

## **Dynamics of Linkage among the Stakeholders Involved in Dairy Farming in Kerala**

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### **ABSTRACT**

Effective transfer of a technology in dairying may depend on various actors like researchers, extension officials from animal husbandry and dairy development departments, cooperative societies and other enterprises related to input and output markets. The study was undertaken in Kerala to identify and analyze the major stakeholders involved in dairy farming in the State. The total of 200 respondent farmers and stakeholders from research and extension domain in the study area were selected randomly. Linkage index was used to analyze the linkage activities between the stakeholders in the study area. Among the technology dissemination activities, research- extension linkage was strong with involvement of researchers as resource person for training programme organized for extension personnel and involvement in animal health and veterinary services. Among technology development activities, a research extension linkage was weak in identifying research problems from field level. There is strong linkage between the extension and clientele in health and veterinary service and involvement in training programmes and seminar. Among the technology dissemination activities, the linkage between research clientele is strong in organizing training programmes, exhibitions and mela. There is weak linkage between research clientele in technology development activities. Overall linkage index is strong in extension clientele linkage, moderate in research extension linkage and weak in research clientele linkage. The linkage between the research-extension is dominated by training, workshop/seminar and farm publication followed by field days and dairy mela. The linkage between the extension-clientele is dominated by training programmes, seminar, farm publications, exhibition, demonstration, field days and dairy mela.

**Keywords:** Clientele, dairy farming, extension, linkage, research, stakeholders, technology.

### **INTRODUCTION**

Stakeholder' is a term commonly used to identify those actors who have a stake or an interest in an issue or activity and is important for improving the functioning of the system. In general, stakeholders can be grouped in several ways, such as "who is concerned, who finally makes decisions, who works and benefits, and who is actively collaborating" (Gerster, 2015). A Stakeholder is operationalized as any person, organization, or society has major stakes in increased milk production.

Multi-stakeholder approach was proposed for use in agricultural research and development, as it was successfully used in a few other sectors in some countries and reported a surge in productivity (Hemmati, 2012). Under this arrangement each stakeholder's group carries out the task they do best based on their competencies, resource domain and mode of operation (Adekunle &

Fatunbi, 2012). Strengthening the linkage between all the actors of innovation is important to hasten the information/knowledge or technology transfer system and also to increase the effectiveness of the developed and disseminated technologies. Each stakeholder possesses unique and complementary strengths and should be best positioned to avoid duplication of efforts and to create genuine decisions on agriculture and dairy investment. Participation of key stakeholders reduces the risk of the development of inappropriate technologies. There is rampant scope to improve the present condition of farmers' information and technology needs through team efforts of different actors. Research and extension need to be in synergy, so as to motivate and encourage the farmers towards scientific dairy farming.

### **METHODOLOGY**

The study was conducted in Kerala State owing to the

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high potential for increased dairy production, as 87.00 per cent of total cattle population of Kerala is exotic/cross bred cattle. Considering the topographical parameters, representative district from each region of Kerala is selected for the study through random sampling method. From each districts, two villages were selected and from each village twenty five farmers were randomly selected for the study. The total number of the respondent farmers comprises 200 from the selected villages. Stakeholders from research and extension domain in the study area were selected randomly. Data collection was done using the structured and pilot tested interview schedule developed for the intended purpose.

### Linkage Index

Linkage index developed by Devi (2004) was used to measure the linkage between selected stakeholders under Research –Extension linkage, Research Clientele linkage and Extension Clientele linkage. The frequency of linkage activity was ascertained on a three point continuum as frequently, occasionally and never with the scores 2, 1 and 0 respectively. Extent of linkage was measured based on the scores obtained against frequency of activities. Linkage index was calculated by using the following formula

$$\text{Linkage Index} = \frac{\text{Actual score obtained}}{\text{Maximum possible score}} * 100$$

Based on the index values obtained, the extent of linkages was categorized into strong, moderate and weak. The cumulative frequency method was used for categorization.

## RESULTS AND DISCUSSION

### Extent of linkage among research, extension and clientele system

#### Research extension linkage

**Table 1: Research-Extension Linkage expressed by researcher**

List of items	Linkage Index	Category
Technology Development Activities		
Involving extension personnel in identifying research problems	40.00	Weak
Involving extension personnel in evaluation of technologies	55.00	Moderate
Discussing with extension personnel to get feedback from dairy farmers	50.00	Moderate
Technology Dissemination Activities		
Involvement in workshops and seminar	66.66	Moderate
Participating as resource person for training programme organized for extension personnel	100.00	Strong

Involvement in field days/farmer days	60.83	Moderate
Involvement in Dairy Mela /Exhibitions/Livestock shows	58.33	Moderate
Involvement in farm broadcast and telecast	60.00	Moderate
Technical article publication	66.66	Moderate
Involvement in animal health and veterinary services	100.00	Strong

It is observed from the Table 1 that among the technology dissemination activities, research-extension linkage was strong in involvement of researchers as resource person for training programme organized for extension personnel and involvement in animal health and veterinary services. The linkage was moderate in case of involvement in field days/farmer days, workshops, seminar, dairy mela, exhibitions/livestock shows, involvement in farm broadcast and telecast and technical article publication.

It may be due to the fact that the ultimate aim of all the research and extension activities is to transfer the technologies to field level. Hence the research and extension system may work synergically for technology dissemination of dairy technologies through involvement in seminar, training programme, animal health and veterinary services, farmer's day, mela *etc.*

Among technology development activities, research extension linkages were moderate in evaluation of technologies and in getting feedback from dairy farmers. It may be due the fact that the field situations are known or realized by the extension system due to their regular contact with the farmers. The weak linkage in identifying research problems from field level may be because technologies are developed based on the researcher expertise and institute mandates.

**Table 2: Extension-Research Linkage expressed by extension personnel**

List of items	Linkage Index	Category
Technology Development Activities		
Contacting researcher for knowing new technologies	52.00	Moderate
Helping researchers in identifying Research Problems	41.66	Weak
Helping researchers in evaluation of technology	54.00	Moderate
Give Clientele Feedback to researchers regarding new technologies	50.00	Moderate
Technology Dissemination Activities		
Involvement in workshops/seminar	60.00	Moderate
Involvement in training programmes	66.66	Moderate
Involvement in field days/farmer days	60.83	Moderate
Involvement in Dairy Mela /Exhibitions/Livestock shows	55.00	Moderate
Involvement in animal health and veterinary services with researchers	65.00	Moderate
Mean	57.31	

Table 2, indicated that among technology dissemination activities there is moderate linkage in case of involvement in workshops, seminar, training programmes, field days/farmer days, dairy mela, exhibitions/livestock shows and involvement in animal health and veterinary services with researchers.

Among technology development activities, research extension linkages were moderate in evaluation of technologies, in getting feedback from dairy farmers. It may be due the fact that the field situations are known or realized by the extension system due to their regular contact with the farmers. Also extension personnel often contact the researcher to get information on new technologies. The weak linkage in identifying research problems from field level may be because technologies are developed based on the researcher expertise and institute mandates.

### Extension Clientele linkage

Table 3, pointed out that among technology dissemination activities, there is a strong linkage between the extension personnel and clientele in health and veterinary service and involvement in training programmes and seminar. This could be due to the fact that clientele gives prime importance to animal health, as health of animals directly affects the milk production which in turn affects the economic return of the clientele. The clienteles have realized the importance of new and improved technologies at field level, to make dairy farming profitable, which implies the strong linkage in training and dissemination of technologies.

**Table 3: Extension-Clientele Linkage expressed by extension personnel**

List of items	Linkage Index	Category
<b>Technology Dissemination Activities</b>		
Involvement in Animal health and veterinary services	100.00	Strong
Involvement in demonstration of new technologies	65.00	Moderate
Involvement in infertility camps	54.44	Moderate
Involvement in clienteles day/field days	48.00	Weak
Conducting training programmes/seminars	82.00	Strong
Involvement in exhibitions/awareness campaigns	58.33	Moderate
Involvement in farm broadcast and telecast	48.00	Weak
Involvement in farm publication	51.11	Moderate
<b>Technology Development Activities</b>		
Meeting dairy clienteles for identifying field problems	72.22	Strong
Meeting dairy clienteles for field trials	50.00	Moderate
Involvement in feedback	61.11	Moderate
Mean		

Moderate linkage was found in involvement in infertility camps, exhibitions/awareness campaigns, demonstrations and farm publications for clienteles. This

may be due to the fact that extension system is disseminating the technologies through various extension methods to reach the end users. Weak linkage was found in those activities which are organized in some district level like clienteles day/field day. It may be because of the lack of time for clienteles, to travel and participate in those activities in between the farming activities. Also extension personnel involvement in farm broadcast and telecast is weak. It may be because extension personnel are more focused on field level activities.

In technology development activities, strong linkage was found because extension system have close contact with the clienteles and can better understood the field level problems. Moderate linkage between extension and clientele system in field trials and feedback activities may be because field trials are mainly conducted by research system.

**Table 4: Clientele- Extension Linkage expressed by farmer**

List of items	Linkage Index	Category
Meeting extension personnel for animal health and veterinary services	100.00	Strong
Contacting extension personnel for getting technical advice for field problems	100.00	Strong
Participation in training programmes	68.00	Moderate
Involvement in demonstration of new technologies	66.73	Moderate
Involvement in farmers day/field days	46.00	Weak
Involvement in health and infertility camps	72.00	Strong
Involvement in exhibitions/ campaigns	48.00	Weak
Reading farm publications to update technologies	74.00	Strong
Giving feedback to extension personnel on technology performance	83.00	Strong
Mean	62.10	

The table 4, indicate the linkage exist between the clientele and extension system. Farmers have regular contact with the extension personnel for animal health and veterinary services and for getting technical advice on field problems. All the farmers maintain a better relationship with the extension personnel by involving in camps, giving feedback on technology performance. It may be because farmers have direct access to the extension personnel. Farmers used to read farm publications to update their information.

Weak linkage was found in those activities which are organized in some district level like exhibitions and campaigns and farmers day. It may be because of the lack of time for farmers, to travel and participate in those activities in between the farming activities.

### Researcher farmer linkage

Results on research clientele linkage as expressed by the researcher are presented in the Table 5 implied that among the technology dissemination activities, the linkage is strong in organizing training programmes, exhibitions and mela. Also there is strong linkage in providing advice during field visit and involvement in writing farm articles for farmers. Moderate linkage was found in involvement in farm broadcast/telecast and advice through phone calls/letters.

**Table 5: Research-Clientele Linkage expressed by farmer**

List of items	Linkage Index	Categories
Technology Development Activities		
Involving dairy farmers in identifying Field Problems	33.33	Weak
Involving dairy farmers in technology refinement	55.00	Moderate
Technology Dissemination Activities		
Organizing training programmes for dairy farmers	88.33	Strong
Organizing Farmers day/field day	66.66	Moderate
Organizing Exhibitions/Mela	72.00	Strong
Advice during field visit	78.00	Strong
Involvement in farm broadcast/telecast	60.00	Moderate
Involvement in farm articles	76.00	Strong
Advices through phone calls/letters	66.00	Moderate
Mean	66.14	

Table 6 indicated the linkage activities between clientele and research system as expressed by the farmers. The linkage is strong in case of reading farm articles by the farmers. The linkage was weak in case of meeting researchers at research institutes and during village visits for technical advice, involvement in farmers day/field day, involvement in exhibitions/mela, seminar/workshops, advices through phone calls/letters and involvement in discussions.

**Table 6: Clientele-Research Linkage as expressed by farmer**

List of items	Linkage Index	Category
Meeting researchers at research institutes for getting technical advice	30.00	Weak
Meeting researchers at villages during their visits	40.00	Weak
Participating in training programmes organized by research institutes	68.00	Moderate
Participating in farmers day programmes organized at research institutes	48.00	Weak
Participating in seminars/workshops organized at research institutes	33.50	Weak
Writing letters/phone calls to researchers seeking advice in dairy farming	34.00	Weak

Participating in discussions with researchers for solving field problems	30.00	Weak
Reading farm articles by researchers	74.00	Strong
Mean	44.68	

The possible reasons could be that the linkage activities organized in the villages had strong linkage, as the farmers need not spend time and expenditure to reach in between their farming activities. If the research system organize training programmes at the village level and field visit, the farmer participation is more for gaining knowledge and technical advice. Majority of the farmers regularly read the farm articles and listen to the radio and television programmes regarding agriculture and dairying, the linkage is strong in involvement of these activities.

In technology development activities, the research farmer linkage is weak in identifying field problems and involvement in evolving new technologies and the linkage is moderate in case of involvement in technology refinement. The possible reason might be the importance of linkage in these activities may not have been felt by researchers as well as the farmers and non availability of time for the activities. The linkage was moderate in technology refinement because it could be done by conducting field trials which needs farmer co-operation and participation.

Among the linkage activities between research-farmer, the linkage was comparatively more in technology dissemination than technology development. This could be due to the fact that the importance being felt by both the systems for technology transfer than development.

### Overall linkage Index

From the Table 7, it could be seen that the results of overall linkage index is strong in extension clientele linkage, moderate in research extension linkage and weak in research clientele linkage.

**Table 7. Overall linkage Index**

Type	Linkage Index	Category
Research -Extension Linkage	61.19	Moderate
Research Clientele linkage	55.41	Weak
Extension Clientele linkage	66.61	Strong

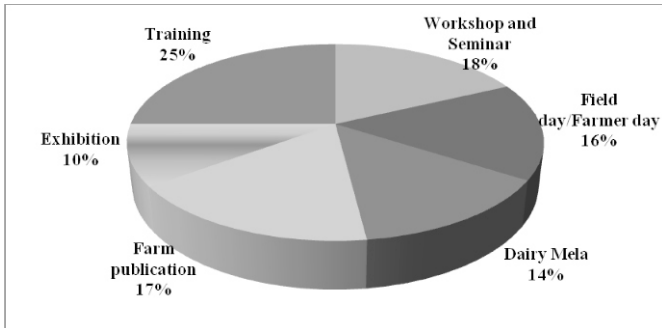
This could be due to the fact that the extension system has direct contact with the farmers and have regular field visit. Farmers are able to reach them directly at village level. Research institute and extension system mutually support in disseminating and implementing improved technologies at field level. Research institutes direct and

update the extension system through technical advices and training. The researcher in institutes and farmers in villages are apart from one another due to their exclusive sphere of work which does not bring them together.

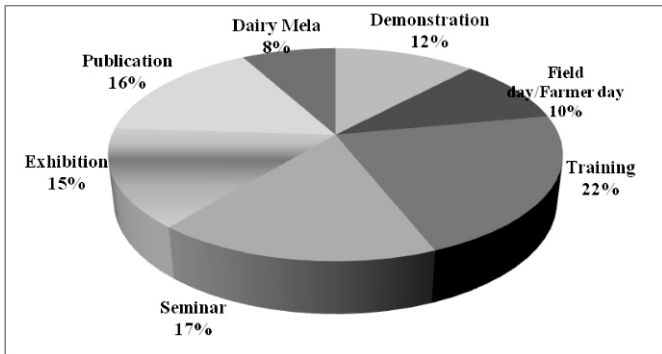
**Linkage Mechanism**

The linkage index, the major linkage mechanism between research-extension and clientele system is concluded and represented in Fig 1. and Fig 2. It is evident that the linkage between the research-extension is dominated by training, workshop/seminar and farm publication followed by field days and dairy mela. The linkage between the extension-clientele is dominated by training programmes, seminar, farm publications, exhibition, demonstration, field days and dairy mela.

**Fig. 1 Linkage Mechanisms among stakeholders involved in research and extension**



**Fig.2 Linkage mechanisms among extension and clientele system**



**CONCLUSION**

The research extension clientele linkage implies that linkage is more is technology dissemination activities compared to technology development activities. Overall linkage index is strong in extension clientele linkage, moderate in research extension linkage and weak in research clientele linkage and is dominated by training, workshop/seminar and farm publication. Technology development process in research system needs to include extension and clientele representation to ensure appropriate technology development and effective technology dissemination.

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