Development of A Scale to Measure Livelihood Security of Agricultural Labourers

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ABSTRACT

Agriculture continues to be the most important source of livelihoods for the agricultural labourers. Livelihood security is an important mechanism for economic growth and it can be facilitated by technological breakthrough, changes in consumer demand and suitable government policy and development of requisite infrastructure. In this context, it is essential to study the different livelihood requirements of agricultural labourers to attain better living conditions. Keeping these facts in view the present investigation is designed to develop a scale to measure livelihood security of agricultural labourers and to compare the livelihood security status of agricultural labourers in different agricultural situations. To construct the scale method suggested by the Likert (1932) in developing summated rating scale was followed and developed scale was found to be reliable and valid.

The developed livelihood security scale was administered to 210 agricultural labourers in six districts of Karnataka state viz., Kolar, Chickballapur, Mandya, Mysore, Coorg and Chickamagalur. In rainfed situation more than half of the respondents (57.14%) belonged to low level of livelihood security. Similarly, in the irrigated situation slightly more than fifty per cent of the agricultural labourers (64.29%) had medium level of livelihood security. Correspondingly 54.28 per cent of the agricultural labourers fall under high level of livelihood security in plantation situation. In case of pooled situation, 39.52 per cent of the agricultural labourers belonged to medium level of livelihood security which is tracked by 32.38 per cent and 28.10 per cent had high and low levels of livelihood security, respectively.

Key words : *Agricultural labourers, Livelihood security, Relevancy, Reliability, Validity.*

Agriculture and allied sector is unique because of its diversity and location-specific requirements, necessitating adaptation of technologies to a range of agro ecological conditions. Earlier it was subsistence farming, where a farmer produced whatever quantity was necessary to sustain his farm and family. With the advancement of technology, there are lots of changes in the society and its waves are reflected in the agricultural sector also. A livelihood comprises the capabilities, assets (both material and social resources) and activities required for a means of living (Anonymous, 2000). Livelihood is the means people use to support themselves, to survive, and to prosper. Livelihood security means secured ownership of, or access to resources (both tangible and intangible) and income earning activities, including reserves and assets, to offset risks, ease shocks and meet contingencies (Chambers, 1988). The risk of livelihood failure determines the level of vulnerability of a household to income, food, health and nutritional insecurity. Therefore, livelihood are secure when households have secure ownership of or access to, resources and income earning activities, including resources and assets, to offset risks, ease shocks and meet contingencies (Chambers, 1989). The concept of Sustainable Livelihood Security (SLS) was defined as livelihood options which lead to ecological security, economical efficiency and social equitability (Swaminathan, 1991). A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. Income is one of the pull factors responsible for shift of the households from farm to non farm sector. The agriculture led growth has suggested that a sustained rise in farm output and income can act as a prime mover in initiating the development of non-farm activities in rural areas. Similarly, urbanization, proximity to urban and development of infrastructure, which emanates outside agriculture, can also lead to growth of non-farm activities. Both these lead to shift of rural workers to productive employment in the non-farm sector for their livelihood (Archana Sinha, 2006). From the above concepts, it is clearly confirmed that the concept of livelihood comprises the capabilities, assets and activities required for a means of living and livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets, now and in future, while not undermining the natural resources base. Livelihoods are also shaped by the broader economic and political systems within which they operate. Put crudely, almost half of the world's population does not have the socio-economic and political means to realize their economic and social rights. One of the major causes of the

poverty is the lack of viable livelihoods in the developing world. Government plays a major role in attaining secured livelihood by the farming community in general and agricultural labourers in particular. The present investigation is aimed at studying the livelihood security of agricultural labourers. Very few studies have been conducted on livelihood security in respect of agricultural labourers in the Karnataka State. With the paradigm shift from green revolution to evergreen revolution, the focus on livelihood diversification needed to be broadened to adopt sustainable livelihood approach. Agriculture continues to be the most important source of livelihoods for the agricultural labourers. In this context, it is essential to study the different livelihood requirements of agricultural labourers to attain better living conditions. Keeping these facts in view the study was planned with the following specific objectives.

1. To develop a scale for measuring livelihood security of agricultural labourers and its application.
2. To compare the livelihood security status of agricultural labourers in different agricultural situations.

METHODOLOGY

For the study six districts viz., Kolar, Chickaballapur (Rainfed), Mandya, Mysore (Irrigated), Coorg and Chickamagalur (Plantation) were selected, as these districts represent rainfed, irrigated and plantation situations which is intended for making comparison. Thirty five agricultural labourers were selected from each district making total 210 respondents (Rainfed – 70, Irrigated – 70, Plantation situation – 70). The scale on livelihood security was developed for the study. The developed livelihood security scale was used to quantify livelihood security status among agricultural labourers. Personal interview method was followed to collect the data and appropriate statistical tests were used for analyzing the data for interpretation.

RESULTS AND DISCUSSION

1. Development of a scale to measure livelihood security of agricultural labourers : A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets now and in future, while not undermining the natural resources base (Chambers and Conway, 1992). In the present investigation livelihood security of the agricultural labourers is operationally defined as "the ability of the agricultural labourers to earn and spend their income on all basic and other necessities, coping strategies, transformation, employment status and development orientation which are essential for decent living. Further, it refers to the ability of the agricultural labourers to protect their capabilities, assets and activities which are essential for their livelihood". The method suggested by the Likert (1932) in developing summated rating scale was followed through six stages viz., identification of dimensions, collection of items/ statements, relevancy test, item analysis, reliability and validity.

a. Identification of dimensions: Eight major dimensions related to livelihood security were identified based on review of literature and discussion with experts in the field of extension education. The identified dimensions are assets, living amenities, economic efficiency, ecological security, social equitability, transformation over a period of time, coping strategies against stress and employment status.

b. Collection of items / statements: A large number of draft statements on each dimension of livelihood security were collected based on review of literature, discussion with relevant specialists and researcher's own experience. These statements were carefully edited, revised and restructured to avoid ambiguity and duplication. Thus, 85 statements including negative statements were selected for further analysis.

c. Relevancy test: The selected 85 statements were so worded so as to express varying degrees of livelihood security among the agricultural labourers. These statements were then subjected to scrutiny by an expert panel of judges to determine their relevancy and subsequent screening of items for their inclusion in the final scale. A questionnaire consisting of all the items was sent to 85 judges comprising of Assistant Professors (those who had minimum of 3 years experience), Associate Professors, Professors, scientists, extension personnel of State Agricultural Universities, Deemed universities, National institutes such as NIRD and MANAGE and ICAR institutes with appropriate instructions to critically judge the items for their relevancy in measuring livelihood security of agricultural labourers. They were asked to check each of the statements carefully for being relevant or not relevant using four point continuum viz., 'Most Relevant' (MR), 'Relevant' (R), 'Some What Relevant' (SWR) and 'Not Relevant' (NR) with scores of 3, 2, 1, and 0, respectively. The judges were also requested to make necessary modifications and additions or

deletion of statements, if they desire so. The relevancy score for each item was found out by adding the relevancy scores of the rating given by 53 judges, who replied in time. These were considered for further processing.

Selection of items: The responses of the judges were tabulated and data were analyzed to work out Relevancy Percentage (RP), Relevancy Weightage (RW) and Mean Relevancy Score (MRS) for all the statements by using following standard formulas.

$$\text{Relevancy Percentage (RP)} = \frac{(MR \times 3) + (R \times 2) + (SWR \times 1)}{\text{Maximum possible score (i.e. 53 x 3 = 159)}} \times 100$$

$$\text{Relevancy Weightage (RW)} = \frac{(MR \times 3) + (R \times 2) + (SWR \times 1)}{\text{Maximum possible score (i.e. 53 x 3 = 159)}}$$

$$\text{Mean Relevancy Score (MRS)} = \frac{(MR \times 3) + (R \times 2) + (SWR \times 1)}{\text{Number of judges responded (i.e. 53)}}$$

Taking into consideration the overall values, the items having relevancy percentage of more than 70.00 per cent, relevancy weightage of more than 0.70 and mean relevancy score of more than 2.11 were considered for the inclusion in item analysis. Further, in the light of criticisms and comments of judges few statements were modified and rewritten. Thus, 50 statements (8 were negative and 42 were positive statements) were retained in the scale to measure the livelihood security of agricultural labourers.

d. Item analysis: Further, it was considered essential to delineate the items based on the extent to which they can differentiate the item by agricultural labourers as highly oriented from the one which is less oriented. For this purpose, item analysis was carried out on the items chosen from the first stage. A schedule comprising of 50 statements were administered to 40 agricultural labourers in non-sample area (Chamarajanagar district, Karnataka) with five point continuum *viz.*, to a Very Great Extent (VGE), to a Great Extent (GE), to a Moderate Extent (ME), to a Least Extent (LE) and to a Very Least Extent (VLE). The ratings for each response by the respondents were utilized for the calculation of 't' values under each item. The response to each statement was considered as a rating score and the scores were summed up for all statements.

From the total score, the frequency distribution of scores was considered, which was based on the responses to all statements. Then, 25 per cent of the subjects with the highest total score and 25 per cent of the subjects with the lowest total score were taken, which provided the criterion groups to evaluate the individual statement. The critical ratio was calculated using the following formula.

$$t \approx \frac{\bar{X}_H \quad \bar{X}_L}{\sqrt{\frac{(\Sigma X^2{}_H) \quad \frac{(\Sigma X_H)^2}{n} \quad (\Sigma X^2{}_L) \quad \frac{(\Sigma X_L)^2}{n}}{n(n \quad 1)}}}$$

Where,

$\Sigma X^2{}_H$ = Sum of the squares of the individual scores in the high group

$\Sigma X^2{}_L$ = Sum of the squares of the individual scores in the low group

$\bar{X}_H$ = The mean score for a given statement for the high group

$\bar{X}_L$ = The mean score for a given statement for the low group

n = Number of respondents

The 't' value is a measure of the extent to which a given item differentiates the higher group from lower group. Fifty statements were subjected to 't' test. The calculated 't' was found to be greater than table 't' in all the 50 statements

e. Reliability of the scale: Reliability in its true sense refers to precision of the scale constructed for any purpose. It is otherwise called the extent to which repeated measure produces the same results. In any social science research, newly constructed scale has to be tested for its reliability before it is used. In the present study, the reliability of livelihood security scale was determined by test-retest method and split-half method.

Test - retest method: In the study, the test conducted on 40 agricultural labourers in the non-sample area (Chamarajanagar district, Karnataka) with five point continuum *viz.,* to a Very Great Extent (VGE), to a Great Extent (GE), to a Moderate Extent (ME), to a Least Extent (LE) and to a Very Least Extent (VLE). After 15 days retest was conducted on same respondents. This yields two independent sets of responses and the score of each respondent was calculated with a scoring pattern of 5, 4, 3, 2 and 1 for positive statements and for negative statements scores were reversed. The correlation between the two sets of scores was calculated by using Pearson -product moment correlation coefficient and it gives the value of reliability coefficient (r = 0.832**). A positive and highly significant correlation coefficient between the two sets of scores (P < 0.01) indicated high degree of evidence of reliability of livelihood security scale.

Formula,

$$t \approx \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{n}}{\sqrt{(\Sigma X^2 H) - \frac{(\Sigma X)^2}{n} \quad (\Sigma Y^2) - \frac{(\Sigma Y)^2}{n}}}$$

Where;

X = Test scores

Y = Re-test scores

n = Sample size

Split-half method: In the present study, for testing reliability scores of two halves are correlated to find out reliability coefficient, split-half method was employed. Split-half method of reliability is used with instrument that has many items and where pairs of items can be considered equivalent. Equivalence indicates the internal consistency of measuring device. The scale developed for the study was administered to 40 agricultural labourers in the non-sample area (Chamarajanagar district, Karnataka) with five point continuum *viz.,* to a Very Great Extent (VGE), to a Great Extent (GE), to a Moderate Extent (ME), to a Least Extent (LE) and to a Very Least Extent (VLE). Further, the scale was divided into two halves based on odd and even numbered statements and scores were found out from the same respondents for each half. The score of each respondent was calculated with a scoring pattern of 5, 4, 3, 2 and 1 for positive statements and for negative statements scores were reversed. Reliability coefficient was calculated for each half ($r_{½}$) by using Pearson-product moment correlation coefficient formula.

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{n}}{\sqrt{(\Sigma X^2) - \frac{(\Sigma X)^2}{n} \quad (\Sigma Y^2) - \frac{(\Sigma Y)^2}{n}}}$$

Where,

$r_{½}$ = Pearson-product moment correlation coefficient

X = Odd scores

Y = Even scores

ΣX = Sum of 'X' values

ΣY = Sum of 'Y' values

ΣX^2= Sum of squares of 'X' values

ΣY^2 = Sum of squares of 'Y' values

n = Number of pairs of observations

Thus, reliability coefficient calculated for each half was found to be $r_{½}$ = 0.720 which was significant at one per cent level. Further, scores of two halves are correlated to find out reliability coefficient. Reliability coefficient for whole test was estimated by applying Spearman-Brown prophecy formula,

$$r_{II} = \frac{2r_{½}}{1 + r_{½}}$$

r_{II} = Spearman-Brown prophecy reliability coefficient

$r_{½}$ = Pearson-product moment correlation coefficient

Reliability coefficient calculated for whole test was found to be = 0.8372 which was significant at one per cent level of significance. Reliability coefficients thus obtained indicate high internal consistency of livelihood security scale developed for the study.

f. Validity of the scale: Validity refers to the ability of the instrument to measure what it proposed to measure (Mulay and Sabarthanam, 1980).

Validity of a scale is the property which ensures that the test scores obtained measure the variable they are supposed to measure. Content validity or construct validity and criterion validity are the methods generally followed to know the validity of the scale.

Content validity: According to Kerlinger (1966), it is the representativeness or sampling adequacy of the content – the substance, the matter and the topics of a measuring instrument. He further stated that, content validation consists essentially in judgment. Alone or with others, one judge the representativeness of the item.

Construct validity notion arises because of the complex and intangible traits associated with the variable included in the study. Anastasi (1976) had indicated specific techniques which could be utilized to establish construct validity. They are: a. Correlation with criterion, b. Internal consistency, c. Correlation with other tests, d. Factor analysis and e. Effect of experimental variables on test scores. In the present study, the first two techniques were employed to establish the construct validity of the scale.

Content validity of the livelihood security scale was established in two ways; firstly, The items selected for inclusion in the scale were based on extensive review of literature. Secondly, the opinion of the panel of judges, discussion with experts and resource personnel was done to find whether the statements suggested were suitable for inclusion in the scale or not. Thus, validity of the present scale is established.

Criterion validity: In the present investigation, criterion validity was measured after establishing theoretical relationship between livelihood security and two criteria namely, education and family employment generation.

Information on education and family employment generation was collected from 40 respondents in a non sample area by using a structured schedule. The scores obtained for these two variables were correlated with livelihood security score. The 'r' value was worked out and which was found to be 0.398* for education and 0.446** for family employment generation. Since, both the 'r' values were significant at 5 per cent and one per cent level, respectively. The scale developed was considered as valid.

Pre-testing: The developed scale was pre-tested with five agricultural labourers in a non-sample area of the study to know the suitability of the scale as well as to observe the difficulties of test administration. There was no difficulty or inadequacy in the test administration as well as to observe and record the performance of the respondents. Further, the respondents were found to be enthusiastic to take the test.

Administration of livelihood security scale and method of scoring: The final scale consisting of 50 statements / items (Table 1) can be administered to the respondents with a five point continuum *viz.,* to a Very Great Extent (VGE), to a Great Extent (GE), to a Moderate Extent (ME), to a Least Extent (LE) and to a Very Least Extent (VLE) with the scores of 5, 4, 3, 2 and 1, respectively for positive statements and 1, 2, 3, 4 and 5 for negative statements, respectively. The total livelihood security score for each respondent can be calculated by summing up scores of all the items. Thus, 50 to 250 were the minimum and maximum possible scores obtainable by the respondents, respectively. Based on the scores obtained, respondents can be categorized into three categories by taking the mean and standard deviation as measure of check.

Table 1
Scale to measure livelihood security of agricultural labourers

Sl. No.	Statements	Response Categories				
		VGE	GE	ME	LE	VLE
A.	**Assets**					
1.	Owning land provides a means of livelihood security					
2.	The land owned provides greatest prestige in the society					
3.	Possessing own house as a means of security					
4.	Livestock owned ensures economic security					
5.	Assured irrigation facilities is a means of guaranteed livelihood					
6.	Practice of shared cropping partly meets the food requirement of the family					

B.	**Living amenities**					
7.	Savings provide security to spend on other requirements					
8.	Safe drinking water is available locally					
9.	Firewood / fuel is available at reasonable cost					
10.	Hygienic living is possible even by doing agricultural labourer job					
11.	Food grains provided through public distribution system is a major means of livelihood security					
12.	Quantum of food consumed is sufficient to generate required calories					
13.	Type of food consumed is nutritionally unbalanced					
C.	**Economic efficiency**					
14.	Earning from wages are saved to a reasonable extent					
15.	Members of the household migrate from the area in search of job					
16.	Considerable income can be invested as savings in post office, banks and other institutions					
17.	Insurance and health coverage programmes are satisfactory and extended to agricultural labourers attending risky jobs					
D.	**Ecological security**					
18.	Forest resources serves as a means of secured livelihood					
19.	Water is available sufficiently for farming and for maintaining livestock					
20.	Drought / famine is a major constraint in the habitat zone					
E.	**Social equitability**					
21.	Community support is always forth coming whenever required					
22.	Sufficient recognition is forth coming from the society					
23.	Festivals are celebrated to the level of self / family satisfaction					
24.	There are schooling facilities for our children in nearby place					
25.	Poor social relationship exists between agricultural labourers and other sections of the society					
F.	**Transformation over a period of time**					
26.	We feel secure over a period of time					
27.	Sufficient assets are created over a period of time					
28.	There is steady rise in the level of income over a period of time					
29.	Multiple sources of income have facilitated increase in income over a period of time					
30.	Opportunities of health care is possible whenever it is needed					
G.	**Coping strategies against stress**					
31.	Sufficient savings are maintained to meet the unforeseen situation					
32.	Kitchen garden helps in getting liquid capital					
33.	Contract work like weaving, rolling cigarettes, making incense sticks helps in stress condition					
34.	Borrow food grains from relatives, friends, neighbours and merchants during crisis situation					
35.	Resources are not sufficient to meet the requirement of balanced nutrition of all family members					
36.	Migration for seasonal work like brick making, construction work at urban areas					
H.	**Employment status**					
37.	Assured employment is available all through the year					
38.	Subsidiary enterprises help to keep us fully engaged and provides additional income					
39.	Self satisfied and feel competent to do varied agricultural labourer work					

40.	Basic facilities are made available at the work place					
41.	Family members are skillful to get guaranteed employment					
42.	There is wage difference between men and women for the same work					
43.	Minimum wage policy and other labour policies of the government are strictly adhered and favourable to labour community					
44.	Advance payment is given whenever it is required					
45.	Follow all protection/safety measures during work hours					
46.	Eight hours of work is treated as one day work					
47.	Slack employment will lead to migration of labourers to other places in search of employment					
48.	Food for work is the major attraction for attending work					
49.	Our employment situation necessitates our children to take up our job in the early ages					
50.	Employment is assured through various employment programme of government such as MGNREGA					

The developed livelihood security scale was administered to 210 agricultural labourers in six districts of Karnataka state viz., Kolar, Chickballapur, Mandya, Mysore, Coorg and Chickamagalur (35 respondents from each district). The minimum and maximum scores obtained by agricultural labourers were 83 and 183, respectively.

Table 2
Classification of agricultural labourers based on livelihood security status in different agricultural situations

Livelihood security level	Different agricultural situations					
	Rainfed (n_1=70)		Irrigated (n_2=70)		Plantation (n_3=70)	
	No.	%	No.	%	No.	%
Low (< 135.41 score)	40	57.14	10	14.28	09	12.86
Medium (135.41 to 151.63 score)	15	21.43	45	64.29	23	32.86
High (> 151.63 score)	15	21.43	15	21.43	38	54.28
Total	70	100.00	70	100.00	70	100.00

Mean = 143.52 Standard Deviation = 16.23

An examination of the Table 2 indicates the livelihood security status of agricultural labourers in different agricultural situations.

In rainfed situation more than half of the respondents (57.14%) belonged to low level of livelihood security which is followed by 21.43 per cent each had medium and high levels of livelihood security. The uncertainty of rainfall results in low employment opportunities and low income generation lead to low rate of wages. As it is rainfed situation only one crop can be harvested per year was the possible reason for this type of results.

Likewise, in the irrigated situation slightly more than fifty per cent of the agricultural labourers (64.29%) had medium level of livelihood security, subsequently 21.43 per cent and 14.28 per cent fit under high and low levels of livelihood security, respectively. The likely reasons might be that to a considerable extent assured irrigation facilities exits in irrigation situation due to this two to three crops can be harvested per year which results in increased employment opportunities and income of the family.

Correspondingly 54.28 per cent of the agricultural labourers fell under high level of livelihood security afterward medium (32.86%) and low (12.86%) levels of livelihood security in plantation situation. The reasons might be their larger size of land holding, growing commercial crops like coffee, pepper, cardamom etc., and high rate of wages when compared to rainfed and irrigated situations.

Table 3
Distribution of agricultural labourers according to their livelihood security status in pooled situation (n=210)

Livelihood security	Number	Per cent	Mean	SD
Low (< 135.41 score)	59	28.10		
Medium (135.41 to 151.63 score)	83	39.52		
High (>151.63 score)	68	32.38	143.52	16.23
Total	210	100.00		

The critical look at the Table 3 shows that 39.52 per cent of the agricultural labourers in pooled situation belonged to medium level of livelihood security which is tracked by 32.38 per cent and 28.10 per cent had high and low levels of livelihood security, respectively. This might be due to the reason that majority of the respondents depended on-farm and off-farm activities for their source of income. They were in a position to improve their livelihood in a better level in terms of their assets, economic efficiency, ecological security, social equitability, coping strategies and employment status hence, the present trend was observed.

CONCLUSION

The livelihood security scale constructed is found to be reliable and valid; therefore it can be used to measure the livelihood security of agricultural labourers. As the study noticed that the agricultural labourers in rainfed situation had low livelihood security due to their limited employment opportunities when compared to irrigated and plantation situations. Thus, it is fundamental to provide year round employment opportunities through increased irrigation facilities and strengthening of employment generation programmes like MGNREGA and such other programmes. In irrigated and plantation situations the agricultural labourers had medium and high livelihood security, respectively. Therefore, it is necessary to motivate them to diversify their income on other income generating activities and also build self confidence to take up self employment activities and small agro-based enterprises to ensure additional income thereby better livelihood security. Livelihood security is an important mechanism for economic growth and it can be facilitated by technological breakthrough, changes in consumer demand and suitable government policy and development of requisite infrastructure.

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