and National Animal Disease Referral Expert System (NADRES), which facilitate monitoring, early detection, and management of animal diseases (Malik *et al.*, 2021)^[25].

Agricultural Technology Management Agency

It is a decentralized, district-level autonomous institution in India, designed to revamp and modernize the agricultural extension system. Its core aim is to make extension services more farmer-centric, participatory, and responsive to local needs through the integration of technology and bottom-up planning. Institutionalized in 2005–06 under the "Support to State Extension Programmes for Extension Reforms" scheme-following pilot initiatives in seven states (Sulaiman & Ban, 2002)^[33]. ATMA focuses on promoting participatory extension systems, enhancing research-extension-farmer linkages, fostering collaboration across departments and public-private stakeholders, and building the capacities of both farmers and extension personnel.

As a registered society, ATMA enjoys financial and operational flexibility at the district level. It prepares Strategic Research and Extension Plans (SREPs) using Participatory Rural Appraisal (PRA) methods to ensure localized and inclusive planning (Swanson & Rajalahti, 2010)^[34]. The model encourages the formation of Farmer Interest Groups (FIGs) and Farmer Advisory Committees at both block and district levels to institutionalize farmer feedback. Special attention is given to gender inclusion by

involving women farmers in decision-making processes. ATMA now operates under the Sub-Mission on Agricultural Extension (SMAE), part of the broader National Mission on Agricultural Extension and Technology (NMAET), aligning with national goals to strengthen extension infrastructure and services across India.

Extension Education Institutes (EEIs)

The Ministry of Agriculture & Farmers' Welfare, Government of India, has set up Extension Education Institutes (EEIs) as regional hubs to build the skills of mid-level extension workers in agriculture and allied fields. India has four EEIs located at Nilokheri (Haryana) for the North, Anand (Gujarat) for the West, Jorhat (Assam) for the East & North-East, and Hyderabad (Telangana) for the South. These institutes offer training programs, workshops, and consultancy services focused on extension management, communication methods, ICT use, participatory techniques, and capacity building for state departments, SAUs, KVKs, and NGOs (Ministry of Agriculture & Farmers' Welfare, 2023; Extension Education Institute Jorhat, 2022)^[15].

Agri-Clinic and Agri-Business Centres (ACABC)

The Agri-Clinic and Agri-Business Centres (ACABC) scheme provides opportunities for agriculture graduates who face unemployment, enabling them to develop entrepreneurial skills and establish their own ventures. These ventures may include soil testing laboratories, seed production and marketing, vermicomposting, veterinary clinics, crop protection centers, floriculture, food processing, horticulture units, mushroom cultivation, biofertilizer production, and poultry production and marketing (Kanwat *et al.*, 2011)^[20]. The primary goal of the scheme is to create job creators rather than job seekers. By encouraging agricultural graduates to set up agri-clinics (ACs) and agri-business centres (ABCs), the program aims to strengthen technology transfer and enhance extension services. This initiative is expected to help young graduates increase their income, achieve a better socio-economic status, and contribute to both social and economic transformation in the country.

Agricultural Technology Information Centre (ATIC)

The Agricultural Technology Information Centre (ATIC) serves as a single-window support system that connects various units of research institutions with both intermediary users and end users (farmers), assisting them in decision-making and problem-solving. Timely and efficient delivery of quality inputs and services to farmers is essential for boosting agricultural production (Chaturvedani *et al.*, 2016)^[11]. ATIC's activities include providing advisory services, selling technological products, distributing farm literature, offering plant clinic services, and running helplines. These centres not only diagnose plant samples but also provide comprehensive recommendations and remedial measures for a wide range of plant health issues. They promote integrated pest management technologies among farmers, conduct field visits for on-the-spot diagnosis of complex field problems, and issue press releases suggesting measures to tackle pest or disease outbreaks and nutritional disorders. Additionally, ATIC plays a crucial role in reorienting research programmes by supplying feedback to scientists about

emerging plant disorders and the level of technology adoption in farmers' fields.

Farmer FIRST Programme (FFP)

The Farmer FIRST Programme (FFP) is an initiative launched by the Indian Council of Agricultural Research (ICAR) to shift the focus of agricultural research and extension from being solely scientist-driven to farmer-centric. The term FIRST stands for Farmer, Innovation, Resources, Science, and Technology, highlighting the integration of these elements to empower farmers. Its goal is to enrich farmers' knowledge, adapt and integrate technologies to their local conditions, and strengthen the farmer-scientist interface. This approach is distinctive as it provides a platform for scientists from all disciplines to engage regularly with rural farming communities, gather valuable feedback on challenges, priorities, and opportunities, and understand the status of livestock and technology at the grassroots level (De *et al.*, 2022) ^[13]. Overall, the Farmer FIRST Programme aims to make research more inclusive, participatory, and responsive to farmers' real-life situations, leading to improved productivity, sustainability, and livelihoods in rural areas.

Farmers' Field School (FFS)

The Farmers' Field School (FFS) is a non-formal, learner-centered educational approach designed to empower farmers to address their field problems through active participation, interaction, dialogue, and joint decision-making (Gopala *et al.*, 2012) ^[18]. FFS serves as an open platform or "school without walls" that enhances the decision-making abilities of farming communities and encourages local innovation for sustainable agriculture (Braun *et al.*, 2000) ^[8]. Farmers gain knowledge by practically engaging in activities related to selected farming technologies and by continuously observing their performance in the field. This approach fosters meaningful discussions and collective decision-making, leading to better problem-solving and improved farm practices.

Farmer Producer Organizations

Farmer Producer Organizations (FPOs) were introduced by the Government of India in 2002. FPOs enable farmers to adopt innovative agricultural practices, improve production efficiency, and secure higher returns (Krishnan *et al.*, 2021) ^[22]. As a result, they play a vital role in enhancing income, promoting rural entrepreneurship, and making farming more sustainable and market-oriented (Bikkina *et al.*, 2018) ^[6]. Farmer Producer Organizations (FPOs) support livestock farmers by providing training on animal health, breeding, feeding, and management, along with doorstep veterinary services like vaccination and artificial insemination. They supply quality feed and medicines at lower costs, promote improved breeding, and share timely advisories through ICT tools. FPOs also aggregate milk, meat, and eggs for better market access, set up value-addition facilities, and guide farmers on credit, insurance, and government schemes. This collective approach improves animal productivity, reduces costs, and increases farmer income while reducing dependence on middlemen.

Information and Communication Technology (ICT)

Information and Communication Technology (ICT) has

transformed development across many sectors, including agriculture and animal husbandry, helping them reach new levels of progress. Among the various ICT tools available, mobile-based solutions are especially popular due to their convenience and accessibility (Doiphode *et al.*, 2021) ^[14]. ICT innovations have immense potential to strengthen extension services aimed at spreading modern technologies. Since farmers have specific informational needs, the main purpose of ICT in animal husbandry is to fulfill these needs effectively. Addressing these requirements is crucial for the overall growth of the livestock sector. ICT facilitates smooth communication and knowledge exchange among researchers, extension professionals, and farmers. It also supports community development by improving access to information and empowering groups such as women and youth. As a result, ICT helps create new opportunities for economic advancement and contributes to improving the standard of living.

ICT (Information and Communication Technology) is rapidly shrinking the world, allowing individuals in even the most remote regions to connect with one another in just seconds. It includes all technologies that manage information and support various forms of communication—both between people and between humans and electronic systems (Acharya *et al.*, 2013) ^[2]. In recent times, the adoption of ICT has been growing steadily, playing a crucial role in advancing agriculture and contributing to overall socio-economic development.

WhatsApp Groups

WhatsApp, as a widely used social media platform, is rapidly gaining popularity even in rural regions. It is being utilized by various stakeholders in the agricultural sector, including agricultural development departments in India (Chander, 2016) ^[9]. This platform offers a highly cost-effective and user-friendly way to connect and communicate with livestock owners. It has the potential to significantly expand the reach and improve the effectiveness of livestock advisory services (Thakur *et al.*, 2015) ^[35]. The platform acted as a crucial space for farmers to exchange and discuss information not only about diseases but also on production, value addition, and marketing. It enabled them to make better assessments and take timely decisions for their livestock enterprises. Additionally, WhatsApp played an important role in strengthening networking among farmers and with various institutional stakeholders in the livestock sector (Thakur & Chander, 2017) ^[9].

Facebook Channels

Facebook groups have become a powerful medium for bringing together people with common interests, including those in the livestock sector. As one of the most popular social networking platforms, Facebook not only connects individuals personally but also serves as a valuable channel for information exchange within specialized interest groups. In the livestock domain, Facebook groups act as virtual meeting spaces where stakeholders can engage in meaningful discussions, forming active communities focused on livestock-related topics. Farmers can connect across geographical boundaries, share their experiences, and discuss best practices, while researchers and subject-matter experts can directly share scientific updates, innovative

technologies, and advanced farming techniques with the community, encouraging quicker adoption of new methods (Alam & Basu, 2022) ^[3].

Mobile apps

Mobile apps for livestock farmers provide information and advisory services through a mix of audio, video, text, graphics, and animations, often in local languages to make them accessible even to illiterate users. Some apps work offline, while others require internet access (Belakeri *et al.*, 2017) ^[5]. They feature simple touch-screen interfaces with farmer-friendly icons for easy use and offer services such as health management, vaccination reminders, feeding and breeding guidance, and record-keeping for livestock productivity

Kisan Call Centres (KCC)

The Kisan Call Centre (KCC) was introduced on January 21, 2004, by the Department of Agriculture & Cooperation (DAC) under the Ministry of Agriculture & Farmers Welfare, Government of India, with the aim of providing farmers with free agricultural advisory services through telephone support. This facility is available nationwide from 6:00 a.m. to 10:00 p.m. every day, allowing farmers to seek advice in their local language by calling the toll-free number 1800-180-1551. The Kisan Call Centre operates through a three-tier system. At Level I, farmers' calls are attended by agricultural graduates who respond to most queries in the local language. If the issue remains unresolved, it moves to Level II, where Subject Matter Specialists (SMS) from Krishi Vigyan Kendras (KVKs) or Krishi Bhavan provide expert advice. For highly complex or specialized problems, the query is escalated to Level III, where senior Subject Matter Specialists at the nodal office offer final solutions.

Role of NGOs in Livestock Services for Farmers

ANTHRA

ANTHRA is an India-based NGO working to improve the livelihoods of marginalized groups such as pastoralists, dalits, and tribals. It focuses on ethnoveterinary practices, women's empowerment, and sustainable livestock systems. Its work includes community-led action research, training materials, and promotion of traditional livestock care methods. ANTHRA reaches farmers through newsletters, journals, books, posters, and other educational materials in local languages and has documented over 300 traditional fodder species.

BAIF Development Research Foundation

BAIF Development Research Foundation, founded in 1967, is an NGO that focuses on rural development through sustainable natural resource management. Its primary initiative is providing breeding services to produce crossbred cows, supported by the promotion of fodder cultivation to enhance profitability.

J.K. Trust

J.K. Trust is an NGO focused on rural development, with a major emphasis on livestock improvement. It runs Integrated Livestock Development Centres that provide artificial insemination, vaccination, and health care services to improve cattle productivity. The trust also promotes

fodder cultivation, farmer training, and better animal management practices, helping farmers increase milk yield and income.

Constraints in Accessing Livestock Extension Services

The livestock sector faces several critical challenges in the delivery and accessibility of extension services. A major concern reported by respondents is the absence of female extension staff, insufficient training opportunities, lack of local women's organizations, and restricted access to market information (Luqman *et al.*, 2014) ^[24]. Specific issues encountered by farmers associated with Krishi Vigyan Kendras (KVKs) also vary. Trainee farmers highlighted the high cost of commercial feed, low milk prices, and rising expenses for green fodder as their primary difficulties. In contrast, non-trainee farmers pointed to delays in receiving veterinary support, inadequate access to credit, and low milk prices as their main constraints (Patel *et al.*, 2016) ^[29]. Additional barriers include the high cost of services and limited awareness about their availability (Anuranjan *et al.*, 2017) ^[4]. Women farmers, in particular, face distinct obstacles such as lack of training in scientific livestock management, limited knowledge of government programs and schemes, and time constraints that prevent their participation in extension meetings and camps.

Conclusion

Livestock advisory services are indispensable in empowering farmers, bridging knowledge gaps, and supporting the adoption of modern animal husbandry practices in India. Government institutions, NGOs, FPOs, and ICT platforms collectively contribute to creating an ecosystem that enhances livestock productivity, income generation, and rural development. Despite their impact, challenges such as insufficient outreach, gender disparities, limited financial support, and high costs of inputs continue to restrict service effectiveness. To address these gaps, policies should focus on expanding farmer-centric, participatory, and ICT-based advisory models, strengthening veterinary infrastructure, and ensuring greater inclusion of women in extension activities. By integrating traditional practices with scientific knowledge and leveraging digital tools, livestock advisory services can become more sustainable, inclusive, and impactful in raising farmers' awareness and improving their livelihoods.

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