DEVELOPMENT OF A SCALE TO MEASURE THE ATTITUDE OF RURAL WOMEN TOWARDS MIXED FARMING

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Abstract

Women play a pivotal role in mixed farming or livestock-crop integrated production system, which is known as the most sustainable livestock production system in the world. Accordingly, the recognition of various aspects of women participation in mixed farming is one of the main priorities of agricultural research. Among different psychological traits, attitude seems to be one of the most important determinants of behavior of rural women, which in turn influences their work performance in agriculture. Hence, it is usually considered as a principal variable to be studied in many researches conducted in the field of agricultural extension or gender issues in agriculture. Therefore, the main objective of the present study was to develop a useful instrument to measure the attitude of rural women towards mixed farming as part of a research on "Participation of rural women in mixed farming in Iran". The scale was developed by using Likert's technique of summated rating method. The final format of the scale consisted of 20 statements selected based on "t" value obtained for each item as an index of discrimination, "Alpha coefficient" obtaind for each item and different sets of items as index of internal consistency, relevancy score obtained based on judge's opinion at the initial step of scale development called as "content validity", representativeness of different dimensions and correced item-total correlation for each item. The developed scale was subjected to split-half method of reliability, which indicated of the scale. The scale was also tested for validity by using content validity and criterion-related validity. Both of these methods showed a high level of validity a high reliability of the scale. The scale could be applied in other areas if it is proved to be reliable based on additional checks.

Introduction

Women play a pivotal role in mixed farming or livestock-crop integrated production system, which is known as the most sustainable livestock production system in the word. Therefore, any study on participation of rural women in agriculture or, mixed farming has an important implication for agricultural researchers and extensionists. It is because efficiency and effectiveness of technology development and disseminiation are in relation with analyzing women-specific issues and their productive activities in agricultural or mixed farming system. For example, patterns of gender-division of labor appear to have only a partial basis in biology and most tasks exhibit high variability. This is especially true in food production tasks pertaining to agriculture and the care of domesticated animals (Kuper and Kuper, 1999). However, attitude is one of the most important psychological determinants of behavior of farm women which in turn influences their work performance in agriculture. In addition, attitude of farm women towards mixed farming has a significant relationship with the productivity and development of mixed farming where farm women play a major role.

However, attitude cannot be studied by adopting haphazard measurement approach, which runs the risk of yielding inaccurate data. Instead, scale development is a well-known method of developing attitude scale, which in turn requires certain procedures to be followed. An appropriate and comprehensive device to measure attitude of rural women towards mixed farming in Iran has not been reported. Therefore, it was decided to develop an attitude scale. Since the term "scale" and "index" are sometimes used interchangeably, it is necessary to differentiate these two terms. Devellis (1991) reveals that a scale should be contrasted with an index. A scale consists of "effect indicators" which are items whose values are caused by an underlying construct. An index, on the other hand, is made up of "cause indicators" or items that determine the level of construct. According to Kerlinger (1995), an index is a number that is a composite of two or more numbers of a series of observations. For example, in a study related to the role of women in mixed farming, attitude scale responses to items that presumably are caused by the underlying construct which is one's attitude, but in the case of participation index, scoring to the items is based on the responses of respondents on an observable phenomenon. "Milking by hand" is an observable phenomenon and not underlying construct.

According to Guilford (1954), an attitude is a personal disposition common to individuals, but possessed in different degrees. This impels them to react to objects, situations, or propositions in ways that can be called favorable or unfavorable. In this study, it is operationally defined as a favorable or unfavorable disposition of rural women towards various aspects of mixed farming. Attitude scale also as defined by Anastasi (1976) is designed to provide a quantitative measure of the individual's relative position along a uni-dimensional attitude. In the present study, Likert's method of summated rating (Likert, 1932) was used for measuring the attitude of farm women towards mixed farming.

Material and Methods

The process of scale development involved several deliberate steps. The details of the steps followed in developing of the scale to measure the attitude of rural women towards mixed farming are discussed below:

1 Item pool: After a thorough review of the existing literature and consulting experts, 15 dimensions were identified. They included the following aspects: economic, agronomic, sustainability, drudgery, size of landholding, labor utilization, management, marketing, time utilization nuntritional status, women participation, health and extension contact. Based on these dimensions, an initial pool of 45 items was written.

2 Editing of the items: the items were edited in accordance with the criteria suggested by Edwards (1957). Thus, certain repetitions were removed. Each item was made simple and easily understandable.

3 Content validity: To measure the content

validity of the scale, after editing the items and in order to know the relevance of each item, they were subjected to judges' rating. These items were randomly listed and presented to a group of 70 judges out of whom 65 judges responded. They were mostly extension specialists, psychologists, and sociologists of the University of Agricultural Sciences, Bangalore. The responses were obtained on a four-point continuum viz, very much relevant, much relevant, somewhat relevant and not relevant with the scores of three, two, one and zero respectively. A combination of relevancy percentage and weightage was obtained by the following standard formula as followed, et al (1996):

$$\text{Relevancy weightage (\% RW)} = \frac{\text{Frequency of very much relevant} \times 3}{\text{Maximum possible score (i.e. total frequency} \times 3)} \times 100 + \frac{\text{Frequency of much relevant} \times 2}{\text{Maximum possible score (i.e. total frequency} \times 3)} \times 100 + \frac{\text{Frequency of somewhat relevant} \times 1}{\text{Maximum possible score (i.e. total frequency} \times 3)} \times 100$$

According to the magnitude of obtained relevancy scores and considering other criteria like adequate sampling of different dimensions of mixed farming system, out of 54 items, 30 items were selected to be included in the final format of the scale. Among these 30 items, 17 were positive and 13 were negative. These were later arranged in a random order.

4 Selection of the respondents: The selected items were later translated to Persian language; the regional language of Tafresh (The area of the study) and were administered to 140 respondents who were randomly selected in the area. The respondents were selected from different households having a combination of different aspects of mixed farming in terms of the size of landholding, number of animals possessed, extent of women participation, etc.

5 Method of scoring: After obtaining the data from the 140 respondents, the scoring was done in the order of five, four, three, two, and one for "strongly agree", "agree", "undecided ", "disagree", and "strongly disagree" responses, respectively, in the case of positive statements and the reverse in the case of negative statements. By summing up the scores obtained for each of the statements in the scale, the total score for each respondent was obtained.

6 Item analysis: Item analysis was done through the following procedure:

I. "t" value: As an index of discrimination between high and low groups: "t" value is a very common measure of the extent to which a given item differentiates high group from low group.Thus after obtaining the total score of each respondent, they were arranged in the ascending order. Then, twenty five per cent of the subjects with the high scores and twenty five per cent of the subject with the low scores were selected and used for further analysis. To evaluate if each item differentiated between the high and the low groups, the "t" values were computed using SPSS package. However, the "t" values of 23 items were found to be highly significant (at 1 per cent level) and 2 items significant (at 5 per cent level) which showed that these items have good disriminating power.

II. Alpha Coefficient as an index of internal consistency: According to Cronbach (1951) and Cronbach (1970): coefficient Alpha is a measure of the internal consistency of a scale. It is a direct function of both the number of items and their magnitude of interrelation. Coefficient Alpha reflects internal-consistency reliability, which does not necessarily reflect reliability over time. The values of coefficient alpha look like correlation. It is usually positive, taking on values from zero to just under one, where larger values indicate higher levels of internal consistency. It involves comparison of a total scale score (sum of all items) with the variances of the individual items. As the items

become increasingly interrelated, the variance of the total scale will increase.

According to Spector (1992) the formula for coefficient alpha is:

$$\alpha = \frac{k}{k-1} \times \frac{s_T^2 - \Sigma s_I^2}{s_T^2}$$

Where s_T^2 is the total variance of the sum of the items, s_I^2 is the variance of an individual item, and k is the number of items. To find out the internal consistency of the scale, alpha coefficients were worked out for the same data by using SPSS.

According to the criterion given by Spector (1992), coefficient alpha was obtained for the overall scale with 30 items and analyisis was proceeded.

In any step some items can be rejected in order to increase alpha coefficient or internal consistency. Accordingly, the analysis was proceeded in seven steps through which the alpha coefficient increased from 0.78 at first step to 0.86 at seventh step. The analysis gave an important picture of internal consistency, which was very important in taking the last decision on item selection or scale construction.

Final Scale construction: The items to be included in the final format of the scale were selected by considering the following criteria:

* "t" value obtained for each item as an index of discrimination.

* Alpha cofficient obtained for each item and different sets of items as an index of internal consistency.

* Relevancy score obtained based on judge's opinion at the initial step of scale development called "content validity".

* Representativeness of different dimensions.

* Corrected item-total correlation for each item.

Results and Discussion

In accordance with the above criteria, 20 items were selected and included in the final format of the scale which is shown in Table 1. Based on the general rating criteria given by Robinson et al (1991) for evaluating attitude measure, the attitude scale developed for the study can be rated as "exemplary scale" in terms of theoretical development and structure , coefficient alpha, known groups validity and inter-item correlation.

Reliability of the scale: Kerlinger (1995) has defined reliability as the accuracy or precision of a measuring instrument. Synonyms for reliability are dependability, stability, consistency, and accuracy. In this study, the scale was administered to 40 respondents in the area of study. To test the reliability of the scale, split-half method was applied. The "r" value obtained by using Spearman-Brown Formula was 0.73 at 1 per cent level, which indicated a high reliability of the scale.

Criterion-related Validity: Validity as defined by Devellis (1991) concerns whether the variable is the underlying cause of item covariation. According to Kerlinger (1995), the commonest definition of validity is epitomized by the question: Are we measuring what we think we are measuring?

In this study, apart from content validity, which is concerned with item sampling adequacy, criterion-related validity was also worked out. To test the validity of the scale based on this method, attitude of the young girls at the age of 19 was considered as a relevant criterion. Many psychologists have identified personal experience as a source of attitude formation. Freedman et al. (1981) stated that attitude formation begins primarily as a learning process. An individual is exposed to information and experience, relating to a particular object and forms an attitude towards that object by process of reinforcement and imitation. The basic assumption behind this selection was the fact that young girls in the same families have had less experience than their mothers in mixed farming activites, as they have mostly been engaged with school attendance and assignments. As far as experience has been identified as a basic source of attitude formation in rural areas, it was assumed that the attitude of mothers with more and longer experience in mixed farming should be significantly

Table 1. Attitude towards mixed farming (Final scale)

Please indicate your response to the following statements:

No.	Statements	Response Categories				
		SA	A	UD	D	SD
1	More profit is obtained in mixed farming than crop farming/growing					
2	Mixed farming ensures high productivity in both growing crop and animal husbandry					
3	Mixed farming makes family more indebted than crop farming/growing farming					
4	Mixed farming increases soil fertility					
5	The by-product of crops can be used by animals in mixed farming					
6	In mixed farming woman cannot find any time for rest during the day					
7	Manure requirements of farm can be met by adopting mixed farming					
8	Mixed farming is the best method to overcome unpredictable failures of crops					
9	In mixed farming woman has no time for social participation					
10	Mixed farming has less harmful effects on natural resources than grazing					
11	Mixed farming ensures continuous income for the family					
12	Mixed farming ensures self-reliance for the family					
13	In mixed farming woman does not have time for self-development					
14	The managerial ability of woman is improved by adopting mixed farming					
15	Mixed farming is profitable when there are good marketing facilities					
16	Mixed farming causes deterioration of women's health					
17	Mixed farming requires more effort from family members					
18	Mixed farming depends on participation of more family members					
19	Mixed farming is appropriate method of farming for small farmers than big farmers					
20	Nutritional status of women is better when mixed farming is adopted					

SA = Strongly agree A = Agree UD = Undecided D = Disagree SD = Strongly disagree

different from their daughters with less and shorter experience. Comparison of age, level of education, farming and animal husbandry experiences of the two groups as given in Table 2 and Table 3 show significant differences between the two groups. According to the data given in the two tables, the

Table 2. Comparison of different characteristics of rural women and their daughters, those whose attitude was considered as criterion in estimating validity of the attitude scale (No=55)

Characteristics	Respondents	Mean	SD	Minimum	Maximum	"t" values
Level of education	Mothers	1.04	1.4	0	5	13.33**
	Daughters	4.15	1	3	7	
Age	Mothers	49.15	9.8	27	68	19.60**
	Daughters	19.05	5.8	11	34	
Farming experience	Mothers	28.38	16	0	58	11.02**
	Daughters	3.75	4.5	0	20	
Animal husbandry experience	Mothers	27.3	15.1	0	58	11.04**
	Daughters	3.82	4.4	0	20	

** Significant at 1% level

Table 3. Comparison of level of education of rural women and their daughters, those whose attitudes were considered as criterion in estimating validity of the attitude scale

Level of educaton	Mothers		Daughters	
	Frequency	Percentage	Frequency	Percentage
Illiterate	32	58.2	0	0
Can read only	5	9.1	0	0
Can read and write	7	12.7	0	0
Primary school	8	14.5	29.1	16
Middle school	1	1.8	34.5	19
High school	2	3.6	29.1	16
College education	0	0	5.5	3
Graduate	0	0	1.8	1
Total	55	100	55	100

girls were totally different from their mothers in these variables, which influence the process of attitude formation. Therefore, it was also considered as another reason to take girl group as a criterion to examine validity of the scale. However, the test was administered to 55 rural women and 50 rural girls from the same families and the "t" value was obtained.

The "t" valule was "4.01" and highly significant. It showed that the attitude of the two group was highly different. The differentces between attitude of the two groups can be considered as an empirical evidence of validity of the scale. Although the validity and reliability of this scale were tested only in Tafresh area of Markazi province in Iran, nevertheless, the scale could be applied in other areas if it is proved to be reliable based on additional checks. In conclusion, it is believed that the final instrument offers a useful tool for the study of attitude of rural women towards mixed farming.

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