



Functional linkage between research and extension in Veterinary universities

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Received: 2 November 2018; Accepted: 10 February 2020

ABSTRACT

This ex-post-facto study was carried out to measure the research-extension linkage in veterinary universities of India with the help of a developed index, incorporating 7 major dimensions of functional linkage. Data were collected from 120 respondents comprising of 80 researchers and 40 extensionists sampled from four veterinary universities and linkage strength between the two were computed in terms of Extent of Functional Linkage (EOFL) to categorize them in four classes of linkage strength. The results of the study revealed an unsatisfactory functional research-extension linkage between research and university-extension system. In all the selected veterinary universities, majority of respondents expressed weak to very weak linkage strength for almost all the studied dimensions of linkage.

Keywords: Extension system, Research-Extension Linkage, University

The linkage between research and extension is inter-dependent. Extension needs research findings to provide solutions to farmers in overcoming their farming related problems. On the other hand, extension serves as a main source for research to develop an orientation to and awareness of, actual farm problems (Anonymous 1985). Research focuses on the technical aspects of generating useful technologies, while extension focuses on the adoption and transfer of those technologies by users (Agbamu, 2000). Effective linkage between research and extension assume greater significance to meet the challenges and emerging issues in the changing agricultural landscape. India has more university-based researchers with Ph. D qualification (Stads and Rahija 2012) and they are engaged in research and education related to agriculture and allied disciplines. A review on agricultural development indicates ‘weak research-extension linkages’ as a major impediment in the process of agricultural development (Samanta and Sontakki, 2006). Hence, we need efficient research and extension systems with effective linkage mechanisms to meet the needs in changing agricultural scenario. Therefore, an ex-post-facto study on ‘Research-Extension Linkage in Veterinary Universities’ was conducted to measure the linkage between research and extension systems of veterinary universities.

Data and Methodology

A total of 80 research personnel comprising 20 each from the Guru Angad Dev Veterinary and Animal Sciences

University (GADVASU), Ludhiana; West Bengal University of Animal and Fishery Sciences (WBUAFS), Kolkata; Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai and Maharashtra Animal and Fishery Sciences University (MAFSU), Nagpur were randomly selected for study. Similarly, a total 40 extension personnel comprising 10 from each selected university, were chosen. The data were collected using pre-tested, semi-structured questionnaire through personal interview as well as through e-mail.

The functional linkage between university research system and extension systems was measured with the help of developed ‘research-extension linkage index’ incorporating different dimensions of linkage, i.e. communication, teamwork, decision making, supply and service, planning, implementation and evaluation and training (Kumar 1999 and Singh 1994). After expert judgment and item analysis, 39 statements were included to frame final index. Responses on linkage level were taken on five point continuum, i.e. regularly, quite often, sometimes, rarely and never with a respective score of 4, 3, 2, 1 and 0. For calculating the extent of functional linkage (EOFL), the responses recorded for the each parameter were summed-up. The overall summed-up score was divided by maximum obtainable score to arrive at percentage extent of linkage of each respondent. Lastly, the respondents were categorized into four categories on the basis of obtained linkage-extent level, i.e. very weak linkage (<25), weak linkage (25–42), moderate linkage (42–60) and strong linkage (≥60).

Communicational linkage between research and extension personnel

From the data presented in Table 1, it is evident that

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Table 1. Extent of communicational linkage among respondents

Respondent type	University	Extent of linkage								χ^2
		Very weak		Weak		Moderate		Strong		
		F	%	F	%	F	%	f	%	
Research personnel	GADVASU	5	25.00	8	40.00	4	20.00	3	15.00	11.983
	MAFSU	1	5.00	3	15.00	12	60.00	4	20.00	
	TANUVAS	4	20.00	7	35.00	8	40.00	1	05.00	
	WBUAFS	3	15.00	6	30.00	8	40.00	3	15.00	
	Pooled (N=80)	13	16.25	24	30.00	32	40.00	11	13.75	
Extension personnel	GADVASU	2	20.00	4	40.00	3	30.00	1	10.00	14.919
	MAFSU	1	10.00	6	60.00	2	20.00	1	10.00	
	TANUVAS	2	20.00	0	0	5	50.00	3	30.00	
	WBUAFS	2	20.00	5	50.00	3	30.00	0	0	
	Pooled (N=40)	7	17.50	15	37.50	13	32.50	5	12.50	
Overall	GADVASU	7	23.33	12	40.00	7	23.33	4	13.33	8.042
	MAFSU	2	6.67	9	30.00	14	46.67	5	16.67	
	TANUVAS	6	20.00	7	23.33	13	43.33	4	13.33	
	WBUAFS	5	16.67	11	36.67	11	36.67	3	10.00	
	Pooled (N=120)	20	16.67	39	32.50	45	37.50	16	13.33	

f, frequency; %, percentage.

Table 2. Extent of linkage in teamwork among respondents

Respondent type	University	Extent of linkage								χ^2
		Very weak		Weak		Moderate		Strong		
		F	%	F	%	F	%	f	%	
Research personnel	GADVASU	4	20.00	5	25.00	7	35.00	4	20.00	13.163
	MAFSU	1	5.00	6	30.00	7	35.00	6	30.00	
	TANUVAS	8	40.00	7	35.00	3	15.00	2	10.00	
	WBUAFS	5	25.00	9	45.00	4	20.00	2	10.00	
	Pooled (N=80)	18	22.50	27	33.75	21	26.25	14	17.50	
Extension personnel	GADVASU	4	40.00	0	0	5	50.00	1	10.00	12.939
	MAFSU	2	20.00	4	40.00	3	30.00	1	10.00	
	TANUVAS	3	30.00	4	40.00	1	10.00	2	20.00	
	WBUAFS	5	50.00	1	10.00	2	20.00	2	20.00	
	Pooled (N=40)	14	35.00	9	22.50	11	27.50	6	15.00	
Overall	GADVASU	8	26.67	5	16.67	12	40.00	5	16.67	13.394
	MAFSU	3	10.00	10	33.33	10	33.33	7	23.33	
	TANUVAS	11	36.67	11	36.67	4	13.33	4	13.33	
	WBUAFS	10	33.33	10	33.33	6	20.00	4	13.33	
	Pooled (N=120)	32	26.67	36	30.00	32	26.67	20	16.66	

f, frequency; %, percentage.

more than one-third (37.50%) of both research and extension personnel were under moderate communication linkage followed by 32.50 and 16.67% with weak and very weak linkage respectively, while only 13.33% of them had strong communication linkage.

The mean communication linkage implies that the research personnel expressed slightly better linkage level than the extension personnel. The χ^2 value revealed that regarding communication linkage level there was no significant difference among respondents across the

universities in all three cases of respondent types. It is well accepted fact that, communication activities are the vital points for maintaining linkage between any two entities, which itself directly depends on quality and exploitation of existing structural mechanism between them. So, based on findings of study, mean communication linkage extent is still less than 50%, there is a need for establishment of more mechanism and better performance of existing mechanism for effective and productive communication between two pillars of universities, research and extension.

Linkage in teamwork

This dimension of functional linkage represents the degree of collaborative professional activities between research and extension personnel in university. Results on this perspective as presented in Table 2 reveal that 56.67% of the pooled respondents conveyed weak to very weak linkage strength between them. The percentage of respondents articulating strong linkage was only 17.50 and 15.00, respectively in case of research personnel and extension personnel. Degree of linkage in teamwork is an absolute, direct and tangible form of linkage which directly defines the productivity of any organization. But, the findings obtained on this aspect in present study are not inspiring and insist immediate action by university management to remove the barriers responsible for the same.

Linkage in decision-making process

It was studied in terms of participation of the concerned personnel in decision making on each others' programme/activity like research projects, adaptive research, trials, survey, camp, campaign, etc. Findings on this aspect as presented in Table 3 clearly reflect that more than one-third (38.33%) of the overall respondents expressed weak linkage level followed by moderate (30%), very weak (19.17%) and strong (12.50%) level with mean linkage-extent of 37.57 in decision-making on research and extension activities. Application of Chi-square-test revealed a significant difference among research personnel of four universities in relation to their linkage with extension personnel in decision-making process. This variation may be due to the difference in specific structural mechanism and organizational set up and hence, in decision making units among universities. For example, in WBUAFS both the Directorate of Research and Extension are merged as

single unit while other three universities have separate Directorate of Research and Directorate of Extension. Also, WBUFAS and GADVASU have only one constituent veterinary college located nearby university main campus while, TANUVAS and MAFSU have respectively 5 and 6 veterinary colleges at distant locations.

Linkage in supply and services

In present study it referred to the involvement of research and extension personnel in assessment of input, suggestions and sparing of their own services at work. It is evident from the Table 4 that linkage strength in this dimension was not satisfactory, since nearly three-fourths of the pooled respondents considered it as 'weak' and 'very weak' linkage; only 5.83% of them perceived 'strong' linkage. A nearly equal mean extent of linkage was also perceived by both the three categories of respondents. The finding further gets support from Chi-square test which revealed no significant difference in sharing inputs and resources among respondents across all the universities.

Linkage in planning

It was studied in respect of involvement of research and extension personnel in planning of programmes of both concerned and findings pertaining to this facet have been presented in Table 5. The perusal of Table 5 indicates that as high as overall 41.67% of respondents expressed weak linkage between planning research and extension activities however, 10% of them perceived strong linkage. Since all the sampled universities have similar basic research-extension mandates along with basic functional-structural mechanism hence, nearly similar results on distribution of their professionals regarding planning linkage was obtained.

Table 3. Extent of linkage in decision-making process among respondents

Respondent type	University	Extent of linkage								χ^2
		Very weak		Weak		Moderate		Strong		
		F	%	F	%	F	%	f	%	
Research personnel	GADVASU	3	15.00	4	20.00	10	50.00	3	15.00	16.802**
	MAFSU	2	10.00	8	40.00	4	20.00	6	30.00	
	TANUVAS	7	35.00	5	25.00	6	30.00	2	10.00	
	WBUAFS	4	20.00	11	55.00	4	20.00	1	5.00	
	Pooled (N=80)	16	20.00	28	35.00	24	30.00	12	15.00	
Extension personnel	GADVASU	1	10.00	5	50.00	4	40.00	0	0	12.337
	MAFSU	3	30.00	4	40.00	2	20.00	1	10.00	
	TANUVAS	0	0	6	60.00	2	20.00	2	20.00	
	WBUAFS	3	30.00	3	30.00	4	40.00	0	0	
	Pooled (N=40)	7	17.50	18	45.00	12	30.00	3	7.50	
Overall	GADVASU	4	13.33	9	30.00	14	46.67	3	10.00	11.355
	MAFSU	5	16.67	12	40.00	6	20.00	7	23.33	
	TANUVAS	7	23.33	11	36.67	8	26.67	4	13.33	
	WBUAFS	7	23.33	14	46.67	8	26.67	1	3.33	
	Pooled (N=120)	23	19.17	46	38.33	36	30.00	15	12.50	

f, frequency; %, percentage.

Table 4. Extent of linkage in supply and services among respondents

Respondent type	University	Extent of linkage								χ^2
		Very weak		Weak		Moderate		Strong		
		F	%	F	%	F	%	f	%	
Research personnel	GADVASU	6	30.00	8	40.00	5	25.00	1	5.00	14.019
	MAFSU	4	20.00	5	25.00	7	35.00	4	20.00	
	TANUVAS	11	55.00	6	30.00	2	10.00	1	5.00	
	WBUAFS	8	40.00	8	40.00	4	20.00	0	0	
	Pooled (N=80)	29	36.25	27	33.75	18	22.50	6	7.50	
Extension personnel	GADVASU	3	30.00	4	40.00	3	30.00	0	0	5.942
	MAFSU	2	20.00	5	50.00	2	20.00	1	10.00	
	TANUVAS	4	40.00	3	30.00	3	30.00	0	0	
	WBUAFS	3	30.00	6	60.00	1	10.00	0	0	
	Pooled (N=40)	12	30.00	18	45.00	9	22.50	1	2.50	
Overall	GADVASU	9	30.00	12	40.00	8	26.67	1	3.33	15.664
	MAFSU	6	20.00	10	33.33	9	30.00	5	16.67	
	TANUVAS	15	50.00	9	30.00	5	16.67	1	3.33	
	WBUAFS	11	36.67	14	46.67	5	16.67	0	0	
	Pooled (N=120)	41	34.17	45	37.50	27	22.5	7	5.83	

f, frequency; %, percentage.

Table 5. Extent of linkage in planning among respondents

Respondent type	University	Extent of linkage								χ^2
		Very weak		Weak		Moderate		Strong		
		F	%	F	%	F	%	f	%	
Research personnel	GADVASU	4	20.00	9	45.00	4	8.00	3	15.00	14.420
	MAFSU	3	15.00	5	25.00	8	16.00	4	20.00	
	TANUVAS	5	25.00	10	50.00	5	10.00	0	0	
	WBUAFS	5	25.00	12	60.00	2	4.00	1	5	
	Pooled (N=80)	17	21.25	36	45.00	19	23.75	8	10.00	
Extension personnel	GADVASU	2	20.00	4	40.00	3	30.00	1	10.00	4.849
	MAFSU	3	30.00	2	20.00	4	40.00	1	10.00	
	TANUVAS	2	20.00	5	50.00	2	20.00	1	10.00	
	WBUAFS	4	40.00	3	30.00	3	30.00	0	0	
	Pooled (N=40)	11	27.50	14	35.00	12	30.00	3	7.50	
Overall	GADVASU	6	20.00	13	43.33	7	23.33	4	13.33	12.856
	MAFSU	6	20.00	7	23.33	12	40.00	5	16.67	
	TANUVAS	7	23.33	15	50.00	7	23.33	1	3.33	
	WBUAFS	9	30.00	15	50.00	5	16.67	1	3.33	
	Pooled (N=120)	28	23.33	50	41.67	31	25.83	11	9.17	

f, frequency; %, percentage.

Linkage in joint implementation and evaluation

This aspect has been studied to measure the degree of sharing of responsibilities by the respondents in their respective organization/department to carry out and evaluate common programmes like research trials, training, survey, meeting etc. Perusal of the Table 6 indicates a significant difference among research personnel of the studied four universities related to joint implementation and evaluation pattern of research-extension activities.

Findings obtained on this dimension of functional linkage can be explained on the basis of fact that the process of implementation and evaluation of any programme or activity is highly determined by its planning and decision-making process. Here, as the status or linkage in joint planning and decision-making was discouraging, the strength of same in joint implementation and evaluation of any research and extension activity was in the similar line.

Table 6. Extent of linkage in implementation-evaluation among respondents

Respondent type	University	Extent of linkage								χ^2
		Very weak		Weak		Moderate		Strong		
		F	%	F	%	F	%	f	%	
Research personnel	GADVASU	5	25.00	5	25.00	5	25.00	5	25.00	17.269**
	MAFSU	3	15.00	2	10.00	8	40.00	7	35.00	
	TANUVAS	7	35.00	8	40.00	4	20.00	1	5.00	
	WBUAFS	8	40.00	7	35.00	4	20.00	1	5.00	
	Pooled (N=80)	23	28.75	22	27.50	21	26.25	14	17.50	
Extension personnel	GADVASU	4	40.00	3	30.00	3	30.00	0	0	11.413
	MAFSU	3	30.00	7	70.00	0	0	0	0	
	TANUVAS	2	20.00	5	50.00	2	20.00	1	10.00	
	WBUAFS	1	10.00	5	50.00	3	30.00	1	10.00	
	Pooled (N=40)	10	25.00	20	50.00	8	20.00	2	5.00	
Overall	GADVASU	9	30.00	8	26.67	8	26.67	5	16.67	7.418
	MAFSU	6	20.00	9	30.00	8	26.67	7	23.33	
	TANUVAS	9	30.00	13	43.33	6	20.00	2	6.67	
	WBUAFS	9	30.00	12	40.00	7	23.33	2	6.67	
	Pooled (N=120)	33	27.50	42	35.00	29	24.17	16	13.33	

f, frequency; %, percentage.

Table 7. Extent of linkage in training among respondents

Respondent type	University	Extent of linkage								χ^2
		Very weak		Weak		Moderate		Strong		
		F	%	F	%	F	%	f	%	
Research personnel	GADVASU	1	5.00	7	35.00	8	40.00	4	20.00	23.724**
	MAFSU	0	0	5	25.00	6	30.00	9	45.00	
	TANUVAS	7	35.00	2	10.00	3	15.00	8	40.00	
	WBUAFS	3	15.00	9	45.00	5	25.00	3	15.00	
	Pooled (N=80)	11	13.75	23	28.75	22	27.50	24	30.00	
Extension personnel	GADVASU	0	0	3	30.00	4	40.00	3	30.00	15.790
	MAFSU	1	10.00	8	80.00	1	10.00	0	0	
	TANUVAS	2	20.00	4	40.00	2	20.00	2	20.00	
	WBUAFS	0	0	3	30.00	5	50.00	2	20.00	
	Pooled (N=40)	3	7.50	18	45.00	12	30.00	7	17.50	
Overall	GADVASU	1	3.33	10	33.33	12	40.00	7	23.33	19.591**
	MAFSU	1	3.33	13	43.33	7	23.33	9	30.00	
	TANUVAS	9	30.00	6	20.00	5	16.67	10	33.33	
	WBUAFS	3	10.00	12	40.00	10	33.33	5	16.67	
	Pooled (N=120)	14	11.67	41	34.17	34	28.33	31	25.83	

f, frequency; %, percentage.

Linkage in training

The concept of training referred to the participation and involvement of research and extension personnel in the process of organizing training programmes for each others' staff and the results regarding this element of linkage have been presented in Table 7. It reveals a satisfactory finding in comparison to most of above discussed dimensions of research-extension linkage like decision-making, teamwork, planning, implementation and evaluation. More than half (54.16%) of the overall respondents were found to have

moderate to strong linkage and only 11.67% felt very weak linkage. The study also revealed that a significant difference was noted among overall respondents as well as research personnel across universities under study. Training is a process which depends on not only the organizational (university and its professionals) factors but also on agro-climatic condition of region, socio-economic characteristics, knowledge-attitude-skill and need-interest of trainees, which must be different for different university and that may be prime reason of variation obtained in linkage

strength in this case across studied universities.

Overall, the data and findings presented and discussed earlier clearly indicates that the extent of functional linkage between research and extension personnel was not satisfactory in almost all the studied dimensions of linkage in all the selected veterinary universities. Nearly similar findings on research-extension linkage status have been reported by Singh (1994), Gupta (1998) and Kumar (1999).

CONCLUSION

Out of seven studied dimensions of research-extension linkage in veterinary universities, only communication and training aspect was found to have a marginally better mean extent of linkage. Other dimensions like supply and services, implementation and evaluation, team-work, decision-making and planning reflected an insignificant research-extension linkage. Based on these findings, inference can be drawn that the existing mechanisms in the studied universities are not adequate. It necessitates an appropriate research-extension linkage design aiming to enhance the institutional efficiency in offering the intended service to the end-users.

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