

# Agricultural Extension Roles of Farm Scientist: An Empirical Study

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## ABSTRACT

Farm scientists working in a university must have to work with the goals of the organization. As per the Indian Council of Agricultural Research (ICAR), farm scientists have to perform extension role along with teaching and research. The extension roles includes number of activities starting from writing farmer friendly literature to conducting training, visiting the farmers field and so on. The farm scientists are the driving force for the agricultural transformation. Keeping these in view, the present study was under taken among the farm scientists of Bidhan Chandra Krishi Viswavidyalaya of West Bengal. The result, of this empirical study revealed that, farm and home visit, training of farmers, demonstration in the farm fields were the major extension activities that were performed by the farm scientists on a regular basis. The major perceived constraints were inadequate modern scientific equipments, inadequate transport facilities, non-availability of labours during trial and demonstration, paucity of funds for research and lack of co-ordination among the scientists of various disciplines.

**Keywords:** Farm scientists, extension involvement, perceived constraints, adoption process etc.

## Introduction

Transfer of technology is extremely important for modernizing agriculture. Farmer scientist occupies a crucial position in influencing the innovation-diffusion-adoption process of agro-technologies for farming community, who are the ultimate user of the technologies. Farmers are in one end of 'Lab-to-Land' process and scientists are in another end. Their joint efforts make it possible for rapid agro-technologies adoption. In this connection the Expert Committee on Assessment and Evaluation (1960 – 1968) observed, "In order to keep the Agriculture University extension education and

research programmes attuned to the needs of agricultural modernization, it is essential that the University subject matter specialists also have access to the field problems. This can be achieved in several ways, one of which would be to post of the University subject matter specialists in the Intensive Agricultural District Programme to work with the district specialists and to forge links at the District level. The liaison between the University and extension can be further strengthened by the working together of the subject matter specialists from University and Agricultural Department on some selected projects such as Adaptive Research Field Trails”.

So, more involvement of farm scientists in extension activities leads more adoption of agro-technologies. Kramic (1987) reported that farmers trust on county extension agents was just after family members rather than other resource persons. Subject-matter specialists and scientists had faced several constraints while discharging their extension roles. Ray and Chatterjee (1990) noted that change agents in ICAR system for the transfer of agricultural technology facing the constraints of weak organizational system, low quality of working life, lack of adequate compensation, lack of organizational stability, lack of adequate authority and responsibility and lack of suitable organizational climate. Nataraju *et al.* (1991) reported that more scriptory work, more time consumption due to individual contact, target orientated approach, diversification of work, more span of control were some of the problems perceived by extension personnel in implementation of Training and Visit (T&V) system. Prasad and Hanumanthappa (1992) noted seed farm managers found that problems with low wages of labourers, non availability of labours in time were some of the problems. Mukherjee (1994) reported that poor interdepartmental co-ordination, unnecessary delay in bureaucracy, lack of permanent office at grass root level, poor facilities for mobility, poor communication facilities with scientists, poor supply of reading material and lack of proper research findings were some of the constraints faced by VAW's (Village Agricultural Workers). Reddy and Reddy (1998) noted the constraints expressed by the farm scientists in conduct of research were scientific equipment, training and career development, availability of budget in time, library, laboratory, information system, transport, and data analysis system. Popat *et al.* (2002) concluded that non availability of vehicle, more of reporting working and paucity of funds to prepare teaching aids were the major constraints faced by Subject Matter Specialists (SMSs). The technical constraints like inadequate and proper guidance from superiors, lack of vehicle facility to arrange field trips and lack of new research recommendations and need based research were most felt by large majority of SMSs. Anil Kumar *et al.* (2003) noted that the field based job roles of Agriculture Officers were the most neglected mainly due to non- availability of transport, untimely supply of inputs, excessive paper work and insufficient clerical support. Keeping these in view the present investigation

was undertaken with the objectives of to study the extent of involvement of farm scientists in extension activities, to assess the extent of constraints perceived by the farm scientists to perform their extension activities and to study the interrelationship between extension involvement and perceived constraints.

### Materials and Methodology

The study was carried out at the main campus of Bidhan Chandra Krishi Viswavidyalaya, West Bengal. All the farm scientists working in the main campus of the university for more than three years were the respondents of the study. The total number of such scientists were 96. Hence the sample size was 96. Since the respondents were highly educated, henceforth, it was found to develop an appropriate questionnaire for the collection of necessary required data. The questionnaire was developed on the basis of the objectives of the study. The data were collected during the period from Sept’ 04 - May’ 05.

**Variables and their measurement:** In view of the objectives of the study two types of variables were selected i.e. independent and dependent variables. The list of selected variables and their empirical measurement is given here under:

Independent variables	Empirical measurement
Socio-personal profile	Questionnaire developed for the study
Constraints faced by the farm scientists	Questionnaire developed for the study
Dependent variable	
Extension Involvement	Questionnaire developed for the study

For the analysis of data SPSS/PC (Argyrous, 2002) were used.

### RESULTS AND DISCUSSION

Adoption of agro-technologies among the farming community is largely depending on the extension involvement of farm scientists. Again, the performance of scientists in extension activities influence by working condition under which they have to perform. So, it is this imperative to study along with other factors, the profile of respondents.

**Table 1:** Socio-personal profile of the Farm Scientists (N = 96)

Socio-personal profile	Number	Percentage
<i>Age(in years)</i>		
Young (between 25-35)	11	11.45
Middle (between 36-45)	43	44.79
Old (more than 45)	42	43.75

<b>Gender</b>		
Male	94	97.91
Female	02	02.08
<b>Family Size</b>		
<5	88	91.66
>5	08	08.33
<b>Family Type</b>		
Joint	19	19.79
Nuclear	77	80.20
<b>Number of Children</b>		
No children	06	06.25
Upto 1	53	55.20
From 2 to 3	37	38.54
<b>Family Back Ground</b>		
Rural agriculture	39	40.60
Rural non-agriculture	05	05.20
Urban	35	36.45
Sub-urban	17	17.70
<b>Educational Qualification</b>		
M.Sc./M.Sc(Ag.)/M.V.Sc.	04	04.16
M.Phil	0	0
Ph.D.	92	95.83
D.Sc.	0	0
<b>Job Experience (Present) in Year</b>		
<4	11	11.45
> 4 <8	26	27.08
> 8 <12	10	10.41
> 12 <16	17	17.70
>16	32	33.33
<b>Salary (per month)</b>		
Between ₹ 15,000 to ₹ 20,000	39	40.63
Between ₹ 20,000 to ₹ 25,000	30	31.25
More than ₹ 25,000	27	28.12

Data from the Table 1 revealed that 44.79 per cent of the farm scientists were in the age group of 36-45 years followed by 43.75 per cent scientists in the age group of more than 45 years. It was observed that majority of the farm scientists were male (97.91%) and having less than five members in the family. About eighty per cent respondents belonged to nuclear family. It was also noted that 55.20 per cent of farm scientists have only one child.

It was also observed that 40.60 per cent farm scientists had rural agriculture back ground. Majority of the scientists (95.83%) having Ph.D. degree and 33.33 per cent

of then respondents already were more than 16 years in their present job. From the Table 1 it was also observed that 40.63 per cent respondents got between ₹ 15,000 to ₹ 20,000 followed by 31.25 per cent respondents got ₹ 20,000 to ₹ 25,000 and 28.12 per cent scientists got more than ₹ 25,000 per month.

**Table 2:** Extension Involvement of Farm Scientists in different activities (Rank wise) (N = 96)

Sl. No.	Activities	Total Score	Rank
1	Kisan Mela	177	V
2	Farm and home visit	228	I
3	Kisan Gosthi	163	VIII
4	Writing extension/popular articles in news paper/magazine	194	IV
5	Training of farmers	209	II
6	Monthly workshop	139	X
7	Radio Talk	132	XII
8	Demonstration in the farm field	205	III
9	Consultancy to the farmers	168	VII
10	Preparing extension literature	171	VI
11	Field day's lecture	158	IX
12	T.V. Talk	136	XI

Extension activities are one of the most important job aspects of farm scientists. The nature and extent of involvement of farm scientists were thoroughly assessed in this section. From the above table (Table 2) it is noted that out of different extension activities involvement by farm scientists - Farm and home visit got rank one, followed by Training of farmers, demonstration in the farm field, writing articles, Kisan Mela, Preparing extension literature, got II,III,IV,V,VI ranking respectively.

**Table 3:** Distribution of the farm scientists based on number of training attend as a trainer (On Campus- during the last five years) (N = 96)

Sl. No.	Range of attending on campus training as trainer	Number	Percentage
1	0	25	26.04
2	1 to 3	28	29.17
3	4 to 6	19	19.79
4	>6	24	25.00
<b>Total</b>		<b>96</b>	<b>100</b>

From the above Table 3 it is observed that 29.17 per cent farm scientists acted as on campus trainings trainer. Whereas 26.04 per cent respondents did not offered any training on the campus.

**Table 4:** Distribution of the farm scientists based on number of training attend as a trainer (Off Campus- during last five years) (N = 96)

Sl. No.	Range of attending off campus training as trainer	Number	Percentage
1	0	25	26.04
2	1 to 3	27	28.12
3	4 to 6	16	16.67
4	>6	28	29.17
<b>Total</b>		<b>96</b>	<b>100</b>

It is observed from the above Table 4 that 29.17 per cent farm scientists had attend as trainer on off campus training more than six times, but 26.04 per cent scientists did not act as trainer at all.

**Table 5:** Distribution of the farm scientists according to total number of popular article wrote in different newspaper (For last five years) (N = 96)

Sl. No.	Article wrote in newspaper (Range)	Number	Percentage
1	0	35	36.46
2	Up to 5	42	43.75
3	>5	19	19.79
<b>Total</b>		<b>96</b>	<b>100</b>

It is observed from the above Table 5 that 43.75% farm scientists wrote upto 5 popular articles in different newspaper, whereas 36.46% respondents did not wrote any articles in newspaper.

**Table 6:** Distribution of the farm scientists based on their contribution to farm literature (During last five years) (N = 96)

Sl. No.	Contribution to farm literature (Range)	Number	Percentage
1	0	34	35.42
2	Up to 5	40	41.66
3	>5	22	22.92
<b>Total</b>		<b>96</b>	<b>100</b>

It is observed from the above Table-6 that farm scientists (41.66%) had upto 5 extension literature/farm literature publication. But 35.42% farm scientists had no such publication.

**Table 7:** Distribution of the farm scientists based on radio talk (During last five years)  
(N = 96)

Sl. No.	Radio talk (Range)	Number	Percentage
1	0	72	75.00
2	Up to 5	14	14.58
3	>5	10	10.42
<b>Total</b>		<b>96</b>	<b>100</b>

From the above Table 7 it is evident that cumulatively 25 per cent farm scientists had performed radio talk but 75 per cent scientists had no such contribution.

**Table 8:** Distribution of the farm scientists based on Television talk (During last five years)  
(N = 96)

Sl. No.	Television talk (Range)	Number	Percentage
1	0	65	67.71
2	Up to 5	26	27.08
3	>5	05	05.21
<b>Total</b>		<b>96</b>	<b>100</b>

It is observed from the above Table 8 that cumulatively 32.29 per cent respondents had took part on television programme, whereas 67.71% scientists did not have such response.

**Table 9:** Constraints related to perform extension activities and its weighted score and their individual rank position (As perceived by the respondents) (N = 96)

Sl. No.	Category/type of constraints	Weighted score	Rank
1	Lack of delegation of authority in the organization.	220	I
2	Paucity of fund for research.	204	IV
3	Lack of communication with the experts of the other institutions for upgrading research information.	212	II
4	Lack of prompt decision by the head of the research team.	200	V
5	Lack of interdepartmental communication.	209	III
6	Lack of coordination among different departments.	180	IX
7	Insufficient modern scientific equipments.	198	VI
8	Non availability of labours during trail and demonstrations.	189	VIII
9	Lack of transport facilities.	190	VII
10	Lack of fund for training for farmers.	178	X
11	Lack of coordination of events.	175	XI

12	Lack of proper information system.	164	XIII
13	Constraints in organizing farmers training programme.	151	XVII
14	Unavailability of sufficient land for field experiment/trail.	162	XIV
15	Lack of farmer hostels.	160	XVI
16.	Constraints in demonstration in the farmers field.	161	XV
17	Provision of budget in time.	165	XII
18	No proper protection of research field from grazing animals.	130	XXII
19	Farm scientists being used as generalists.	140	XIX
20	Lack of data analysis system.	150	XXVIII
21	Lack of access to radio talk or T.V. talks (related to farm programme).	139	XX
22	Inadequate field and farmers problem oriented research.	138	XXI

Analysis of constraints is an important aspect to study the involvement in extension activities of the farm scientists and some of the constraints were overlapping. The nature and extent of constraints (as perceived by the respondents) are thoroughly assessed. Table 9 gives a view of the rank position of constraints among the respondents. Out of twenty two factors selected to study constraints faced by the farm scientists, it is observed from the table (Table 9) that the factor lack of delegation of authority in the organization was the most vital constraints as perceived by the respondents and got rank one, followed by lack of communication with the experts of the other institutions, lack of interdepartmental communication, paucity of fund for research, lack of prompt decision by the head of the research team, insufficient modern scientific equipments and lack of transport facilities had got rank II, III,IV,V,VI,VII respectively. Lesser constraints faced by the respondents were no proper protection of research field from grazing animals, inadequate field and farmers problem oriented research, lack of access to radio talk or T.V. talks (related to farm programme) and farm scientists being used as generalists.

**Table 10:** Extension Involvement as Related with constraints (as perceived by the respondents) (N = 96)

Sl. No.	Category/type of constraints	r-value
1	Lack of delegation of authority in the organization ( $X_1$ ).	-0.455**
2	Paucity of fund for research ( $X_2$ ).	-0.385**
3	Lack of communication with the experts of the other institutions for upgrading research information ( $X_3$ ).	-0.328**
4	Lack of prompt decision by the head of the research team ( $X_4$ ).	-0.308**



5	Lack of interdepartmental communication (X <sub>5</sub> ).	-0.301**
6	Lack of coordination among different departments (X <sub>6</sub> ).	-0.273*
7	Insufficient modern scientific equipments (X <sub>7</sub> ).	-0.243*
8	Non availability of labours during trail and demonstrations (X <sub>8</sub> ).	-0.242*
9	Lack of transport facilities (X <sub>9</sub> ).	-0.241*
10	Lack of fund for training for farmers (X <sub>10</sub> ).	-0.230*
11	Lack of coordination of events (X <sub>11</sub> ).	-0.214*
12	Lack of proper information system(X <sub>12</sub> ).	-0.188 <sup>NS</sup>
13	Constraints in organizing farmers training programme (X <sub>13</sub> ).	-0.179 <sup>NS</sup>
14	Unavailability of sufficient land for field experiment/trail (X <sub>14</sub> ).	-0.159 <sup>NS</sup>
15	Lack of farmer hostels (X <sub>15</sub> ).	-0.156 <sup>NS</sup>
16	Constraints in demonstration in the farmers field (X <sub>16</sub> ).	-0.156 <sup>NS</sup>
17	Provision of budget in time (X <sub>17</sub> ).	-0.108 <sup>NS</sup>
18	No proper protection of research field from grazing animals (X <sub>18</sub> ).	-0.079 <sup>NS</sup>
19	Farm scientists being used as generalists (X <sub>19</sub> ).	-0.073 <sup>NS</sup>
20	Lack of data analysis system (X <sub>20</sub> ).	-0.069 <sup>NS</sup>
21	Lack of access to radio talk or T.V. talks (related to farm programme) (X <sub>21</sub> ).	-0.069 <sup>NS</sup>
22	Inadequate field and farmers problem oriented research (X <sub>22</sub> ).	-0.024 <sup>NS</sup>

\*\* Significant at the 0.01 level. \* Significant at the 0.05 level. NS = Non Significant.

It is observed from the Table 10 that the involvement in extension activities of farm scientists were significantly and negatively affected by the constraints X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub>, X<sub>10</sub>, and X<sub>11</sub>. So, these were the main constraints or obstacle that stand in the way of getting the desire level of extension involvement on the part of respondents.

**Table 11:** Result of the Stepwise Multiple Regression of extension involvement on five significant variables of extension activities related to constraints

Independent variables entered stepwise in equation	Multiple R	R Square
X <sub>1</sub>	0.429	0.184
X <sub>1</sub> and X <sub>2</sub>	0.510	0.260
X <sub>1</sub> , X <sub>2</sub> and X <sub>3</sub>	0.553	0.306
X <sub>1</sub> , X <sub>2</sub> , X <sub>3</sub> and X <sub>4</sub>	0.587	0.344
X <sub>1</sub> , X <sub>2</sub> , X <sub>3</sub> , X <sub>4</sub> and X <sub>5</sub>	0.615	0.378

Result of the Stepwise Multiple Regression reveals that variables X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub> and X<sub>5</sub> had explained 37.80 per cent of the variance in extension involvement of farm scientists. R-value i.e. *multivariate equivalent* indicates the strong relationship

between the combination of independent variables (X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub> and X<sub>5</sub>) and the dependent variable (extension involvement). It was also observed that the variable X<sub>1</sub> (lack of delegation of authority in the organization) was the best single predictor of involvement in extension activities of the respondents.

## Conclusion

From the study it can be concluded maximum scientists were either middle or old age group. Most of the scientists lived in nuclear family and regarding their family background majority of the respondents either came from rural agriculture or urban background. It was also observed that 95.83 per cent respondents had Ph.D. degree. Farm and home visit, demonstration in the farm field, training of farmers, writing articles, Kisan Mela and preparing extension literature were the most performed extension activities of respondents. Lack of delegation of authority, lack of communication with the experts of the other institutions, lack of interdepartmental communication, paucity of fund for research, lack of prompt decision by the head of the research team, insufficient modern scientific equipments and lack of transport facilities were major constraints faced by the farm scientists to perform their extension activities. Factors like lack of delegation of authority in the organization, paucity of fund for research, lack of communication with the experts of the other institutions, lack of prompt decision by the head of the research team and lack of interdepartmental communication and these were the major barriers that stand on the way of scientists to perform their extension activities, these were again confirmed by stepwise multiple regression. Communication is the life and blood of any system for its smooth operation, but it was noted here, communication problem in relation to interdepartmental communication, delegation of authority as well as interaction with other institution was the major impediment for transfer of technology and paucity of fund was also another major constraint. So, administrators should take special care to solve these problems for better involvement of farm scientists in extension activities, which in return will assist to more adoption of agro-technologies among the farming community.

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