Journal of Community Mobilization and Sustainable Development Vol. 13(2), 279-285, May-August, 2018

Construction of Multi-dimensional Scale for Measuring Perception towards Migration

Sukanya Som[1], R. Roy Burman[1], J.P. Sharma[1], R.N. Padaria[1], M.A. Iquebal[2] and A. Suresh[3]
[1]Division of Agricultural Extension, [2]Centre of Agricultural Bio-informatics, [3]Division of Agricultural Economics, ICAR-Indian Agricultural Research Institute, New Delhi-110012

ABSTRACT

Growing rural to urban migration assumes special importance for the current socio-economic and agricultural scenario of the country. Understanding the perception of people towards migration is essential in order to understand overall dynamics of migration. A multi-dimensional scale was constructed for measuring perception of respondents towards migration as perception is a multi-dimensional variable. Measuring such variable using uni-dimensional scale might lead to faulty result because of high multi-collinearity effect. For construction of the scale, data were collected from 300 randomly selected respondents of Uttar Pradesh (UP), Bihar and Maharashtra. After construction of the scale, perception of respondents towards migration was measured. For this purpose, forty farmers and ten extension professionals, each from Jhansi (UP), Bhagalpur (Bihar) and Nashik (Maharashtra) were chosen randomly. The results showed that farmers of Jhansi and Bhagalpur held significantly more favourable perception towards migration than that of Nashik. However, no significant difference was found in case of the professionals of three regions. The findings of the study could be useful for developing an insight about the migration dynamics of the country.

Keywords: Migration, Perception, Multi-dimensional scale

INTRODUCTION

Migration of human being from one region to the other has been an age old phenomenon all over the world. However, it has gained concern of the policy makers recently, due to its potential future impacts on socio-economic system of the country. There has been a steady increase of migration in the country over the years. Whereas in 1961 there were about 144 million migrants by place of birth, in 2001 Census, it was 307 million that is around 30 per cent of total population. In case of inter-state migration the trend is mostly to shift from rural to urban centers for better employment opportunities. According to Satapathy and Mishra (2010) mostly, the people within age group of 25 to 50 years move out of villages for jobs a village based jobs are not remunerative enough to meet their requirements. Another reason might be several constraints associated with agriculture like decreasing land man ratio, poor socio economic condition of the farmers, vagaries nature of agriculture, new risks from environmental deterioration, etc. (Saha and Bahal, 2014).

This growing rural to urban migration has a number of severe implications, one of them being its prospective effect on agriculture. India is losing more than 2,000 farmers every single day since 1991 and the overall number of farmers has dropped by 15 million (Sainath, 2013). Large numbers of people, mostly young are moving away from rural areas to urban centresin search of employment. The migration of rural youth to cities is around 45 per cent in the country and out of total migrants from rural to urban areas youth account for 30 per cent (Hazra, 2012). Furthermore, shifting out of agriculture is high among farmers below 30 years of age (Sharma and Bhaduri, 2009). As a result, presently, there is insufficient youth participation in the agriculture in India even though this class of people is the most productive of any society (Mangal, 2009). Given the growing disinterest of youth in this sector, there are risks

*Corresponding author email id:

to sustenance of agriculture and food security. Under these prevailing circumstances a study on migration assumes special importance. It is imperative to understand the underlying psychological subtleties of the population that lead them to migrate from one place to other. Hence an attempt has been taken to measure the perception of respondents of the study towards migration.

Conceptually, perception is the process by which people translate sensory impressions into a coherent and unified view of the world around them. Like most of the other psychological variables perception is multi-faceted and perception towards migration is expected to carry even larger number of underlying aspects as migration itself is a multi-dimensional phenomenon. Measuring perception using uni-dimensional scale might give us faulty result as there could be high inter-correlation among the statements used for measuring perception leading to multi-collinearity effect. Therefore, an attempt has been taken to construct a multi-dimensional scale to measure perception of respondents towards migration. For the purpose of the study a null hypothesis has been formulated stating no significant difference in perception between the respondent categories. Proper statistical tests have been employed to test the stated hypothesis.

MATERIALS AND METHODS

The study was conducted in three randomly selected districts namely, Jhansi, Bhagalpur and Nashik from Uttar Pradesh (UP), Bihar and Maharashtra, respectively. The states were chosen purposively, due to the significance of these three states in migration scenario of the country. While UP and Bihar are the two states with largest number of persons (26.9 lakhs and 17.2 lakhs, respectively) migrating out of the states (Census, 2001) Maharashtra is the state with highest in-migration (32.31 lakhs) in a decade. On the basis of net migration (difference between in-migration and out-migration) during last decade, Maharashtra stands at the top of the list with 2.3 million net migrants while UP (-2.6 million) and Bihar (-1.7 million) stand at the lowest position among all states. The share of the total out-migration of youth in the country is also highest In UP (23.83%) and Bihar (14.89%) (68th round of NSS). As per the reports of Census (2001), 51.5 per cent and 62.5 per cent youth migrated to Maharashtra from UP and Bihar, respectively for employment from 1991 to 2001.

A multi-dimensional scale was constructed to measure the perception of the respondents towards migration. For this purpose 240 farmers and 60 agricultural professionals who were not part of the sample chosen for measurement of perception were selected randomly from the locale of study. M-K-J-B-D (Maheshwari-Kumar-Jhamtani-Bhaskaran-Dandapani) method (Mohanty *et al.*, 2009) was used to construct the scale in ten sequential steps which have been described below:

Step 1: Formulation of initial set of statements for measuring perception towards migration with the help of review of literature and discussion with the experts

Step 2: Item analysis by the experts and selection of the final set of statements

Step 3: Collection of data for all the selected statements using personal interview method

Step 4: Conducting exploratory factor analysis using Principal component method for identification of underlying dimensions

Step 5: Eliminating statements whose communality were found to be less than 0.6.

Step 6: Determining the number of components (Factors) to be kept in final scale

Step 7: Verification of the factor analysis model by using other methods of factor analysis namely, Maximum likelihood method and least square method.

Step 8: Finding out set of b (beta) values of each variable in different components through rotated component matrix and regressing statements (variables) into factors (components). That is Y1 = b1*X1 + b2*X2 + b3*X3…, Y2 = b1*X1 +b2*X2 + b3*X3…, Y3 = b1*X1 + b2*X2 + b3*X3…, Y4 = b1*X1 + b2*X2 + b3*X3…, and so on.

Step 9: Adding up Y1, Y2, Y3, Y4 …, which were uncorrelated to each other, to obtain overall score Y for individual respondents on the multidimensional scale of measurement.

Step 10: Checking reliability of the scale using Cronbach's Alpha.

For measurement of perception using the constructed scale, forty farmers and ten extension professionals were

selected randomly from each district, therefore making the total sample size 150. These respondents were socio-economically similar but not part of the sample selected for construction of the scale. After measurement, an attempt was made to find out if there was any significant difference in terms of their perception towards migration using independent samples t test. Data were analyzed using the software SPSS.

RESULTS AND DISCUSSION

Construction of multidimensional scale:

Stepwise results have been presented below:

Item selection, Item analysis and data collection (Step 1, 2, and 3): Initially 100 statements were formulated which were expected to reveal respondents' perception towards migration. These statements were presented to thirty experts for checking their relevancy in a 5 point continuum scale. Finally, fifty statements were chosen whose t scores were more than 1.75. These fifty statements were presented to 300 respondents. Responses were recorded in 5 point continuum that ranged from strongly agree to strongly disagree and scores ranging from 5 to 1 were given accordingly, to the responses.

Conducting the factor analysis (Step 4, 5, 6, and 7): Sampling adequacy and inter-correlation among variables (statements) were checked through Kaiser-Meyer-Olkin (KMO) test and Bartlett's test, respectively (Table 1). A score of 0.911 in KMO test indicated high sampling adequacy. Significant result in Bartlett's test led us to reject null hypothesis of non-collineraity. Therefore, there was inter-correlation among the variables making it a suitable case to construct a multidimensional scale by eliminating covariance effect in overall measurement of perception.

Table 1: Results of KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.911
Bartlett's Test of Sphericity	Approx. Chi-Square	5.805E3
	df	1225
	Sig.	.000

After conducting the principal component method of factor analysis communalities of the variables were found (Table 2). Eighteen variables with communality less than 0.6 were rejected (Statement No. 1, 2, 6,8,10,13,14,18,20,21,22,28,30,31,32,33,43, and 49).

Table 2: Communalities of the variables (St.-Statement No., E-Extraction)

St.	E	St.	E	St.	E	St.	E	St.	E
1	.508	11	.637	21	.559	31	.547	41	.867
2	.574	12	.825	22	.510	32	.510	42	.676
3	.737	13	.589	23	.616	33	.372	43	.586
4	.714	14	.502	24	.649	34	.622	44	.839
5	.645	15	.722	25	.723	35	.664	45	.667
6	.565	16	.631	26	.841	36	.775	46	.695
7	.659	17	.784	27	.641	37	.743	47	.634
8	.573	18	.413	28	.530	38	.681	48	.611
9	.620	19	.698	29	.619	39	.749	449	.533
10	.573	20	.549	30	.487	40	.619	50	.985

Ten components were extracted through principal component method. Initial eigen values reduced to less than one after tenth component. Ten components could also explain total variance up to 70.28 per cent. The increment in total variation explained by subsequent components was marginal. Therefore the number of components in factor analysis was restricted to ten. The scree plot (Figure 1) and Table 3 explain the fraction of total variance in data represented by each component.

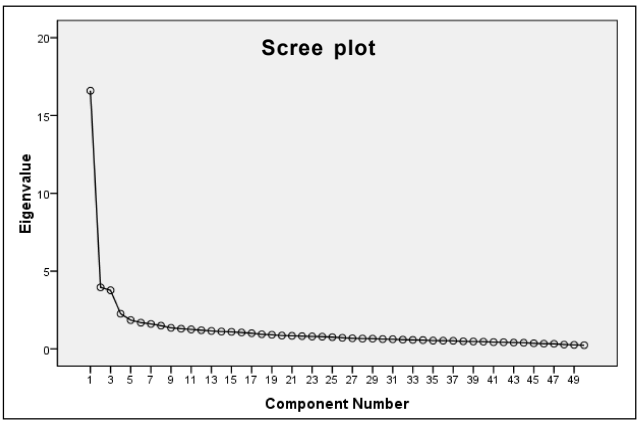

Figure 1: Scree plot showing contributions of components w.r.t. eigen values

In order to verify the result, other models of factor analysis like Maximum likelihood method and least square method were also employed and similar results were obtained.

Regressing statements (variables) into factors (components) (Step 8): The rotated component matrix (Table 4) demonstrates the beta values which explain contribution of each statement (Variable) to the components. Only thirty two statements have been

Table 3: Percentage of total variance by ten components for initial eigen values, after extraction and after rotation

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	16.595	26.510	26.510	13.101	26.201	26.201	7.155	14.310	14.310
2	3.956	8.320	34.830	3.124	8.248	34.449	5.144	12.539	26.849
3	3.766	7.016	41.846	1.434	4.867	39.316	3.631	10.262	37.111
4	2.257	6.605	48.451	1.795	6.590	45.906	1.874	7.749	44.860
5	1.851	5.957	54.408	1.581	6.161	52.067	1.849	5.697	50.557
6	1.686	4.694	59.102	1.404	4.652	56.719	1.737	4.474	55.031
7	1.604	3.563	62.665	1.326	3.784	60.503	1.631	3.998	59.029
8	1.492	3.383	66.048	1.226	3.985	64.448	1.464	3.929	62.958
9	1.353	2.161	68.209	1.108	2.216	66.704	1.392	2.958	65.916
10	1.298	2.074	70.283	1.070	2.141	68.845	1.291	2.929	68.845

Table 4: Rotated Component Matrix (Rescaled)

Statements	Highest factor loading (Component No.)	Statements	Highest factor loading (Component No.)	Statements	Highest factor loading (Component No.)	Statements	Highest factor loading (Component No.)
ST3	.623 (1)	ST16	.468 (3)	ST29	.707 (6)	ST41	.828 (8)
ST4	.527 (1)	ST17	.527 (4)	ST34	.492 (2)	ST42	.612 (8)
ST5	.440 (1)	ST19	.566 (9)	ST35	.644 (2)	ST44	.564 (8)
ST7	.474 (1)	ST23	.646 (9)	ST36	.640 (7)	ST45	.635 (2)
ST9	.346 (3)	ST24	.582 (5)	ST37	.583 (7)	ST46	.555 (9)
ST11	.468 (1)	ST25	.477 (4)	ST38	.559 (2)	ST47	.462 (10)
ST12	.490 (1)	ST26	.818 (5)	ST39	.656 (2)	ST48	.531 (10)
ST15	.578 (3)	ST27	.400 (6)	ST40	.631 (2)	ST50	.962 (10)

considered here as eighteen statements were dropped in the previous stage. The statements which have major contribution to a particular component have higher beta values than for other components. On the basis of beta values of dimensions to a particular component (factor), the components are given a name to represent the group of statements that have major contribution to that particular component (factor). As per the Table No. 4, the first component (Y_1) has major contributions from statement no. 3, 4, 5, 7, 11 and 12. These statements mostly represented economic factors; e.g. "It is not possible to earn sufficiently to feed one's family in village". Therefore component 1 was named as economic factor. Similarly, the ninth component has major contribution from statement no. 19, 23 and 46 which mostly talk about mental health; e.g. "I suffer from frustration for staying in village", "I fear I might indulge into gambling and addiction if I move to cities" *etc.* Hence this component was named as mental health factor. In similar fashion, rest of the statements was contributed to different components and components were named (Table 5). Mathematically, each component could be regressed using beta values of the statements to obtain uncorrelated component scores of individual respondents as shown in Table 5. X_3, X_4, …, X_{50} denote the scores obtained by a respondent in individual statements that ranged from 1 to 5.

Final score in multidimensional scale (Step 9): After calculating the scores of individual components for a respondent the total score for each respondent could be obtained by adding the regressed value of Y_1, Y_2,…,Y_{10}. Mathematically it could be represented as Total Multidimensional Score $Y=Y1+Y2+Y3+Y4+Y5+Y_6+Y_7+Y_8+Y_9+Y_{10}$. The lowest possible score in the scale was found to be 41.908 while the highest possible score was 209.54.

Reliability Testing (Step 10): The reliability of the scale was measured using Cronbach's Alpha and the reliability coefficient was found to be 0.81 which was satisfactory.

Table 5: Extracted components and Component scores

S.No.	Component Name	Statement Number	Formula for component score
1	Economic (Y_1)	3,4,5,7,11,12	$0.533*X_3+0.550*X_4+\ldots+0.113*X_{50}$
2	Facilities and privileges (Y_2)	34,35,38,39,40,45	$0.243*X_3+0.229*X_4+\ldots+0.134X_{50}$
3	Family orientation (Y_3)	9,15,16	$0.051*X_3+0.276*X_4+\ldots+0.117*X_{50}$
4	Aspiration (Y_4)	17,25	$0.117*X_3+0.124*X_4+\ldots+0.069*X_{50}$
5	Risk (Y_5)	24,26	$0.016*X_3+0.101*X_4+\ldots+(-0.005)*X_{50}$
6	Satisfaction (Y_6)	27,29	$0.028*X_3+(-0.071)*X_4+\ldots+0.079*X_{50}$
7	Social Relation (Y_7)	36,37	$0.023*X_3+(-0.013)*X_4+\ldots+(0.002)*X_{50}$
8	Social Status (Y_8)	41,42,44	$0.133*X_3+0.025*X_4+\ldots+0.006*X_{50}$
9	Mental health (Y_9)	19,23,46	$0.071*X_3+0.016*X_4+\ldots+(-0.012)*X_{50}$
10	Cultural orientation (Y_{10})	47,48,50	$0.153*X_3+0.108*X_4+\ldots+0.962*X_{50}$

Measurement of perception of respondents towards migration using multi-dimensional scale: The total perception scores were calculated for each respondent based on their responses on the multi-dimensional scale. Higher scores indicated more favourable perception towards migration. Respondents were classified into three categories using 'Mean ± Standard deviation' method (Table 6). Most of the farmers of Jhansi and Bhagalpur were found to be holding favourable perception towards migration while in case of Nashik, they were holding mostly neutral to unfavourable perception. The mean scores of respondents for Jhansi, Bhagalpur, and Nashik were found to be 138.69, 173.65, and 84.07, respectively. Only 20.6 per cent respondents in Nashik were having favourable perception towards migration, while in case of Bhagalpur, the figure was approximately 70 per cent.

Professionals of all three districts were found to have mostly neutral to unfavourable perception towards migration. This could be attributed to their deeper understanding about the potential negative impacts of growing rural to urban migration and concern for rural and agricultural development as part of their professional role. Further, it was investigated whether there was any significant difference among the respondents of three districts regarding their perception towards migration using t test for equality of means (Table 7). It was found that scores for three districts significantly varied from each other in case of farmers as p value was <0.05 in all three pair-wise comparisons. Therefore, the null hypothesis of no significant difference between the respondents of three regions was rejected.

Contradictorily, scores for three districts were not found to vary significantly from each other in case of extension professionals. This indicated professionals of different states had more or less uniform perception towards migration. The difference in perception between the farmers of these three regions could be explained by different agricultural and as well as socio-economic circumstances prevailing in these states. A study by

Table 7: Significance of difference between respondents of three districts

	t	df	Sig. (2-tailed)
Farmers			
Between Bhagalpur and Nashik	20.353	73.433	.000
Between Nashik and Jhansi	-10.772	77.730	.000
Between Bhagalpur and Jhansi	7.649	71.408	.000
Professionals			
Between Bhagalpur and Nashik	1.197	16.630	.248
Between Nashik and Jhansi	.000	18.000	1.000
Between Bhagalpur and Jhansi	-2.163	18.520	.352

Table 6: Percentage distribution of respondents according to their perception towards migration (N=150)

Perception level (Range of scores)	Jhansi (UP)		Bhagalpur (Bihar)		Nashik (Maharashtra)	
	Farmers (n_1=40) (%)	Extension Professionals (n_2=10) (%)	Farmers (n_3=40) (%)	Extension Professionals (n_4=10) (%)	Farmers (n_5=40) (%)	Extension Professionals (n_6=10) (%)
Favourable (>166.79)	47.1	16.3	70.7	20.6	19.9	0.9
Neutral (78.11-166.79)	35.5	37.0	19.6	41.2	40.5	19.9
Unfavourable (<78.11)	17.4	46.7	9.7	38.2	39.6	79.2

Sherawat and Sharma (1994) found that most important factors for youth to shift out of agriculture and rural areas were uncertainty of crop production, lack of assured income, low profit, inadequate credit *etc*. However most of them were interested in obtaining training in profitable agricultural and allied activities. Maharashtra is a state that provides lots of employment opportunities for rural youth by providing them both farm and non-farm skill trainings. Several public and private organizations in the state like State Agricultural Universities (SAUs), Krishi Vigyan Kendras (KVKs), private agricultural universities, cooperatives and farmers' organizations offer facilities for youth to get assured employment after training. Therefore, farmers of this region are naturally less oriented towards migration and leaving agriculture as there is plethora of opportunities in their home state for making enough money in agro-based sector. On the other hand, UP and Bihar are two states which provide lower employment opportunities to people in both agricultural and non-agricultural sector. A study by Chandrashekhar and Sharma (2014) stated that there is a constant drain of human capital from economically backward states of Bihar, Uttar Pradesh, Odisha and Rajasthan to the states with better job opportunities such as Delhi, Maharashtra, Gujarat, Karnataka *etc*. Unemployment rate in Maharashtra is only 2.1 per cent as compared to 7.4 per cent and 6 per cent in UP and Bihar, respectively which are higher than national average of 5 per cent (Anonymous 2016). The average annual income of farm households was also found to be Rs. 91,501 for Maharashtra which was double and one and half times of that of Bihar (Rs. 44,172) and UP (Rs. 59,683), respectively (Ranganathan, 2014). Average agricultural landholding is also higher for Maharashtra (1.44 ha) than that of UP (0.76 ha) and Bihar (0.39 ha) (Agricultural Census, 2011). These secondary data discussed above clearly give us probable explanation for the result of our investigation. The differential socio-economic and agricultural status of the states under study clearly affects the perception of the respondents towards migration.

CONCLUSION

Use of uni-dimensional scales for Measurement of psychological variables in social sciences often leads to faulty measurement as these variables are mostly multi-dimensional with highly inter-correlated dimensions. This study aimed to construct a multi-dimensional scale to measure perception of farmers and extension professionals towards migration. The procedure explained in the paper for construction of multi-dimensional scale can be useful for developing such scales for measurement of other socio- psychological variables which are difficult to measure by uni-dimensional scales. The constructed scale was tested for its reliability and then used for measuring perception of respondents. We could find that farmers of Jhansi, Bhagalpur and Nashik were significantly different in terms of their perception towards migration. Farmers of Nashik were found to hold less favorable perception towards migration than those of other two districts under study. This difference could be attributed to the different agricultural and socio-economic scenarios of these three districts belonging to three important states of the country from the migration perspective. Understanding the perception of farmers towards migration would help to device suitable economic and agricultural policy in future.

REFERENCES

Agricultural Census of India. 2011. Available at http://agcensus.nic.in/

Anonymous. 2016. Report on Fifth Annual Employment-Unemployment Survey (2015-16). Ministry of Labour and Employment. Government of India.

Census of India. 2001. Available at www.censusindia.gov.in

Chandrashekhar, S., Sharma, A. 2014. Internal Migration for Education and Employment among Youth in India. Indira Gandhi Institute of Development Research, Mumbai

Hazra, A. 2012. Rural India: Still floating towards cities. *Kurukshetra*, 60(4).

Mangal, H. 2009. Best Practices for Youth in Agriculture: The Barbados, Grenada and Saint Lucia Experience.

Mohanty, A.K.; G.A.K. Kumar; B.B. Singh and S.N. Meera. 2009. Developing Multidimensional Scale for Effective Measurement of Rural Leadership. *Indian Research Journal of Extension Education,* 9(2).

NSSO. 2014. Final Report. National Sample Survey, 68th Round.

Ranganathan, T. 2014. Farmers' income in India: evidence from secondary data. Agricultural Economics Research Unit (AERU), Institute of Economic Growth (IEG) New Delhi - 110007.

Saha, B. and R. Bahal. 2014. Training Needs for Livelihood Diversification of the Farmers of West Bengal. *Journal of Community Mobilization and Sustainable Development*, 9(2).

Sainath, P. Over 2,000 fewer farmers every day. The Hindu. 2 May, 2013. Available at http://www.thehindu.com/opinion/columns/sainath/over-2000-fewer-farmers-everyday/article4674190.ece.

Satapathy, C. and S. Mishra. 2014. Micro-enterprise Promotion: Perception of Rural Youths. *Journal of Community Mobilization and Sustainable Development*, 5(1).

Sharma, A. and A. Bhaduri. 2009. The "tipping point" in Indian Agriculture: Understanding the withdrawal of Indian rural youth. *Asian Journal of Agriculture and Development*, 6(1).

Sherawat, P.S. and R.K. Sharma. 1994. Educated unemployed youth, problems encountered by educated unemployed rural youth. *Research and Development Reporter*, 12(2): 57-60.

Received on March, 2018, Revised on April, 2018