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Development of Reliability and Validity of Social Cohesiveness Rating Scale (SCRS)

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ABSTRACT

Natural Rubber is an important plantation crop and is gaining importance in North Eastern states of India due to increasing demand of rubber nationally and globally. Method of summated rating was administered in the construction of Social Cohesiveness Rating Scale (SCRS). Comprehensive literatures review and experts' judgements were considered while identifying the item statements of SCRS. The scale was further standardized by establishing uni-dimensionality through administration of Exploratory Factor Analysis (EFA) using Principal Component with Varimax rotation to extract factors. The final scale consisted of 11 items. Spearman rank-order correlation coefficients (r_s) on inter-rater reliability of the item statements range from 0.577 to 0.812. High concurrent validity as specified by $r_s = 0.75$ ($p < 0.01$) signifies a good consideration on the validity of the SCRS to be administered in a research setting.

INTRODUCTION

The top Natural Rubber (NR) producing countries in the world are Thailand, Indonesia, Malaysia, Vietnam, China, and India. Globally, around 12.40 million tonnes and 12.60 million tonnes of NR are now produced and consumed, respectively. India by producing 775,000 tonnes of NR during 2021-22, is currently the sixth-largest NR producer in the world and the second largest consumer by consuming over 1.2 million tonnes of NR annually (National Rubber Policy, 2019). During the period 2018-19, the North-Eastern Region (NER) of India (encompassing the seven states *viz.*, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura) produced nearly 94,430 tonnes of NR. The average productivity of NR in the NER is 1206 kg/ha, wherein the state Tripura begged the highest productivity at 1226 kg/ha and Arunachal Pradesh posited the lowest productivity at 928 kg/ha. Strikingly, the average productivity is far lesser than the national average of 1472 kg/ha (Rubber Board Statistics, 2022). Despite of the less production and productivity in the NR at NER of India, there remains a huge potential to enhance the production and productivity, provided the rubber growers are given appropriate training on scientific package of practices on NR cultivation by examining their social-economic and psychological factors imparting increase adoption of the NR growing technologies. Under the aegis of the Rubber Board, Government of India (GoI), the NR plantation programmes are being continuously performed and accelerated through North East Rubber Plantation Development and Extension Scheme by providing proper technical and financial assistance to growers (Rubber Board, 2022).

As understanding on social aspects of NR growers are one of the prime pre-requisites to be ascertained, the study has paroled to examine certain socio-psychological dimensions of NR growers. In the study, the construct- 'Social Cohesiveness' has been conceptually defined as the ongoing process of developing a community of shared values, challenges and equal opportunity, based on a intellect of trust, hope and reciprocity among all citizens. In order to measure 'Social Cohesiveness', the study has devised a rating scale namely the Social Cohesiveness Rating Scale (SCRS) with the entailing steps.

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METHODOLOGY

The procedure of summated rating envisaged by Likert (1932) was pursued in the development of Social Cohesiveness Rating Scale (SCRS). A set of item statements which wrings the different dimension of the construct SCRS were collected through a survey of literature and in deliberation with the subject matter experts from Rubber Board, GoI and extension educationists. A conjectural list of 31 statements were accumulated considering the appositeness of statements in the area of study alongside the fourteen (14) criteria as postulated by Edward (1957). The identified set of item statements were carefully examined by panel of three subject matter experts *viz.*, five field officers of Rubber Board, GoI, and two senior professors of extension education. Based on the Mean Relevancy Score (MRS) and estimated 't' values (wherein > 1.75) of the experts' responses, as described in Table 1, finally eleven (11) item statements were identified for the study.

The rating scale developed was further put into the procedure of standardization by establishing uni-dimensionality through administration of Exploratory Factor Analysis (EFA) using Principal Component with Varimax rotation to extract factors. The suitability of data for factor analysis was measured with use of Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity as depicted in Table 2. Kaiser-Meyer-Olkin measure indicates the suitability of data for factor detection and Bartlett's test of sphericity indicates the association between items variables. Associated items point toward the suitability of data for the factor analysis. Kaiser criterion (Kaiser, 1960; i.e., eigenvalue >1) and scree test (Cattell, 1966) was used to determine the number of factors to retain as specified in the Figure 1: Scree Plot..

RESULTS AND DISCUSSION

The study underwent to test reliability and validity of SCRS. Method of inter-rater reliability was employed in examining the reliability of the SCRS with Group Cohesion Scale (GCS), 2013. Concurrent validity was deployed in order to statutory the validity of SCRS. Thirty-two (32) rubber growers were purposively selected from the Karimganj district of Assam as respondents of the study. Two field officers of Rubber Board, GoI, Regional Office Silchar, Assam were identified to independently administer the developed SCRS and pre-established GCS to the identified respondents.

Table 2. Kaiser-Mayer-Olkin (KMO) sample adequacy test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.619
Bartlett's Test of Sphericity	Approx. Chi-Square	1042.853
	df	55
	Sig.	.000

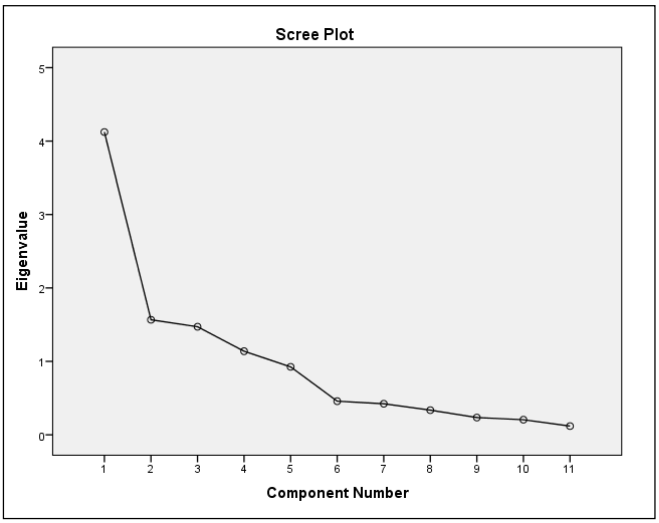

Figure 1. Scree plot

Reliability

Inter-rater reliability of the item statements was examined by comparing the scores assigned by two experts on the respective item statement of the two rating scales. The correlation of the individual item scores between the two scales are given in Table 3. The correlation between the total scores on the scale ranged from 0.577 to 0.812. All the correlations are significant at 0.001 level.

Validity

Concurrent validity of SCRS was examined by administering Spearman rank-order correlation between the mean score of the two raters completing each scale with the mean score of the other scale. The correlation between SCRS and GCS was 0.75 (p < 0.001), and this high significant correlation implies a good consideration on the validity of the SCRS (Table 4).

Table 1. Mean Relevancy Score (MRS) and estimation of t-value of the selected items

S.No.	Item statements of SCRS	MRS	t-value
1.	Original inhabitant of the village.	2.57	2.21
2.	Sense of belongingness due to rubber cultivation.	2.66	2.54
3.	Fellow rubber growers are trusted.	2.91	2.20
4.	government initiatives on rubber cultivation.	3.12	2.23
5.	Mass media plays a major role in bringing solutions to rubber problems.	3.49	2.12
6.	Takes active part on Gram Panchayat/Headman activities related to rubber cultivation.	2.94	1.99
7.	Beneficiary of rubber board schemes.	3.24	2.08
8.	Member of Farmers' Club/Union.	3.35	2.30
9.	Member of Cooperative societies.	3.13	2.29
10.	Registered member of Rubber Producers/Growers Societies.	3.56	1.88
11.	Member of SHGs.	2.99	1.79

Table 3. Interrater reliability, Spearman rank-order correlation coefficients (r_s) between two raters for the individual items of the SCRS (n = 32)

Individual items of SCRS		Correlation (r_s)*
1.	Original inhabitant of the village.	0.689
2.	Sense of belongingness due to rubber cultivation.	0.760
3.	Fellow rubber growers are trusted.	0.789
4.	Government initiatives on rubber cultivation.	0.801
5.	Mass media plays a major role in bringing solutions to rubber problems	0.812
6.	Takes active part on Gram Panchayat/Headman activities related to rubber cultivation.	0.733
7.	Beneficiary of rubber board schemes.	0.744
8.	Member of Farmers' Club/Union.	0.577
9.	Member of Cooperative societies.	0.805
10.	Registered member of Rubber Producers/Growers Societies.	0.774
11.	Member of SHGs.	0.696

$p < 0.001$

Table 4. Spearman rank-order correlation coefficient (r_s) between the Group Cohesion Scale and Social Cohesiveness Rating Scale (n = 32)

Ratings	Group Cohesion Scale
Social Cohesiveness Rating Scale	0.75
Group Cohesion Scale	-

$p < 0.001$

CONCLUSION

The prime target of the study was to bring theoretical and practical contributions by developing and validating a scale to measure 'Social Cohesiveness' of rubber growers in North East India. The SCRS was found to be reliable and valid rating scale to measure 'Social Cohesiveness' of rubber growers. The scale lays a foundation for future research and interventions to promote social cohesiveness among rubber growers.

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