

**RESEARCH ARTICLE :**

Development of an index to measure the level of role performance as perceived by the agricultural development officers under revitalized extension system in Assam

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SUMMARY : An index was developed to measure the level of the role performance as perceived by the Agricultural Development Officers under revitalized extension system in Assam based on Likert's technique. Tentative lists of 56 statements were drafted keeping in view the applicability of statements suited to the area of study. The statements collected were edited in the light of the informal criteria suggested by Thurstone and Chave(1929), and Edward and Kilpatrick(1948). There was no index available to measure the performance of the Agricultural Development Officers under revitalized extension system in Assam. The present study was contemplated to develop and standardize the same. The final index consists of 42 statements and the reliability and validity of which indicates its precision and consistency of the results. This index can be used to measure the performance of the extension personnel's beyond the study area with suitable modifications.

KEY WORDS :

Attitude scale, ATMA, Extension reform, Likert's summated rating, Item analysis, Reliability, Validity

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BACKGROUND AND OBJECTIVES

Most of the poverty alleviation programmes implemented by Govt. of India in the past could not succeed to the desirable extent as these programmes did not consider the needs and interest of the peoples at the grass root level. It has been realized that the public sector extension system on its own is not capable enough to meet the ever increasing and multi faceted demands of the farming community. So It was felt that extension system should be made broad based and

holistic by utilizing a farming system approach and involving various stakeholders. To address the situation, the Government of India (GOI) and the World Bank pilot-tested a new, decentralized, market-driven extension model under the National Agricultural Technology Project (NATP). The key institution in implementing this new approach was the agricultural technology management agency (ATMA) which was responsible for facilitating and co-ordinating "farmer-led" extension activities within each district.

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The agricultural technology management agency (ATMA) calls for integrated approach wherein different stakeholders come closer to plan, organise, and execute the activities to take full advantage of the technologies demonstrated in the operational area (Kumar *et al.*, 2011). In the midst of this change, extension system is grappling with the question of how best to harness 'extension reform' to improve farming community. The performance of the employee is the key to the success of most of the organizations and must be evaluated. The effective implementation of 'ATMA' largely depends on how effectively the extension functionaries perceive their roles and perform those. No standardized instrument, however, is available for measuring the level of role performance of the extension personnel under this changing scenario. Hence, the present study was contemplated to develop a standardized index to measure the level of role performance as perceived by the Agricultural Development Officers (ADOs) who had worked as conveners in the respective Block Resource Centres (BRCs) of different ATMA districts in the state of Assam.

RESOURCES AND METHODS

The study was conducted in Assam, one of the states of North-eastern India. At the time of the study, there were 27 districts in Assam. Out of these, 11 (eleven) districts were purposively selected for the study because agricultural technology management agency (ATMA) was first constituted in these districts under the World Bank aided Assam Agricultural Competitiveness Project (AACP). The role performance in the study has been operationally defined as the view points or opinions of the respondents on the list of role items identified under each of the seven role dimensions, namely, 'planning', 'organizing', 'staffing', 'directing', 'coordinating', 'reporting' and 'budgeting' in the study area as being performed or not performed with respect to their position as an Agricultural Development Officer (ADO). Thus, the role performance reflects the 'actual does' part of the role incumbent. The procedure followed for development of the index is described in the following paragraphs.

Collection of items :

Seventy statements, expressing the role items of extension personnel in the revitalized extension system

were collected from available literature, ATMA guideline 2010, researchers and experts in the field of extension. In order to maintain uniformity, these role items were then categorized under seven role dimensions with equal number of role items under each dimension. Thus, there were ten role items under each role dimension. These items were edited on the basis of criteria suggested by Thurstone (1946); Likert (1932) and Edward (1957). Finally, a total of 56 role items were retained having eight items under each role dimension.

Selection of judges :

A total of 60 judges comprising of experts in the field of extension education of Assam Agricultural University, Extension Education Institute, Jorhat, Nagaland University and field experts of ATMA were selected.

Judges' ratings / opinion :

The judges' rating was primarily used to ascertain the role items under various dimensions. The selected 56 role items were sent to 60 judges through self-addressed envelope. The judges were requested to evaluate these role statements on a three point continuum, viz., 'Most relevant' (MR), 'Relevant' (R) and 'Less relevant' (LR). A score of 3, 2 and 1 were given for MR, R and LR, respectively. Finally, the responses of 50 judges were taken into consideration that fulfilled the following criteria: (1) Completeness (2) Response within the time frame. Accordingly, ten responses were rejected, which were not complete. Thus, the relevancy data furnished by 50 judges were taken into consideration for arriving at the selection of role items for the index.

Selection of items for the final index :

The responses obtained from judges were tabulated for each role item under three response categories and appropriate score was assigned for each item. The following procedure was followed for consolidating the scores assigned.

The ratings for each response by the judges were utilized for the calculation of 't' values under each role item. The response to each item was considered as a rating score and the scores were summed up for all items.

From the total score, the frequency distribution of scores was considered, which was based on the

responses to all items. Then, 25 per cent of the items with the highest total score and 25 per cent of the items with the lowest total score were taken, which provided the criterion groups to evaluate the individual item. The relevancy test (RT) was carried out using the formula:

$$RT = \frac{[(MR \times 3) + (R \times 2) + (LR \times 1)]}{56 \times 3}$$

where,

MR =Most Relevant

R =Relevant

LR =Least Relevant

If the value of RT was more than 0.75 per cent for a statement, it was considered for inclusion in the index. The 't' value for each item was worked out using the formula:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\frac{\sqrt{\sum(X_H - \bar{X}_H)(X_L - \bar{X}_L)}}{n(n-1)}}$$

where,

$$\sum(X_H - \bar{X}_H) = \frac{\sum X_H^2 - (\sum X_H)^2}{n}$$

$$\sum(X_L - \bar{X}_L) = \frac{\sum X_L^2 - (\sum X_L)^2}{n}$$

\bar{X}_H = The mean score on given statement of the high group

\bar{X}_L = The mean score on given statement of the low group

$\sum X_H^2$ = Sum of squares of the individual score on a given statement for high group

$\sum X_L^2$ = Sum of squares of the individual score on a given statement for low group

$\sum X_H$ = Summation of scores on given statement for high group

$\sum X_L$ = Summation of scores on given statement for low group

n = Number of respondents in each group

\sum = Summation

OBSERVATIONS AND ANALYSIS

The value of 't' was considered as a measure of the extent to which a given item differentiates between the high and low group. After calculating the 't' values, items were arranged in rank order according to their 't' values. Finally 42 items with the largest 't' values were selected for the performance index. The statements included in the final index are presented in Table 1.

Method of administration :

The final index to measure the level of role performance of the extension personnel consisted of 42 role 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. If the response to this question was positive, the role items were then administered for evaluating the perceived level of regularity and quality in performing those role items. Two columns on the right hand side of the role items with two questions, viz., "How regularly?" and "How well?" were put for this purpose. The answers to the question "How regularly?" was administered on three point continuum ranging from "regularly", "sometimes" and "never" and the scores assigned were 2, 1, 0, respectively. The answers to the question "How well?" was administered on four point continuum with categories ranging from "very well", "well", "somehow" and "poor" and the scores assigned were 3, 2, 1 and 0, respectively. The total score of each respondent was calculated by summing the scores obtained by him/her on the two performance dimensions, i.e. regularity and quality of performance.

The score on role performance of a respondent was worked out by summing the score received by him/her on the two dimensions against each role item. The scores on each of the 6 items under each role dimension were worked out for all the respondents separately. Mathematically, performance level of a respondent on a given role dimension can be expressed as follows.

$$P.I. = dR_i + dQ_i$$

where,

\sum = Summation

R_i = Score on regularity in performing different roles (i= 1, 2....6)

Q_i = Score on quality in performing different roles (i= 1, 2....6)

P.I. = Performance index

The total score for a given role dimension obtainable by a respondent ranged from 0 to 30. Thus the total score on this index ranged from 0 to 210. The higher score indicates that respondent had higher level of role performance and *vice-versa*.

Estimation of reliability and validity of the index:

Test-retest method was employed to get an estimation of the reliability of the index. The final set of the 42 statements, which represent the area of

Table 1: The statements included in the final index

Sr. No.	Role statements
Planning	
1.	Helping district core team in up gradation of SREP
2.	Preparation of Block Action Plan detailing extension activities to be undertaken
3.	Carrying out socio-economic analysis for group formation
4.	Identification and prioritization of needs and interest of the farmers
5.	Developing module for capacity building programmes
6.	Exploring new area of farming having present and future prospects
Organizing	
1.	Operationalising SREP in each block and move towards single window extension delivery
2.	Organizing farmers organization at block level
3.	Organizing capacity building programmes for farmers and farmers' group
4.	Organizing farmer's meeting in setting aims, objectives and addressing key issues
5.	Organizing exhibition, kissan mela, fruits/ vegetable show
6.	Establishing linkages for convergence with line department
Staffing	
1.	Selection of beneficiaries in consultation with farmers advisory committee and village panchayats
2.	Helping farmer's group in selection of its members
3.	Identification and development of leader for farmers group
4.	Identification of farmers and farmers' group for rewards and incentives
5.	Helps in formation of Farm Information and Advisory Centre
6.	Identification of resource persons for capacity building programmes
Directing	
1.	Intimating farmers and resource persons for the capacity building programmes
2.	Facilitating farmer to farmer technology dissemination and learning
3.	Helping farmers in getting necessary inputs from the service centre
4.	Helping farmers groups in maintaining sustainability and leadership
5.	Detailing the activities to be carried out by Farmers advisory committee
6.	Providing timely and relevant information to farmers
Coordinating	
1.	Coordinating the implementation of extension programmes detailed in BAP
2.	Coordinating block meeting to discuss the issues brought by farmer's advisory committee
3.	Coordinating assessment, refinement, validation and adoption of front line technologies with local research centres
4.	Monitoring the functioning of farmers group on a regular basis
5.	Helps in federation of farmers group from block to district level
6.	Helps in establishing information portals for information sharing
Reporting	
1.	Documentation and publication of success stories of farmers
2.	Reporting farmer's feed back in block meeting
3.	Keeping inventory of all the beneficiary farmers and farm related activities in the operational area
4.	Supporting ATMA management committee in discharging its function by reporting necessary feedback
5.	Compiling report on reviewing of progress and reporting the same to ATMA Management Committee
6.	Submission of work plans to State Level sanctioning Committee for funding under the scheme
Budgeting	
1.	Working on the credit appraisal and approval for the activities to be carried out
2.	Maintaining proper record and account for the activities carried out
3.	Provisioning rewards and incentives for successful famers/ groups
4.	Provisioning seed money/revolving fund for functioning of farmers group
5.	Compiling report on utilization of fund and the physical progress of work
6.	Mobilizing fund needed for documentation and publication of success stories

performance of extension personnel under extension reform, was administered to a randomly selected group of 60 Agricultural Development Officers (ADOs) who had worked as conveners in the respective Block Resource Centres (BRCs) of eleven ATMA districts in the state of Assam. After a period of 15 days the instrument was administered again to the same respondents and thus two sets of scores were obtained. The correlation co-efficient between the two sets of scores was worked out. The 'r' value (0.675) was significant at 0.01 level of probability indicating that the index was highly suitable for administration to the extension personnel as the index was stable and dependable in its measurement.

As the content of the attitude was thoroughly covered the entire universe of extension reform through literature and expert opinion, it was assumed that present index satisfied the content validity. As the index value difference for almost all the statements included had a very high discriminating value, it seemed reasonable to accept the index as a valid measure of the level of role performance as perceived by the extension personnel under extension reform, thus ensuring a fair degree of content validity.

Conclusion :

The reliability and validity estimates of the index indicated the precision and consistency of the results. This index can be used to measure the extension personnel's performance beyond the study area with suitable modifications.

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