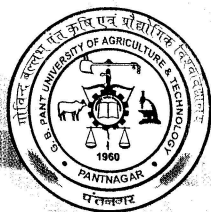


# Livestock Development for Societal Needs: Extension and Allied Sectors Initiatives



**Department of Veterinary & AH Extension Education**  
**College of Veterinary and Animal Sciences**  
**G.B. Pant University of Agriculture & Technology**  
**Pantnagar – 263145, U S Nagar, Uttarakhand (India)**





## Chapter-46

### Technology-Led Revolution through KVKs for Empowering Livestock Farmers

Pragya Bhadauria, Rajbir Singh and Y.S. Jadoun

ICAR-Agricultural Technology Application Research Institute, Zone-1, Ludhiana  
pragyacari@gmail.com

Livestock sector is a prime component of India's agrarian economy providing employment and nutritional security to rural masses especially among the landless, small and marginal farmers. This is evident by the fact that more than 50 per cent of the rural population is engaged in rearing of livestock and its contribution to agricultural GDP is around 26 percent which itself depicts its role in socio-economic up-liftment of the down trodden section of the society. Livestock production and processing is a complex activity. Beyond a direct role in generating food and income, livestock are valuable asset, serving as store of wealth, collateral for credit and an essential safety net during times of crisis for huge numbers of rural households. Livestock are complementary to mixed farming systems, consuming waste products from crop and food production, while producing manure for fertilizing the fields. In many parts of the India, livestock still provide draught power and transport. From last several decades in India, the growth of livestock sector has been ascertained due to technological revolution. Considerable technological progress has taken place in animal husbandry sector realising the facts that technology-induced growth would improve food and nutritional security, alleviate poverty and reduce inter-regional and interpersonal economic inequities among livestock rearer. In spite of this the impacts and adoption of livestock technologies have been slow and sporadic at field level and the socio-economic standards of livestock farming communities is still in the pre-dormant phase due to a multiplicity of factors.

As technological change and adoption of improved production techniques are important steps in empowering the livestock community. Many of the animal husbandry practices followed by farmers are still not in tune with the scientific rearing. As such there are numbers of livestock technologies are available for field application, but they are yet to gain wide acceptance. Misconceptions and ignorance coupled with poor extension interventions are some of the reasons for poor popularization status of improved animal husbandry practices (Sen and Venkatadri, 1997). Therefore, it is necessary to promote suitable livestock technologies which can enable the local communities to enhance their efficiency and earnings. Over the years, a large number of trials have been done both On-Farm and Off-Farm and various adoption and diffusion studies were carried out by different researchers across the world including India. There is a growing awareness among researchers and policy-makers that research should be 'demand-driven means that farmers should help to set the research agenda.

#### Types of Livestock Technologies for Dissemination

The various types of livestock related technologies available in India are mainly categorized as; Breeding technologies for various species of animals for genetic enhancement of indigenous breeds through crossbreeding with exotic breeds; Feeding technologies for improvement of nutritive quality of feed and fodder through biological and chemical treatments, complete feed blocks, mineral mixtures, urea molasses mineral blocks, varieties of feed and fodder, non conventional feed resources and many more; Health and Biosecurity related technologies includes, development of vaccines against animal diseases and surgical devices, livestock biotechnology products includes detection and diagnostic kits; management related technologies includes, improved livestock management practices, and post harvest management and livestock processing technologies; milk and their products, eggs, meat and their products has been developed to strengthen the vertical linkages between the farm and livestock industry. Additionally, technologies related to animal welfare, livestock manure and waste handling, biogas production and use, organic fertilizer production etc. are also been developed by various research institutes.

#### Characteristic of Livestock Technologies for Rural Empowerment

Technology is defined as an output of a research process which is beneficial to the target clientele (mainly farmers), can be commercialized and can be patented under Intellectual Property Rights (IPR). It consists of research outputs such as tools, equipment, genetic materials, breeds, farming and herding practices, production practices, laboratory techniques, models etc. Improved and proven information may also serve as a type of technology such as recommendation(s) on practice(s) that is/are considered necessary for a technology to achieve its optimum output. These include, for instance, different animal management



practices (vaccination, deworming, colostrum feeding, milk replacer, dehorning, disbudding etc), feed rations and disease control methods for animal breeds. This is therefore important information which is generated through research to accompany the parent technology before it is finally released to users and the technology would be incomplete without this information. Similarly, innovation may also serve as a modification of an existing technology for an entirely different use from the original intended use. (e.g. correct method and routes of administration of vaccine).

Significant research advances have been made in the areas of animal breeding, nutrition, health management and processing. Many research products have been found to be technically and economically viable under controlled experimental conditions, but the extent of their on-farm application has been rather low. This poses several questions for researchers, research administrators and policy-makers: Is the technology economically feasible and tested on-farm in different farming systems? To what extent have farmers' perceptions and needs been taken into consideration in the design of the technology? Have proper pathways been followed to transfer the technology. Suitability of a technology in a particular environment depends on many factors, such as, the nature of technical complexity, the existing institutional and individual capacity to implement, the costs and benefits etc. Livestock innovations and diffusion of new technologies must be sustainable, economical and intensive in order to provide dependable, long-term support for rural households. The technologies identified were multidimensional, need based and appropriate to different production systems, which inclines towards "*Farming System Research*". The assessed and refined technologies should not only profitable, eco-friendly and practicable but also they should be sustainable to promote faster diffusion. The technology available has to be permeated depending upon the necessities of the region – its soil, climate, culture and needs and means of the farmers, available human resources, feasibility and viability of different parts of the country. The benefit of technology is able to reach all sections of the community and hence it should be able to fulfil social equity and economic security.

There is no doubt that the research system has generated very useful results for synthesis of appropriate technology for livestock farmers. However, it has not been possible to develop and integrate the results in the form of appropriate technology for different production systems, the essential conditions of which are inadequate understanding of the farming situations, resource availability and needs and aspirations of farmers having different socio-economic and cultural background. This is mainly due to lack of appropriate scientist-farmer linkages. To achieve these, farmers must have access to sustainable technology in various fields of livestock sector. New technologies are critical factors to open new information channels to the information-poor rural areas of developing countries (Morris, 2005). Therefore, it is appropriate to develop suitable extension strategies to make full use of developed technology by farmers for their sustained development. The system should aim for improving livestock productivity by disseminating latest technological knowledge and advice the farmers both in a timely and personalized manner.

### **Livestock Extension Delivery System**

About 70 percent of the Indian rural households are keeping the livestock, of which the resource-poor farmers own majority of the livestock, so transfer of livestock technologies has become an important component for rural development. Nonetheless, the sector is still considered as subsidiary to crop sector and the extension format and methodology developed for crop production are considered to take care of the livestock extension needs (Chander *et al.*, 2010). The NSSO survey revealed that only 5.1% of the farmer households in India were able to access the information on animal husbandry against 40.4% of the Indian households accessing information on modern technologies for crop farming. The Government of India (GoI) spends below 10% on livestock extension activities. The 10<sup>th</sup> and 11<sup>th</sup> plans have emphasized the need for effective livestock extension services. The 11<sup>th</sup> Plan Approach Paper also states that "in the longer run, growth in livestock productivity can be sustained only through a continuous technological progress". This continuous technological progress would require high priorities not only for basic research but also, equally importantly, to ensuring that the results of such research go to the grass root level of the livestock sector.

FAO (2005) points out that the information is very important for rural development because it improves the incomes of smallholder farm families which crucially depend upon raising their productivity. Information within the hands of the farmers means empowerment through control over their resources and decision-making processes (Maningas *et al.*, 2008). An effective and efficient delivery system of necessary information and technology services facilitates the client's critical role in decision-making towards improved production, processing, trading and marketing. There are significant gaps in backward and forward linkages between the research institutes and the farmers, in so far as transfer of technology is concerned in animal husbandry sector. Moreover, the highly specialized livestock extension service has different requirements since it has distinct features from agriculture extension due to longer time-scale of animal production, slower speed of technology development, lack of



synchronous of different animals, difficulty in demonstrating merits because of their poor observability, frequently dispersed and non-uniform needs of livestock owners (Matthewman *et al.* 1997).

Numerous studies have highlighted the short-comings of traditional extension methods for providing transfer of technologies to rural community, who are generally illiterate and relatively remote from formal sources of information. To overcome these barriers by delivering need based information to the clientele, it is becoming increasingly evident that, extension services need to undergo a paradigm shift. Livestock extension delivery in India is being carried out by different organizations broadly classified as public delivery system and private delivery system, but we are still lacking an efficient extension system for livestock services. The weaknesses and failures of earlier extension approaches forced Indian extension system to undergo a series of organizational and operational changes in the form of Krishi Vigyan Kendras (KVKs). The Krishi Vigyan Kendras (KVKs) is of national importance which are accelerating the agricultural production and also in improving the socio-economic conditions of the farming community. Their basic objective is to conduct extension research, demonstrate latest technologies, provide feedback to scientists, and capacity building of various stakeholders.

### Role of Krishi Vigyan Kendras in dissemination of Livestock Technologies

The effectiveness of livestock research is dependent on adequate uptake and up-scaling of research products and innovations. Since in India, the livestock services provided by most of the institutions are mainly dealt with animal health with negligible attention to management and production related advices to the farmers. Moreover, time spend on livestock extension activities is only around 1-3 % of their total budget (Ravikumar, 2005). To address issues related to technology dissemination in agriculture and allied fields, the Krishi Vigyan Kendras (KVKs), previously known as Farm Science Centre, a grass root level scheme has been designed and nurtured by ICAR for the past few decades. So far, ICAR has established 706 KVKs across the country under different host organizations like SAUs, ICAR Institutes, Central institutes/Deemed Universities, State Government, Public Undertakings and NGOs. The KVKs are evolving as the grass root level institutions for empowering the livestock farming community. Krishi Vigyan Kendras (KVKs) was established across the country with an aim to address the needs of the stakeholders in the following way:

#### • Livestock Technology Assessment and Refinement

A productive research for extension is crucial for the improvement of livestock sector and the farmers' participation in the development process is prerequisite to solve field problems of livestock keepers. PRA (Participatory Rural Appraisal) tools are used by the KVKs for problem diagnosis, which enabled farmers to define and then focus on resolving their immediate problems. A range of technologies are provided to the farmers in the form of On Farm Testing (OFT) to assess which performed best under local conditions to select most suitable technology for their animals. OFT of technologies is mainly focused to test already developed livestock technologies generated by different institutions in a given set of environment and production system. It is a type of research carried out by KVKs at farmer's fields and with farmer's perspective. Therefore, the objective of OFT is to test and evaluate the research findings of research stations at the farmers' fields and to refine and modify the technologies since many farm technologies developed so far do not fit well to all agro-climatic condition. Later on diffusion of these tested technologies and its horizontal expansion are carried out through Frontline Demonstrations (FLDs).

#### • Capacity Development of Stakeholders

Under capacity building, various livestock based training courses eg. commercial dairy farming, pig farming, goat rearing, backyard poultry farming, feed formulation, milk processing, hay and silage making, scientific management practices etc. were organized by the KVKs for farmers, farm women, rural youth and extension functionaries. Training provides them an opportunity to get aware about the various animal husbandry technologies as well as the shift in livestock development approach through farming enterprises. KVKs organized training programmes mainly; short term trainings (1-2 days); long term or vocational trainings (>4days-1months or even more duration); skill development trainings (>200hrs sponsored by ASCI) and need based training courses like AI technician, dairy entrepreneur, poultry farmer etc.

#### • Extension Services

KVKs are playing important role in creating awareness about improved livestock technologies through large number of extension methods. The various livestock technology transfer methods mainly includes individual/household extension method, group method and mass media method. None of these methods can be singled out as the best one as they all have some advantages and disadvantages. According to Anandajayasekaram *et al.* (2008), the choice of a method depends on various factors such as the tenure system in the area, community organisation, and resources availability. Animal scientists of KVKs made efforts to create awareness about recent developments in livestock sectors among farmers, extension personnel and other stakeholders through field extension activities like field days, farmers' fairs, livestock fairs, animal health camps,





farmers' visits, demonstrations, *kisan gosthis*, exhibitions, method demonstrations, exposure visits, interactions etc. In this process the coordination with development departments and private agencies is crucial for successful conduct of extension programmes. Various extension programmes carried out by KVKs in coordination and collaboration with other line departments/agencies working in the district.

- **Supply of technological information and inputs**

Critical and quality inputs like piglets, chicks, kids, poultry strains, fingerlings, organic products, bio-fertilizers, mineral mixture, UMMB, bypass fat etc are made available to the farmers by the KVKs. Further, KVKs are in the forefront of mass media utilization in disseminating timely and relevant livestock technologies to the farming community without any time lag either through Kisan Mobile Advisory (KMA) or Krishi Vigyan Kendra Knowledge Network (KVKN) services.

### Adoption of Technology

Over the past few decades, animal science research has offered a number of technological options that could raise the productivity of different livestock species if adopted area-wide. A large number of institutions in the field of animal sciences are contributing to research and development of high yielding breeds of livestock, technological innovations and other initiatives to boost animal production. Improved technologies derived from research require some degree of adaptation and innovation, if they are to be integrated into local farming systems. Feder *et al.* (1985) defined adoption as the degree of use of a new technology in long run equilibrium when a farmer has full information about the new technology and its potential. The adoption pattern of technologies varies widely across species, farm typologies and regions. Studies on adoption have shown that the adoption of new technologies or technology does not just happen at once and it takes time and sequence of steps before the final results can be realised. Putting a technology into practice by the livestock farmers depends upon several factors and all of them in a village or region will not adopt the technology at the same time. Therefore, factors affecting adoption of livestock technologies were classified into different categories: economic, social, ecological and institutional factors. The farmer's decisions about whether and how to adopt new technology are conditioned by the dynamic interaction between characteristics of the technology itself and the array of conditions such as needs, cost incurred and benefit accruing from the adoption of the technology (Karki, 2004). According to Mwangi and Kariuki (2015), the rate of adoption of livestock technologies has remained low in most of the developing countries. The importances of frequency of extension contact and closeness with the extension agent in adopting various technologies have been also playing a major role. Technology adoption is constrained by lack of development of market infrastructure, information asymmetry and livestock extension services. Policies that address these constraints and strengthen local institutions to collectively improve access to technology, credit, and information will increase both the spread and intensity of adoption. Moreover, the overall context of government policies and the local level of support is a key factor in determining which technologies are adopted at the farm level.

### Conclusion

Livestock is an integral part of agriculture in India, and is likely to be the instrument of future growth and development of the agricultural sector. However, the level of transfer of technology and adoption of livestock technologies at grass root level is still comparatively low. The importance of livestock extension and its hitherto neglect have generated an interest towards looking for the options to improve the scenario with respect to information delivery to the livestock farmers. Nonetheless, KVKs are playing a pro-active role in transferring livestock technologies at field level and with beneficial impacts. Although, in view of the changing scenario of agriculture diversification, the activities of KVKs need to keep pace addressing newer challenges in the areas of climate change, market led extension, mechanization, agri-business and so on. It is also ascertained if the new technologies of livestock are to be percolating to the ground level it should be conditioned by political, social, economic, and cultural factors that can impede the diffusion or transfer of technology.

**References:** on request