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Strengthening of Research-Extension-Farmers-Market Linkage

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Abstract **– Over the last few decades the major sources of agricultural growth have been diffusion of improved varieties, intensification of input usage and investment in modern technology. In areas where green revolution has had its major impacts, growth form these sources is now slowing down. Now latest technologies are needed to push out the yield frontier, utilize the inputs more efficiently, and diversify to more sustainable and higher value cropping patterns to realize more farm income. These knowledge intensive technologies require strong research-extension-farmer and market linkage mechanism to achieve the desired outputs the links between research, extension and farmers often tended to weaken over the time. Lack of a close working relationship between agricultural research and extension system and with different categories of farmers and farm organizations, is one of the most difficult problems. This ineffective link between research and extension has hinder the development and transfer of technology appropriate for small resource poor farmers, heterogeneous agro-ecological area. This paper deals with the major types of linkages, reasons for linkages failure, major problems in linkages i.e. political problems, technical problems, organizational problems resources problems, communicational problems, motivational problems and incentives problems linkages mechanism i.e. structural mechanism, organizational mechanism and managerial mechanism. After systematic analysis various approaches shall be used to strengthen linkage between research-extension farmers and market.**

Keywords **– Research, Linkage, Strengthen, Farmers, Problems, Mechanism.**

I. INTRODUCTION

The major sources of agricultural growth have been diffusion of improved varieties, intensification of input usage and investment in modern technology. In areas where green revolution has had its major impacts, growth form these sources is now slowing down. Now latest technologies are needed to push out the yield frontier, utilize the inputs more efficiently, and diversify to more sustainable and higher value cropping patterns to realize more farm income. These knowledge intensive technolo--gies require strong research-extension-farmer and market linkage mechanism to achieve the desired outputs the links between research, extension and farmers often tended to weaken over the time. Lack of a close working relationship between agricultural research and extension system and with different categories of farmers and farm organizations, is one of the most difficult problems. This ineffective link between research and extension has hinder the development and transfer of technology appropriate for small resource poor farmers, heterogeneous agro-ecological areas (Ewell, 1989) Problems in technology development and transfer functions because these function are treated in isolation (World Bank, 1985). According to a World Bank report, "Bridging the gap between research and extension is the most serious problem in developing an effective research and extension system". The age old problem of weak linkages between research and development and extension continues to beset the flow of information, knowledge and resources among actors in the technology - delivery - utilization system. As a result, farmers have limited options in making decisions on technologies appropriate to their specific farming needs and those within their local, social, cultural, economic and political environment (*Faylon and Acoba, 2002*). Poor linkages explain the present low adoption of technology and minimal research utilization in agricultural production systems. There is a growing mountain of shelved, perfected yet unutilized research outputs and there are large amounts of information getting tied up in journal publications targeted to peer groups rather than intended beneficiaries (*Smith et al, 2004*).

Research and extension systems generally compete over the same scarce government resources and frequently, these institutions do not see themselves as part of a broader system the Agricultural Technology System (ATS). Instead, they try to increase the flow and to resources coming to their respective institutions and to solve day to day management problems, rather than ensuring that their respective organizations contribute to the broader goal of getting improved agricultural technology to all major categories of farmers. In addition, the leadership and staff of many research and extension system do not appreciate the major roles that farmers or farmer organization can pay both in disseminating technology and through effective feedback mechanisms.

Utility and Types of Linkages: -

Indian agriculture has made rapid stepin achieving self-sufficiency in food production. However the pattern of growth has contributed for uneven development, across the region, crops and also different sections of farmer's community. It is essential that the farmers should be given access to linkage mechanisms through which they can clear their problems and needs in order to create a demand driven research and extension system.

Linkage mechanisms are used to channel information between groups and to conduct required tasks in the process of getting relevant technologies timely to farmers. Benefits of this mechanisms are

- Network all concerned and bring them together to share

idea, materials, information, expertise by the development chain.
- Mechanisms of information flow, material flow and providing necessary services.
- Ensure continuity in the absence of persons.
- Preserve continuous flow of updated information to the client system.

The true test of linkage is the achievement of the ultimate goal of increasing production, productivity, profitability within the overall context of the national economy.

Linkages can be Classified into Three Types:-

1. *Production Linkages:*

Maintaining regular flow of information from its source to the client system through Government and Non-government agencies including input supply and services.

2. *Technology Generation Linkages:-*

Developing new technologies to meet the emerging problems faces by the client systems as well as contingency measures to manage pest outbreaks and natural calamities.

3. *Post Production Linkages:*

With marketing agencies both for domestic and export markets to dovetail the products and services to suit the consumer preferences. Linkages with storage, transportati--on, packaging, agro-industries helps for value addition. Linkages with various commodity interest groups to identify the bottlenecks and get the feedback to improve the efficiency at all levels.

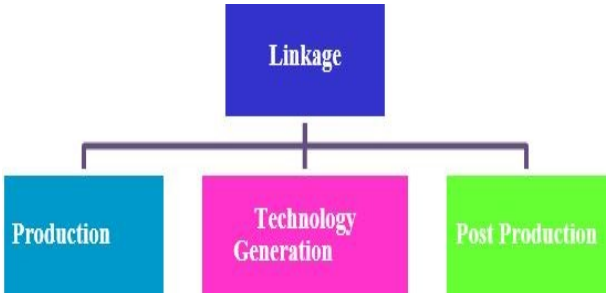

Fig.1. Types of Linkage

II. Reasons for Linkage Failure

In spite of several involvement through various extension and research programmes, still many gap exist among research-extension-farmers. These are mainly due to organizational functional or communication gaps which often lead to research results not reaching farmers or being irrelevant to their needs. These linkage problems among major stakeholders in agricultural development are extremely complex, involving technical, environmental organizational and human factors. The reasons for poor linkages between research and extension have been categorized into political, technical and organization, Resource, Communication, Motivational and Incentive

Fig. 2. Reasons for Poor Linkages

1. *Political Problems*
- Participation of the private sector is irrelevant in resource-poor areas, the pressure exerted by resource-poor farmers on research and extension is also negligible.
- Lack of external or internal pressure on system to achieve high levels of performance.
- External pressure could come from national policy makers, foreign donors, farmers or the private sector.
- Except in exceptional circumstances, such as disease outbreaks, major crop shortfalls etc. intervention by national.
- Policy makers is generally minimal.

2. *Technical Problems*
- Lack of independent authentication mechanism to check the linkages.
- Surplus emphasis on specialization.
- Lack of professional ethics and values.

3. *Organizational Problems*
- Treat the linkages with least priority.
- Researcher and extension personnel lack the system's perspective.
- Responsibility of conducting adaptive research, communication of research results or feedback from users to researchers is not generally assigned to individuals.

4. *Resource problems*
- Sufficient financial resources for linkage functions such as publications, testing of research results and training of extension workers are often lacking.

5. *Communication problems*
- Poor documentation skills of the extension workers and negligible feedback on problems and technology.
- Extension workers perceive searchers are developing technologies which are not useful at farm level.
- Researchers question extension workers capability to understand research outcomes to communicate properly with farmers.

6. *Motivational and Incentive Problems*

- Little incentive to perform linkage activities.
- Rewards for journal publication may be higher than those for performing linkage activities.
- No appreciation for the scientists involved in training functions.
- In house interaction in planning, implementing and assessing the training function is lacking in research institutions.

III. Linkage Principles

Since research and extension personnel have comple- - mentary roles in agricultural development, the success of each group is determined largely by the effectiveness of linkage activities. Therefore, appropriate mechanisms to strengthen linkages need to be developed. For developing such mechanisms it is important to understand the principles that determine the success of linkage activities. Mainly six principles of linkage have been identified (Zuidema, 1989):

- Sharing of a common purpose.
- Linkage activates should be compatible with other activities of each group.
- They should perceive that it is advantageous for them to participate in linkage activities.
- There should be common ground or proximity of location to facilitate collaboration.
- Rewards participating in linkage activities should be given.
- Communication between members of different groups should be effective and there should be free flow of information between groups.

IV. Linkage Mechanisms

The linkage mechanisms is the concrete procedure, regular event, arrangement, device or channel which bridges the gap between components of the system and allows communication between them (Roling, 1989). A number of mechanisms was identified which could be used to strengthen the research-extension linkage. Mechanisms over which policy makers may have control are categorized into structural, organizational and managerial.

The structural and Organizational Mechanisms are:-

- Joining research and extension functions into one unit.
- Farmer involvement in research activities.
- De-centralizing research and extension activities into regional institutions.
- Creating inter-agency committees.
- Developing inter-agency agreements for collaborati- - on.
- Staffing extension liaison positions in research institu- -tions.
- Establishing communication - cum - information departments.
- Redefining roles and responsibilities between research and extension units.
- Liaising with private organizations and NGOs.

The Managerial Mechanisms are:-

- Establishing joint reviews of research and extension activities.
- Redefining job descriptions to strengthen relationships.
- Improving individual incentives for collaboration.
- Changing evaluation procedures.
- Exchanging personnel.
- Joint training for elaborate roles in a technology system.
- Joint use of facilities and services.
- Joint participation in technology demonstrations.
- Promoting informal linkages.
- Exchanging information using jointly developed protocols.

Approaches in Strengthening Linkages-

Earlier the extension and research infrastructure in the country was strengthened under training and visit system through National Agricultural Extension Project (NAEP) and National Agricultural Research Project (NARP) with a view to establish better R-E-F linkages. The mechanism by which the linkages established was State Level Research Advisory Committees, Zonal Research and Extension Advisory Committees and Joint Diagnostic Teams, monthly/by-monthly workshops and fortnightly trainings at district level. This mechanism was very successful in providing two-way channel for transmission of research findings to farmers and feedback of the problems faced by the farmers to research system. Due to closure of World Bank supported project the R-E-F linkages have been considerably weakened. Therefore the following R-E-F-M linkage mechanism is implemented based on the experiences of Innovations in Technology Dissemination (ITD) component of National Agricultural Technology Project (NATP).

1. Institutional Mechanism to strengthen the linkage:- The challenging situation calls for systematic reforms of the Agricultural Technology.
2. System (ATS), both to strengthen linkages between research, extension and farmers and to achieve better system integration among agencies involved in technology transfer.

The following R-E-F-M Linkage Mechanisms have been implemented under Extension Reforms.

1. The State Level Inter-Departmental Working Group.
2. Agricultural Technology Management Agency (ATMA).
3. Farm Information and Advisory Centre (FIAC).
4. Commodity Interest Groups (CIGs).

In addition to these formal linkage mechanisms both research and extension personnel would be expected to have regular, Informal contacts with different groups of farmers while carrying out joint on-farm-trails, frontline demonstrations, exposure visits to success stories and field days where farmers have the opportunity to communicate their problems and concerns.

Linkage through Strategic Research and Extension Plan:-

The Agricultural Technology Management Agency (ATMA) is responsible for bringing together researchers,

extensionist, farmers and other stakeholders, it is mandated to develop a demand-driven, location specific, multi-sector oriented Strategic Research and Extension Plan (SREP) for each district. The main goal is to increase the farmers input into programme planning and resource allocation especially at the block level and to increase accountability of stakeholders. Further, it is also to increase the programme coordination and integration so that program thrust such as Farming system Innovation, Farmer's Organization, Research Management can be more effectively and efficiently implemented. The ultimate objective of both research and extension system is to increase agricultural production with sustainability. Formulating research and extension agenda based on producer's requirement results in technology that will be more acceptable to users. This also helps in allocation of resources to both research and extension activities to be taken up in the district.

V. Conclusion

The above presented information showed that majority of the farmers belonging Marginal and Small operational land holding category. Majority of the farmers had low market linkage with the researchers, extensionist and market. The various sources of information is make available to the farmers so that they may further establish strong linkage.

Participatory technology generation and participatory conduct monitoring and evaluation of research and extension activities should be used to enhance the research extension farmer linkage. Formation of village knowledge centres in the adopted villages and farmers organizations will help in increasing market linkages of the farmers.

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