*Original Research*

# Strengthening Research-Extension Linkages in Veterinary Universities

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**Abstract**

*Higher research and educational institution by its nature has provisions for collaboration, coordination and linkage but due to various constraints, it fails to strengthen establish such linkage. This study was carried out to identify such constraints in maintaining university research-extension (R-E) linkage and propose strategies to overcome them. Using pre-tested, semi-structured questionnaire, data were collected from 120 respondents comprising 80 researchers and 40 extensionists sampled from four veterinary universities representing four main regions of India. Of the total 28 problems identified, 'lack of initiative for joint action', 'unsatisfactory performance of available communication channel', 'deficiency of adequate budget for linkage activities', 'available technologies' inappropriateness for field level application owing to basic flaws in planning and implementation of research agenda' and 'lack of motivating force to towards linkage' were most prominently perceived constraints by the respondents. Spearman-rank-correlation revealed the relationship exists between research and extension personnel. Of the total 14 strategies, the respondents recognized most-appropriate to strengthen linkage included; 'training for managers/directors to co-ordinate linkage', 'allocating staff time to linkage activities', 'forming integrated field teams' and 'adopting improved personnel management practices'. The results would help the university administration to strengthen its research-extension linkage.*

**Key words:** Constraints, Linkage, Research-Extension, University

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## Introduction

According to Webster's Dictionary, the term 'linkage' means series or systems of links. Literally, link means anything serving to connect or tie. Linkage is clusters of channels, which connect one major component with other (Axinn and Thorat, 1972). Linkages create regular channels through which product, data, information and knowledge are exchanged between the various partners in the developmental process.

Havelock (1986) explains that if the two systems are permeable enough to allow and facilitate smooth exchange of information, messages and responses among each other, a link will be created between them. From this angle, the agricultural research and extension services are the two systems that are linked by information flows, message and response exchanges, and feedback and feed-forward. And, these links are vital for the assessment of local needs, modifications of technological recommendations and in initiating further research (Samanta and Sontakki, 2006). Research-extension institutions are established for promoting agricultural development. The agricultural research and extension institutions help to increase agricultural productivity and thereby alleviate poverty to raise the living standards of the huge agrarian population. How well researchers, extension agents and farmers communicate and cooperate each other has a strong influence on whether agricultural science succeeds or fails as a catalyst of national development and as a tool for eliminating poverty (Shimels, 2012 as cited in Sewnet *et al.*, 2016). The present Indian agricultural research system comprises essentially two main streams, viz., the Indian Council of Agricultural Research (ICAR) at the national level and the Agricultural Universities at the state level (Balaguru, 2013). At present, there are 15 SVUs (64 State Agriculture Universities, 2 Central Agriculture Universities and 4 Central Universities with Agriculture Faculty) as autonomous functioning with 46 veterinary colleges (ICAR, 2018 and VCI, 2017) and two ICAR-deemed universities *i.e.*, IVRI and NDRI, which are performing the responsibilities of veterinary-research, education and extension in country. Out of these two agricultural research streams, state agricultural universities have been reported relatively ahead in most of the studies. India has more university-based researchers with Ph.D. qualification (Stads and Rahija, 2012) engaged in research and education related to agriculture and allied areas. Despite the fact that the research and extension have intrinsic interdependence, various forces cause ineffective functional relationships between them.

A number of studies (Singh, 1994; Kumar, 1999; Gupta, 1998) on this aspect reveal unsatisfactory status of University research-extension linkage. State agricultural and veterinary/animal science universities have greatly expanded in number with funding support from state governments but their research capacity has weakened (Pal *et al.*, 2012) leading to poor interface of research, extension and education. Further, studying the constraints of linkages between university-research and university-extension along with strategies to improve the same would be a matter of interest and immediate use for university-planning system. Thus, keeping in view the above facts, the present study entitled, 'Strengthening research-extension linkages in veterinary universities' was undertaken with an objective to identify the major constraints prevailing in strengthening research-extension linkage along with strategies to strengthen the same.

**Materials and Methods**

The study was carried out using ex-post-facto research design in four purposively selected veterinary universities representing four main geographical regions in India, during the year 2017-18. The universities studied are: 1. Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana; 2. West Bengal University of Animal and Fishery Sciences (WBUAFS), Kolkata; 3. Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai and 4. Maharashtra Animal and Fishery Sciences University (MAFSU), Nagpur. A list of research personnel, who were carrying out or completed at least one research project, was prepared as a sampling frame based on the available secondary data *i.e.*, annual reports, vision documents and others along with online-data accessible from the official website of the selected universities. A total of 80 research personnel comprising 20 each from the selected universities were randomly selected from the frame. Similarly, a total of 40 extension personnel comprising 10 from each selected university, were randomly selected for study.

With the help of the subject matter specialists' expertise, research-extension linkage categories, constraints and strategies were identified to prepare the questionnaire. The data were collected using pre-tested, semi-structured questionnaire through personal interview from respondents who were accessible at university main campus and nearby colleges and through e-mail from respondents who were at constituent university institutes located far away from main campus. Total 28 constraints, classified under categories *viz.*, organizational, communication, financial-budgetary, technological and motivational-psychological constraints, were identified to take responses on a three-point continuum *viz*. most-serious, serious and less-serious with respective score 3, 2 and 1. Summation of total score for each constraint was termed as obtained score, which was divided by number of respondents to compute mean score. Based on mean score, constraints were ranked for research personnel and extension personnel separately. Spearman rank correlation was used to assess how well the relationship exists between research and extension personnel. Similarly, the list of 14 strategies to strengthen the R-E linkage was, were kept forward to rate them as most-needed (3), needed (2) and less-needed (1). The strategies were ranked in the same way as the constraints were.

**Results and Discussion**

The findings of study with relevant discussion have been presented under following sub-heads:

**Perceived Constraints in Maintaining Research-Extension Linkage**

Totally, five types of constraints were studied; organizational, communication, financial-budgetary, technological and motivational-psychological.





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**Organizational Constraints**

Results in Table 1 show that out of six listed organizational constraints related to research-extension linkage, 'lack of initiative for linkage' was perceived as the most prominent constraint by both types of respondents.

**Table 1:** Constraints perceived by respondents in strengthening R-E linkage

| S. No. | Constraints | Research Personnel | | Extension Personnel | |
|---|---|---|---|---|---|
| | | MS | Rank | MS | Rank |
| **A. Organizational/institutional constraints** | | | | | |
| 1 | Top down management of research and extension system | 1.85 | IV | 2.08 | III |
| 2 | Lack of initiative for linkage/joint action | 2.26 | I | 2.3 | I |
| 3 | Lack of provision of joint activities/programme for linkage | 1.7 | V | 1.6 | V |
| 4 | Lack of provision of compulsory involvement | 2.15 | II | 1.83 | IV |
| 5 | Too much bureaucracy and highly centralized administrative control | 2.1 | III | 2.13 | II |
| 6 | Lack of appropriate administrative policy of research and extension activities | 1.54 | VI | 1.45 | VI |
| **B. Communication constraints** | | | | | |
| 1 | Absence of well-defined channels of communication between research and extension | 1.26 | IV | 1.3 | IV |
| 2 | Available communication channel between research and extension system are far from satisfactory | 2.1 | I | 2.13 | II |
| 3 | Limited representation in research/extension activities | 2.01 | II | 2.3 | I |
| 4 | Limited knowledge about linkage activities | 1.09 | V | 1.15 | V |
| 5 | Research and extension system are managed and administered as separate entity | 1.78 | III | 1.75 | III |
| **C. Financial-budgetary constraints** | | | | | |
| 1 | Biased allotment of budget/fund for research/extension use | 1.68 | V | 2.68 | I |
| 2 | Deficit in attracting/compelling to allot sufficient funds | 2 | III | 1.45 | V |
| 3 | No provision of adequate budget for carrying joint activities | 2.39 | I | 2.45 | II |
| 4 | Lack of fund for individual use | 2.31 | II | 1.88 | IV |
| 5 | Field oriented research are not encouraged financially | 1.9 | IV | 2.25 | III |
| 6 | Delay in payment of travelling and other allowances | 1.16 | VI | 1.3 | VI |
| **D. Technological constraints** | | | | | |







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|---|---|---|---|---|---|
| 1 | Research activities output only the findings to be published not the technology in the concrete form | 1.45 | IV | 1.8 | III |
| 2 | No matching of farmers problems and technological option recommended | 1.79 | III | 2.05 | II |
| 3 | Lack of coordination among research and extension departments at technical level | 1.36 | V | 1.33 | V |
| 4 | Available technologies are not appropriate for field level application owing to basic flaws in planning and implementation of research agenda | 2.08 | I | 2.33 | I |
| 5 | Lack of contemporary growth in infrastructural establishments | 2.06 | II | 1.6 | IV |
| **E. Motivational-psychological constraints** | | | | | |
| 1 | Unparallel perception of research and extension personnel about each other | 1.1 | VI | 1.63 | IV |
| 2 | Lack of motivating force to think about linkage related activities | 2.18 | I | 2.13 | I |
| 3 | Lack of interest for coordinated research and extension activities | 2.08 | II | 1.95 | II |
| 4 | Lack of incentive for linkage oriented activities | 1.71 | III | 1.45 | V |
| 5 | Personality and cadre clash | 1.51 | IV | 1.65 | III |
| 6 | Lack of appreciation and recognition for good work | 1.39 | V | 1.4 | VI |

*MS - Mean score*

Among research personnel, it was followed by 'lack of provision of compulsory involvement' (II rank) and 'too much bureaucracy and highly centralized administrative control' (III rank), whereas extension personnel perceived 'too much bureaucracy and highly centralized administrative control' and 'top down management of research and extension system' as the second and third most severe organizational constraints for upholding linkage. Lack of provision of joint activities/programme (V rank) and lack of appropriate administrative policy of research and extension activities (VI rank) were not considered as serious constraints. Spearman rank correlation ($r_{s=}$.829*) showed a significant correlation between the constraint-ranking pattern by research personnel and extension personnel. These findings are partially in line with Coulter (1983), Bennett (1988) and Kumar (1999).

**Communication Constraints**

Table 1 also reveals that out of five identified communication barriers 'unsatisfactory performance of available communication channel' was the top ranked communication blockade for respondent scientists followed by 'limited representation in research-extension activities'. Contrarily, extension personnel rated these two constraints reversibly *i.e.*, 'limited representation in research-extension activities' was relatively more serious concern. The 'management and administration of research and extension as two separate





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entities' was perceived as next major constraint to maintain linkage by both types of respondents. 'Limited knowledge about linkage activities' (V rank) and 'availability of communication channels' (IV rank) were not considered as severe constraints by the respondents. In this category also, there was a significant correlation ($r_{s=}$.900*) between two respondent system regarding constraints status. Communication is vital at every point from the initiation or planning a programme till its implementation and evaluation. In the same way, to maintain the linkage between two entities, there is a need of purposive interaction which might be possible through process of communication.

**Financial-Budgetary Constraints**

It could be inferred from Table 1 that perception on the six items of financial-budgetary constraints revealed significant difference ($r_{s=}$.257) between two respondent types. Three major financial constraint in the order of severity perceived by researchers were; 'no provision of adequate budget for carrying joint activities', 'lack of fund for individual use' and 'deficit in attracting/compelling to allot sufficient funds', while the same were rated as second, fourth and fifth severe constraints respectively by extensionists. Extension personnel felt bias in allotment of fund between research and extension as top ranked financial-budgetary constraints, but research personnel disagreed such bias and they rated it V rank. Both respondent categories felt payment of travelling and other allowance related to research-extension activities as least serious constraint. The high mean score attributed to the different items under financial-constraints category concludes that financial constraints have considerable negative effect on linkage. Thus, as allocation of fund would result in direct consequence with an ultimate effect on linkage. The constraints should be addressed at university level while dealing with budget and fund allocation. Agbamu (2000) has reported that past efforts on research-extension linkage in Nigeria showed that poor funding was one of the biggest constraints facing linkage activities.

**Technological Constraints**

Table 1 also reveals that the foremost perceived technical constraints related to university research-extension linkage were 'inappropriateness of available technologies for field level application owing to basic flaws in planning and implementation of research agenda' (I), 'unmatched farmers problems and technological option recommendation' (II) and 'lack of contemporary growth in infrastructural establishments' (III). Significantly, both categories were agreed that 'lack of coordination among research and extension departments at technical level' (V rank) was not a major constraint. The correlation between technical constraints perceived by research and extension personnel in linkage was notable ($r_{s=}$.700) but non-significant.







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**Motivational-Psychological Constraints**

The perusal of Table 1 reveals that for both the respondent categories, two most prominently felt motivational-psychological constraints related to strengthen research-extension linkage were 'absence of motivating force to think about linkage related activities' and 'lack of interest for coordinated research and extension activities'. Following these, the third major constraint for research personal was 'lack of incentive for linkage oriented activities' and that for extension personnel was 'personality and cadre clash'. 'Lack of appreciation and recognition for good work' and 'unparallel perception of research and extension personnel about each other' were two lower ranked constraints for both the systems under study. The Spearman rank correlation coefficient ($r_s$) between two ranking pattern of psychological constraints was found to be 0.714. On the basis of data obtained on the motivational and psychological constraints, it could be inferred that these constraints would contribute considerably in minimizing the research-extension linkage.

The types and extent of constraints discussed in the above sub-heads provide an apparent rationale to the weak research-extension linkage status. It implies that overcoming such constraints would be helpful to establish and maintain optimum and effective linkage between the university-research and university-extension system. Further, these findings demand review of existing structural research-extension linkage mechanism. Compton (1984), Balaguru and Rajgopalan (1986), Singh (1994), Kumar (1999), Obiora and Madukwe (2013) and Sewnet *et al.* (2016) had reported nearly similar findings in their studies on types and frequency of constraints responsible to minimize the research-extension linkage.

**Strategies to Strengthen University Research-Extension Linkage**

Table 2 shows the respondents' perception on the strategies that are appropriate for effective research-extension linkages in veterinary universities. A glance of Table 2 reveals that the top five suggestions expressed by researcher personnel were; 'allocating staff time to linkage activities', 'allocating operating funds for linkage activities' and 'training for managers/directors to support and provide leadership to linkage,' 'forming integrated field teams' and 'adopting improved personnel management practice' with respective mean score 2.51, 2.23, 2.09, 2.04 and 1.96. While, the extensionists considered 'training for managers/directors to support and provide leadership' as most important suggestion followed by 'forming integrated field teams,' 'allocating staff time to linkage activities,' 'building linkage responsibilities into job descriptions,' and 'adopting improved personnel management practice' with respective rank of II, III, IV and V. Other important suggestions stated by respondents were, 'adopting a practice of symbiotic coordination of technology transfer at grass-root', 'regular organization of professional events like workshop /conference/ conference', 'joint use of farmers' group for training and their feedback *etc*. While, strategies like, 'use of task force', 'forming coordinating/liaison committee/unit', and 'adopting a practice







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of sharing research information among the agencies' were rated as less important by both research and extension personnel.

**Table 2:** Suggestions expressed by respondents to strengthen R-E linkage

| S. No. | Suggestions | Research Personnel | | Extension Personnel | |
|---|---|---|---|---|---|
| | | MS | Rank | MS | Rank |
| 1 | Allocating operating funds for linkage activities | 2.09 | III | 2 | VI |
| 2 | Allocating staff time to linkage activities | 2.51 | I | 2.18 | III |
| 3 | Training for managers/directors to support and provide leadership to linkage | 2.23 | II | 2.55 | I |
| 4 | Forming integrated field teams like diagnostic survey, priority setting | 2.04 | IV | 2.38 | II |
| 5 | Forming coordinating/liaison committee/unit | 1.64 | XII | 1.63 | XII |
| 6 | Use of task force | 1.59 | XIV | 1.6 | XIII |
| 7 | Adopting a practice of symbiotic coordination of technology transfer at grass-root | 1.96 | VI | 1.93 | VII |
| 8 | Adopting a practice of sharing research information among the agencies | 1.65 | XI | 1.55 | XIV |
| 9 | Adopting improved personnel management practice like interest creating and motivation | 2.01 | V | 2.03 | V |
| 10 | Productive and open communication | 1.61 | XIII | 1.75 | X |
| 11 | Building linkage responsibilities into job descriptions | 1.89 | VIII | 2.1 | IV |
| 12 | Research projects/extension programmes should be jointly planned and funded | 1.76 | IX | 1.73 | XI |
| 13 | Regular workshop/conference *etc.*, for personnel | 1.89 | VII | 1.85 | IX |
| 14 | Joint use of farmers' group for training and their feedback | 1.7 | X | 1.88 | VIII |

*MS - Mean score*

It was interesting to note that both categories of respondents expresses a near equal agreement on strategies *viz.*, 'adoption of personnel management practices like interest creating and developing motivation on linkage' and 'forming coordinating/liaison committee/unit'. On the other hand, the opinions of two respondent categories were noticeably differing on a number of suggestions like 'building linkage responsibilities into job descriptions', 'allocating operating funds for linkage activities', 'productive and open communication' and 'adopting a practice of sharing research information among the agencies'. Although, Spearman rank correlation revealed a high (0.855) and significant correlation (1% L.S) between two ranking patterns. The mean score obtained on strategies expressed by respondents clearly reveals that exclusive time and fund for linkage activities along with linkage co-ordination skill are essential for effective linkage. In order to realize effective linkages, it is necessary to build competency in research and extension personnel, through appropriately designed learning and capacity building (L&CB) programmes





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(NAARM, 2006). Dimelu and Emodi (2012) and Sewnet *et al.* (2016) in their study on strategies to enhance research-extension linkages had reported nearly similar findings.

## Conclusion

In spite of the established structural and functional mechanism for linkage between two major wings of university *viz.* research and extension, a number of organizational, communicational, financial, psychological and technological constraints were reported to prevail. Out of them the most frequently cited were; lack of initiative for joint action, unsatisfactory performance of available communication channel between research and extension system, deficiency of adequate budget for carrying joint activities, available technologies' inappropriateness for field level application owing to basic flaws in planning and implementation of research agenda and lack of motivating force to think about linkage. While, strategies perceived appropriate for linkage include; training for managers/directors to support and provide leadership to linkage, allocating staff time to linkage activities, forming integrated field teams, adopting improved personnel management practices like interest and motivation creating etc. Hence, the study strongly recommends the university administration to address the above mentioned constraints and consider the strategies to strengthen research-extension linkage.

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