RESEARCH ARTICLE :

Individual level performance analysis of agricultural technology management agency in Assam

■ CHITTARANJAN DEKA, P. MISHRA AND R.K. TALUKDAR

SUMMARY : The agricultural technology management agency (ATMA) is a registered society of key stakeholders involved in agricultural activities for sustainable agricultural development in the district. It is a focal point for integrating research and extension activities and decentralizing day-to-day management of agricultural extension system. As the ATMA programme is under operation for the last ten years in Assam, the researchable questions may arise that to how and what extent the extension personnel (Members of ATMA Governing Body) from respective district performed their role to accomplish the functions/activities of ATMA. Keeping in view, a research study was carried out with the objectives *i.e.* 1. To assess role performance of members ATMA governing body, 2. To find out direct and indirect effects of a set of selected predictor variables on role performance of members of ATMA governing body. A multistage purposive cum random sampling method was followed for selection of the respondents of the study. The findings of the level of role performance of the GB members revealed that 80.00 per cent of the respondents had low to medium level of performance. Only 20.00 per cent of them were found with high level of role performance. The value of co-efficient of multiple regression (R^2) being 0.611 indicated that the independent variables *viz.,* job satisfaction, achievement motivation, motivational profile, job value cherished, attitude towards extension work, organizational climate, leadership ability, role conflict and job stress jointly contributed 61.10 per cent towards the role performance of GB members. The F value (F=4.937**) was also found to be significant. The results of the path analyses that the variables leadership ability, job stress, motivational profile, achievement motivation, organizational climate and job satisfaction emerged to be six most important variables which exhibited substantial direct effects on the level of role performance of the GB members.

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BACKGROUND AND OBJECTIVES

Agriculture plays a vital role in India's economy. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the gross domestic product (GDP). Hence, agricultural extension plays a crucial role in disseminating modern agricultural technology to increase production and productivity in agricultural and allied sectors. Agricultural extension through

advisory services and programmes forges to strengthen the people's capacity to innovate by providing access to knowledge and information.

The revamping of extension will certainly play a catalytic role for ushering in farmer-led and market led extension in India (Moni, 2004). India's agricultural extension system is at a pivotal point in its development. The arrangements for agricultural extension in India have grown over the last five decades, in terms of activities, organizational types and available manpower. At the outset, extension worked to bring about broad-based rural development. However, the food crisis starting in the late 1950s refocused the efforts of extension on food security and increasing food production. The combination of green revolution technology in the late 1960s and training and visit (T&V) system in the mid 1970s enabled India to achieve food self-sufficiency during the 1980-1990s. The T&V system was effective in disseminating green revolution technology, especially in the high potential, irrigated areas, but it had little effect on the productivity and incomes among farmers in rain fed areas (Swanson and Mathur, 2003 and Singh *et al.*, 2005). In mid-1990s, the Govt. of India and the World Bank began exploring new approaches to extension that would address these system problems and constraints resulting in new, decentralized extension approach, which would focus more on diversification, thereby that making it more market-oriented and increasing farm income and rural employment. The central institutional innovation that emerged to address these system problems was the Agricultural Technology Management Agency or ATMA model that was introduced at the district level.

As the ATMA programme is under operation for the last ten years, the researchable questions may arise that to how and what extent the extension personnel (Members of ATMA governing body) from respective district performed their role to accomplish the functions/activities of ATMA. Keeping in view, a research study was carried out with the objectives *i.e.* 1. To assess role performance of members ATMA governing body 2. To find out direct and indirect effects of a set of selected predictor variables on role performance of members of ATMA governing body.

RESOURCES AND METHODS

The present study was conducted in two districts namely Kokrajhar and Bongaigaon of Assam during the year 2014-15. A multistage purposive cum random sampling method was followed for selection of the respondents of the study. From two selected district 80 per cent of GB members were selected randomly. The eighty per cent of GB members accounts 30 numbers. of respondents from two districts. To measure the level of role performance as perceived by the extension personnel of ATMA governing body (GB), the ATMA revised guidelines 2010 was followed where distinctly delineated the key functions of GB. From the key functions 14 numbers. of role items of members of GB were drawn out after several line discussions with Project Director, Deputy Project Director of ATMA, researchers and extension personnel involved in ATMA.

Hence, final index to measure the level of role performance of the extension personnel of GB members consisted of 14 numbers of items. Before measuring 'performance' of a particular role item, a filter question (Did you perform?) was asked to check whether a particular role item was performed or not. The role items were then administered for evaluating the level of performance. The answers to the question "what level?" was administered on five point continuum with categories ranging from "most frequently performed" to "never performed" through "frequently performed", "sometime performed" and "rarely performed" and the scores assigned were 4,3,2,1 and 0, respectively. The total score of each respondent was calculated by summing the scores obtained by him/her against each role item. The scores on each of the items were worked out for all the respondents separately.

The total score for a given role items obtainable by a respondent ranged from 0 to 56 for GB members. Thus, the total score on this index ranged from 0 to 56. The higher score indicates that respondent had higher level of role performance and *vice-versa*.

Based on the mean ($\overline{x}$) and standard deviation (S.D.) of the obtained scores, respondents were classified into three categories as shown below:

Category	Score range
Low level of performance	Up to $\overline{X}$ -1 S.D.
Medium level of performance	$\overline{X}$ -1 S.D. to $\overline{X}$ +1 S.D.
High level of performance	Above $\overline{X}$ +1 S.D.

Ranks were given to each role items based on the weighted mean score to find out the level of role performance. The highest rank of the role item in the

rank order means the highest perceived level of role performance.

The primary data in the present study were collected directly from the respondents with the help of the structured schedule through personal interview method. The interview schedule was taken to each of the respondent's *viz.*, members of GB by the investigator. After establishing rapport, questions contained in the schedule were explained to each respondent and the responses received were recorded by the investigator. The data collected in the study were coded, classified, tabulated and analyzed in order to make the findings meaningful. Various descriptive and inferential statistical methods were used to analyze the data in the present study.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Level of role performance as perceived by the respondents (GB members) :

Table 1 reveals that majority (63.33%) of the respondents had medium level of role performance followed by 20.00 per cent respondents had high level of role performance. The least number of GB members *i.e.* 16.67 per cent had low level of role performance. The value of co-efficient of variation (24.26) indicates that the respondents were homogenous with respect to their level of role performance. A pie diagram showing the distribution of respondents according to their level of role performance was drawn and presented in Fig. 1.

Performance of different role items by the respondents (GB Members) :

Table 2 reveals that the highest rank was occupied by the role "Participated and help in holding the meetings of ATMA GB every quarter or frequently" with a weighted mean score of 3.93. The role "Help in development of FIGs and farmers' organizations within
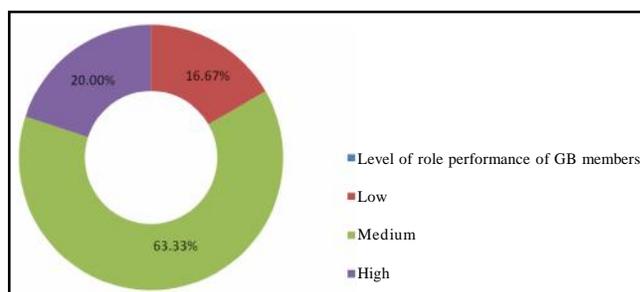

Fig. 1 :   Level of role performance of GB members

the district" stood second in the rank order with a weighted mean score of 3.40. The third rank was occupied by the role "Adopt and amend the rules and by – laws for the ATMA" with a weighted mean score of 3.30 followed by the role numbers 1, 14, 2, 3, 7, 10, 5, 11, 6, 9 and 8 stood in the rank fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh, twelfth and thirteenth, respectively.

"Participated and help in holding the meetings of ATMA GB every quarter or frequently" makes the yardstick for policy making, planning and designing the extension activities to be undertaken in the district. The success of any extension programme depends on how best the farmers' problems and prospects were shorted out and fulfilled considering the socio-economic and ecological condition of the district. The implementation of extension activities are generally easy through formation of FIGs and farmers' organization which are being prioritized before putting it into the action plan. "Adopt and amend the rules and by – laws" for the ATMA is another important issue for successful implementation of the programme by the members of GB which are being clearly indicated by the chairman of GB. These fairly justified the role numbers 13, 4 and 12 being in the rank 1, 2 and 3, respectively.

Four major roles that were "Facilitate greater involvement of private sector firms and organizations in providing inputs, technical support, agro-processing and marketing services to farmers", "Take part in encouraging agriculture lending institutions to increase the availability of capital to resource poor and marginal farmers especially SC, ST and women farmers",

Table 1 : Distribution of respondents (GB members) according to their level of role performance						(n=30)
Category	Score range	Frequency	Percentage (%)	Mean	S.D	C.V
Low	23 to 29	5	16.67	38.36	9.30	24.26
Moderate	30 to 48	19	63.33			
High	49 to 41	6	20.00			

"Providing own inputs for creating a convergence model for executing extension activities" and "Identify other sources of financial support that would help ensure the financial sustainability of the ATMA" placed in the later rank *viz.*, ninth, eleventh, twelfth and thirteenth, respectively. This perhaps ignored to some extent by the GB members.

Relationship between the independent variables and the level of role performance of GB members:

It is evident from data presented in the Table 3 (a) that the level of role performance of GB members had positive and significant correlation with job satisfaction (r=0.601**), achievement motivation (r=0.671**), motivational profile (r=0.467**), job values cherished (r=0.590**), attitude towards extension work (r=0.645**) and leadership ability (r=0.646**) at 0.01 level of probability.

The findings also highlighted that the level of role performance of GB members had positive and significant correlation with age (r=0.369*), job involvement (r=0.383*) and organizational climate (r=0.398*) at 0.05 level of probability.

It can be seen that while job satisfaction, achievement motivation, motivational profile, job values cherished, attitude towards extension work and leadership ability had moderately strong relationship with the level of role performance of the GB members, the variables *viz.,* age, job involvement and organizational climate showed relatively weaker relationship with the level of role performance of the GB members.

Table 3 (a) also reveals that the level of role performance of GB members had negative and significant correlation with job experience (r= -365*), role conflict (r= -0.466**) and job stress (r= -0.633**).

Contributory effects of selected independent variables on the level of role performance of GB members :

It is evident from the data presented in the Table 3 (b) that job satisfaction (b=0.127**), achievement motivation (b=0.163*), motivational profile (b=0.149**), job values cherished (b=0.343*) attitude towards extension work (b=0.234*), organizational climate (b= 0.449**) and leadership ability (b=0.236*) had positive and significant contribution towards explaining the variation in the level of role performance of GB members.

It is observed from the table that variables like role conflict (b= -0.145**) and job stress (b= -0.486**) were found to have negative and significant contribution towards the role performance of GB members.

The value of co-efficient of multiple regression (R^2) being 0.611 indicated that the independent variables jointly contributed 61.10 per cent towards the role performance of GB members. The F value (F=4.937**) was also found

Table 2 : Performance of different role items by the respondents (GB Members)		(n=30)	
Sr. No.	Role items	Weighted mean score	Rank
1.	Reviewing of SREP and annual action plans that are prepared and submitted by the participating units	3.16	IV
2.	Timely receive and review annual reports presented by the participating units	2.90	VI
3.	Providing feedback and direction to the AMC as needed, for various research and extension activities being carried out within the district	2.76	VII
4.	Help in development of FIGs and farmers' organizations within the district	3.40	II
5.	Facilitate greater involvement of private sector firms and organizations in providing inputs, technical support, agro-processing and marketing services to farmers	2.13	IX
6.	Take part in encouraging agriculture lending institutions to increase the availability of capital to resource poor and marginal farmers especially SC, ST and women farmers	1.90	XI
7.	Encouraging each line department to establish FAC to provide feedback and input for their respective R-E programme	2.76	VII
8.	Identify other sources of financial support that would help ensure the financial sustainability of the ATMA	1.60	XIII
9.	Providing own inputs for creating a convergence model for executing extension activities	1.66	XII
10.	Help in establishing revolving funds/accounts for each participating unit and encourage each unit to make available technical services	2.56	VIII
11.	Helps in arranging the periodic audits of ATMA financial accounts	2.00	X
12.	Adopt and amend the rules and by – laws for the ATMA	3.30	III
13.	Participated and help in holding the meetings of ATMA GB every quarter or frequently	3.93	I
14.	Perform any other activities that support effective function of ATMA in the district	2.93	V

to be significant. This indicates the significant effectiveness of these variables in explaining the role performance of GB members when all of them were functioning jointly.

Direct and indirect effects of selected independent variables on the role performance of GB members:

A hypothetical causal model showing the paths of interrelated variables influencing the role performance of GB members was constructed. The variables which were found significant in the correlation analysis were selected for the causal model to show their indirect interrelationship towards the level of performance. Sequential multiple regression was done to analyze the actual causal interrelationship among the variables. Hence, the model was restructured based on the values

of multiple regressions. The diagram was drawn to show the direct and indirect effects among the interrelated independent variables towards the level of performance of the GB members.

The effect of the two exogenous variables namely 'job satisfaction' (X_3) and 'organisational climate' (X_{10}) were channelized through different variables to ultimately affect the role performance of GB members. 'Attitude towards extension work', 'motivational profile' and 'Role conflict' were the three most important variables through which most of the indirect effects were channelized. The highest total effect on the level of role performance of GB members was exhibited by leadership ability (3.779) followed by job stress (3.195), organizational climate (3.188), job satisfaction (2.915), achievement motivation (2.570) and motivational profile (2.512).

Table 3 (a) : Relationship between the independent variables and the level of role performance of GB members			(n=30)
Sr. No.	Independent variables	'r' value	't' value
1.	Age	0.369*	2.100
2.	Job experience	-0.365*	2.074
3.	Job satisfaction	0.601**	3.978
4.	Achievement motivation	0.671**	4.788
5.	Role Conflict	-0.466**	2.786
6.	Motivational profile	0.467**	2.794
7.	Job values cherished	0.590**	3.867
8.	Job involvement	0.383*	2.199
9.	Attitude towards extension work	0.645**	4.467
10.	Organisational climate	0.398*	2.295
11.	Job stress	-0.633**	4.326
12.	Leadership ability	0.646**	4.479

* and ** indicate significance of values at P=0.05 and 0.01, respectively, level of probability

Table 3(b) : Contributory effects of selected independent variables on the role performance of GB members			(n=30)
Sr. No.	Variables	b value	t value
1.	Age	0.267	0.602
2.	Job experience	0.230	0.763
3.	Job satisfaction	0.127**	0.591
4.	Achievement motivation	0.163*	0.762
5.	Role conflict	-0.145**	0.494
6.	Motivational profile	0.149**	0.625
7.	Job values cherished	0.343*	1.197
8.	Job involvement	0.299	1.348
9.	Attitude towards extension work	0.234*	1.222
10.	Organisational climate	0.449**	1.902
11.	Job stress	-0.486**	1.642
12.	Leadership ability	0.236*	1.293
	R^2 = 0.611	Adjusted R^2= 0.496	F value = 4.937**

* and ** indicate significance of values at P=0.05 and 0.01, respectively, level of probability

It is evident from Table 3 (c) that the highest direct effect on the level of role performance of GB members was exhibited by leadership ability (3.401) which was followed by job stress (2.208), motivational profile (1.741), achievement motivation (1.521), organizational climate (1.302) and job satisfaction (1.031). The remaining other variables namely attitude towards extension work (0.926), role conflict (0.057) and job values cherished (0.043) had registered comparatively smaller direct effects on the level of role performance of GB members.

The maximum indirect effect was exhibited by the organizational climate (1.886), which was followed by job satisfaction (1.884), and achievement motivation (1.049). The remaining other variables namely job stress (0.987), role conflict (0.819), motivational profile (0.771), job values cherished (0.588) and leadership ability (0.378) had registered comparatively smaller indirect effect on the level of role performance of GB members.

It is evident from the results of the path analyses that the variables leadership ability, job stress, motivational profile, achievement motivation, organizational climate and job satisfaction emerged to be six most important variables which exhibited substantial direct effects on the level of role performance of the GB members.

The findings of the level of role performance of the GB members revealed that 80.00 per cent of the respondents had low to medium level of performance. Only 20.00 per cent of them were found with high level of role performance. An effective extension management approach for organizational performance should seek to pin point the gaps in performance of their assigned roles and try to reduce them as far as realistic. Higher level of role performance is likely to impact positively on employees' and organization's well-being. Care should also be taken to improve the organisational climate to increase the job satisfaction and achievement motivation which is evident from the direct and indirect relationships among these variables. The findings of correlation analysis between the independent variables and the level of role performance of the extension personnel, indicated that the variables job satisfaction, achievement motivation,

Table 3(c) : Direct and indirect effects of selected independent variables on the role performance of GB members					(n=30)
Sr. No.	Independent variables	Direct effect	Variables through which indirect effects are channelized	Total indirect effect	Total effect
1.	Job satisfaction (X_3)	1.031	0.616(X_4)	1.884	2.915
			0.084(X_5)		
			0.303(X_6)		
			0.881 (X_9)		
2.	Achievement motivation (X_4)	1.521	0.092(X_5)	1.049	2.570
			0.303(X_6)		
			0.654(X_9)		
3.	Role conflict (X_5)	0.057	0.254(X_6)	0.819	0.876
			0.565(X_9)		
4.	Motivational profile (X_6)	1.741	0.771(X_9)	0.771	2.512
5.	Job values cherished (X_7)	0.043	0.588 (X_9)	0.588	0.631
6.	Organisational climate (X_{10})	1.302	0.103 (X_5)	1.886	3.188
			0.117 (X_6)		
			0.079 (X_7)		
			0.371 (X_9)		
			0.875(X_{11})		
			0.341(X_{12})		
7.	Job stress (X_{11})	2.208	0.100(X_5)	0.987	3.195
			0.746(X_9)		
			0.141 (X_{12})		
8.	Leadership ability(X_{12})	3.401	0.2706(X_7)	0.378	3.779
			0.108(X_9)		
9.	Attitude towards Extension work(X_9)	0.926	-		0.926

motivational profile, job values cherished, attitude towards extension work, leadership ability, age, job involvement and organizational climate were the important variables influencing the level of role performance of extension personnel. A highly significant and positive correlation of these variables with the level of performance indicated that the extension personnel with higher job satisfaction and achievement motivation, more favourable motivational profile, highly respect their job values, highly favourable attitude towards extension work, more favourable organizational climate and high leadership ability were likely to influence the level of role performance to great extent. Where these attributes are at lower level in the extension personnel, appropriate management strategies may be adopted to modify their behaviour for increased level of performance of their roles. The value of co-efficient of multiple regression (R^2) being 0.611 indicated that the independent variables *viz.,* job satisfaction, achievement motivation, motivational profile, job value cherished, attitude towards extension work, organizational climate, leadership ability, role conflict and job stress jointly contributed 61.10 per cent towards the role performance of GB members. The F value (F=4.937**) was also found to be significant. The results of the path analyses that the variables leadership ability, job stress, motivational profile, achievement motivation, organizational climate and job satisfaction emerged to be six most important variables which exhibited substantial direct effects on the level of role performance of the GB members. Therefore, there is possibility for policy makers, extension planners; higher level administrators, etc to manipulate these crucial factors in order to bring about desirable changes in level of performance of their roles.

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