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Development of a Scale to Assess the Role Performance of Field Extension Functionaries

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Abstract

This study aims to develop a valid and reliable scale to measure the role performance of field extension functionaries (FEFs) of the Dairy Development Department (DDD), Kerala. An exploratory research design was adopted. Non-stratified random sampling was adopted to select 120 FEFs, of which 60 were Dairy Extension Officers (DEOs) and 60 were Dairy Farm Instructors (DFIs). Item-content validity index and scale-content validity index were used to measure the content validity of the role performance scale. Cronbach's alpha reliability coefficient was used to determine the internal consistency of the items. Cronbach's alpha was found to be very high and indicates strong internal consistency among the items.

Keywords: Cronbach's Alpha Reliability Coefficient, Dairy Development Department, Exploratory Research Design, Field Extension Functionaries, Role Performance.

Introduction

The DDD of Kerala serves as a crucial entity delivering extension services in the dairy sector within the state. Despite recent adversities, Kerala is nearing self-sufficiency in milk production. The department's field extension personnel have significantly contributed to enhancing the state's dairy cooperative sector. Their responsibilities encompass executing dairy and fodder development initiatives, enhancing quality milk output via rural extension and advisory support, and fostering collaborations with various stakeholders. According to Patel (2015), role performance refers to how effectively individuals fulfill various job responsibilities associated with their positions. Both a person's role and personality significantly impact their job performance. Over the past few decades, India has introduced numerous dairy development programs aimed at enhancing the nutritional security and socio-economic well-being of rural communities. These programs are predominantly devised and executed by governmental entities, with active involvement from local organizations such as farmer service cooperative societies, financial institutions, and non-governmental organizations. The success of these developmental initiatives hinges upon the FEFs tasked with their implementation. FEFs must possess a thorough understanding of their roles and exhibit enthusiasm and innovation in executing their duties to ensure the goals of these programs are met.

Materials and Methods

Role performance was operationally defined as the manner and extent to which various duties expected from FEFs were performed as perceived by them in terms of the frequency, level of importance, difficulty and effectiveness of performance.

During the initial phase of scale development, the identification of pertinent domains and the creation of items related to these domains were undertaken. This process was conducted with the assistance and guidance of FEFs and selected experts affiliated with the DDD. Thus, a total of 65 items were enlisted under five major domains i.e., office management, field extension activities, management of cooperative societies, implementation of schemes and quality control activities to assess the role performance of the respondents.

Relevancy Rating

During the second phase of scale development, a relevancy rating process was conducted. A total of 65 items were assessed by a panel consisting of 33 judges. Each judge was asked to rate the relevance of each item on a three-point scale: "most relevant," "relevant," and "not relevant," corresponding to scores of three, two, and one, respectively. The highest possible score for a respondent was 99, while the lowest was 33. The midpoint of this scale, ranging from 33 to 99, was determined to be 66, serving as the cutoff point for item selection. Items scoring above 66 were included in the final scale, following this criterion (Kumar, 2003). Out of the initial 65 statements identified, 54 items met this criterion and were thus selected.

Content Validation of the Scale

In phase three of scale development, content validation of the scale was done. Content validity was conceptualised as the extent to which the items in the measuring instrument were appropriate enough to represent the domain of content, according to various researchers (Waltz *et al*, 2005; Polit and Beck, 2006). Waltz and Bausell (1981) proposed the 'Content Validity Index (CVI)' as a quantitative assessment of content validity. The CVI is a measure of inter-rater agreement based on expert ranking of items on a scale of relevance to the variable being assessed.

Based on their experience and qualifications, a panel of nine subject matter experts comprised of professors from Dairy Science College, Mannuthy and Assistant directors from DDD were chosen to examine the content validity of the scale. The experts were asked to rank the relevance of the items on a four-point continuum, with scores of 4, 3, 2, and 1 for highly relevant, relevant, slightly relevant and not relevant, respectively.

Item Content Validity (I-CVI) for each statement was then calculated as follows:

$$\text{I-CVI} = \frac{\text{Number of experts giving a rating of 3 or 4}}{\text{Total number of experts}}$$

The items with I-CVIs of 0.78 and above were retained (Lynn, 1986), while the others were eliminated, based on the results of content validation. As a result, the scale retained 52 items. The I-CVI values for items that were retained ranged from 0.78 to 1.

The item validated scale was then subjected to content validation at the scale level. The formula for calculating the scale level Content Validity Index (S-CVI) was given below:

$$\text{S-CVI} = \frac{\text{Sum of I-CVIs}}{\text{Number of Items}}$$

As a result, S-CVI of the scale was calculated and determined to be 0.93. This demonstrated that the content validity of the scale was excellent according to Waltz *et al* (2005).

Reliability Analysis of the Scale

The degree to which a phenomenon's assessment produces a consistent stable result is referred to as its reliability. Taherdoost (2016) defines reliability as being associated with repeatability. If a test measures the same thing repeatedly, it should produce close or identical results. The consistency with which the test measures what it does determines its reliability (Sarmah and Hazarika, 2012).

In phase four, a reliability analysis of the scale was done. Internal consistency was determined using Cronbach's alpha coefficient, which ensured the scale's reliability. The content validated scale was administered among the 30 FEFs who were selected randomly from the non-sampling area.

The item scores had been correlated with the total score in the subsequent item analysis. Items with correlation values less than 0.2 and greater than 0.8 were eliminated according to Di Iorio's (2005) guidelines. As a result, all of the items were selected from the content validated scale. Cronbach's alpha coefficient was then used to assess the scale's internal consistency. The subscale of perception of effectiveness obtained an alpha coefficient of 0.94, the level of importance obtained an alpha coefficient of 0.89 and the frequency of performance obtained an alpha coefficient of 0.77, all of which were deemed acceptable (Hair *et al*, 2006). Since there was high internal consistency, all 52 items were selected for the final scale.

Administration of the Scale

The final scale developed was administered to the respondents under study. The FEFs were asked to rate the statements of role performance in terms of their frequency of performance, level of importance, performance difficulty and perception effectiveness as follows:

Frequency of Performance

It referred to how frequently each task was performed by the FEFs. The scoring pattern adopted was as follows

Category	Score	
Daily		5
Weekly (Once/twice)	4	
Monthly		3
Occasionally	2	
Seldom/Never	1	

Level of Importance

It referred to the perception of the respondents about the importance of each task. The scoring procedure was as follows:

Category	Score
Extremely important	3
Moderately important	2
Marginally important	1

Performance Difficulty/Learning

It referred to the degree of difficulty while performing/learning tasks as perceived by the respondents. The scoring was as follows:

Category	Score
Very difficult	4
Difficult	3
Moderately difficult	2
Easy	1

Perception of Effectiveness

It referred to the perception of the respondents about the effectiveness of each task. The scoring was as follows:

Category	Score
Most effective	4
Effective	3
Somewhat effective	2
Not effective	1

The mean score of the respondent was calculated using the formula given below:

$$\text{Mean score of the respondents} = \frac{\text{Score of the respondent}}{\text{Number of Items}}$$

The respondents were grouped into three categories based on the mean scores obtained i.e., low, medium and high.

Further, the mean scores of each item were calculated using the formula given below and the items were ranked based on the mean scores obtained.

$$\text{Mean score of the item} = \frac{\text{Score of the items}}{\text{Number of respondents}}$$

The mean scores of the major domains were calculated using the formula given below and the domains were ranked based on the mean scores of the major domain obtained.

$$\text{Mean score of the major domain} = \frac{\text{Sum of scores of all the items under the domain}}{\text{Number of Items in the domain}}$$

Results and Discussion

Table 1: Final scale to measure the role performance of FEFs

		Frequency of performance					Level of importance			Performance difficulty				Perception of effectiveness			
		1.Seldom/ never **2.**Occasionally **3**. Monthly **4**. Weekly (once/twice) **5**.Daily					**1**Marginally important **2**Moderately important **3**Extremely important			**1**Easy **2**Moderately difficult **3**Difficult **4**Very difficult				**1.**Not effective **2.**Somewhat effective **3.**Effective **4.**Most effective			
1. Office Management		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
1	Administration of dairy cooperative																

	societies																
2	Office administration																
3	Maintenance of office records																
4	Supervision of office sub-ordinates																
5	Salary disbursement to office subordinates																
6	Financial assistance to scheme beneficiaries																
2. Field Extension Activities		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
1	Dairy farms and famer house visits																
2	Assisting farmers for availing subsidies and loans																
3	Establishment of fodder demonstration plots and their periodical inspection																
4	Evaluation of various schemes of the department																
5	Consultancy services to dairy farmers regarding dairying activities																
6	Mass media publicity																
7	Conducting farmers contact programmes																
8	Demonstrations on innovative dairy farming practices and value addition																
9	Organising exhibitions, cattle-shows, seminars and study tours for farmers																
10	Enterpreneurship trainings for dairy farmers																
11	Project formulation for dairy start-ups																
12	Preparation of audio-visual aids																
13	Technical advice for milk marketing																
		Frequency of performance					Level of importance			Performance difficulty				Perception of effectiveness			
		1.Seldom/ never **2.**Occasionally **3**. Monthly **4**. Weekly (once/twice) **5**.Daily					**1**Marginally important **2**Moderately important **3**Extremely important			**1**Easy **2**Moderately difficult **3**Difficult **4**Very difficult				**1.**Not effective **2.**Somewhat effective **3.**Effective **4.**Most effective			
14	Organising consumer interface programmes																
3. Management of co-operative societies		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
1	Attending the general body meetings of dairy cooperative societies																
2	Monitoring the routine activities of milk collection centres and bulk milk chilling units																
3	Verifying officer duty of pensions and insurance																
4	Role as arbitrator in arbitration cases against the society or individual																
5	Returning or electoral officer duty of milk cooperatives managing committee elections																
6	Supervision of primary dairy cooperative																

	societies																	
7	Periodical inspection of dairy cooperative societies																	
8	Registration of dairy cooperative societies																	
9	Audit rectification																	
4. Implementation of schemes		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
1	Milk shed development programme																	
2	Assistance to dairy cooperative societies																	
3	Fodder development programmes																	
4	Modernisation of dairy cooperative societies																	
5	Mineral mixture/ Input distribution																	
6	Construction/Renovation of cattle shed																	
7	Subsidy for cattle feed and heifer purchase																	
8	Rural dairy extension and advisory services																	
9	Comprehensive insurance programme																	
		Frequency of performance					Level of importance			Performance difficulty				Perception of effectiveness				
		1.Seldom/ never **2.**Occasionally **3**. Monthly **4**. Weekly (once/twice) **5**.Daily					**1**Marginally important **2**Moderately important **3**Extremely important			**1**Easy **2**Moderately difficult **3**Difficult **4**Very difficult				**1.**Not effective **2.**Somewhat effective **3.**Effective **4.**Most effective			
		1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
10	Strengthening quality control labs																	
11	Implementation of schemes under KDFWFB (Pension to dairy farmers, Family pension, Cremation assistance, Marriage assistance, Education assistance)																	
12	Milk incentives																	
13	Implementation of schemes under local self-government (Cattle feed subsidy, cattle purchase, cattle shed construction, fodder cultivation)																	
5.	**Quality control activities**																	
1	Monitoring milk quality at farmers level																	
2	Assessing milk product quality at the DCSs and quality control labs																	
3	Recommend dairy farmers about clean milk production																	
4	Supervision of quality control labs at the check post																	
5	Conducting intensive quality drive programmes during festival season																	
6	Microbiological evaluation of milk samples to ensure safety and well-being of individuals																	
7	Data collection regarding quality of milk																	

	at farmers level and DCSs level																
8	Assessing and ensuring the quality of market milk available in local market																
9	Providing necessary infrastructure and equipment's for testing the milk quality																
10	Reporting any identified adulterated milk to the FSSAI																

Conclusion

The items for this research were sourced from discussions with experts from DDD, and the content validity of these items was assessed through judges' ratings. Reliability and internal consistency were evaluated using Cronbach's alpha coefficient, indicating the accuracy and consistency of the outcomes. Given the enhanced reliability and strong positive relationships among all items in the developed scale, there's no necessity to revise or re-examine individual statements for future research. This scale can effectively gauge FEFs' role performance in terms of performance frequency, importance level, performance difficulty, and perceived effectiveness. Strategies for program implementation could be formulated based on the assessed level of role performance. With appropriate adjustments, the scale can extend its utility to assessing FEFs' role performance outside the study area.

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Contribution by Authors

All the authors contributed equally to writing the manuscript. The final manuscript was read by all authors and consented to publication.

Conflict of Interests

There is no conflict of interest.

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References

1. De Iorio, C.K. (2005). *Measurement in Health behaviour. Methods for research and education.* (1st Ed.). Jossey-Bass, San Francisco, 336p.
2. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham, R. L. (2006). *Multivariate data analysis.* (6th Ed.). Upper Saddle River, New Jersey: Pearson University Press. 74p.
3. Kumar, N.V.R. (2003). Training needs of dairy farm instructors of the Dairy Development Department of Kerala. *M.V.Sc. thesis*, College of Veterinary and Animal Sciences, Mannuthy, 140p.
4. Lynn, M.R. (1986). Determination and quantification of content validity. *Nursing Research*. **35**: 382– 385.
5. Patel, D. (2015). Role performance of field extension functionaries in transfer of technology in dairy sector of Bangalore districts. Doctoral dissertation, *M.Sc. thesis*, NDRI, Bengaluru, 88p.
6. Polit, D.F. and Beck, C.T. (2006). The content validity index: are you sure you know what's being reported? Critique and recommendations. *Res. Nurs. Health.* **29**: 489-497.
7. Sarmah, H.K. and Hazarika, B.B., (2012). Determination of Reliability and Validity measures of a questionnaire. *Indian J. Edu. Inf. Manage*. **1**: 508-517.
8. Taherdoost, H. (2016). Validity and reliability of the research instrument; how to test the validation of a questionnaire/survey in a research. *How to test the validation of a questionnaire/survey in a research*. *Int. j. acad. res. manag*. **5**: 28-36.
9. Waltz, C.F. and Bausell, R.B. (1981). *Nursing research: Design, statistics, and computer analysis*. FA Davis

company. Philadelphia. 362p.
10. Waltz, C.F., Strickland, O.L. and Lenz, E.R. (2005). *Measurement in nursing and health research*. (3rd Ed.). Springer Publishing Company. New York. 448p.

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