LIVESTOCK PRODUCTION THROUGH EXTENSION EDUCATION - A REVIEW

A. Shyam Singh*, Khajan Singh, Imtiwati and Chandan Kumar
Dairy Extension Division,
National Dairy Research institute, Karnal - 132 001, India

Received: 13-02-2013
Accepted: 25-11-2013

ABSTRACT

Extension of knowledge, technology and service through extension education to the grass root level is of paramount importance for the growth of the livestock sector. The XI Plan document of Planning Commission has highlighted the importance of livestock extension, while addressing the various issues concerning livestock extension delivery system and it has also been written in the report of the working group on animal husbandry and dairying 12th five year plan (2012-17) submitted to planning commission government of India. Unfortunately, extension education is almost totally absent in animal husbandry, and special efforts need to be made in this area. Both Central and State Government agencies have kept extension education at a low priority as hardly 1% of the total budget for the sector is allocated for extension activities. To cater to the diverse needs of livestock farmers, among others an efficient livestock extension education system is required. This situation was analyzed towards improving the framework of extension education for livestock production.

Key words: Extension education, Livestock production.

Livestock are the best insurance against the vagaries of nature like drought, famine and other natural calamities (Anonymous., 2012). Extension of knowledge, technology and service through extension education to the grass root level is of paramount importance for the growth of the livestock sector. However, compared to crop sector, extension education for livestock production has so far been a non-starter severely hampering its growth. 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, Anonymous., 2012). Both, Central and State Governments have kept extension as a low priority as hardly 1% of the total budget for the sector is allocated for extension activities (Anonymous., 2012). Only one centrally sponsored scheme on “Livestock extension and delivery services” with a budgetary outlay of Rs.15.00 crore was proposed by Department of Animal Husbandry, Dairying and Fisheries (DAHDF) during the 11th Plan period. No expenditure however, has been incurred, which clearly shows the livestock extension education remains grossly neglected.

On the other hand, the livestock sector has been growing faster than crop sector (Rao et al., 1993). Livestock sector is expected to emerge as an engine of agricultural growth in the 12th plan and beyond in view of rapid growth in demand for animal food products (Anonymous., 2012). The sector has remained under-invested and neglected by the financial and extension institutions (Chander et al., 2010). Whereas, the demand for, and production of livestock and livestock products in less developed countries is expected to double over the next 20 years (Delgado et al., 1999). The overall growth rate in livestock sector is steady and is around 6% and this has been achieved despite the fact that investment in this sector was not substantial (Bhat and Das, 2002). But in terms of productivity, India’s huge livestock resources are one of the poorest in the world. Citing an example, the milk yield of a cow in India is 900 kg, which is about 20% of the world average. According to DAHDF, the milk productivity per lactation is only 987 kg in India as against world average of 2,038 kg. Allocation of funds to DAHDF as a proportion of the overall allocation to agricultural sector has been meager over the last
several plan periods in spite of rising contributions of the livestock sector (Anonymous., 2012). This is a paradoxical situation wherein the growing sector is not being fully supported. One of the arguments put forth is that the DAHDF and State AH Departments do not have sufficient absorption capacity. This however should not deter higher fund allocation to livestock sector. Instead of this, the states should be supported for strengthening infrastructure and man power for better performance and utilization of funds for livestock development.

At the institutional level, strengthening the research and extension activities, developing feedback and support mechanism will enhance the livestock production of the country. Farmer - extension - scientist linkage mechanism needs to gear up in all institutions. The functioning of various livestock development agencies especially the State Departments of Animal Husbandry (SDAH) in relation to the extension education performed by them need to be analyzed so as to ascertain a paradigm for livestock extension service (Chander et al., 2010). Government of India (GOI) initiated livestock development programmes such as IADP (1960), ICDP (1964-65), LLP (1979), National Demonstrations (1964), Operation Flood (1970-71) etc. since 1960s through 1980s (Singh et al. 2009, Ray 2008). As per the annual report 2011-12, DAHDF, Ministry of Agriculture, GOI, reported that India owns a huge livestock population (529.70 million), attended by extensive network of the veterinary institutions (52757), and lot many personnel (among others, over 50000 professional veterinarians) looking after the task of livestock development. The reason behind the low production of our livestock is that the sector did not receive the policy and financial attention as it deserved. The sector received only about 12% of the total public expenditure on agriculture and allied sectors, which is disproportionately lesser than its contribution to agricultural GDP. In 2010-11 livestock generated outputs worth Rs 2075 billion (at 2004-05 prices) which comprised 4% of the GDP and 26% of the agricultural GDP.

The livestock sector too has been neglected by the financial institutions. The institutional mechanisms to protect animals against risk are not strong enough. At present, only 6% of the animal heads (excluding poultry) are provided cover by livestock insurance. No doubt, livestock extension has remained grossly neglected in the past. Only about 5.1% of the farm households in India access information on livestock production (Anonymous., 2012). These clearly indicate an apathetic outreach of the financial and information delivery systems. A first step towards this end would be to undertake detailed institutional analysis.

At the state level, the Animal Husbandry Department (AHD) is the major stakeholder as far as livestock productivity is concerned. The AHD with its huge infrastructure, however, is primarily involved in treatment and handling of sick animals for which it has a clear mandate. With more effective control of serious diseases such as Rinderpest (now eradicated from India) and Newcastle disease and more easily available treatment for many other conditions, animal health constraints are gradually being overcome (Morton and Matthewman, 1996, Gandhi, 1998). It is expected that farmers’ education and extension contacts enable them to acquire, receive and decode new information to evaluate benefits of alternative sources of economically useful information and to have earlier access to such information (Duraisamy, 1992, Adeokun and Akinyemi, 2003). This necessitates a system through which farmer can receive desired information. However, there is no organized system of providing livestock extension messages to the farmers. The activities relating to livestock extension education are sporadic and spread over time and space and do not meet the requirements of a vast majority of farmers (Lehmann et al. 1994, Gandhi, 1998). The problem is further compounded with the neglect of policy makers and by researchers towards livestock extension (Morton and Matthewman, 1996, Gandhi, 1998, Sen, 2003 and Anon., 2002) system since the animal health extension gets precedence over production extension.

At the national level, upto 1960, agricultural extension was purely a function under the guidance of the State Department of Agriculture (DoA). But, subsequently many other programmes like Training and Visit (T&V) system were introduced to cater to the needs of farmers. Over the last 25 years, T&V became the dominant method of restructuring the extension system (Ray, 2008). However, it was
recently realized that the inclusion of livestock component into broad based T & V system was unsuccessful for several reasons, such as plan to nominate the Department of Agriculture as the lead organization, increase in the work load on Village Extension Workers (VEWs), the staff were primarily trained in agriculture and that they would be unable to provide an adequate technical service, skepticism that livestock production was amenable to the provision of regular, standard messages of the kind suitable for crops, longer time-scale in animal production, slower speed of technical development and lack of synchronization of different animals and herds (Matthewman et al., 1997, Morton and Matthewman, 1996 and Rao et al., 1992). Thus, the T & V system could not make much impact on livestock development. Matthewman and Ashely (1996) further argued that farmers see village extension workers as crop specialists and do not go to them for livestock extension education. Thus, introducing poor livestock keepers to new technologies without securing access to support services like training and advice do not succeed (Chipeta, 2002). These features substantiate the claim that State Department of Animal Husbandry (SDAH) has to relook its policy to provide adequate livestock extension education, since agricultural extension education is the primary responsibility of DoA in any given state and livestock extension per se is under the domain of the SDAH. But the question remains how far the SDAH dedicated for livestock extension education. As far as the livestock extension education relating to production is concerned, the SDAH remains the primary stakeholder. The investments of the GOI including share of states in animal husbandry and dairying sector is extremely low and varied between 0.4% and 1.0%. The investment in animal husbandry and dairying as percentage to total investment of GOI in 9th Plan was 0.4% only (Bhat, 2003). This is compounded by the investment of National Department of Animal Husbandry, Dairying and Fisheries, i.e. DAHDF, which commits less than 10% of its budget to information delivery (Chipeta, 2002). The DAHDF pays inadequate attention to livestock extension education activities which is evident from its spending, for instance during 1996-97, it spent only Rs 78.6 million on extension and training activities (9.7% of total expenditure on animal husbandry). The low investment by the DAHDF in information delivery including livestock extension education activities is also likely to be followed by state departments, which often face budgetary constraints. This calls for a thorough review of the situation with respect to provision of livestock extension education system especially by the SDAH. An insight into these issues is essential towards augmenting the efficient use of livestock extension. Other than SDAH, we need to look into various extension systems, their role in extension education at critical level.

**Indian agricultural extension system:** Rao and Kherde (1985) and Gill (1991) reported the importance of extension education in adopting various livestock technologies. Thus, the GOI had laid special emphasis on extension education in implementing various rural development programmes such as Community Development Programme (CDP), National Extension Service (NES) and Intensive Area Development Programme (IADP). As the agriculture and allied activities are under the state list, the State Department of Agriculture (SoA) was given the prime responsibility in implementing various extension programmes and activities until 1960’s (Sulaiman and Hall, 2002). Subsequently, with the establishment of Indian Council of Agricultural Research (ICAR) as well as the State Agricultural Universities (SAUs), Departments/ Directorates of Extension were established in the year 1994. Their basic objective is to conduct extension research, demonstrate latest technologies, provide feedback to scientists, and training support to State Departments of Agriculture (Pal and Singh, 1997). To extend the support to the farmers, village level functionaries were assigned the task of spending 75% of their time on functions related to the promotion of improved agricultural practices (Bajaj, 1989). Soon it was realized that extension worker serving the farming community must be a full time trained staff and there should be two-way flow of information between research, extension and farmers. This led to the introduction of T & V system in mid 1970s (Hayward, 1989). However, the sectorial approaches introduced through the T & V system meant that in practice the form of extension was oriented for crop production and livestock was neglected (Matthewman et al., 1997). The Agricultural extension system in India, as such, is not oriented and focused on the needs of
livestock farmers, since its primary concern remains crops.

**Need for a specialized livestock extension system:** Considering the importance of livestock in the national economy, there is an alarming need for specialized livestock extension system. Livestock production has been steadily growing, faster than any other agriculture and other allied sectors, and it is foreseen that by 2020, livestock sector will account for more than half of total agricultural output in economic terms (Rao et al., 1993). So as to reach the target growth rate of 4% in the agriculture sector as envisaged in the 12th Plan, the growth in livestock sector becomes more and more essential for which role of extension agencies livestock development becomes vital (Chander et al., 2010). For this, the livestock owners need time-bound relevant and reliable information. However, considerable resources have been directed towards disseminating information on basic crops, little attention has been given for disseminating information related to livestock development.

The National Sample Survey Organization (Anonymous., 2005) in its survey of 51,770 farmer households across the country revealed that only 5.1% of the households were able to access information on animal husbandry as against 40.4% households accessing information on modern technology for crop farming (Chander et al., 2010). The survey also revealed that the public sector extension education are not the preferred option for accessing information related with livestock production, because, in the livestock sector the concept of livestock extension delivery system was very weak. Moreover, just 5.7% farmers had access to information from extension workers. This showed that the number of extension workers is inadequate to meet the needs of the livestock farmers. This situation underscores the need for paying attention to the livestock extension education in our country.

The Indian Agricultural extension system try to integrate livestock into general extension systems by providing cross training of crop specialists in the areas of livestock production and vice-versa. But in practice, its availability has been patchy and the course work too short and too classroom based (Morton and Matthewman, 1996). This obviously affected the quality of the information to livestock owners, which had inhibited them in adoption of modern livestock technology (Rao et al., 1992). Moreover, the highly specialized livestock extension education system has different requirements since it has distinct features from crop extension education due to longer time-scale of animal production, slower speed of technology development, wide variation in production status among different animals, difficulty in demonstrating merits because of their poor observability, frequently dispersed and non-uniform needs of livestock owners (Matthewman et al., 1997, Rao and Kherde, 1985). To cite a proof in this regard, India government initiated various livestock programmes like Key Village Scheme (1952), Intensive Cattle Development Project (1964-65), Operation Flood (1970-71) etc., which could not improve the productivity of milch animals substantially for want of a specialized extension education system for livestock farmers (Rao and Kherde, 1985). Many of the animal husbandry practices followed by farmers are still not in tune with the scientific rearing practices. Sen and Venkatadri (1997) reported that misconceptions and ignorance coupled with poor extension interventions are some of the reasons for such state of affairs in respect of the poor popularization status of improved animal husbandry practices.

A holistic way of livestock extension education system is necessary for socio-economic transformation of rural India. Extension education for livestock development includes timely transfer of relevant and reliable information and also strengthening of locally relevant innovation systems; advisory service; the provision of access to a range of services that include input and output markets; and the strengthening and support of farmers’ organizations (Rivera, 1989). Extension education assist rural livestock owners through educational process, to improve livestock farming methods and techniques, increase production efficiency and income, better levels of living, and lift the social and educational standards of rural life.

**Need for specialized livestock extension agency:** Livestock development means the shift from traditional to improved scientific methods of livestock production system. Therefore, the technology generated at the research stations is required to be adequately presented to the livestock owners in
appreciable form for its effective implementation. This advocated the role of qualified livestock extension agency to tide over the inadequacies in relation to livestock in the general extension system (Chander et al., 2010). In the absence of a specialized livestock extension agency, many departments are performing livestock extension education activities one way or other at different levels.

**Extension education activities of Department of Animal Husbandry, Dairying and Fisheries (DAHDF) for livestock production:** In India, DAHDF is the apex body for livestock production and development, which invested only Rs 10.41 crore during Ninth Five-Year Plan against the allocation of 20 crore under the Animal Husbandry Extension Programme, which was started in 1992-93. Under this scheme, financial assistance is provided to State Governments, Agricultural and Veterinary Universities and Veterinary Colleges for establishment and development of an information network to promote and propagate latest animal husbandry practices among farmers. The scheme has the components like establishment of national demonstration unit, organization of seminar, workshop, training etc. for field staff on animal husbandry extension, and conducting training programme for breeders and farmers including women. It also has provision for the organization of various competitions, livestock shows at various levels and evaluation of animal husbandry extension education programmes. The general allocation pattern of funds (Fig 1) during 1996-97 by the Department of Animal Husbandry and Dairying (GOI, 1998), showed that only 10% of total budget was earmarked for extension education activities. The central government is mainly responsible for the policy formation and to ensure adequate guidelines for the state livestock development agencies.

Report of the Working Group on Animal Husbandry and Dairying for the Tenth Five-Year Plan (2002-2007) for the first time treated livestock extension differently from crop related extension education activities and therefore a separate sub-group was created to address the issues concerning livestock extension activities. The Plan Document indicated that livestock extension education will be driven by technology transfer rather than transfer of knowledge (Bhat and Das, 2002). And the report of the Working Group on Animal Husbandry and Dairying for the 12th Five-Year Plan (2012-2017) also reported that only 5.1% of the farmer households in India were able to access any information on animal

FIG 1: Allocation pattern of funds at DAHDF, GOI (1998)
husbandry as against 40.4% on crop farming. The plan documented that it is essential to accord utmost priority to develop appropriate livestock extension education system to fully exploit its potential for agricultural growth and rural development. A differentiated approach of providing extension education and input services would be necessary to address the various technical, advisory and financial needs of different livestock production systems and species. This would call upon for building up an exclusive cadre of extension workers with appropriate skills and knowledge. Special KVKs with emphasis on various livestock extension education activities should be established. These efforts should be complemented with support from para-vets, NGOs and other development organizations. KVKs distinctly created for livestock should support education of farmers and upgradation of skills of the paravets and field guides. Presently the major activities of ATMA are confined to improving crop production. There is a need to strengthen ATMA with AH experts to coordinate various extension and training activities; the private AI and other workers could be effectively utilized for providing extension education. The DAHDF should have special extension cell with matching official machinery in the states for formulation and implementation of programs. The shortage of technical manpower for work in the field should be addressed appropriately. Public-Private-Partnership (PPP) in extension education has to be encouraged. The potential private extension education providers could be identified and made partners in PPP mode for effective management of services. A major program on livestock extension, delivery of services and women empowerment should be initiated in 12th plan to enhance efficiency of production. As against the proposal of Rs 150 crores for livestock extension activities, only a sum of Rs 15 crore was allocated for livestock extension component during 11th plan (Fig 2). Further, out of this allocation, major share was for establishment of private veterinary clinics, which is not a typical livestock extension education activity. By the end of 2009, only Rs 1 lakh was utilized under the head, livestock extension. This tells about the status of livestock extension especially under the centrally sponsored schemes.

Extension education system of Indian Council of Agricultural Research and Department of Agriculture and Co-operation: Throughout the country, the ICAR under Ministry of Agriculture (MoA) propagates a vast network of the Central

**FIG 2:** Allocation for livestock extension during 11th plan under centrally sponsored schemes, GOI. (Source: Annual Report of DAH&D 2010-11)
Research Institutes (48), Project Directorates (12), National Research Centres (31) and Deemed Universities (4) which are basically mandated for research or academic programmes in the their respective mandated areas, yet perform some extension education as well. The ICAR research institute on animal science such as IVRI, NDRI, CIRG, CSWRI, CARI have division of extension / directorates of extension or extension section which are manned by extension scientists and technical officers. The basic focus these extension unit remains to conduct research, nevertheless, some field extension education activities like farmers’ fairs and dairy mela, animal health camps, farmers’ visits, demonstrations, kisan sangosthis, farmers’ door to door extension, exhibitions etc. are organized by these units but their area of coverage and influence remains jurisdiction of the institute. So, the extension efforts by these ICAR institutes have very limited reach, scope and influence over farmers leading to very limited implications for livestock development.

The ICAR has also established 44 Agricultural Technology Information Centres (ATICs) in ICAR Institutes and SAUs. These centres provide a ‘Single Window’ delivery system for technology products, services and information available in the institutions to the farmers. However, the impact of these centres specifically on livestock extension activities is yet not visible.

**Krishi Vigyan Kendra (farm science centre):** KVK or farm science centre is an innovative institution mandated for imparting vocational training to the farmers and field functionaries to accelerate agriculture production and also to improve the socio-economic conditions of the farming community which is 100% financed by the ICAR, responsible for extension activities at district level (Ray, 2008). KVKs, since the establishment of first KVK in Puducherry in 1974 have grown to about 630 moving towards the goal of at least 1 KVK in each district of the country (Anonymous., 2012). Now, even 2 KVKs have been envisaged in larger districts. The annual reports of these KVKs clearly reveal a crop bias, with very little contribution towards livestock extension education activities. The KVKs including those under the animal sciences institutes of the ICAR and veterinary universities as also with a few NGOs have largely ignored animal husbandry component as these have taken up only a bit of care for livestock. These KVKs maintain demonstration sights for crops but rarely have demonstration units on livestock. As such, livestock extension education is poorly represented within the KVK set up.

**Directorate of Extension:** It is a very important extension agency under Ministry of Agriculture which is responsible for organizing extension education activities and trainings of extension functionaries through sponsoring these activities to be carried out by various organizations including the NGOs. The Extension Education Institutes (EEIs) under this directorate too organize extension education and training in their respective zones. The Directorate of extension organizes a national level workshop to decide on the training to be entrusted to various agencies. A cursory look at the proceedings of the 21st National workshop on Planning and Management of Agriculture Extension training (Anon., 2002) revealed that there is a little scope on livestock extension under the Directorate of Extension, GOI. Out of the 63 national training courses on extension sponsored by the directorate during 2001 - 02, only 2, viz. Transfer of technology in clean milk production, and extension strategies for animal health and production were approved in animal husbandry by the Directorate of Extension (Chander et al., 2010). This might be due to the poor response given by the various states with respect to livestock extension. As a result, there was very poor representation of animal husbandry extension education programmes under the central scheme of the directorate during the year.

**Extension Education Institutes (EEIs):** To cater to the extension education and training needs of the large number of extension professionals in the country, four Extension Education Institute (EEIs) were established in India at the regional levels with the 100% financial and technical sponsorship of central government through the Directorate of Extension, GOI (Ray 2008). These were: Nilokheri in Haryana (1959), Anand in Gujarat (1962), Hyderabad in Andhra Pradesh (1962), and Jorhat in Assam (1987). However, their activity profile as also the mandate does not reflect any direct and significant role in livestock extension.

**Role of Agricultural Technology Management Agency (ATMA):** It is a registered society of key stakeholders recently launched on pilot basis with
the World Bank funding initially in selected districts of 7 states, now in place in 262 districts. It is further going to be expanded in more districts with additional funding (up to Rs 230 crore), since the ATMA is being seen as a major instrument to revitalize agricultural extension system in India. In the 11th Plan document, the sub-group on Livestock Technology Transfer Service too has stressed the role of ATMA in improving the livestock sector performance (Chander et al., 2010). It remains to be seen, how much impact it will have on livestock sector. As per the project reports of various ATMAs, the activities in the area of animal husbandry extension education have been very negligible so far.

**Role of National Dairy Development Board (NDDB):** The NDDB was created in 1965 to take up dairy development programmes in the country on Anand model. It also has a very elaborate mechanism for transfer of technologies especially for dairy development and it plays a very vital role in augmenting milk production through nationwide network of dairy cooperatives. The Anand pattern of dairy cooperatives has become world famous through its brand name AMUL. Among various extension interventions, setting up milk producers cooperative societies was the central plank of the project linked with dairy development and marketing (Ray, 2008). Many reports indicated that India is number one in milk production in the world largely due to the efforts under cooperative movement launched by NDDB. But the extension activities of NDDB has remained restricted to bovines, and limited only to the members of the dairy cooperatives (Chander et al., 2010). It caters to the needs of only 10 million households among 70 million households who depend on dairy animals (Patel, 2004). The livestock extension by NDDB and dairy cooperatives has confined to dairy animals and members only, thus, excluding other diverse livestock species and thereby majority of the Indian farmers.

**Role of states in livestock extension education activities:** The responsibility of Agriculture and animal husbandry development is a state subject. To carry out the agricultural development work, states have various agencies and institutions such as State SAUs and Department of Agriculture (DoA). The SAUs and Veterinary Universities have Departments/ Directorates of Extension on the pattern similar to the ICAR institutes. There are about 45 SAUs, 1 Central Agricultural University and 7 Veterinary Universities spread over different states (Anonymous., 2012). These universities with primary mandate for teaching, like ICAR institutes have very limited scope for livestock extension, lacking in focus, intensity and reach (Chander et al., 2010). Whereas, a maximum of livestock farmers remain untouched by the limited and sporadic extension education efforts by these SAUs and veterinary universities.

**Role of SDAH in Extension education:** It is noted that SDAH field staff consider treating of sick animals and AI work as the two most important activities they are responsible for. Lehmann et al. (1994) found that treating of sick animals was listed by 83% of the veterinarians as the first or second most important activity and AI work by 74%. Vaccination was ranked third on an average. For 10%, the maintenance of records was the most time consuming activity. Further, the most important difficulty mentioned was inadequate mobility. This, in turn, definitely hampers extension activity, if any. Discussion activities with farmers was only ranked seventh, as per time allocation of the working hours, and only 1% felt it as most important. The veterinary service personnel act more as doctors rather than extension functionaries. While treatment of the animals, vaccination or AI are performed in veterinary clinics, reaching out to the farmers through extension activities receive much less priority as compared to clinical services. This is due to the fact that veterinary functionaries are requested to perform 25 multifarious activities in which extension is one calling for rationalizing in their job chart (Venkatadri, 2002). Education of the dairy farmers, which is crucial in livestock development work, was given low preference in a study (Rao and Kherde, 1985). The extension management in Animal Husbandry is the weakest link in the whole process of technology transfer (Sen, 2002). The weaknesses in animal husbandry extension performed by the SDAH is also reported by Sen in 2003. As such, the SDAH though considered to be the major agency to cater to the needs of the livestock farmers, their role is limited to treatment services, vaccinations and artificial insemination (AI) services. Their contribution in providing extension educational support for farmer capacity building is limited in practice. The veterinary
officers and para-vets of the SDAH are the only functionaries who can effectively deliver livestock related information to the farmers but their main focus is on health care (Sulaiman and Van Den Ban, 2003). Moreover, the expenditure incurred over the years by various SDAH in India on livestock extension activities was found only around 1 - 3% of their total budget (Ravikumar, 2005). Most of the states do not possess staff devoted specifically to livestock extension and in most cases this was restricted to 1 or 2 relatively junior staff members looking after livestock extension work for whole state, while located at headquarters (Matthewman and Ashley, 1996, Kurup, 2003, Ahuja et al., 2000). However, appreciably, some states in recent times have identified veterinarians specifically to look after animal husbandry extension activities at district level. The livestock extension worker may be understood as one who has specialized skills in changing the behavior complex of the livestock farmers and actively involved in livestock development work. Unfortunately, there are only few persons who could be considered as livestock extension personnel. Many people who have not acquired any professional qualifications in livestock extension are also engaged in livestock extension work, for instance the veterinary surgeons, livestock assistants/stockman who is considered grassroots animal husbandry extension workers (Rao and Kherede, 1985).

**Extension education strategies for improving livestock production.**

1. **Reformation of institutional set up:** So as to improve the extension education system for livestock production, the extension institution must have 3 vibrant systems, viz. knowledge generating system, knowledge disseminating system, and knowledge consuming system. To improve the livelihood of livestock owners, these three systems should be very strong; however, there is thick evidence that the knowledge disseminating system is the weakest of all in the context of livestock development (Chander et al., 2010). The responsibility for the transfer of information to livestock owners fall with the extension education, but these are largely focused on the extension of crop messages, and the livestock extension under the SDAH are geared to mainly animal health concerns. There is also growing concern about the lack of clear understanding of livestock owners’ needs. The SDAH are in better position for delivering livestock related information to the farmers when compared with other agencies because of the availability of huge infrastructure and technical persons. Therefore, it is pertinent to study the livestock extension education system rendered by the SDAH.

2. **Revitalization of operational mechanism:** The concentration of government services on livestock health has been justified by the immediacy of animal diseases. As farmers gain confidence that diseases are under control, they are prepared to invest more in animal and livestock production, constraints in genetic potential, nutrition and husbandry are now becoming limiting. Moreover, the livestock extension education faces additional institutional problem of being marginal to both agricultural extension and animal health services (Morton and Matthewman, 1996). Chipeta (2002) argued that for efficient livestock production system, the institutional structure must possess a qualified advisory service with the task to supply best knowledge available to farmers, guidance, processing of economic data, to analyze farm conditions, training projects and to constitute an effective link between practical farmers and the research institutes and vice-versa. It concluded that creation and dissemination of knowledge was the tool that paved the way for livestock development. Sen (2003) discussed that by way of replacing the predominantly clinical approach, even if partially, extension orientation among the field functionaries can attain supreme importance.

The institutional mechanism through such orientation need to be equipped with appropriate tools like Farming System Research and Extension (FSRE), Participatory Rural Appraisal (PRA) etc., to enable them to know the farmers’ practices, problems and priorities in respect of livestock management. Sen (2002) emphasized the importance of analyzing the existing strength and resources on this count and to build on the same for further improvement so that improved technologies reach the grassroots level for integration with the production system. At present, there is no formal extension education service in many states and extension activities account for very small
proportions of SDAH budgets (Matthewman et al., 1997 and Lehmann et al., 1994). It is also mentioned that SDAH generally are not designated as learning organizations, where it deals primarily in treatment of animals. This, however, is fundamentally important for providing adequate extension service (Van Den Ban, 1997).

The various stakeholders need to understand the role played by the SDAH in providing extension education in livestock development and ways for improving the existing pattern so as to develop an institutional context for livestock extension delivery system within the states under the SDAH. This calls for a detailed institutional analysis of the SDAH in context of the livestock extension delivered system by this important institution. The need for creating a separate unit within the SDAH for livestock extension and provision of enhanced budget, staff, vehicles and other infrastructure required for delivery of extension messages is clearly felt by the key stakeholders (Ravikumar, 2005). In coming years, some of the burden of government agencies is likely to be reduced by private sector, wherein; contract farming for milk, meat and egg production may improve delivery of extension messages to contract farmers (Chander et al., 2010). The role of NGOs like BAIF, J K Trust or even the private agencies like Nestle may increasingly be visible in extension education efforts. This will change the dynamics of livestock extension a bit but the responsibility of the SDAH will continue to deliver extension activities albeit more efficiency through appropriate need based delivery mechanisms.

3. Revitalization of Extension Education System: Extension education systems in different states need to be recalled upon for effective and efficient extension delivery system for improving livestock production. Identification of information on training needs, sources of information among the livestock owners is also important as it will help the authorities concerned to fine tune their efforts according to the perceived needs of the livestock farmers. It is imperative to work on a policy for livestock extension suitable to the needs of Indian livestock farmers. It has to orient its extension education system through suitable staffing, budgeting, creation of facilities and functioning. These issues need urgent attention so as to harness the potential of livestock which can substantially reduce the incidence of poverty in India as elsewhere. The XI Plan working sub - group on livestock extension education service observed that while there is an agriculture extension policy in-built into the national agriculture policy as well as in several state agriculture policies, the livestock extension policy has not received its due importance. There is a need to articulate within the overall national agriculture and livestock policy the vital role of livestock extension.

4. Upscaling the uses of ICT (Information Communication Technology): India covers a vast geographical area of nearly 3.29 million sq. km with population of more than 1.2 billion distributed in 28 states and seven centrally administered union territories covering 6,00,000 villages (Sasidhar et al., 2006). The number of state run veterinary institutions (which includes veterinary hospitals, dispensaries, clinics and AI centres) grew from about 2,000 in 1951 to over 52757 in 2011-12. Out of the 28 states, still some of the states via. Manipur, Meghalaya, Arunachal Pradesh and Sikkim do not have veterinary college. There is only one veterinarian for every 10,000 livestock units in our country (Sasidhar et al., 2006). The comparable figures in the states of West Bengal and Rajasthan were 20,000 - 25,000 livestock units (GOI, 1997). Few states viz. Tripura, Punjab, Haryana, Himachal Pradesh and Kerala states had one institution for every 5,000 animals, which is as per the recommendation by the National Commission on Agriculture (1976). The challenge for these institutions to reach millions of livestock owners spread through the length and breadth of the country remained insurmountable. However, the outreach of livestock production services can be multiplied manifold by trying ICT initiatives with the cooperative sector. Preliminary result indicates that extension education alone is not sufficient to sustain information shops at village or even at block levels. The information supply domain has to be much larger and more dynamic to offer value-added information like market prices, weather forecasts etc. Thus upscaling the use of ICT is necessary for effective coverage and dissemination of livestock outreach programme to the farming communities.

Information Technology ordinarily refers to computer based technology. These are electronic systems for receiving, processing, storing, retrieving
and transmitting information (Ray, 2008) for effective communications. Properly developed, selected and used, IT can provide good support to knowledge-based extension system for improving livestock production. New ICTs include community radio and television, cellular telephony, use of computing devices, digital imaging, the internet and wide area networking (WAN), Wi-Fi and mixed media. Few ICT projects have come up in some states although patchy viz. e-Governance, Bhoomi project in Karnataka, Gyandoot in MP, CARD (Computer-aided registration of deeds), FRIENDS in Kerala, e-Chaupal, expert system in Agriculture Extension, expert system developed by MANAGE, expert system developed by the Indian Institute of Horticultural Research, AGREX in Kerala, Farm advisory service system in Punjab, Kisan call centre, NAIP programmes of ICAR etc. However, most of these ICTs were designed for specific purpose and none of these models fit for the livestock extension services. So the convergence of livestock technology with these models is necessary for rapid information dissemination down to the livestock owners.

Need for policy reframe: Since the development schemes were emanated as a result of framework policy, the livestock extension component should be integrated in the policy making for livestock development. The recent extension reforms programme specifically the ATMA with AH experts need to be coordinated for various extension and training activities; the private Artificial Insemination (AI) and other workers could be effectively utilized for providing specific livestock extension. The livestock extension education should be incorporated in all extension reforms initiated by the Government of India. For this, the SDAH should be fully associated with the efforts of the central government. The XI Plan document of Planning Commission has highlighted the importance of livestock extension, while addressing the various issues concerning livestock extension delivery system. Subsequently, it is also written in the report of the working group on animal husbandry & dairying 12th five year plan (2012-17) submitted to planning commission government of India. If implemented as envisaged, it may positively impact on livestock sector. Therefore, it is important that the states should take into consideration the XII Plan recommendations concerning the livestock extension education delivery system in the country and implement them to exploit the full potential of the livestock sector.

It is therefore necessary to establish a separate Indian Council for Veterinary and Animal Sciences Education and Research by carving out animal science institutes from ICAR and its development would provide better coordination between the research and development efforts in livestock sector.

REFERENCES


