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Constraints in Convergence for Dairy Development: A System's Analysis

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ABSTRACT

The study was conducted in Haryana - the state of India which is well known for its bovine wealth. The study was conducted to identify constraints in convergence of different agencies working for dairy development. The respondents constituted 50 animal scientists working in state veterinary university and research institutes of Indian Council of Agricultural Research (ICAR) representing disciplines like extension, Livestock Production and Management(LPM) animal nutrition, reproduction ,medicine, etc. Also 50 field functionaries working in Hisar district of Haryana state were the respondents for the study .Out of which there was randomly selected 30 field veterinarians and 20 senior officials working in ATMA, dairy cooperatives, lead banks, DRDA, input agencies and NGOs. After a thorough editing, 31 constraints in convergence of different agencies working for dairy development emanating from interaction with them were identified for eliciting the response on 5 point continuum. Thus serious and comparatively less serious constraints were identified by subjecting the data to k-means cluster analysis. The constraints in convergence so identified were classified into different groups. The analysis grouped 31 items into 5 clusters and each included 10 administrative, 11 functional, 6 operational 2 organizational and 2 policy related constraints. The study further endeavored to identify serious and comparatively less serious constraints in convergence of different agencies for dairy development.

Keywords: Buffalo, constraints, dairy, convergence,

INTRODUCTION

There is an increasing demand among the farmers for knowledge on improved dairy technologies. However, due to lack of convergence among the different agencies involved in dairy promotion, these needs are not sufficiently met. The public animal husbandry extension system is very weak and has failed to respond to the demands for knowledge support as it doesn't have adequate human and financial resources. Moreover, its bureaucratic nature of functioning and the huge load of administrative responsibilities on its field level workers have rendered the public extension services supply driven rather than demand driven. Without convergence of efforts by the varied public, private and Non- government organization (NGO) agencies involved in dairy development, it will not be possible to reach a large number of farmers with the new and improved knowledge. The word convergence has been derived from Latin word 'convergere' which means to incline together. Thus, convergence is mainly sharing of ideas, resources, manpower, knowledge and experiences of different entities which have different backgrounds for a common purpose *i.e.* enhancing production, productivity and income of dairy farmers resulting into synergistic effects of their combined efforts.

Systems and institutions co-exist addressing the needs of farming community so as to derive synergistic advantages of both. There are pluralistic extension organizations working in the state. A lot of manpower is being utilized in this process. There is duplication of efforts with multiplicity of agents in extension work without convergence or coordination, resulting in loss of efficiency. In order to reduce the redundancy, repetition and better utilization of scarce resources, convergence and better linkages are required. Each and every organization has comparative advantages over the other. For example dairy cooperatives and state department of animal husbandry have reach to every village while research institutions have limited reach. Therefore, single development agency and research institution may have

ICAR- Central Institute for Research on Buffaloes Hisar, Haryana

limitations of time, resources and infrastructure. That is why convergence is needed: a clear strategy for a planned multi-stakeholder involvement with mandated activities as per the expertise, to supplement and complement the efforts and to ensure effective involvement of community partnerships (Mukherjee and Maity, 2015). The State Department of Dairy and Animal Husbandry (SDAH) is implementing several development programs by expending huge resources in order to enhance the income of the farmers. In addition, other organizations like, dairy cooperatives, veterinary universities, Indian Council of Agricultural Research (ICAR) institutions, financial institutions, input companies, Agricultural Technology Management Agency (ATMA), District Rural Development Agency (DRDA) and Non Government Organizations (NGOs) are also working for farmers. But most of these agencies are working in isolation and the adoption of improved practices by farmers is limited. In the case of research, institutions such as Central Institute Research on Buffaloes (CIRB) Hisar, National Dairy Research Institute (NDRI), Karnal Lala lajpat Rai University of Veterinary an Animal Sciences (LUVAS) ,Hisar and are converging with each other through network projects, National Agricultural Innovation Project (NAIP) projects and also on few occasions like workshops and meetings for technology reviews. But these events are not organized on a regular basis. Therefore, it was felt that there are constraints in working together and convergence though it can benefit all of them. Thus, in order to strengthen dairy extension system it became imperative to find out constraints in convergence of different agencies. The study was planned and conceptualized with the following objectives: To study the seriousness of constraints in convergence of different agencies working for dairy development and to classify the constraints in convergence identified into different categories.

METHODOLOGY

Dairy development is a function of number of factors, feeds inputs, marketing, prices, etc. It was therefore postulated to examine the issue in a holistic manner following system's approach because of the cumulative and interactive effect rather than influence of any single agency. Thus the study sample included scientists and field functionaries. The study sample constituted 50 animal science scientists representing disciplines like extension, LPM animal nutrition, reproduction and medicine having at least five years of experience and participated in development activities more frequently. Also 50 field functionaries working in Hisar were the respondents for the study out of which there were 30 field veterinarians and 20 senior officials working in ATMA, dairy cooperatives, lead banks, DRDA, input agencies and NGOs.

To find out the constraints in convergence in dairy and animal husbandry extension system, a list was prepared on the basis of review of literature, discussion with animal scientists, field functionaries, ATMA officials, dairy cooperatives, DRDA officials, input agencies and NGOs. A pilot study was conducted to make this list comprehensive and complete. After a thorough editing, 31 constraints emanating from interaction with different agencies were identified for eliciting the response on 5 point continuum ranging from 'most serious' to 'not at all serious' with respective scores of 5 to 1. Thus serious and comparatively less serious constraints were identified by subjecting the data to k-means cluster analysis. The constraints in convergence so identified were classified by using k-means cluster analysis into different categories.

k-means clustering

The main idea is to define k centers, one for each cluster. These centers should be placed in a specific way because of different location causes different result. So, the better choice is to place them as much as possible far away from each other. The next step is to take each point belonging to a given data set and associate it to the nearest center. When no point is pending, the first step is completed. At this point we need to re-calculate k new centroids as barycenter of the clusters resulting from the previous step. After we have these k new centroids, a new binding has to be done between the same data set points and the nearest new center.

Given a set of observations ($x_1, x_2, \ldots, x_n$), where each observation is a d-dimensional real vector, k-means clustering aims to partition the n observations into k ($\leq n$) sets $S = \{S_1, S_2, \ldots, S_k\}$ so as to minimize the within-cluster sum of squares (WCSS) (*i.e.* variance). Formally, the objective is to find:

$$\arg\min_{\mathbf{S}} \sum_{i=1}^{k} \sum_{\mathbf{x} \in S_i} \|\mathbf{x} - \boldsymbol{\mu}_i\|^2 = \arg\min_{\mathbf{S}} \sum_{i=1}^{k} |S_i| \operatorname{Var} S_i$$

where μi is the mean of points in Si. This is equivalent to minimizing the pairwise squared deviations of points in the same cluster:

$$\sum_{\text{Cluster } C_i} \sum_{\text{Dimension } d} \sum_{x,y \in C_i} (x_d - y_d)^2$$

Because the total variance is constant, this is also equivalent to maximizing the squared deviations between points in different clusters (between-cluster sum of

squares, BCSS). The term "k-means" was first used by James Mac Queen in 1967 idea goes back to Hugo Steinhaus in 1957. The standard algorithm was first proposed by Stuart Lloyd in 1957 though it wasn't published outside of Bell Labs until 1982.

RESULTS AND DISCUSSION

The schedule was administered to different categories of respondents to study constraints in convergence of agencies working for dairy development, i.e. scientists and field functionaries. The response was elicited on 5 point continuum from most serious to not at all serious and these were scored 5 to 1 respectively .Thus serious, and comparatively less serious constraints were identified by subjecting the data to k-means cluster analysis and groups emanating from the analysis were classified and named accordingly.

Table 1: Cluster analysis of constraints in convergence of dairy extension system

Constraints in convergence	Clustering of constraints	
	Distance to centroid	Classification
Lack of staff for convergence in some agencies	4.730	Administrative
Lack of understanding about roles and expectations of each other	6.243	Administrative
Unfavorable attitude towards convergence	7.441	Administrative
No funds for convergence activities specially	5.794	Administrative
Institutions of dairy development have different funding agencies	6.047	Administrative
ATMA dealing with many schemes, therefore, problems in identification of areas of convergence	6.014	Administrative
ATMA confined to crop improvement mainly	4.332	Administrative
Poor linkage of ATMA especially with animal husbandry	4.814	Administrative
No systematic review of existing mechanism of convergence like C-DAP & RKVY, SREP of ATMA and PLPs of NABARD	6.401	Administrative
Strategic research and extension plan of ATMA not known to rest of the agencies	5.232	Administrative
Egos create problem in convergence as nobody wants encroachment over rights	6.634	Functional
Unaware about the strengths of each other	7.059	Functional
Lack of orientation regarding convergence	7.508	Functional
Lack of opportunity for interface amongst different agencies	4.844	Functional
Lack of appreciation about the benefits of convergence amongst stakeholders for convergence	6.823	Functional
Lack of linkages among line departments	6.001	Functional
Lack of awareness amongst different agencies about available latest technologies for convergence	6.896	Functional
Absence of professionals at field level to provide technical support for preparation of viable projects for convergence	7.423	Functional
Lack of unified planning, implemental and monitoring mechanism	7.324	Functional
Lack of institutional mechanism for convergence	5.569	Functional
No documentation of success stories regarding convergence	7.027)	Functional
Lack of training of representatives of agencies for convergence	5.824	Operational
Lack of MOUs for convergence among different line departments	4.752	Operational
Lack of leadership to initiate convergence	3.905	Operational
Lack of trust amongst different participating agencies	5.708	Operational
Lack of participation of different agencies in ATMA meetings	5.377	Operational
Own infrastructure and resources are available. Thus, need of convergence not felt.	5.679	Operational
Different administrative setup of institutions	4.153	Organizational
No shared targets, responsibilities and mutually agreed program	4.153	Organizational
No instructions from higher officials of different agencies regarding convergence	6.265	Policy-related
Long procedures to take permission from higher authorities for collaboration	6.265	Policy-related

Classification of constraints

For further grouping of constraints identified in convergence of different agencies, the data collected from scientists and field functionaries on five point continuum were subjected to k-means cluster analysis and 31 constraints were identified and grouped into different categories (Table 1). The centroid of the k-clusters was used for grouping. Thus on the basis of responses of scientists and field functionaries 31 constraints were classified into 5 clusters which were named as administrative, functional operational ,organizational and policy related .

Cluster pertaining to administrative constraints included 10 items. Out of these, constraints ATMA confined to crop improvement was having minimum distance from centroid (4.33), followed by lack of staff (4.73) and poor linkages of ATMA specially with animal husbandry (4.81). The study was in line with the contentions of (Chander et al, 2010) who also reported about poor linkages and lack of staff and funds in public sector extension system. While unfavorable attitude towards convergence was located at a maximum distance (7.44). It can be inferred that the constraints which were near to centroid were considered serious while those at a distance were perceived comparatively less serious. Thus administrative constraints in convergence like poor linkages of ATMA should be addressed through regular interactions with different line departments including animal husbandry. Higher ups in each department should be sensitized about the need of convergence for dairy development. Jain (2015) suggested that a national level coordination committee may be constituted to develop better linkages amongst various agencies.

Cluster related to functional group contained 11 items. Lack of opportunities for interface amongst different agencies (4.8) was at a minimum distance from the centroid followed by lack of institutional mechanism for convergence (5.5), lack of linkages of animal husbandry with other line departments (6.0) and lack of

appreciation for convergence (6.8). Absence of professionals at field level to provide technical support for preparation of viable projects for convergence (7.4) was at a maximum distance from the centroid. Thus to address functional constraints more and more opportunities should be created through close interaction so that they develop better understanding of each other's strengths. For convergence different line departments should address the problems of farmers jointly through ATMA as it is mainly responsible for this purpose.

Six constraints were grouped in operational category. Lack of leadership to initiate convergence (3.9) was considered most serious followed by lack of MOUs for convergence among different line departments (4.7) and lack of participation by different agencies in ATMA meetings (5.3) while lack of training of representatives of different agencies for convergence was perceived as comparatively less serious (5.8). Thus for convergence of programs some agency must take initiative besides ATMA which is basically meant for this purpose. State department of animal husbandry must take initiatives for convergence with different agencies like research institutions, KVK etc as they have set up in each village.

There were only two constraints in organizational category and both were considered serious by the respondents. Different administrative set of agencies and no shared targets, responsibilities and mutually agreed programs were identified in these categories which were at an equal distance from the centroid (4.1). Thus for better convergence efforts may be made to fix the targets of different agricultural development programs jointly. .Mutually agreed programs may also be developed for this purpose .Similar findings were reported by Jain (2015).

Cluster pertaining to policy related group contained two items and they were; no instruction from higher ups regarding convergence and long procedure to take permission for convergence from higher ups (6.2). Thus, there is a need to address these constraints in convergence at the highest level. Heads of departments of each agency must encourage their departments to converge with other agencies for dairy development. Dixit et al (2016) also suggested the apex level committees may be constituted at the state level under the chairmanship of Animal husbandry commissioner to look into the issues of convergence in animal husbandry extension system. Perhaps there is no appreciation for the concept of convergence amongst the agencies working for dairy development in the state. Therefore there is a need to popularize the concept of convergence through regular workshops, meetings and campaigns. Venkata-subramanian *et al* (2009) also proposed model of convergence for agricultural development. It was emphasized that better linkages may be established amongst agencies and various line departments to address the issues for convergence. This can also be achieved by the agencies working for dairy development by understanding roles and expectations of each other and designing programs jointly which promote convergence. Kumar and Vijayraghvan (2007) also stressed on integrated extension services.

CONCLUSION

There is a need to address these constraints in convergence of different agencies working for dairy development at the highest level. Heads of departments of different agencies may be sensitized about the benefits of convergence. Concept of convergence may be popularized through regular workshops meetings campaigns etc. Better linkages may be established among different agencies and line departments through ATMA to reduce redundancy, repetition and proper utilization of scarce resources.

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