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FACTORS AFFECTING LINKAGES AMONG RESEARCH, EXTENSION AND FARMERS - A REVIEW

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ABSTRACT

The effective link among research, extension and farmers depends on multiple factors. In one stance, the linkage strength is influenced by the personal and psychological factors of the concerned personnel. Also the organizational factors like goal of the organization, organizational climate, etc., external factors like government policy, donor agencies, farmers group etc., and varieties of the constraining factors have limiting effects on the linkage strength. The present review aptly highlights all such factors influencing the linkage strength.

The continuing poor living conditions of large portions of the world's population can be traced to many factors. Few among them are ineffective national development strategies and policies, unfavourable international economic relations and high rates of population growth. The existing policies and strategies have focussed separately on agricultural research groups and technology transfer. However, it is the interaction of these groups that largely gain access to the technology and whether the technology is relevant to them. Good linkages between them are essential. In fact, the agricultural technology systems of many developing countries suffer from weak linkages and in some cases, they do not even exist. On the other hand, there is no single recipe for effective links between agricultural research institutions and technology users. Each institution operate within a specific content over which managers often have little control. However, to make good decisions about links, they need to diagnose the factors present in particular setting. The key contextual factors which a manager should consider fall into four main categories - policy factors, resource factors, technical factors and organizational factors (Merrill-Sands and Kaimowitz, 1990).

In the present article, related literature have been reviewed and synthesized under the factor heads, viz., organizational, psychological, external and constraining factors which are affecting the strength of linkage or could be hypothesized to affect the same.

ORGANIZATIONAL FACTORS

Axinn and Thorat (1972) found that the extent of linkage was related to the extent of knowledge gap between situations/agencies/systems. Cernea (1981) stressed for more decentralized extension system and argued that it will foster efficient linkage of extension with farmers and researchers. Whereas, Hyami and Rattan (1983) identified resource endowment and policy support, both from organization and government, as the factors affecting the linkage between research and extension.

With particular reference to India, Axinn (1991) said that both the size factor and extent of decentralization are relevant for the nature of linkage required. However, Goals of the organization is yet another determinant of successful linkage. The organizational goals are the objectives that the organization, as a whole, is trying to achieve and the orientation towards goals decides the success or failure of the organization (Khandwalla, 1977). Sharma (1994) reported considerable agreement in the ranking of goals by the managers of high and low performing development projects.

Sharma and Motilal (1971) reported that open organisational climate was conducive to the attainment of higher level of achieve-

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ments and satisfaction of the staff. Prakasam *et al.* (1979) found that organizational climate had a significant bearing upon the performance of bank employees. According to Sinha (1980), authoritarian and bureaucratic climate were inversely related while rest of the climatic factors were positively related with efficiency rating. Huli (1989) reported that the organisational climate as perceived by the top executive was noticed to be bureaucratic while the functional executives largely perceived affiliation and dependency climate.

Bhattacharya and Talukdar (1996) found "dependency" as the most dominant motivational climate in the gram sevak training centres of the North-Eastern region of India. Contradicting to this, however, Singh (1997) reported "extension" as the dominant organisational climate component in the non-governmental organisations functioning in Bihar for tribal development.

With linkage perspective, Block and Seegers (1988) found that in many developing countries, the agricultural knowledge information system is administratively divided into research and extension directorate, department or division. This administrative set-up might or might not create and adequate structural arrangement. They, however, reiterated that what is important to distinguish the administrative set-up from the knowledge and information system.

Though the variables like goals of the organization and organizational climates have not been empirically reported to affect the linkages between research and extension, albeit, linkage being the inherent phenomena of research and extension organization, these variables, hence, could be hypothesized to affect the strength of linkage.

PERSONAL AND PSYCHOLOGICAL FACTORS

Ambastha (1980) found that research-extension personnel contact span had positive and significant correlation with cadre, education and service experience. He also found that the same variables significantly co-varied with researcher-farmers contact span. Ambastha and Singh (1979) reported that extension personnel - farmers contact span had significant and negative association with cadre and job commitment and positive correlation with dedication. With respect to development of the organisation, Stephenson (1963) and Nakkiran (1968) reported that the attitude of the members, managing committee and staff of the cooperative societies was the important determinant of success of organisation. Krishnaraj (1981) also found that the attitude of managerial system had positive and significant relation with efficiency of organization. In another study, Sharma (1994) reported the presence of more number of employees with favourable attitude in good performing organisation than the poor one. Singh (1994) found that the variables like age, education and training received were positively and significantly associated with the extent of linkage between research and extension. However, professional experience, achievement motivation and value-orientation were non-significantly correlated with the same. Based on the experience, author suggested to include the variables like job satisfaction, organizational climate, employee's morale, etc. in future course of such investigations.

Bharati (1993) found that cadre was the important variable influencing the interaction of scientists with extension functionaries. He also reported that caste, herd size, extension contact and economic motivation of the farmers were some of the variables affecting their interaction with extension functionaries.

EXTERNAL FACTORS

Most discussions of the institutions concerned with agricultural technology focus on their internal dynamics, with little reference to the broader social relation in which they are

immersed. This gives the impression that both technology development and technology transfer are autonomous processes that obey their own internal laws of development, independent of their social context (Burmeister, 1985).

Lawrence and Lorsch (1969) propounded the contingency theory in business and stressed that the external environment of an organization is an important factor determining its internal dynamics. Based on this hypothesis, Hayani and Rattan (1971) argued that the pattern of technological change in agriculture is influenced by national resource endowments through the interaction among farmers, researchers and administrators in the political arena. During the late seventies, it was organized that how and when different interest groups start to organize themselves to influence research and extension priorities (Guttman, 1978; deJanvry and LeVeen, 1983; Pineiro and Trigo, 1983; Huffman and McNulty, 1985).

Following the work of Heaver (1981) on the interaction between bureaucratic politics and external incentives, Sims and Leonard (1989) developed a comprehensive theory for the specific case of agricultural technology in developing countries. They coined the term "default incentives" to describe the behaviour of researchers and extension workers in the absence of pressure from outside their institutions. In order to validate the above hypothesis, Kaimowitz (1989) carried out the case studies in seven developing countries. He conceptualized four groups that constituted the principal source of external pressure for technology development and delivery. These were: National policy makers (government policy), foreign agencies, farmers and provide sector. In the similar line, Kaimowitz *et al.* (1990) stipulated that positive external pressure was necessary for any agricultural technology system to be responsive to farmers' needs.

CONSTRAINING FACTORS

A number of reasons have been given to explain the gap between research and extension. For example, separate institutional housing decreases the opportunities to work together. In a study from developing countries, extension managers ranked the lack of links with research as seventh in order of importance out of nine problems they faced (Sigman and Swanson, 1984; Balaguru and Rajagopalan, 1986). Administrative procedure that creates separate work plans, as well as the failure to budget enough money to conduct joint field work and training are another part of the problem (Coulter, 1983). Similarly, Bennett (1988) found that administrative distinction between research and extension leaves an information gap which can not be abridged easily by linkage mechanism.

Attitudinal problems, arising from the socio-economic gap that sometimes exists between the two sets of workers may also contribute to research-extension gap. Extension workers are often less well paid, less educated, and work at less prestigious jobs than researchers and feel they are under-valued, while researchers might not see the need to work with extension staff and thus, remain to themselves (Coulter, 1983). Extension workers feel that researchers are not part of the "real world", staying only in their laboratories and ignoring the applied aspect of research (Compton, 1984).

The problem of establishing effective research-extension linkages appears frequently in the literature. Cummings (1981) noted that R&E have traditionally been separate organizations with no functional linkages. Fernandez (1981) reported on a 1975-76 survey of eight extension services and six research institutes in Central and South America that revealed a wide gap between the two entities. Mosher (1978) called the relationship between R&E organizations a "quarrel", while Maalouf (1983)

identified the lack of official linkages as the most regrettable situation, noting that with a few exceptions not a single model of this relationship has been found effective. They also summed up that the poor inter-organizational relation between extension agency and research organization almost guarantee that research result will not reach farmers.

Too often analysis of this linkage has revealed the weakness of the research and development system in agriculture research system. The lack of understanding of each other's role, nature of taste, its constraints has caused a widening empathy and communication gap. Sivaraman (1978) in a paper on the agriculture research system in India noted that a class and caste tendency permeates much of the research and extension system and that field workers and those employed in applied research have lower status, pay and motivation.

Administrative or organizational integration of research and extension under one authority function has found to cause professional conflict, the only feasible exercise is coordinating these two units through an overall council approach. A better insight of the major issues must be interrelated, namely basic with applied or adaptive research and the role of scientists with extension personnel is the research design and development process.

As it has been very rightly stated by Bunting (1983) for development, the most significant, but usually the least effective part of the knowledge systems is the extension or advisory sector, through which the objectives, potentials and difficulties of producers can be known, and by which both the products of new research, and accumulated experiences of the past research and practice are conveyed to them. This part of the system is too often conceived as one way stream, through which the "technology" developed by research workers seen as the lead agents, is transferred by extension workers to the expectant producer users. This flow often fails, sometimes because the technology is inappropriate, often a considerable time-lag exists between the availability of new research findings and their application by the farming community, extension system can work effectively with farmers only if it can offer relevant innovative information. Lack of effective linkage affects the quality of research which is not sufficiently oriented towards the need, problem, resource constraints of the farmers. The important reverse flow, which should be the leading stage in the whole system, is often omitted, neglected or even held in contempt.

Jain (1985) made an effort to analyze some of the major constraints on the effective establishment of research-extension linkages in India. Some of the crucial issues that deserve attention and debate are:

* The lack of an effective role of the State Department of Agriculture (SDA) in identifying the specific production problems.
* The ineffective utilization of the opportunities for getting feedback through programmes, which are implemented by scientists.
* The gap between the technology and that being accepted by farmers, which has to be bridged by developing stronger links between scientists and official of the SDA in large scale testing and demonstration of the generated technology.
* The lack of formal links between research and extension activities, which need to be supplemented by frequent joint visits and informal discussions on farmers' fields.

He further stated that despite all efforts, however, research and extension linkages are still quite weak in India for three main reasons:

* Scientists at the Agricultural Universities and official of the SDA are reluctant to accept changes in concepts and procedures.
* Although the programmes of the SDA and

the Universities bring officials and scientists together, they often have no real involvement with or appreciation for each other.

* Although the physical infrastructure may be built up at the regional level, decentralization of the administration and management of research and extension is a slow process because of insufficient institutional freedom, competency, and will.

Seegars (1990) also analyzed the cause of poor links between research and extension and he observed that there were differences in the background of research and extension personnel, lack of fit between the extension service and the regional research centre and the expiration of foreign funding.

Singh *et al.* (1991) studied constraints operating in forward and backward linkages of monthly workshop of T&V extension system. They classified and studied them into various categories, i.e., training constraints, supply and infrastructural constraints, organizational incentives, coordination, visits, administrative, and budget and financial constraints. Singh (1994) reported constraints in terms of lack of communication activities, lack of adequate funds, lack of incentives and motivation and lack of new technology which affected research and extension interaction.

Similarly, Malik (1993) identified following first five constraints as the major limiting factors in linking extension workers with the farmers: i) Shortage of funds for contingency and other allowances; ii) Lack of audio-visual aids; iii) Difficulty in understanding required touring for want of vehicle; iv) Problem of coordinating veterinary and animal science activities at KGKs and University level; and v) Lack of interest of work.

Nevertheless, organizational factors, extension techniques employed, infrastructural problems, inputs inadequacy, and social barriers were some of the constraints impeding the effective interaction of extension personnel with the farmers (Bharati, 1993).

Eponou (1996) identified following constraints affecting research - farmers linkage: i) Lack of explicit linkage policies because of their research strategies; ii) Lack of awareness; and iii) Perceived transaction of cost and time.

In the similar line, Wuyts (1996) suggested that the research and farmers' organization have the potential to make relevant technologies, but the potential can not be realized unless the associated problems are adequately addressed.

While analysing the planning of research with farmers at five locations in South Africa with a view to develop appropriate technology, Fischer *et al.* (1996) observed the common difficulties encountered included farmers' expectation of free inputs, adherence of farmers and facilitators with TOT mentality and loss of interest by the farmers after planning exercise. Working on similar lines, Farrington (1997) made review of a decade of work on farmers' participation in research and extension. He found that lack of clarity in the objectives of kinds of participation, their mode of client orientation and the various roles of different organizations in promoting participation were the major problems affecting farmers' participation in research and extension.

CONCLUSION

The reviewed literature revealed the existence and influence of numerous factors on linkage strength. Among organisational factors, important are the size and goals of organisation and organisation climate. Psychological factors include the attitude, job satisfaction, etc. Similarly, there are number of factors external to the organisational domain which have influence on the research-extension-farmers linkage. Besides, the constraining factor as non-existence of proper mechanism to bring research, extension and farmers

at common plateform is the most crucial factor. These factors are required to be identified as objectively as possible. Not only this, they should be properly manipulated in order to strengthen and design the effective linkage strategy for research, extension and farmers.

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