

# Strengthening Extension and Advisory Services through Producer Organizations

## A Case of Milk Producer Cooperatives in India



November 2014

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### **November 2014**

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## **Abbreviations**

<b>KVK</b>	Krishi Vigyan Kendra
<b>PO</b>	Producer Organizations
<b>GOI</b>	Government of India
<b>AMUL</b>	Anand Milk Union Limited
<b>NCDFI</b>	National Cooperative Dairy Federation of India
<b>NDDB</b>	National Dairy Development Board
<b>FOP</b>	Farmers' Orientation Programme
<b>STEP</b>	Support to Training and Employment Programme
<b>SDAH</b>	State Department of Animal Husbandry
<b>WDCS</b>	Women Dairy Cooperative Societies
<b>NDP</b>	National Dairy Plan
<b>UCDF Ltd</b>	Uttarakhand Co-operative Dairy Federation Ltd.
<b>EAS</b>	Extension and Advisory Services
<b>PONLAIT</b>	Pondicherry Milk Union
<b>CMP</b>	Clean Milk Production
<b>IDDP</b>	Intensive Dairy Development Programme
<b>WDCLP</b>	Women's Dairy Cooperative Leadership Programme
<b>ICT</b>	Information and Communication Technologies
<b>DAHDF</b>	Department of Animal Husbandry, Dairying & Fisheries

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# 1 INTRODUCTION

India's milk supply comes from millions of small producers, dispersed throughout the rural areas. These farmers maintain an average herd of one or two milch animals, comprising cows and/or buffaloes. Ample labour and a small land base encourage farmers to practice dairying as an occupation subsidiary to agriculture. While income from crop production is seasonal, dairying provides a stable, year-round income, which is an important economic incentive for the small farmer. Over the past two decades, the demand for services related to animal breeding, health care and marketing support have increased manifold.

There is a considerable shift in dairying in the past two decades. Introduction of cross-bred cattle and improved buffaloes; a shift from grazing to partial or complete stall feeding systems; new animal health challenges; changes in the mode of delivery of livestock services; new marketing arrangements; and liberalized trade policies have all made dairying sector more challenging (Thirunavukkarasu et al 2008). Against this background of change, access to relevant information on all aspects of dairying is ever more essential for effective decision making by today's dairy farmers. In the case of dairying, the producer organisations (POs), which are organised as dairy cooperatives (DCS) to primarily market milk, are playing an important role in empowering farmer members with appropriate technological knowledge and skills through various extension education and training programmes.

Understanding the strengths and limitations of extension services delivery mechanisms of dairy cooperatives is important for enhancing their contribution to the dairy sector competitiveness. With this aim, two types of discussions were organized. The first one was an e-discussion on "the role of producer organisations in strengthening extension and advisory provision in the dairy/livestock Sector" in India. The second one was organisation of face-to-face dialogues with milk producer members and officials of dairy cooperatives and their federations at district/state levels milk unions in four states, namely Chhattisgarh, Jharkhand, Uttar Pradesh and Uttarakhand.

This report discusses the major findings from these exploratory investigations on the role of dairy cooperatives in provision of extension and advisory services. The report is organized as follows. The current situation on dairy cooperatives in India is presented in Chapter 2 which is followed by the methodology adopted for this study in Chapter 3. Findings from this study are discussed in Chapter 4. The conclusions are presented in Chapter 5. The paper ends with a brief set of recommendations in Chapter 6.

# 2

## CONTEXT

### Dairy cooperatives in India

India currently has about 15.1 million farmers under the ambit of 1,55,634 village level dairy cooperative societies which are federated into about 170

district milk unions and 22 state cooperative dairy federations (GOI, 2014 a).

#### Box 1. The Indian Dairy Cooperatives: Structure and Functions

The Indian dairy development programme “Operation Flood” has been a successful model of dairy development through capacity enhancement of milk producer co-operatives. The Kaira District Co-operative Milk Producers Union at Anand (AMUL) was the first producer oriented milk union formed in 1946 and this constituted an important landmark in the development of the dairy cooperative movement. The Anand Pattern of cooperative envisages an integrated cooperative structure that procures, processes and markets produce. Supported by professional management, producers decide their own business policies, adopt modern production and marketing techniques and receive services that they can individually neither afford nor manage. The Anand Pattern succeeded, as it involved people in their own development through cooperatives where professionals are accountable to leaders elected by producers.

The institutional infrastructure under the pattern which includes village cooperative, dairy and cattle feed plants; state and national marketing is owned and controlled by milk producer members. The Indian Dairy Cooperatives are organized as a three-tier structure with Primary Milk Producers' Cooperative Societies at the village level followed by the District Cooperative Milk Producers' Union at the district level. A state level Cooperative Milk Producers' Federation supports and guides district unions. All the unions in a state are normally members of a federation whose prime responsibility is the marketing of milk and milk products outside the state. There is also a fourth tier, the National Cooperative Dairy Federation of India Ltd. (NCDFI), which is a national-level body that formulates policies and programmes designed to safeguard the interests of milk producers.

**Table 1. Dairy Cooperatives- Key Parameters**

Parameters	Nos.
No. of DCSs Organized (Cumulative)	155634
Producer Members ('000)	15115
Women Members ('000)	4380
Milk Procurement (TKgPD)	32825
Milk Marketing@(TLPD)	23786

Source: NDDDB, 2013



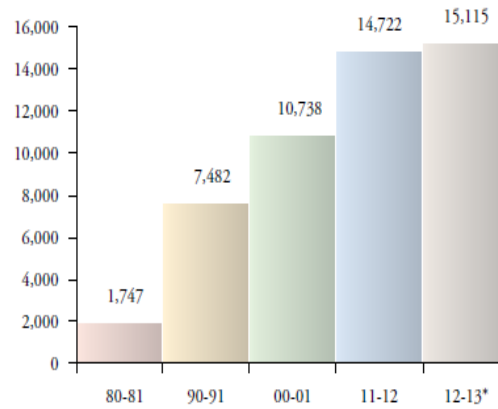
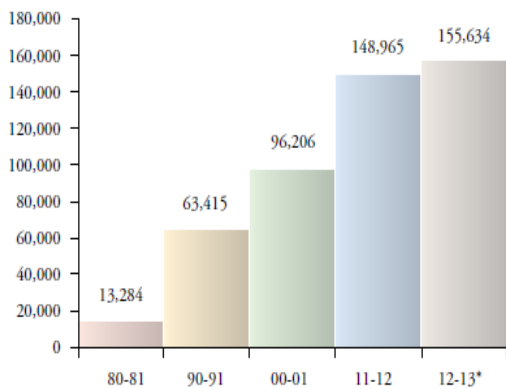


Fig 1: Dairy Cooperative Societies in India (NDDDB, 2013) Fig 2: Producer Members (in thousands) (NDDDB,2013)

## Extension and advisory service delivery by dairy cooperatives

Extension and advisory services also play an important role in enabling application of new knowledge by livestock producers. Dairy/livestock extension services can help to assist milk producers at every stage of production, from improved animal husbandry through to better

quality milk and increased production. However, compared to its contribution in the economy, livestock sector has received much less resources and institutional support. Livestock extension remains grossly neglected (Planning Commission, 2013).

### Box 2: Livestock Extension in India

The focus of all the five-year plans in India has been on breed improvement and improving health services with inadequate attention given to knowledge provision to livestock keepers. For want of coherent livestock extension policy and programmes, livestock extension activities in India continue to remain sporadic, casual, occasional and highly unorganized and therefore do not effectively meet the requirements of a vast majority of livestock keepers.

Under the central sector scheme, the investments in livestock extension activities have also been consistently very low. Moreover there has not been any exclusive livestock extension programme sponsored by the government. For instance, in the 11th plan, a meagre Rs. 15 crores was allocated to Department of Animal Husbandry Dairying and Fisheries (DAHDF) under central sector schemes for livestock extension activities. Here too, Rs. 10 crores was earmarked for establishment of private veterinary clinics while only Rs. 5 crores was meant for strengthening animal husbandry extension. This small allocation too remained unutilized till close to the end of the 11th plan. Similarly the investment on livestock extension activities at the state level also remained very low.

India's Planning Commission in its document, 'Agriculture Strategy for 11th Plan: Some critical issues' rightly observed that "unfortunately, extension advice is almost totally absent in animal husbandry and thus, special efforts need to be made in this area". There is no coordination and sharing of information and resources among multitude of agencies claiming to have extension component in their array of activities. The 12th Plan sub-group on Animal Husbandry constituted by the Planning Commission recently observed that extension services for livestock have so far been a non-starter severely hampering its growth (Planning Commission, 2012).

Though the State Animal Husbandry Department (SDAH) is the major stakeholder in livestock development (having its vast infrastructure like veterinary hospitals, dispensaries, personnel and budget), its primary focus is on diagnosis/ treatment of animals and breeding services for which it has a clear mandate (Chander et al 2010). The veterinarians and other staff like Livestock Extension Officers/Livestock Inspectors of the SDAH hardly have any motivation, appreciation, support,

equipment, budget and also the required training to take up extension educational efforts (Ravi kumar and Chander, 2011).

The paravet (a paravet is not a veterinarian but he is responsible for providing basic animal health care and animal production advice to people in their communities.) initiatives taken up by some of the state governments also failed to bridge the gap since the paravets too often compete for treatment and breeding services with the veterinarians leading to conflicts, while lacking in proper training on knowledge delivery to the livestock owners. The investment in terms of budget allocated as well as the expenditure incurred on livestock extension activities by most of the SDAH in general is very low (1% to 3% of total budget), while 10% is considered as optimum per cent of budget allocation in a developing country context. In spite of clear recommendation by various committees including 10th and 11th plan working groups on Animal Husbandry Extension, only 8 states have created an exclusive extension wing within the SDAH. It is important for the SDAH to streamline its extension activities by ensuring well designed programmes, sufficient funds, infrastructure and human resources development strategy to train its manpower on delivery of extension support to livestock producers.

Source: Chander, 2013. Beyond treatment and breed improvement: Why extension is critical for Indian livestock sector? AESA Blog 1 (February 2013), Agricultural Extension in South Asia

As a result, only 5% of farm households in India access any information on animal husbandry against 40% farm households accessing information on crops as per NSSO survey done in 2003(GOI, 2005). The only centrally sponsored scheme on “Livestock extension and delivery services” with a budgetary outlay of Rs.15.00 crore remained non-operational (Planning Commission, 2012).

In India, over 11 million farmers receive these services through their cooperative milk unions, and the National Dairy Development Board (NDDB) helps to improve the quality of the service through training the dairy union staff, introducing new extension approaches and new technologies. The milk unions have technical officers and extension supervisors that provide the services to the dairy farmers (Roy, 2003). Several dairy cooperatives have competent and reliable human resource team to deliver extension services in the form of training, advisory service, educational tour etc. The member farmers are able to expose themselves to various sources of

awareness and skill acquisition through these activities.

For instance, under farmers’ induction and orientation programme, visits to the dairy plants are arranged to demonstrate the process and disposal of milk collected from the producers. Producers are also taken to visit the model Indian dairy cooperative and they in turn educate other dairy animal owners in their area about the practices and benefits of cooperatives. Audio-visual aids, field demonstrations, trainings and extension camps are often used at the society level to explain feeding, breeding, fodder development, health care and clean milk production practices. The milk union also supplies literature and publications in the form of booklets, magazines, folders etc. to its members. Apart from the above services, the Federations and Unions also implement women empowerment programmes and refresher training programmes for the staff members at the societies and the Union. The National Dairy Development Board (NDDB) and State federations also conduct training programmes and organise exposure visits for the staff and directors of milk unions.

### **Box 3. Extension and advisory services of NDDB**

The National Dairy Development Board (NDDB) has been doing pioneering work in the area of extension and advisory services for milk producer members, staff and boards of directors of milk unions. During the year 2012-13, a total of 5,077 participants attended the Farmers' Orientation Programme (FOP) compared to 4,448 participants in the previous year. Emphasis was given to increasing the participation of women in training programmes conducted by NDDB. During 2012-13, about 1,509 women participants attended training programmes compared to 772 in the previous year (NDDB, 2013).

However, in majority of the cases, these extension services are broadly a part of Government of India schemes and programmes like National Dairy Plan (NDP), Support to Training and Employment Programme (STEP), etc. Apart from training, various other activities like visits to dairy plants and fodder production units are also carried out on timely basis. These efforts of NDDB have also led to increasing number of societies and producer members in India.

Several studies have highlighted the role of dairy co-operatives in sharing and disseminating dairy related information to their members.

A study conducted by Rathod *et al.* (2012 a) on Gokul Dairy Cooperatives in Western Maharashtra pointed out that sample respondents acquired knowledge and skills in improved dairy management practices from the dairy cooperative staff. Different improved practices included heat detection, health care and disease management, selection of breeds etc. They also reported that 37.33 per cent respondents were satisfied and 52.66 per cent of the farmers were partly satisfied with the extension service delivery by dairy cooperatives. Only 10.0 per cent of the farmers perceived that extension services delivered by Gokul union were unsatisfactory. Alderman *et al* (1987) and Tefera (2008) also revealed that cooperatives addressed their role by sharing knowledge and information about

dairy innovation for the producer members.

A study on The Malabar Regional Cooperative Milk Producers Union in Kerala State serves as a good example of extension activities provided by a milk union. The Union has close to 50,000 members for whom 158 technically trained personnel are available for extension activities. The Malabar Union has a particular focus on women engaged in dairying and has a network of more than 90 women 'promoters'. Topics addressed include a broad range of dairy (clean milk, calf rearing, feeding dairy animals, prevention and control of diseases, income generation and AI) and non-dairy matters (family counselling, child psychology, consumer rights and home management) (Thirunavakkarasu *et al.*, 2008).

**Box 4: Mulukanoor Women's Cooperative Dairy Society**

The Mulukanoor Women's Mutually Aided Milk Producers Cooperative Union Ltd (MWCD) was formed as a unique initiative for rural women engaged in the dairy sector in and around Mulukanoor, Andhra Pradesh. Established in August 2002, the Mulukanoor Women's Cooperative Dairy Society sets an example for collective action and rural women empowerment. This was the first time when women completely managed and governed a community-based enterprise, where the producers were present at all stages of the value chain. It was, and continues to be, a self-sufficient and self-managed women's cooperative dairy with the primordial mission to improve the economic status of dairy producers and consumers.

The underlying vision of this cooperative was to contribute more value for dairy service producers and consumers in India by 2015. MWCD markets all its products under the brand name Swakrushi. It has been playing a prominent role in empowering rural women in the economic and social management spheres. By emphasizing that all women members should express their opinions, suggestions and problems at the village level meetings as well as the society's general body meetings, the MWCD management makes it a more participative process for them. The cooperative dairy maintains transparency in every aspect related to the stakeholders — their milk supply, accounts, procurement of milk and profit accounts. This has helped to instil faith amid the women members of the society since their monthly income and expenditure are audited at both the village and cooperative levels.

The design strategy followed by the management was key to the success of the Mulukanoor dairy. A standard for keeping minimum performance criteria for members and leaders has effectively been established to regularly measure performances. Over the past 10 years of its operations, the Mulukanoor Union has grown from strength to strength. The gross surplus income has increased from Rs. 23.40 lakh in 2002- 03 to Rs. 413.52 lakh in 2011-12. As of 2012, the number of milk producers in the network had increased to 21,118, and the number of societies had grown to 109.

*Source:* SFAC (2013), *Krishi Sutra 2: Success stories of Farmer Producer Organisations*, Small Farmer Agribusiness Consortium, New Delhi

Chander *et al.* (2009) reported exposure visits of large number of farmers in the study area of Rajasthan (including good number of women) organized by dairy cooperatives under Farmer Induction Programme at NDDB. This coupled with training on animal rearing, milk production and processing had brought about awareness among members of dairy cooperatives. They also pointed out that direct economic benefits at times may not be much, but women members were benefited in multiple ways by being member of women dairy cooperative societies. Few of the benefits that women milk producer members realized were improved

organizing ability, high decision making ability and confidence level, generation of thrift habits etc. This indicates that dairy cooperative also play a pivotal role in social and economic empowerment of their members as compared to non-members. However, in another study, Rathod *et al.* (2012 b) and Biradar (2009) also pointed out the constraints related to financial, human resources, policies and administrative aspects that hamper the effective functioning of dairy cooperatives.

The Central scheme of 'Assistance to Cooperatives' with a funding pattern of 50:50 sharing basis between Centre and

State is in operation since 1999-2000. The objective of the scheme is to revitalize sick dairy cooperative unions at district level and cooperative federations at state level. Since its inception, 37 rehabilitation proposals of milk unions in 12 states are supported with an outlay of Rs.271 crores of which the Central share is Rs.135.69 crores. Rs. 106.17 crores was released.

The issue of continued support to sick district milk unions at the cost of government funds is of considerable concern. A large number of milk unions/ 69 state milk federations continue to have accumulated losses for various reasons and supporting these sick units on a continuous basis needs a comprehensive relook (Planning Commission, 2012).





# 3

## METHODOLOGY

A judicious mix of both primary and secondary data were collected and used for this assessment. The respondents included dairy producer (members and non-members), key informants, veterinarians, para-veterinarians, secretaries, other office bearers, researchers, extensionists and other field personnel. The report is also supported by data from secondary sources such as annual reports, programme reviews, occasional papers and websites of livestock related agencies.

### **Dairy farmers:**

Multistage random sampling and snow ball method were followed to select 60 dairy farmers each in the states of Chhattisgarh, Jharkhand, Uttar Pradesh and Uttarakhand making a total sample size of 240 respondents. The total number of Cooperatives Societies was 934 for Chhattisgarh, 57 for Jharkhand and 23070 for Uttar Pradesh (NDDDB, 2013). Of these, only 160 were members of dairy from cooperatives. The data were collected

cooperative member farmers and non-member respondents by personal interview method using a pretested semi-structured interview schedule (Annexure I). Further, a total of 15 focus group discussions were also organized for the respondents.

### **Staff of dairy cooperatives and other departments:**

Purposive sampling and snow ball method were applied for selecting the dairy cooperative staff which included veterinarians, para-veterinarians, secretaries of village level cooperative societies and the State Department of Animal Husbandry. The data was collected from a total of 35 staff through a pretested semi-structured interview schedule and questionnaires (Annexure II). The group discussions were also conducted for the staff to assess the role of dairy cooperatives in Extension service delivery.





## E-Discussion

An E-Discussion on “Role of Producer Organisations in Strengthening Extension and Advisory Provision in the Dairy/Livestock Sector in India” was conducted from 18 August 2014 to 5 September 2014. This discussion received a total of 72 posts from 23 participants that included researchers, policy planners, extension personnel and research scholars. The discussion focussed on the following questions:

- What roles the POs in dairy/livestock sector play in delivering extension and advisory services to their member producers and how are these activities funded?
- Do the POs articulate demand for extension and advisory support from their member producers? If so how? (Any evidence of analysing individual needs and prioritise these?)
- Do they engage in policy discussion and advocacy articulating the need for stronger extension and advisory support?
- What capacities are lacking among POs to play a more meaningful role in strengthening the supply and demand for extension and advisory services?
- How these capacities could be enhanced?
- What roles public sector could play in developing these capacities and how?

# 4

## FINDINGS

This chapter illustrates the findings from the study and throws light on the emerging role of the producer organisations viz, the dairy co-operatives in extension.

### Role of dairy cooperatives in delivering extension and advisory provision and their mode of funding

Dairy cooperatives are engaged in provision of extension and advisory service delivery. In the states covered under study, only few milk unions supplied various literature and publications in the form of booklets, magazines, folders etc. to its members at free or nominal charges. The milk union staff also monitors the performance of the society on all aspects related to milk

collection, quality of collected milk and payments to milk producers. Audio-visual aids, field demonstrations, trainings and extension camps are often used at the societal level to illustrate feeding, breeding, fodder development, health care and clean milk production practices to member producers.

However, only about 16 per cent of the respondents out of 160 member producers could access extension and advisory services while 84 per cent respondents did not get any extension services from the dairy cooperatives (Fig 3). Different Indian experiences have also pointed out that cooperative members were partially satisfied with the extension services delivered by the dairy cooperatives.

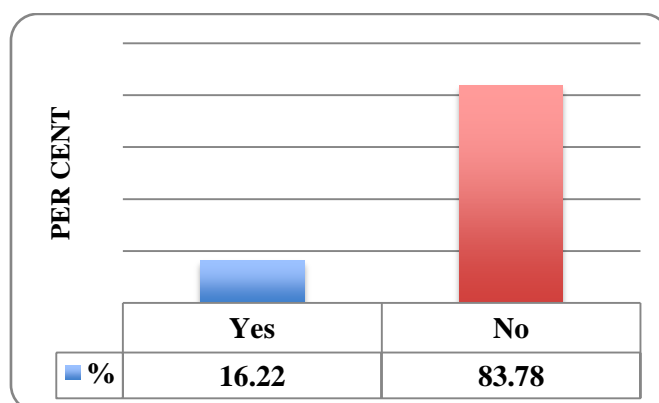


Fig 3. Access to Extension and Advisory Services of Dairy Cooperatives

The cooperatives are successful in improving the welfare of the producer members including the women dairy farmers through WDCS (Women Dairy Cooperative Societies) in the form of

improved social participation, awareness about social issues and thrift generation. However, there is a need for female extension workers to carry out these activities effectively in dairy sector.



The producer members were not keen on receiving extension and advisory services even though these services are accessible to them at free of cost or nominal charges. On the contrary they were willing to get breeding and veterinary health care services even on payment as these

services have direct bearing on milk production. About 83 per cent of the producer members among the respondents perceived that extension services were accessible to them at free of cost.(Fig4).

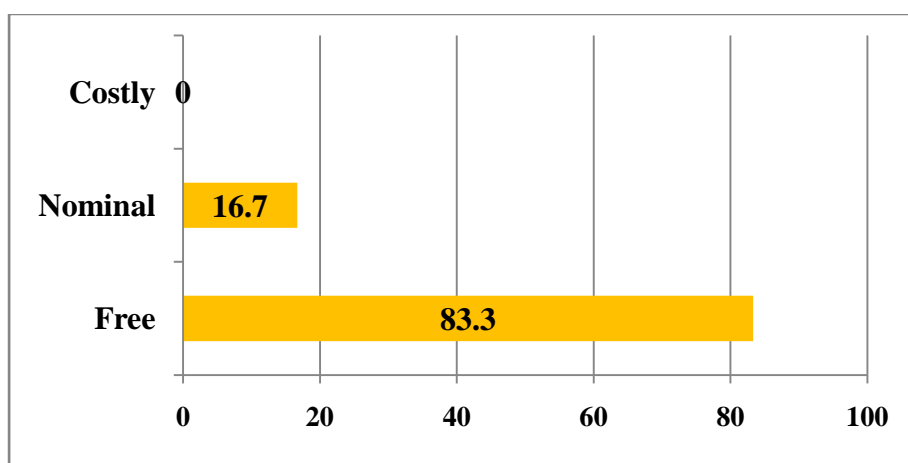


Fig 4.Amount Paid by Dairy Farmers for Extension and Advisory Services of Cooperatives

The extension activities by dairy cooperatives are undertaken with the financial support of agencies such as NDDB or Government Organizations in the form of schemes or programmes like NDP-I, STEP etc. However, there is a need to study the sustainability of extension services by dairy cooperatives once the

financial support is withdrawn. Only in very rare cases, we could find resources specifically allocated for training of milk producer members. The dairy cooperatives and all other types of POs require long term support especially during their initial years to emerge as efficient and sustainable organizations.



## **Articulation of demand for extension and advisory support to member producers**

The village level cooperative societies are primarily focusing on procurement from the member producers. Many of these societies are yet to realize the importance of new knowledge in livestock production and subsequently are yet to realise the full potential of the role dairy cooperatives could play in extending extension and advisory services to their clientele. The farmers rarely discuss their problems with the secretary or other staff of the cooperatives related to access and availability of knowledge and advisory

services. The veterinary officers and para-veterinarians were often consulted for the problems related to health of dairy animals. Milk producers are often more keen on timely payment for milk by cooperatives. Among all the services, dairy extension service was the least focused area in the dairy cooperative set-up.

Quite often farmers who are trained by dairy cooperatives motivate other farmers to adopt better animal husbandry practices and contribute to horizontal dissemination of information and this creates new demands for dairy extension and advisory provision (Box 5).

### **Box 5: Mr.Rajendra Singh Nagarkoti: A Progressive member of dairy cooperative**

Mr.Rajendra Singh aged 40 years of Dajwalpur village in Nainital district is considered as a progressive dairy farmer rearing a total of 48 cattle heads in about 1.21 ha of land. The cattle were mainly Holstein Friesian crossbreds including the young ones. He produces a total of about 220 litres of milk and pours about 180 litres of milk daily to "Nainital District Cooperative Milk Producers Union Limited, Lalkua". The remaining amount of milk is used by his family members and relatives. Mr. Singh started dairying in the 1990s' with two cattle and has grown to this level through scientific dairying. Different management practices followed in the farm include vaccination, deworming, green fodder cultivation, dry fodder storage, concentrates feeding, health care, livestock insurance, etc.

Mr. Singh also acts as a motivational force for majority of the small and marginal farmers interested in dairying in the block and he involves himself in horizontal transfer of information to other farmers in and around his village. Varied groups of farmers and officials from near and far away places are visiting his farm to learn more on scientific ways of dairy farming due to his innovative and entrepreneurial approach to dairy farming. Mr Singh is lately concerned about the non-remunerative prices of milk, lack of quality extension services and inadequate knowledge on subsidy/incentives offered by the government.

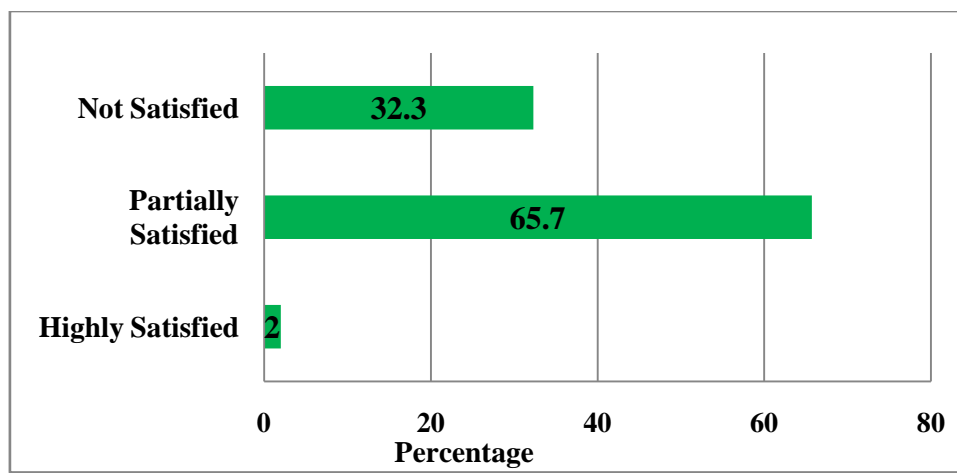
## **POs involvement in articulating the need for stronger extension and advisory support**

Though there is a wider acceptance to the fact that milk procurement and profits increase with adoption of improved dairy

practices, the milk unions organize only a few extension and advisory activities for their member producers. Neither the farmers, nor the societies or the unions are demanding for extension and advisory support through the Union or from agencies such as the Department of Animal Husbandry.

An increase in the number of dairy cooperatives and the producer members does not automatically translates into cooperatives making effective contribution towards provision of Extension and Advisory Services (EAS) to milk producers. These institutions also suffer from various constraints and challenges. Thirty two per cent of the respondent farmers were dissatisfied with

the extension and advisory service delivery and the majority of the farmers (66 per cent), were only partially satisfied (Figure 5). As is evident from the primary data collection, only a marginal group (2%) of farmers found the services to be satisfactory. This clearly reveals the need for improving extension and advisory services by dairy cooperatives.



**Fig 5. Satisfaction Level of Dairy Farmers towards Extension and Advisory Services of Dairy Cooperatives**

**Lack of Capacities within POs in strengthening the supply and demand for extension and advisory services**

As most of the milk producers are small or medium farmers, they need technical support and also support to organize as an effective producer organization. The dairy cooperatives require long term organizational and managerial support especially during their initial years in order

to emerge as efficient and sustainable organizations. While all the cooperatives engage in some extension activity, the major issue is to study the sustainability of extension services of dairy cooperatives once the financial support is withdrawn by Government or private organizations. Also, there is very negligible budget earmarked for training of milk producer members on various aspects of dairy cattle management and rearing.

**Box 6: Nainital District Cooperative Milk Producers Union Limited, Lalkua, Uttarakhand**

“Nainital District Cooperative Milk Producers Union Limited, Lalkua” is the district milk cooperative union functioning under the apex federation “Uttarakhand Co-operative Dairy Federation Ltd. (UCDF Ltd.)”. The head office is located at Haldwani (Nainital) with the brand name of ‘Aanchal’. The union was registered on 16 February 1948 and started functioning on 28<sup>th</sup> October 1948 with seven societies and milk procurement of about 610 liters per day. The major achievements of the union are presented in Table 2:

**Table2. Achievements of Nainital District Cooperative Milk Producers Union Limited, Lalkua**

Item	Till Oct, 2014
Total Number of societies formed	520
Total functional societies	475
Members	26275
Avg. per day milk handling (kg)	95500
Avg. per day milk procurement (kg)	60985
Per society avg./day procurement (kg)	124.82
Total functional women cooperative societies	55
Total Members of women dairy cooperative societies	2810
Number of Women Chairpersons of societies	55
Women Members in Management Board	467
Avg. per day procurement from women societies (kg)	4167
Per woman society avg./day procurement (kg)	75.76

**SWOT Analysis**

- **Strengths:** Good connectivity and market, High demand for milk and milk products, Good cooperation from members and the consumers, Investment from other sources to dairying.
- **Weaknesses:** High perish ability of milk and milk products, old machineries and infrastructure, varying market demand, poor extension activities, vested interests and political interference.
- **Opportunities:** Need for awareness and knowledge, demand for milk and milk products, Land shrinkage leading to increase in dairying opportunities.
- **Threats:** Increasing fuel and packaging costs, rapid industrialization replacing dairying, new challenges for dairying in the era of globalization and liberalization.

With increasing dominance of the milk market by private agencies, the milk unions are running under losses and there is a decreasing trend of dairy farming noted in some places. PONLAIT (Pondicherry Milk Union), Pondicherry and Salem Milk Union, Tamil Nadu are facing this situation for some time. Aavin-Tamil Nadu Cooperative Milk Producers Federations is losing an amount of Rs. 67

Lakhs per day and same situation is also noticed in many other Federations.

During the e-discussion, many pointed out that the cooperatives have become more commercial entities over the past few years deviating from their earlier mandate of welfare of dairy farmers. They have developed various economic and political interests and have become more corrupt and less transparent about their activities. The elected representatives and the dairy

professionals are deviating from the true spirit and principles of “cooperatives”. The quality of trainings, demonstrations and production inputs such as animal feeds has deteriorated. The discussion also pointed that cooperatives and unions have poor extension infrastructure in terms of facilities like training halls, audio-visuals, farm literature and publications. Further, they also lack display boards, audio-visual aids and mobile extension vehicles for organizing extension activities.

### **Enhancing the capacities among POs in strengthening extension and advisory services**

Over the years, dairy cooperatives are doing very little on extension activities, due to which farmers lack knowledge and skill about the scientific practices. Adequate staff to organise extension activities are not in place in many milk unions, which also indicates that neither there is demand nor supply for dairy extension services.

Though much of work of livestock farming is carried out by women, development, extension and training programmes are not generally designed for greater involvement of women and extending

benefits to them. About 75 million women as against 15 million men are engaged in dairying in India (Thakur and Chander 2006). Women play crucial and significant role in livestock rearing but their contribution in livestock rearing has not been given the due place they deserve. They always remain invisible workers (Chayal, et al, 2010). With increasing male migration to urban areas for employment, the livestock sector in India is getting more feminized (GOI, 2007; GOI, 2012) and women are currently playing a much larger role in livestock rearing. The Indian woman farmer has been credited with raising the country’s milk production levels to among the highest in the world (Herath 2007).

NGOs have played a leading role in organizing women milk producers as cooperatives. They also assist in making the benefits of Government schemes available to poor milk producers. NDDB has also initiated a special training programme for women dairy farmers. Despite all these efforts the cooperatives have very poor mechanisms to disseminate information and knowledge for the women members. The cooperatives are yet to increase their support to women to effectively participate in dairying.





### **Box 7: Mrs. Geeta: A Progressive Woman member of dairy cooperative**

Mrs Geeta aged 52 years from Village Jaipur Bisa in Nainital District of Uttarakhand is a member of Padampur Devaliya Milk Producer Cooperative Society. Her husband owns three acres of land. She contributes on an average 2.5 litres of milk /day to the society. Ever since the society was formed and society milk collection centre started procuring milk, she got an alternative to the milk vendor who was not regular in collecting milk and was also not giving a fair price for milk.

A team of dairy development officers and veterinarians from different states visited her on 29<sup>th</sup> October, 2014 to enquire about her association with village milk producer's cooperative society. She said she feels very confident after her association with the milk society and in her capacity as office bearer (Director) of the society, she once attended the Annual General Body Meeting of the Nainital District Milk Producers Cooperative Union Ltd, Lalakua. She has some grievances too. She is not happy with the quality of feed supplied by the Milk Union which she considers as very inferior. While she appreciates the efforts of milk union in recognizing milk producers through awards, she wants the milk union to conduct exposure visits and training on various aspects of milk production (as done by many other milk unions).

She is also supported and helped by other members of the family in raising animals and the younger brother of her husband has also taken membership in the same society. She has recently replaced the manual chaff cutter with a diesel operated chaff cutter which was purchased with the earnings from milk sale to the society alongside the contributions of other members in the family who too use it.

The discussion with women cooperative members revealed that they prefer women extension workers for dissemination of new knowledge. Indian

policy makers have also recognised the importance of women in dairying and encouraged their growing participation in the country's large dairy sector (Box 8).

### **Box 8: Specific Programmes for Women in Dairying**

**Support to Training and Employment Programme (STEP) for Women:** STEP aims to make a significant impact by upgrading skills and providing employment to women on a project basis by mobilising viable groups, improving skills, arranging for productive assets, creating backward and forward linkages, improving /arranging for support services, providing access to credit and awareness generation programmes in gender sensitization, nutrition education, legal literacy and sensitization of project functionaries. Under STEP, exclusive Women Dairy Cooperatives are formed to take up employment cum income generation activities. Women are also given need based and extensive training for skill up-gradation and are also mobilized into Self Help Groups. The ultimate endeavour of the project is to develop the group to thrive on a self-sustaining basis in the market place with the minimal Governmental support and intervention after the completion of project period.

**Women's Dairy Cooperative Leadership Programme (WDCLP) of NDDB:** The Women's Dairy Cooperative Leadership Programme (WDCLP) was launched in 1995 as a pilot programme with the objective of strengthening the dairy cooperative movement by significantly increasing women's participation as active members and as leaders in the governance of cooperative societies, unions and federations. NDDB provided assistance to Milk Unions in conducting several activities to achieve WDCLP objectives.

## **Role of public sector in developing capacities and strengthening extension and advisory services**

Apart from the specific programmes aimed at women in dairying (discussed earlier) the Government agencies are organising several programmes to strengthen dairy cooperatives and enhance their contribution to extension and advisory services. These are discussed below.

### **Strengthening Infrastructure for Quality and Clean Milk Production**

This scheme is aimed at strengthening infrastructure facilities to ensure clean milk production at village level. Clean Milk Production (CMP) initiatives include training of milk producers on modern dairy husbandry practices & CMP, training to cooperative staff and officers of the Unions and exhibiting posters, documentary films and booklets on CMP. This scheme was started in October 2003 with a total outlay of Rs. 30.00 crore for the Tenth Five year Plan. It was continued

during the 11<sup>th</sup> Five year Plan as a merged scheme together with 'Intensive Dairy Development Programme'(IDDP) with a total plan outlay of Rs. 225.00 crore (IDDP&CMP) and budget provision of Rs. 30.00 crore for CMP during 2013-14 (GOI, 2014 b).

### **Feed and Fodder Development Programmes of NDDB**

This programme aims at improving productivity of fodder crops and common grazing lands. It also has provision for organising demonstrations on conservation of surplus green fodder to enhance availability during the lean period. The programme also includes silage making demonstration which is conducted to ensure year round availability of quality fodder for livestock. An integrated approach of growing cultivated crops, grasses, trees and shrubs under silvi-pastoral/horti-silvipasture system improves overall productivity of common grazing land through institutional arrangements.



## National Dairy Plan-I

National Dairy Plan is a central sector scheme implemented with a total investment of about Rs. 2242 crores in 14 major milk producing states namely Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal which together account for over 90% of the country's milk production.

During the current phase (2011-12 to 2016-17) the activities focus on breeding (high quality semen and mobile AI services), animal nutrition (ration balancing) and training and capacity building (use of ICTs and promotion of learning and documentation).

With all these programmes in place, one may wonder, why some dairy cooperatives fail. Box 9 provides some answers to this question.

### Box 9: Why Dairy cooperatives Fail? A Case of Bareilly District, Uttar Pradesh

*Pradeshik* Cooperative Dairy Federation, Lucknow was formed in 1962 with the aim to develop organized dairying in the State on cooperative lines to avoid exploitation of dairy farmers by middle men. Therefore, a direct link was established between the producer and the ultimate consumer further leading to expansion, diversification and channelization of milk business. However, during the last few years, the dairy cooperatives in Uttar Pradesh in general are deviating from the principles of cooperatives. A brainstorming session with the dairy farmers, who were once the members of dairy cooperatives, revealed that farmers are not currently very enthusiastic about reviving the dairy cooperatives. They had a bitter experience with the cooperatives which were defunct mainly because of corrupt management practices and political interference in the union. The farmers value the cooperatives for helping them with marketing of milk and provision of breeding services while extension and advisory services were never a priority for them

Many cooperatives have failed in the last 10 years but, the efforts are currently on to revive these dairy cooperatives. They suggested several ways to revive and make dairy cooperative sustainable in the state. These include: prompt payment for milk, remunerative price for milk and honest and efficient leadership for the cooperatives.

## Research on POs in the dairy sector

Livestock development agencies over the past four decades have made huge investments in establishing and strengthening dairy cooperatives. But still, majority of the dairy farmers in India are not connected to any POs or cooperatives. Why is this so? There are several such policy relevant questions that need answers. Similarly, how many dairy cooperatives provide adequate extension

and advisory support to member producers? How their capacities to do this very important role could be enhanced? Many multi-national companies and domestic private sector companies are acquiring livestock markets in India. Although a healthy competition among different agencies in the private and cooperative sector could be good for producers, there is little information on the experience from this competition.



**Box 10: Mr.Ranjeet Yadav: Reaping the Benefits of Dairy Cooperative and Private Players.**

Mr.Ranjeet Yadav aged 48 years of Rajpur Gutia village, Bareilly District, Uttar Pradesh is educated up to intermediate. He has also taken training as an inseminator from Indian Veterinary Research Institute, Izatnagar and continues to be a lay inseminator in and around his village. Presently he is rearing five buffaloes and produces about 30 litres of milk per day. He is reaping the benefits from both dairy cooperatives and the private players since he pours milk to both of them. Out of the 30 litres milk produced per day, he pours about 10 litres milk to cooperatives which fetch him Rs. 30/- per litre while remaining 20 litres of milk is given to private persons at the rate of Rs. 33 to 35 per litre. However, the farmer perceives that he gets about Rs. 3-5 extra from private players as compared to dairy cooperatives. Since he happens to be secretary of the village level Dairy Cooperative society, he continues supplying milk to cooperatives alongside private milk vendors.

Mr.Yadav who is involved in dairying from almost 30 years perceives that over the years, dairy cooperatives are under threats due to their political and vested interests. Although he has visited few institutions like NDDDB, Anand, and Milk Unions in Rajasthan and Gujarat, long back with the help of Parag Cooperatives under farmer visit programmes, such types of exposure visits are not being organized by the cooperatives currently. Several extension activities such as training, distribution of literature etc. were delivered by Parag Cooperatives long ago. None of these activities are currently organized. "The quality of feed supplied through the societies is inferior compared to the produce supplied by other feed manufacturing companies", he said. Mr Singh feels that the government has to intervene in this matter and save dairying and dairy cooperatives in Bareilly District of Uttar Pradesh.

Also, there is a need to prioritize the most strategic extension activities and pursue these based on a transparent and participatory exercise. The research base in this area is virtually missing and the extension research professionals need to contribute to this area quickly.

Even after four decades of dairy cooperative development, dairy cooperatives cover only less than a

quarter of Indian milk market. The cooperatives have to compete with several new organized private dairies which are emerging in various parts of India. The dairy cooperatives need more support in strengthening their extension and advisory services if they have to expand their membership, milk procurement and most importantly retain the member loyalty which is essential for their milk operations.



Information and Communication Technology (ICT) tools can support rapid information dissemination which has to be explored for supporting dairy farmers in India. Use of rural tele-centres, touch screens and expert systems in providing new knowledge to farmers needs consideration. Computerised milk collection and payment systems are

increasingly used in milk societies currently. Further, mobiles can also be used to deliver messages to the member farmers on timely basis. The mobiles services can be in the form of text or audio messages to serve all the member farmers of the cooperatives. There are very few studies that looked at the role of ICTs in extension and advisory provision.

**Box 11: Use of touch screen kiosks to improve knowledge on animal husbandry**

The Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry developed a touch screen kiosk to provide access to cattle owners to improve their knowledge on scientific animal management. This device is an ordinary computer made interactive through the touch screen facilities which include demand driven information presented in easily understandable local language added with graphics like animations (Rao et al., 2011). The farmers have mentioned that there was an improvement in the health of the cattle (eg. less cases of mastitis, repeat breeding and tick infestations) after utilizing the information accessed from the kiosk and other extension media (Ram kumar et al., 2004). In the similar ways, ICT can act as a very strong mode of information dissemination for the member producers.



# 5

## CONCLUSIONS

Even though the dairy co-operatives cater only to a limited percentage of milk producers in the country, there has been realisation in the public policy arena that milk producers are served better under co-operatives than without it. The dairy cooperative members in most cases have more knowledge on management of animals compared to non-members. There is very little documentation on the contribution of dairy cooperatives in delivery of extension and advisory services.

The dairy cooperatives are delivering a wide range of dairy production services such as breeding, health care and milk procurement. Over the years, the quality of these services has declined considerably. Farmers' main expectation from POs is remunerative price for their produce. Intangible services such as knowledge provision though EAS has been less valued both by the management of cooperatives as well as the dairy farmers.

The importance of extension services in enhancing the productivity and profitability of dairy enterprise is yet to be realised by all the stakeholders involved in

dairy cattle production. There is a need to strengthen the EAS provision by the dairy cooperatives so that it contributes to adoption of new knowledge and enhanced income for dairy farmers.

Farmers' knowledge and support requirements need to be assessed in a participatory mode so that area specific tailor made training programmes could be designed for different categories of dairy producers. Most dairy cooperatives lack relevant extension infrastructure such as training halls, display boards, audio-visual aids, mobile extension centres, farm literature and other publications. The potential of Information and Communication Technologies (ICTs) should also be exploited to disseminate information to the member producers.

Women being the main actor behind the management of dairy cattle, there is a need to organize more programmes for women dairy farmers. Women para-extension workers can play a major role in reaching women dairy farmers better and therefore identifying, training and retaining women para-extension workers should receive priority attention.

# 6

## RECOMMENDATIONS



The dairy cooperatives need to be viable and sustainable to realize the basic objective of providing a remunerative market for their milk producer members. This calls for a long term objective of investing in providing effective dairy extension services.

The Milk Unions must strengthen their procurement and technical input wings to make the technical inputs and extension services accessible to the milk producers.

The three tier structure, milk coops at village level, unions at District level and Federations at state level must be managed professionally to protect the interests of both milk producers and consumers. If not, the milk producers controlling the entire market chain of milk and milk products through efficient functioning of producer coops remain a distant dream.

To infuse confidence among the milk producer members the milk unions must install Automatic Milk Collection units which are transparent and fast in

assessing the quality of milk. Depending on the age old methods of testing milk quality and delays in payment to the producers is identified as the main reasons for the failure of the milk coops.

The Milk unions must involve and take advantage of the available professionals in the nearby institutions which include State Department of Animal Husbandry, Veterinary Colleges, Krishi Vigyan Kendras, District Rural Development Agency etc. to strengthen their extension services. ,

The milk unions must also take advantage of the presence of “progressive” dairy farmers in the milk shed area in horizontal transfer of technologies and information to other milk producers.

An exclusive "Extension Wing" may be created at the Milk Union and Milk Federation level to co-ordinate dairy extension activities. Infrastructure for organizing extension activities at the society, Union and Federation level needs strengthening. Women extension workers



must be promoted to disseminate the technologies to the women dairy farmers.

At central level, a coordinating unit dealing with livestock extension services through POs may be set-up to assist member producers. This unit may be located at the Department of Animal Husbandry, Dairying & Fisheries (DAHDF).

The Milk unions may initiate research to assess the training needs of the milk producers, availability of milk, constraints in milk production etc. with the active participation of all the stakeholders including milk producers. They can also emulate successful unions by studying those unions and also learn lessons from the failure unions.

Extension researchers should undertake studies on performance of producer cooperatives in provision of extension

services; enhancing capacities of para-vets in dairy extension: strengths and weaknesses of different models of POs such as producer cooperatives and producer companies; role of NGOs in establishing and strengthening dairy producer organisations; evaluation of schemes and programmes on dairy extension; use of ICTs in dairy extension; extension activities of private dairies etc.,

Efforts should be made to promote the role and contribution of cooperatives in dairy development and farmer empowerment. Indian Livestock Policy-2013 does not mention the role of POs particularly dairy cooperatives in livestock extension and advisory services. A policy in this regard must be framed and followed up by an operational manual that clearly illustrates how the policy objectives can be achieved.



# 7

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## INTERVIEW SCHEDULE FOR FARMERS

1. Name of the respondent: .....Village: .....
- 2 Age of Respondent (Years): .....3. Education:.....
4. Occupation: .....5.Landholding: ..... Acres
6. Livestock Possession (Mention No)..... 7. Annual Income: Rs .....
8. Social Participation: (Member of organization in No. s):.....
9. Source of Information:.....
10. Major decision maker in the family: .....
11. Are you a member of dairy cooperative? .....
12. **Livestock Extension service delivery for dairy farmers**

Sl. No	Types of extension service	Service delivery by cooperative			Any other agencies delivering similar services			Name of the agency	Which agency is preferred
		Y	N	D	Y	N	D		
1	Training programmes								
2	Demonstrations								
3	Field visits/Tour								
4	Advisory services								
5	Farm literatures								
6	Through ICT tools								
7	Hands on training								
8	KisanGhosti								
9	<i>Kisan/ PashuMela</i>								
10	Exhibition								
11	Campaign								
12	Film/Video show								
13	Group discussions								
14	Puppet shows								
15	Information kiosk								
16	TV/Radio Programme								

(Y-Yes N-No D- Don't know)

**13. Livestock Extension service delivery for dairy farmers**

Sl. No	Types of extension services	Amount Paid			Satisfaction level		
		Free	Nominal	Costly	Highly satisfied	Satisfied	Not satisfied
1	Training programmes						
2	Demonstrations						
3	Field visits/Tour						
4	Advisory services						
5	Farm literatures						
6	Through ICT tools						
7	Hands on training						
8	KisanGhosti						
9	<i>Kisan/ PashuMela</i>						
10	Exhibition						
11	Campaign						
12	Film/Video show						
13	Group discussions						
14	Puppet shows						
15	Information kiosk						
16	TV/Radio Programme						

**14. Among all the above mentioned services which services are most important and why?**

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

**14. Constraints in availing extension services**

Sl. No	Constraints	Constraints		Severity of constraints		
		Yes	No	Most serious	Serious	Not serious
1	Lack of skilled Extension staff					
2	Ext. services are not available in time					
3	Unfriendly attitude of Extension staff					
4	Costly services					
5	Services are restricted to dairy animals					
6	Non-availability door-step Ext. services					
7	Poor credibility of Ext. information					
8	Lack of women Extension officers					
9	Focuses mainly on theoretical aspects					
10	Complex farmers literature					
11	Advisory services are not need based					
12	Lack of time					
13	Lack of awareness about Ext. activities					
14	Breeding and health care services are sufficient					
15	Political intervention					
16	Irrelevant/Complex technologies					
17						
18						

**15. Suggestions of dairy farmers to improve Extension service delivery**

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

## QUESTIONNAIRE FOR STAFF &amp; KEY FUNCTIONARIES

1. Name: ..... 2. Designation:.....  
 3. Age of Respondent (Years): .....4. Professional Experience (Years):.....  
 5. Education:..... 6. Employee of Cooperative: Yes/ No  
 7. Any other services so far:  
 8. Are you professionally in contact with Dairy Cooperatives?  
 9. If Yes, How are you in contact ? .....

## 10. Livestock Extension service delivery for dairy farmers

Sl. No	Types of extension service	Do you deliver following services			Any other agencies delivering similar services			Name of the agency	Which agency is performing well
		Y	N	D	Y	N	D		
1	Training programmes								
2	Demonstrations								
3	Field visits/Tour								
4	Advisory services								
5	Farm literatures								
6	Through ICT tools								
7	Hands on training								
8	KisanGhosti								
9	<i>Kisan/ PashuMela</i>								
10	Exhibition								
11	Campaign								
12	Film/Video show								
13	Group discussions								
14	Puppet shows								
15	Information kiosk								
16	TV/Radio Programme								

(Y-Yes N-No D- Don't know)

11. Are you in regular contact with cooperative staff and member farmers... Yes/No

12. Do you assess the information need of dairy farmer: Yes/No

13. If yes, how do you assess?...

.....  
.....

14. How do you build capacity of cooperative member farmers?

.....  
.....

**15. Perception of officials towards cooperative Extension service delivery**

Sl. No	Types of extension services	Are you satisfied with delivery of Extension services			Suggestions for effectivedelivery of Extension services
		Highly satisfied	Satisfied	Not satisfied	
1	Training programmes				
2	Demonstrations				
3	Field visits/Tour				
4	Advisory services				
5	Farm literatures				
6	Through ICT tools				
7	Hands on training				
8	KisanGhosti				
9	<i>Kisan/ PashuMela</i>				
10	Exhibition				
11	Campaign				
12	Film/Video show				
13	Group discussions				
14	Puppet shows				
15	Information kiosk				
16	TV/Radio Programme				
17					
18					

**16. Constraints in delivery of Extension services. (Please categorise constraints as Human resource, Financial, Policy related, Administrative and miscellaneous constraints)**

**15. SWOT Analysis of dairy cooperatives (Strengths, Weaknesses, Opportunities & Threats)**

**16. Any other relevant information.**

### Synthesis of E-Discussion

E-Discussion on “Role of Producer Organisations in Strengthening Extension and Advisory Provision in the Dairy/Livestock Sector in India” was conducted during 18<sup>th</sup> August, 2014 to 5<sup>th</sup> September, 2014. This discussion received a total of 72 posts by about 20 participants who included researchers, policy planners, Extension personnel, research scholars etc. The aim of this E-Discussion was to take stock of the current status and analyse the role of Dairy cooperatives in strengthening Extension and Advisory services and draw conclusions for the future.

A Background Document was prepared before the discussion (<http://www.aesa-gfras.net/Resources/file/E-Discussion%20on%20POs%20and%20Extension%20-%20Announcement%20August%202014.pdf>). This document provided a description and overview of the role of Producer organization especially dairy cooperatives in accessing inputs, services, markets and knowledge. This document presents a summary of the discussions and issues. The conference was moderated by Dr Mahesh Chander, Principal Scientist & Head, Division of Extension Education, Indian Veterinary Research Institute (IVRI) and Dr R Saravanan, Associate Professor (Extension Education & Rural Sociology), Central Agricultural University (CAU), Pasighat. The moderation was not over-prescriptive thus allowing the discussion to evolve naturally and focused only on the true crosscutting issues. The major points that emerged from this e-discussion are summarised below:

- Case studies about success and failure of POs may be well documented and strategies may be framed accordingly.
- Field based studies need to be emphasized to assess the role and impact of POs in Extension and advisory services.
- There is a need to explore the sustainability of extension services by POs (Ex: dairy cooperatives) once the financial support is withdrawn.
- POs esp. SHGs and dairy cooperatives are successful in few cases. Major positive lesson can be drawn from such cases.
- Since livestock/dairy sector in India is feminized, female extension workers may be identified and well supported accordingly.
- Methods and modalities for establishment of exclusive Extension wing or coordinating unit may be looked for including their role and functioning at all the levels.
- Since majority of the Extension activities have poor observability and slow returns, specific activities may be prioritized for depicting the role of extension activities for direct and tangible benefits.
- There is a need to prioritize the most strategic extension activities and pursue these based on a transparent and participatory exercise.
- Different models of EAS and livestock research viz. para-vet based revenue model, PO-NGO partnerships etc. may be explored based on the field experiences.
- Effective collaboration of POs and other organizations (SDAH, private agencies etc.) may avoid duplication of efforts in terms of human resources, budget etc.

- Role of different models of EAS delivery including use of ICTs (websites, mobiles, expert systems etc) need to be assessed and strengthened accordingly.
- Market based extension and advisory provision must be prioritized.
- The POs must effectively address these challenges with the help of other actors in the Livestock Innovation System
- The role of POs needs to be highlighted in policy documents (NLP-2013) in the provision of EAS.
- Livestock farmers in India should be organised as SHGs, Farmer Producers' Organization, Producer Companies etc. to have better access to credit, inputs and markets.
- Their role in livestock extension and advisory service provision has to be explored in detail.
- Urgent need to follow different Extension strategies depending on the socio-economic background of livestock farmers.
- The potential of ICTs for EAS through POs must be explored (Ex: Expert systems at milk collection centres).
- POs (esp. Cooperatives) face several challenges such as quantity and quality of human resources and constraints related to financial management, administration and policy matters.

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