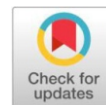


Original Research Article

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Development and Standardization of Attitude scale to measure Livelihood Security of farmers in different agro-climatic zones of Telangana state



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ABSTRACT

Livelihood comprises the capabilities, assets, and activities required as the means of living. A livelihood is considered secure when it can cope up with and recover from stress or shocks and maintain or enhance its capabilities and assets. Interpreting farmer's attitude towards Livelihood security could be measured through attitude scale construction. In the current research study, efforts were directed towards the development and standardization of a scale to measure the livelihood security of the farmers in different agro-climatic zones of Telangana state. As a result, a highly reliable and valid scale was developed. Likert-type scale was developed with statements preparation and validation through juries' method and relevancy score method. The scale was pretested in a non-sample area. Item analysis of 64 statements reduced to 22 attitude statements in the final scale with accepted "t" values. The reliability test showed that the scale was reliable through Cronbach alpha value of 0.79 and the split-half reliability full test value was 0.82 after Spearman-Brown correction. The scale was found to be valid through content validity and a known group method test. The scale was administered to a sample of 120 farmers with a point continuum response. The farmers were categorized into five classes viz., least favorable, less favorable, favorable, highly favorable and very highly favorable attitudes. Measuring attitudes through a standardized scale of stakeholders facilitates future strategy and decision making by policy makers. It can be further validated in meeting future challenges of Sustainable Livelihood security.

Keywords: Livelihood Security; attitude; agro-climatic zones; item analysis; reliability; validity; Policy-making.

1. INTRODUCTION

In India, agriculture is a major sector that plays a crucial role in the development of agrarian economies. During the past decade, securing livelihoods have been increasingly recognized as an important element of sustainable development. However, in India, land-based livelihoods of small and marginal farmers are increasingly becoming unsustainable, since their land is no longer able to meet the requirements of food for the family and fodder for their cattle. The majority of small and marginal farmers cultivate mainly low value, subsistence crops. Therefore, in a subsistence agricultural system, diversification is considered as a strategy to minimize farm risk, which arises as a result of fluctuations in output prices, biotic and abiotic stresses, etc. More precisely in the era of commercial and market-led agriculture, however, diversification is a growth strategy that replaces the subsistence enterprises with sustainable and profitable ones.

Livelihood can be described as combinations of the capabilities and resources people have (i.e. social, human, financial, natural and material assets) and the activities they undertake in order to make a living and to attain their goals and aspirations. Livelihoods are ways of keeping oneself, occupied meaningfully

by using ones endowments (human and material) to generate adequate resources to meet the requirements of the household in a sustainable manner. A livelihood comprises the capabilities, assets (stores, resources, claims and access) and ability to recover from stress and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation as well as which contributes net benefits to other livelihoods at the local and global levels and in the long and short run [1]. According to [2] "livelihoods are the ways by which people combine their capabilities, skills and knowledge with the resources at their disposal to create activities that will enable them to make a living". Livelihood security can be defined as "adequate and sustainable access to income and other resources to enable households to meet basic needs. This includes adequate access to food, potable water, health facilities, educational opportunities, housing, time for community participation and social integration [3]

As we know, a person prefers for or against or being neutral of any psychological object, ideas and values are expressed in terms of opinion or attitude. Among these, attitude act as the determinant factor behind converting covert behavior into over action which is emphasized by Ray that attitude is rooted in motivation which provides a meaningful background for individual's overt behavior [4]. Several researchers define attitude with in-depth analysis to unknot the domain of the vital psychological trait. [5] defined attitude as a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to

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all the objects and situations with which it is related [6]. [7] defined attitude as a degree of positive or negative affect associated with some psychological object that may be any symbol, phrase, slogan, person, institution and idea. An attitude can also be stated as an enduring organization of emotional, perceptual, motivational and cognitive processes with respect to some aspects of the individual's world [8]. [9] indicated social attitude of an individual is a syndrome of response consistency with regard to social objects. A learned orientation, or disposition, toward an object or situation, which provides a tendency to respond favorably or unfavorably to the object or situation [8]. According to [10], an attitude is an idea stimulated with emotion that predisposes a class of actions to a particular class of social situations.

Person's feeling, beliefs, or knowledge about attitude object and inclination to act towards the attitude object in a particular way are three general components of attitude that are affective, cognitive and behavioral respectively. [11] ; [12] suggests it is a 'hypothetical construct' which becomes apparent that it cannot be directly measured and the use of only a single statement or question to assess it [attitude] will not be effective in gaining reliable responses. Henceforth it is very difficult to measure and interpret attitude as personality trait which is subjective in nature. Many researchers tried to develop different scales which are basically meant for objective measurement of subjective variable i.e. attitude illustrated by [13]. [14] narrated a method of equal appearing intervals named Thurstone scaling is 'based on the law of comparative judgment' [15] Subjects select the attitudinal statements they agree with most out of statements, which have a range of weights from high (usually 11) to low (usually 1). Even if items are weighted rather than subjects in this scale but its difficulty in construction, time-consuming, rigorous statistical calculations; and no more reliability than a Likert scale which opens up the path towards developing a comparatively easy simple and quick method of Likert scaling [16].

Telangana, a state in the heart of India, has an agrarian economy that is heavily dependent on the well-being of its farming community. However, understanding the livelihood security of these farmers faces several challenges [17]. One of the primary challenges lies in the inherent complexity of smallholder farming systems. Farmers in Telangana often engage in a diverse range of livelihood activities, including crop cultivation, livestock rearing, and off-farm employment [18]. This diversity can make it challenging to accurately assess the overall contribution of farming to household food security and income. Attitude plays a vital role in behavior leading into social action. There is an imperative to know the attitude of stakeholders towards livelihood security. In these circumstances, it is essential to create a new scale as it's revealed that failure to carefully develop a measurement instrument can result in invalid data [19]. A reliable scale was not available to measure the attitude of farmers towards their livelihood security. The objective of the present study was to develop and standardize a scale for measuring farmers' attitudes towards Livelihood Security in different agro-climatic zones of Telangana state.

2. MATERIALS AND METHODS

In this study, measurement of attitude of farmers towards Livelihood Security in different agro-climatic zones of Telangana state was studied. The attitude scale was developed using the Likert method of summated rating [20]. Likert scales are extremely popular method for measuring attitude, most effective and efficient method in developing highly reliable

scales [21]. It is essential for individuals to make a decision on their level of agreement, mostly on a five-point scale (i.e. Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree) with a statement. The respondent score to each item leads to the total score obtained by summing the subject's response to each item, hence termed as summated rating scale which measures the favourableness-unfavourableness continuum as highest score by any respondent to all the items considered as highly favourable and lowest score by any respondent as highly unfavourable easily. The method provided unique opportunities for item analysis and selecting items based upon their discriminating power as well as being appropriate. The Edwards 14 criteria for developing statements were followed. Validity of statements was measured by juries (experts) opinion through relevancy test (Relevancy percentage, Relevancy Weightage and Mean Relevancy Score). After initial screening of statements, item analysis was done with initial non-sample respondents at Sircilla district of Telanana state. Final scale was developed with "t" value (> 1.75) criteria according to Likert Scale. The reliability of scale was measured by Split half test and Cronbach alpha test. Besides other methods of validity and reliability test were briefed for further suitable tests in future use.

2.1 Collection of Items

A boundary of the universe about the positive and negative attitudes of the farmers towards Livelihood Security was outlined through available relevant literature and discussion with experts at various institutes and universities. A tentative list of 105 statements consisting 55 positive and 50 negative statements were drafted keeping in view the applicability of statements suited to the area of study. It was well discussed by [20] as knowingly preparing and selecting more statements than are likely ever to be used since many of the items would be found unsatisfactory for the intended purpose of an instrument. Also [22] recommended using approximately the same number of positive and negatively stated items in a Likert scale. According to 14 criteria suggested by [23], the statements were carefully edited. Utmost care was taken so that the statements could measure what it is intended. [24] remarked that attitude scales need not be factually accurate they simply need to reflect one possible perception of the truth that feelings which the statement triggers in them.

2.2 Relevancy Test

The statements prepared and collected may not be relevant equally in measuring the attitude of stakeholders towards Livelihood Security in different agro-climatic zones of Telangana state. So these statements were scrutinized by expert panel of judges to determine the relevancy and screening for inclusion in the final scale. Judges comprised experts in the field of agricultural extension of ICAR Research Stations and Institutions, subject matter experts from KVKs, and experts from State Agricultural Universities across the nation namely from NAARM, National Institute of Agriculture Extension Management (MANAGE), Extension Education Institutes (EELs), different ICAR research institutes and NGOs working on Sustainable livelihoods. The statements were sent to 120 judges with a request to critically evaluate each statement and give their response on a four point continuum viz. most relevant, relevant, somewhat relevant, not at all relevant with unipolar scores 4, 3, 2 and 1 respectively. Out of 120 judges, only 60 responded in a period of two months. The relevancy score of each item was established by adding the scores on the rating

scale for all the 60 judges' responses. The relevancy percentage, relevancy weightage and mean relevancy scores were worked out for all the statements by using following formulae. According to [25] illustration in relevancy test, the researcher tried to put the framework in its own situation below.

a. Relevancy percentage: Relevancy percentage was worked out by summing up the scores of most relevant, relevant and somewhat relevant categories, which were converted into the percentage.

$$RP = \frac{FS}{MPS} \times 100$$

b. Relevancy weightage (R.W.): Relevancy weightage was obtained by the formula.

$$RW = \frac{MRR + RR + SRR + NRR}{MPS}$$

c. Mean relevancy score (M.R.S.): M.R.S. was obtained by the following formula.

$$MRS = \frac{MRR + RR + SRR + NRR}{N}$$

MRR = Most relevant response (X4)

RR = Relevant response (X3)

SRR = Somewhat relevant response (X2)

NRR = Not at all relevant response (X1)

MPS = Maximum possible score (60x4=240).

N = Number of judges (60).

2.3 Item Analysis (Calculation of t-value)

Item analysis is to find those items form an internally consistent scale and to eliminate those items that do not represent the universe of study [26]. The item analysis provides evidence about how well each item relates to the other item in the analysis. Similarly, [27] used a technique for determining the discrimination of items in a test. The result of his study that one means of item analysis was possible to build a test which had almost as great reliability as a longer examination containing poor items. [20] also suggested a second objective method for the assignment of correct scale values and for determining whether the items were differentiating. This criterion was designated as the criterion of internal consistency. The final 64 statements after the relevancy test were subjected to item analysis to delineate the items based on the extent to which they can differentiate the respondents with favorable attitude than the respondents with an unfavorable attitude towards Livelihood Security in different agro-climatic zones of Telangana state. For these, there was a pilot study arranged in non-sample area in Sircilla district of Telanana state. This is applied to a schedule of 64 selected relevant statements and is administered by personally interviewing a sample of 120 farmers from non-sampled area. The responses for the statements were obtained on a five point continuum viz., strongly agree, agree, undecided, disagree and strongly disagree with scores of 4, 3, 2, 1 and 0 respectively. In case of negative statements, the scoring was reversed i.e., 0, 1, 2, 3, and 4 respectively. The attitude score of the respondent on the scale was obtained by summing up the scores of all statements.

They were asked to designate their degree of favourableness or unfavourableness for each statement on a five-point continuum ranging from 'strongly agree' to 'strongly disagree'. [20] suggested two types of scoring methods.

The sigma method of scoring is based on the assumption that attitudes are fairly normally distributed. For purposes of obtaining scale values, it appears satisfactory to round off to the nearest whole number in a simpler method, five-point scale and the three-point scale. Here the simpler method of the scoring pattern was used, the respondent was asked to react to each item in terms of several degrees of agreement or disagreement; for example, (1) strongly agree, (2) agree, (3) undecided, (4) disagree, and (5) strongly disagree. The response alternatives were weighted so the most favourable response carries the highest weight. For example, if a statement is favourable regarding the attitudinal object, "strongly agree" carries the highest weight. On the other hand, if the statement is unfavorable toward the object, then "strongly disagree" carries the highest weight. Consequently, when scoring, the tallies on negative items would be reversed.

The criterion of internal consistency is commonly used as a method of selecting items for inclusion on a final Likert scale. [20]; [28] cited by [21]. The criterion of internal consistency is applied by correlating item scores with total scores. Any item with a non-significant item to total correlation is eliminated from consideration for use in the final scale. Researchers agree that high correlations between scores on a particular item and total test scores suggest the item represents the attitude under study.

According to [29] and [30], another test of the validity of a particular item is the discriminating quality of the item. A positively written item is valid only if those individuals with a generally positive attitude toward the attitudinal object agree or strongly agree with the item and if those with a generally negative attitude disagree or strongly disagree with the item. The researchers cited above suggested establishing positive and negative criterion groups composed of subjects having the highest and lowest 27% scores within the overall group being considered. Student "t" scores would then be calculated by comparing the mean score for each criterion group. A significant difference in the mean scores of the two criterion groups would suggest that the item has discriminating quality. Here, based upon the total score, the respondents were organized in the descending order. The top 25 percent of the respondents with their total scores were considered as the high group and the bottom 25 percent as the low group, as these two groups provide criterion groups in terms of evaluating the individual statements as suggested by Edwards [30]. Thus out of 120 respondents, 30 respondents with lower most and 30 respondents with uppermost scores were used as criterion groups to evaluate individual items. The critical ratio, that is the t value, which is a measure of how significantly a given statement could differentiate between the high and low groups of the respondents for each statement was calculated by using the formula suggested by Edwards [30].

$$t = \frac{X_H - X_L}{\sqrt{\sum (X_H - X_H)^2 + (X_L - X_L)^2}} \cdot n(n-1)$$

where:

X_H = The mean score on given statement of the high group

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
 Σ = Summation

2.4 Reliability of the Scale

A scale is said to be reliable, when it consistently produces the same or similar results when applied to the same sample at different times. The reliability of a test indicates the credibility of the scores obtained. The reliability of a test is an expression of both the stability and consistency of test scores [21]. A test to be called sound must be reliable because reliability indicates the extent to which the scores obtained in the test are free from internal defects of standardization, which are likely to produce errors of measurement [31]. Reliability coefficients represented by a numerical value between 0 and 1 reflecting the stability of the instrument. To compute reliability coefficients, four basic methods are generally used [28].

Test-retest method: The same test is administered to the same group of subjects twice (before-after) with administrations separated by an interval of time

Parallel-forms method: An alternative test form is administered to the same group after a period of time.

Split-half method: A test is divided into two parts and two scores are obtained. The paired observations are correlated.

Internal-consistency methods: It is based on the average correlation among items and the number of items on a test.

Cronbach's alpha basically increases when the correlations between the items increase. For this reason the coefficient measures the internal consistency of the test. Its maximum value is 1, and usually its minimum is 0. Coefficient alpha is the basic formula for determining the reliability of test scores based on internal consistency for items not dichotomously scores [32]. According to [33], the coefficient alpha (α) is the mean of all possible split-half coefficients which can result from different splitting of a test and can be used as an index of inter-item homogeneity. In simpler form, Cronbach's alpha is computed by correlating the score for each scale item with the total score for each observation (usually individual survey respondents or test takers), which comparing that to the variance for all individual item scores. Thus, Cronbach's alpha is a function of the number of items in a test, the average covariance between pairs of items, and the variance of the total score. The resulting a coefficient of reliability ranges from 0 to 1 in providing this overall assessment of a measure's reliability. If all of the scale items are entirely independent from one another (i.e., are not correlated or share no covariance), then $\alpha = 0$; and, if all of the items have high covariance, then α will approach 1 as the number of items in the scale approaches infinity. In other words, the higher the 'a' coefficient the more the items have shared covariance and probably measures the same underlying concept. Here, the Cronbach alpha value was 0.79 which indicated moderately high reliability in case of Social sciences. The reliability was tested by means of the split-half method. The scale was administered to 60 non-sample respondents (other than the study area) and was divided into two halves based on odd and even number of statements. The total scores obtained for odd and even numbered items were subjected to correlation analysis. Pearson product moment correlation coefficient is obtained on the scores of even-numbered items and the scores of odd numbered items.

The resulting coefficient is the split half reliability. Based on the analysis, it was found that the split half reliability was 0.82. To adjust the split half reliability in to full test reliability, for example, on a 22 item test, 11 of the items were correlated with the 11 other items with each set of correlated items having similar content. In effect, correlation would occur between paired scores based on scores from two 11 item tests. However, the reliability for the total 22 item test is needed. That's why; the use of the Spearman Brown (SB) formula approximates the reliability for the total test. One form of the Spearman Brown formula (Ferguson, 1981) is shown below:

$$r_{tt} = nr_{11} / 1 + (n-1)r_{11}$$

Where n is the ratio of the number of items on the desired test to the number of items on the original test and r is the already obtained reliability for the partial test. The Spearman-Brown formula can also be utilized to estimate reliabilities obtained by the test-retest and alternate forms methods. Alternately, Spearman Browns prophecy formula can be used which as follows,

$$\text{Reliability} = 2 \times r \text{ half test1} + r \text{ half test2}$$

2.5 Validity of Scale

Validity is an indication of how well a test measures what it was designed to measure [21]. A test can be valid for one group but in appropriate for another. Validity involves gathering and evaluating information for determining how well test measures what its author purport it measures. Although there are many procedures for determining validity, all aspects of validity are interrelated. Types of validity usually considered when instruments are developed for measuring psychological traits are: 1. Content, 2. Concurrent, 3. Construct, and 4. Predictive [34]. Some of the other types of validity mentioned in the literature are 1. Face, 2. Curricular and 3 Differential.

Content validity: The following definition of content validity was offered by [35]: "The test user wishes to determine how an individual performs at present in a universe of situations that the test situation is claimed to represent." If test items are to have content validity, items should be representative of the characteristic being measured.

Predictive and concurrent validity: In describing predictive validity [35] stated: The test user wishes to forecast an individual's future or to estimate an individual's present standing on some variable of particular significance that is different from the test. When tests correlate highly with subsequent performance, the tests are said to have predictive validity. Validation of this type sometimes takes a long period. Concurrent validity sometimes termed "immediate predictive validity," correlates a test in the process of being developed with scores obtained from previously established measures.

Construct validity: In defining construct validity, [35] stated: The test user wishes to infer the degree to which the individual possesses some hypothetical traitor quality (construct) presumed to be reflected in the test performance. Construct validity involves formulating a theory of relationships and cannot generally be expressed in terms of one coefficient.

Face validity: This type of validity merely answers the question, "Does the test appear to measure what it purports to measure"?

Curricular validity: [36] introduced the term “curricular validity. “This type of validity required determining if tests are representative of the instructional content and reflect the goals of instruction.

Differential validity: [37] defined differential validity as the difference between two correlation coefficients when one measure is correlated with two different measures. This procedure is undertaken to determine what test measures and what it does not measure. It is popularly called as Known group method of validation.

Computational procedures: In the case of “Reliability,” several methods were given for approximating the reliability by correlation coefficient obtained by correlating a test in some manner with itself. Correlations can also approximate validity coefficients. When statistical procedures correlate a test (x) and some other external criterion (y), such as another test, then they become calculations of validity coefficients. Thus calculating validity coefficients with considerations concerning the choice of statistical procedures are found in works by several researchers narrated by [21].

Another procedure, factor-analysis, has been suggested by researchers as a useful indicator of the construct validity of scales [21]. Through the use of factor analysis, researchers can test how well statistical clustering of items match the intended construct groupings. These clusters of items which appear as a result of factor analysis can be examined to determine if they represent the component or sub components of the attitude under study.

Meta-analysis: It is another statistical innovation in validity assessment. In relationship to validity, meta-analysis is concerned with quantitative methods for combining evidence

from different studies. [34] explored information from a variety of sources concerning the calculation and merits of meta-analysis, including the empirical Bayesian approach.

The Mantel-Haenszel procedure was proposed as a “practical and powerful way to detect test items that functioned differently in two groups” [38]. This statistical application can be used to shed light concerning the effect of experiential background relative to subject reaction to test items.

Here, the developed scale was verified for validity. Though there are different methods for which validity can be determined cited above, content validity was employed in the study. According to [39], the content validity is the representative or sampling adequacy of the content, the substance, the matter and the topics of a measuring instrument. The content validity was determined by a group of experts. Since the items selected were from the universe of content, it was ensured that the items covered the various aspects of the attitude of the farmers towards livelihood security. The differential validity or commonly called as Known Group Method was used to test the construct validity of the instrument. This method was applied to test whether the developed scale could discriminate between the individuals who have the favorable attitude towards livelihood security and those who do not have the favorable attitude towards livelihood security.

3. RESULTS AND DISCUSSION

3.1 Construction of Attitude Scale

In the screening, statements having relevancy % >70, relevancy weightage >0.70 and mean relevancy score > 2.6 were considered for final selection. Also repetition and duplication of statements as opined by judges were re-looked. By this process out of 105 statements, 41 statements were discarded and finally 64 statements were selected for further item analysis which is depicted in Table 1.

Table 1: Selection of Statements after Relevancy Test

| S. No. | Statements | RP | RW | MRS |
|--------|---|-------|-------|------|
| 1 | A balanced food to all family members is affordable with my income. | 70.78 | 0.71 | 2.81 |
| 2. | Are you satisfied with present occupation | 80.81 | 0.79 | 3.57 |
| 3. | Are you comfortable with present form of dwelling | 84.20 | 0.72 | 2.62 |
| 4. | I could not send my children to higher education due to insufficient income from my livelihood. | 78.30 | 0.74 | 2.94 |
| 5. | I participate actively in the social activities due to the status accrued through my livelihood. | 78.30 | 0.77 | 2.36 |
| 6. | I could able to manage effectively the serious illnesses of the family members with the support of my livelihood. | 76.72 | 0.71 | 2.64 |
| 7. | I could not able to overcome many health issues because of lucrative livelihood. | 76.40 | 0.73 | 2.97 |
| 8. | I feel that most of the time I had been undermined in front of my fellow farmers due to my livelihood. | 80.62 | 0.76 | 2.82 |
| 9. | I am not able to build more assets due to the good performance of my livelihood. | 76.20 | 0.711 | 2.81 |
| 10. | I and my family members felt very much secured through my livelihood. | 75.50 | 0.75 | 4.18 |
| 11. | I had the confidence that the present livelihood will be sustained for generations to come. | 86.70 | 0.86 | 2.85 |
| 12. | I am very much contended with the extent of dividends obtained from my livelihood. | 72.00 | 0.79 | 3.20 |
| 13. | I don't feel the present livelihood is comparatively more profitable than the other livelihoods. | 78.00 | 0.76 | 2.74 |
| 14. | I feel the present livelihood is not sustainable due to lack of marketing facilities. | 73.33 | 0.79 | 3.72 |
| 15. | I feel the present livelihood is not susceptible to the turbulent climatic changes. | 88.60 | 0.76 | 2.65 |
| 16. | I feel the present livelihood is not susceptible to the turbulent climatic changes. | 77.30 | 0.77 | 3.15 |
| 17. | I could able to satisfy my basic needs of food, shelter and clothing with my livelihood. | 75.10 | 0.71 | 2.82 |
| 18. | I am not getting the pride from my peers, relatives and other officials due to my livelihood. | 73.30 | 0.79 | 2.63 |
| 19. | I could able to provide employment to my family as well as others in my livelihood. | 72.40 | 0.71 | 4.12 |
| 20. | The present livelihood has given me the chance to maneuver the existing resources for better results. | 80.67 | 0.76 | 3.52 |
| 21. | I could not able to diffuse risk on attending various operations in the present livelihood. | 70.22 | 0.79 | 2.91 |
| 22. | The livelihood management has not given me launching platform to manage any enterprise in future. | 83.11 | 0.83 | 2.90 |
| 23. | I could able to impress my fellow farmers with better performance of my livelihood. | 87.11 | 0.84 | 2.87 |
| 24. | I could not fulfill all my dreams through my livelihood. | 75.11 | 0.84 | 3.65 |
| 25. | Dedication, determination and decision making ability plays a major role in the maintenance of any livelihood. | 71.11 | 0.71 | 3.24 |
| 26. | I feel continuous financial monitoring is not an essential tool for success of any livelihood. | 76.88 | 0.84 | 4.81 |
| 27. | Reasonable saving of income is possible through good livelihood maintenance. | 81.7 | 0.81 | 3.11 |

| | | | | |
|-----|---|-------|------|------|
| 28. | No way the livelihood of an individual is affected by the external factors like government laws, provisions and regulations. | 86.70 | 0.86 | 5.40 |
| 29. | I don't feel the innate ability of an individual decides the success of the livelihood. | 87.11 | 0.81 | 2.89 |
| 30. | Practicing of diversified farming facilitated me to reduce vulnerability to adverse climatic conditions. | 78.01 | 0.76 | 3.04 |
| 31. | I had no chance of getting quality food through my livelihood. | 73.11 | 0.79 | 2.90 |
| 32. | The diversification in my livelihood facilitated me to have balanced diet. | 72.40 | 0.71 | 2.87 |
| 33. | I could not able to minimize the cost of production by practicing different farming systems. | 80.12 | 0.76 | 2.94 |
| 34. | Practicing different farming systems in my livelihood resulted in higher benefit-cost ratio. | 79.10 | 0.78 | 4.24 |
| 35. | Overcoming stress conditions is not possible through diversification in my livelihood. | 75.00 | 0.76 | 2.62 |
| 36. | The diversification has enabled me to improve water user efficiency (WUE) in my livelihood. | 71.11 | 0.73 | 2.78 |
| 37. | The farm waste cannot be easily recycled productively due to diversification in my livelihood. | 76.67 | 0.78 | 3.34 |
| 38. | The different farming systems promoted the complimentary interaction of different farm components. | 82.41 | 0.81 | 5.12 |
| 39. | Maintaining sustainable soil fertility and soil health is not possible with my farming systems in the livelihood. | 80.12 | 0.79 | 4.41 |
| 40. | Adopting livelihood with diversified farming ensures good linkage with extension agencies. | 71.67 | 0.71 | 3.23 |
| 41. | I feel practicing diversified farming does not improve Cosmo politeness among farmers. | 70.54 | 0.72 | 2.79 |
| 42. | Practicing diversified farming in the livelihood helps in improving my knowledge, skills in farming. | 83.33 | 0.82 | 3.51 |
| 43. | Experience in the diversified livelihood gives me the confidence to try new ideas in my farm. | 76.11 | 0.76 | 2.82 |
| 44. | Diversified livelihood doesnt enhance my confidence level so that I can interact with others easily. | 72.21 | 0.73 | 4.31 |
| 45. | The diversified livelihood has created demand among farmers to visit my farmers and seek advice regarding new things. | 80.56 | 0.80 | 3.38 |
| 46. | Size of land holding does not enhance livelihood security. | 78.32 | 0.71 | 3.16 |
| 47. | Livestock is not a guaranteed source of additional income. | 77.22 | 0.79 | 3.72 |
| 48. | Assistance from friends, neighbors and relatives at the time of need is essential for livelihood security. | 7.76 | 0.73 | 2.93 |
| 49. | I feel possession of vehicles such as bullock cart, tractors and other vehicles indicates the livelihood security. | 82.22 | 0.84 | 3.10 |
| 50. | I could not maintain sufficient savings to meet the unforeseen situation due to my livelihood. | 70.52 | 0.73 | 3.14 |
| 51. | Successive progress in one enterprise and wealth lead to livelihood security. | 73.89 | 0.74 | 2.81 |
| 52. | Benefits of government schemes cannot direct the people towards livelihood security. | 73.33 | 0.74 | 3.72 |
| 53. | Livelihood security provides no scope for acquiring new knowledge and skills. | 85.00 | 0.84 | 3.54 |
| 54. | Livelihood security decreases the social status in the community. | 77.72 | 0.78 | 3.18 |
| 55. | Livestock owned ensures economic security. | 71.67 | 0.70 | 2.98 |
| 56. | Opportunities for entertainment with the family/ friends/ relatives/ neighbors in the village/ outside the village are available. | 75.00 | 0.76 | 2.88 |
| 57. | Multiple sources of income have not facilitated increase in income over a period of time. | 78.12 | 0.76 | 2.97 |
| 58. | Subsidiary enterprises help to keep us not engaged and cannot provide additional income. | 80.81 | 0.78 | 3.42 |
| 59. | Feel proud and satisfied due to valued services rendered to the society. | 73.28 | 0.73 | 3.82 |
| 60. | Owning land doesn't provide me a means of livelihood security. | 81.10 | 0.82 | 4.16 |
| 61. | The land owned provides greatest prestige in the society. | 77.22 | 0.78 | 3.57 |
| 62. | Possessing a own house is a means of security to establish a new livelihood. | 70.45 | 0.71 | 2.92 |
| 63. | Assured irrigation facilities cannot be a means of guaranteed livelihood | 83.33 | 0.84 | 3.68 |
| 64. | Firewood / fuel is available at reasonable cost due to sustainable livelihood | 77.12 | 0.78 | 3.14 |

M.R.S: Mean relevancy score; Rel. W. Relevancy weightage; Rel. %.: Relevancy percentage

The 64 statements selected were rephrased and shortened based on the juries' opinion to create a solid item pool for final scale.

3.2 Selection of the Statements for Final Scale

After calculating the t value for all items, the statements with 't' values equal to or greater than 1.75 were selected and included in the attitude scale. It was observed that twenty-two (22) statements (Table 2) were found to have the values more than 1.75. According to [30], Likert suggested that the 't' value above 1.75 of any item was having high discriminating power, which could be placed in the final attitude scale. Therefore, the attitude scale consisted of 22 items (11 positive and 11 negative statements) which were finally included in the study.

Table 2: Final selection of Statements for Construction of Attitude Scale

| S.No. | Statements | "t" value |
|-------|--|-----------|
| 1 | I am very much satisfied with present occupation + | 4.22 |
| 2 * | I could not send my children to higher education due to insufficient income from my livelihood. | 3.94 |
| 3 | I could able to manage effectively the serious illnesses of the family members with the support of my livelihood.+ | 1.82 |
| 4* | I feel that most of the time I had been undermined in front of my fellow farmers due to my livelihood. | 2.71 |
| 5 | I and my family members felt very much secured through my livelihood.+ | 3.26 |
| 6* | I don't feel the present livelihood is comparatively more profitable than the other livelihoods. | 2.74 |
| 7* | I feel the present livelihood is not sustainable due to weak marketing facilities. | 3.72 |
| 8 | I could able to satisfy my basic needs of food, shelter and clothing with my livelihood.+ | 3.05 |
| 9 | I could able to provide employment to my family as well as others in my livelihood.+ | 3.36 |
| 10 | The present livelihood has given me the chance to maneuver the existing resources for better results.+ | 2.81 |
| 11* | I could not able to diffuse risk on attending various operations in the present livelihood. | 3.16 |
| 12* | I feel continuous financial monitoring is not an essential tool for success of any livelihood. | 2.56 |
| 13* | No way the livelihood of an individual is affected by the external factors like government laws, provisions and regulations. | 2.72 |
| 14 | Practicing of diversified farming facilitated me to reduce vulnerability to adverse climatic conditions.+ | 4.10 |
| 15 | The diversification in my livelihood facilitated me to have balanced diet.+ | 2.81 |
| 16 | Practicing different farming systems in my livelihood resulted in higher benefit-cost ratio.+ | 2.41 |
| 17 | Different farming systems promoted the complimentary interaction of different farm components.+ | 2.19 |
| 18* | Maintaining sustainable soil fertility and soil health is not possible with my farming systems in the livelihood. | 2.71 |
| 19 | Experience in the diversified livelihood gives me the confidence to try new ideas in my farm.+ | 2.62 |
| 20* | Size of land holding does not enhance livelihood security. | 2.76 |
| 21* | Complimentary enterprises in a livelihood may not guarantee additional income. | 3.93 |
| 22* | Subsidiary enterprises help to keep us not engaged and can't provide additional income. | 2.81 |

*Negative statements, The coding procedure for these statements was, strongly agree response with 1, agree with 2, undecided with 3, disagree with 4 and strongly disagree with 5.

The whole test of the scale (22 items) reliability was found to be 0.82 which was highly significant at one per cent level ($p < 0.01$) indicating the high reliability of the scale. Since, the reliability value was more than 0.7, the scale was considered to be highly reliable. Items that have high reliability (Cronbach alpha > 0.60) and discriminating ability were selected for the final scale. [40]; [41]; [42] and [43] also followed the same procedure. [44] stated that a reliability coefficient of 0.50 or 0.60 is adequate when the mean scores of the two groups are within a small range. As an outcome, the developed scale can be considered because the RTT is higher than 0.60.

The pilot testing exposed that the scale could differentiate the people having a favorable attitude from that of unfavorable attitude towards livelihood security. As the scale value difference for almost all the statements included had a very high discriminating value, it seemed reasonable to accept the scale as a valid measure of the attitude. Thus it ensured a fair degree of validity. The computational procedure also helped in ensuring higher validity through clustering items intended to measure different components by factor analysis.

3.3 Utility of the Scale

The final scale which would measure the attitude of farmers towards Livelihood security consisted of 22 statements. Each statement, responses were to be recorded on a five-point continuum as strongly Agree, Agree, Undecided, Disagree and Strongly Disagree with scores of 5, 4, 3, 2, and 1, respectively for positive statements. Reversed scoring was done in the case of negative statements. The score would be obtained for each item and summed up.

The maximum score would be 110 and the minimum score would be 22. These scores would be further converted into T-scores as described below

$$T = 50 + 10(X - xs)$$

Where,

T = T score

X = Score of a given subject

x = Arithmetic mean of the distribution

s = Standard deviation of the distribution of the scores

3.4 Categorization of the Respondents

The respondents would be categorized as follows after getting the total attitude score based on the range values of the attitude score possible. Mean + 2 sd. The formula would be used for categorization.

Table 3. Categorization of respondents based on attitude

| Sl.No. | Category |
|--------|--------------------------------|
| 1 | Least favorable attitude |
| 2 | Less favorable attitude |
| 3 | Favorable attitude |
| 4 | Highly favorable attitude |
| 5 | Very highly favorable attitude |

4. CONCLUSION

The study resulted in the development of a scale to measure the attitude of farmers towards livelihood security in different agro-climatic zones. The attitude scale consisted of 22 items, with high reliability, and more predictive validity. This scale can be used in future studies on the perception, attitude and feeling of farmers towards livelihood security.

The standardized scale would be helpful in ascertaining the practical applicability to the policy makers and administrators to develop suitable strategies towards sustainable livelihood security by knowing the attitude of farmers. It can be used extensively by further validating the scale in meeting future challenges of sustainable livelihood security.

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