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Construction of a scale to measure the attitude of tribal people towards bio-diversity conservation

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Abstract

A scale measuring the attitude of tribal people towards bio-diversity conservation is developed. One hundred and two possible statements were prepared to assess the tribal people's attitude towards biodiversity conservation using the five-point continuum. The equal appearing interval method was used for developing the scale. The S-value and Q-value of each statement were found. The selected statements were tested with validity and reliability. The scale consists of ten statements with positive (7) and negative (3). Thus the final scale was developed to measure the attitude towards bio-diversity conservation of tribal people. This study was implemented among 182 tribal people to assess their level of attitude towards bio-diversity conservation. The results showed that most of the tribal people were found to be a highly favourable attitude towards biodiversity conservation.

Keywords: attitude, bio-diversity, equal appearing interval, S value, Q value, reliability, validity

Introduction

Biodiversity is of great importance to maintaining a stable ecosystem. An ecosystem is a group of life forms that live together in a balanced and stable community. India is well known for its rich biodiversity. The tribal people have been the custodians of the rich bio-diverse heritage for over 4000 years. The prevalent diverse cultural and social groups have sustained the biodiversity. In the Indian context, people and culture are inseparable and one doesn't exist without the other. Local culture, social and ethical norms are the determining factors for the conservation of biodiversity. Tribal people are the forest dweller who conserves the biodiversity by their ethnic cultural practices. The tribal population in India is 104.3 million, which constitutes 8.6% of the tribal population (Census of India, 2011). In Tamil Nadu, 7,94,967 tribal population which constitutes 1.1% of the total population (Census of India, 2011). Most of the tribes in Tamil Nadu are cultivators, agriculture labourers and dependent on forests for their livelihood.

An attitude is a positive, negative or mixed evaluation of an object expressed at some level of intensity also, it involves a complex organization of evaluative beliefs, feelings and tendencies towards a certain action. According, to Thurstone (1946) [6], 'psychological object' means any symbol, phrase, slogan, idea, person and institution towards which people can differ concerning positive and negative effects. The statements from the universe were selected based on psychological measurement. The respondents used to assess and evaluate each statement based on their degree of acceptance.

Tribals are the people who firmly attached to the nature and conservation of bio-diversity of their localities for since long time. Tribals have their shelter, food, water from the forest area also they develop a kind of affinity with the forest area. Nowadays, there is an increasing trend of erosion of traditional knowledge and associated biodiversity due to various reasons viz., globalization, urbanization, the introduction of high yielding crop varieties, application of chemical fertilizers, new food habits, government developmental programmes etc. Erosion of cultural knowledge leads to lesser conservation of bio-diversity. Hence, the research paper aims to develop a scale to measure the attitude of tribal peoples towards bio-diversity conservation. The present study was taken based on the following two objectives.

1. To develop a scale to measure the attitude of tribal people towards bio-diversity conservation.
2. Assessment of attitude of tribal people towards bio-diversity conservation.

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Methodology

Scale construction-methodology

Collection of the universe of statements

Based on the review of literature and consulting with scientist's universe of statements were collected. Totally 120 statements were collected which were structured and organized in the form of items. The items were screened based on the criteria of Edwards (1969) [2]. Based on the screening, 102 statements were selected which forms the universe of contents. The selected items consist of both positive and negative statements. The statements on five point continuum ranging from most unfavourable to most favourable were subjected to the judge's opinion.

Calculation of Scale(S) and Interquartile range (Q) values

The list of statements was sent to 60 judges, they were scientists from the various agricultural universities in the country. Out of 60 judges, 30 judges was responded by sending their judgements. Based on the judgements the "S" and "Q" values for each statement were calculated by applying the equal appearing interval scale suggested by Thurstone and Chave (1929) [5]. When you choose the items for your test you're picking items equally spaced apart This kind of scale is used to measure people's attitude towards a fairly clear and unidimensional concept, using several statements that vary in how they express a positive or negative opinion about the main concept.

The scale (S) value obtained from the following formula

$$s = l + \left(\frac{0.5 - \sum pb}{pw} \right) i$$

Where,

S - The median or scale value of the statement

l – The lower limit of the interval in which the median falls

$\sum pb$ - The sum of the proportions below the interval in which the median falls

P_w – The proportion within the interval in which the median falls

i – The width of the interval and is assumed to be equal to 1.0

Where,

$$Q = C75 - C25$$

C75= 75th centile

$$s = l + \left(\frac{0.75 - \sum pb}{pw} \right) i$$

C25= 25th centile

$$s = \left(l + \frac{0.25 - \sum pb}{pw} \right) i$$

Scale reliability

Reliability refers to the degree of consistency in measurement and to the lack of error. For this study, the reliability of the selected statements was determined by the split half method. The reliability coefficient value was obtained through the Spearman Brown formula.

Spearman Brown Formula

$$\text{Reliability co-efficient} = \frac{2 \times \text{reliability co-efficient of the half test}}{1 + \text{reliability coefficient of the half test}}$$

Scale measurement- methodology

Assessing the attitude of tribal people towards bio-diversity conservation

The above selected statement was administered among the tribal people of Eastern Ghats of Tamil Nadu Jawadhu hills block of Thiruvannamalai district and Pethanaickenpalayam block of Salem district were purposively selected based on higher tribal population. Chinna kalrayan hills vadaku and Periya kalrayan malai keelnadu villages were selected from the Pethanaickenpalayam block of Salem district. Kovilur and Nammiyampattu villages are selected from Jawadhu hills block of Thiruvannamalai district was selected based on higher tribal population. Totally 182 tribal respondents were selected based on a proportionate random sampling method. The cumulative frequency method was used to measure tribal people's attitude in less favourable, moderately favourable and highly favourable.

$$L_i = K + \frac{L_i - C}{f} \times n$$

Where,

K = Median between the lower limit of the class in which L_i occurs and the upper limit of the previous class

L_i = Boundary value namely L_1 and L_2

C = Cumulative square root of frequency up to the classes preceding the class in which L_i lies

N = Interval of the class

F = Square root of the frequency in the class in which the median lies

The categories were formed as detailed below

- 1. Below L_1 value = Low
- 2. Between L_1 and L_2 value = Medium
- 3. Above L_2 value = High

Findings and Discussion

Calculated Scale (S) and Interquartile range (Q) value

The scale value and Q value for the individual item were calculated and presented in Table 1.

Table 1: Equal appearing interval scale (S) value and Interquartile range (Q) value

Statement Number	Q Value	S Value	Difference	Cumulative frequency	Equal appearing class interval	Compartments
87	0.50	1.50			0.40	I
90	8.95	1.50	0.00			
93	10.92	2.10	0.60	0.60	0.80	II
96	6.53	2.10	0.00	0.60		
24	17.77	2.17	0.07	0.67		
42	11.23	2.25	0.08	0.75		
27	3.50	2.50	0.25	1.00	1.20	III
7	37.40	2.50	0.00	1.00		

14	6.93	2.59	0.09	1.09		
26	9.53	2.65	0.06	1.15		
44	3.14	2.65	0.00	1.15		
48	4.92	2.65	0.00	1.15		
13	9.83	2.72	0.08	1.22		
31	5.67	2.75	0.03	1.25		
75	9.30	2.83	0.09	1.33		
45	7.59	2.83	0.00	1.33		
101	19.99	2.83	0.00	1.33		
21	6.12	2.87	0.04	1.37		
71	10.32	2.87	0.00	1.37		
88	9.56	2.93	0.05	1.43		
98	16.69	2.93	0.00	1.43		
15	9.17	3.00	0.07	1.50	1.60	IV
16	3.50	3.00	0.00	1.50		
29	4.91	3.00	0.00	1.50		
63	16.60	3.00	0.00	1.50		
54	9.11	3.06	0.05	1.56		
94	8.24	3.07	0.02	1.57		
19	8.38	3.07	0.00	1.57		
62	8.78	3.08	0.01	1.58		
41	22.83	3.11	0.02	1.61		
6	12.14	3.12	0.02	1.62		
76	3.57	3.13	0.01	1.63		
81	9.16	3.13	0.00	1.63		
40	22.29	3.14	0.01	1.64		
78	14.21	3.14	0.00	1.64		
10	5.04	3.19	0.05	1.69		
55	5.76	3.19	0.00	1.69		
46	5.67	3.20	0.01	1.70		
56	4.27	3.23	0.03	1.73		
61	18.59	3.25	0.02	1.75		
65	4.59	3.25	0.00	1.75		
92	4.68	3.25	0.00	1.75		
33	6.13	3.25	0.00	1.75		
80	5.07	3.27	0.02	1.77	2.00	V
32	8.34	3.30	0.03	1.80		
43	7.76	3.30	0.00	1.80		
47	18.25	3.32	0.02	1.82		
89	7.37	3.33	0.02	1.83		
73	5.64	3.34	0.00	1.84		
70	7.12	3.40	0.07	1.90		
52	7.82	3.41	0.01	1.91		
8	3.83	3.41	0.00	1.91		
84	0.25	3.43	0.02	1.93		
53	7.64	3.49	0.07	1.99		
83	34.03	3.49	0.00	1.99		
4	4.40	3.50	0.01	2.00		
22	11.77	3.50	0.00	2.00		
18	8.01	3.60	0.10	2.10		
11	5.71	3.61	0.01	2.11		
58	1.25	3.61	0.00	2.11		
38	26.99	3.62	0.01	2.12		
30	6.24	3.62	0.01	2.12		
5	24.25	3.64	0.01	2.14		
91	11.79	3.67	0.03	2.17		
25	7.33	3.68	0.01	2.18		
72	-0.83	3.68	0.00	2.18		
82	10.82	3.68	0.01	2.18		
68	6.78	3.70	0.02	2.20	2.40	VI
57	25.39	3.75	0.05	2.25		
77	21.96	3.75	0.00	2.25		
12	16.47	3.75	0.00	2.25		
64	11.68	3.75	0.00	2.25		
95	-0.50	3.75	0.00	2.25		
86	-0.38	3.77	0.02	2.27		
35	14.69	3.79	0.02	2.29		
2	4.51	3.83	0.05	2.33		

28	9.86	3.87	0.04	2.37		
74	3.49	3.87	0.00	2.37		
34	13.81	3.90	0.02	2.40		
36	1.67	3.90	0.00	2.40		
17	11.23	3.93	0.03	2.43		
49	7.00	3.93	0.00	2.43		
97	8.48	4.00	0.07	2.50		
23	20.74	4.00	0.00	2.50		
99	5.94	4.06	0.06	2.56		
37	24.62	4.09	0.03	2.59		
50	-1.30	4.09	0.00	2.59		
9	7.12	4.15	0.05	2.65	2.80	VII
20	11.23	4.26	0.11	2.76		
39	6.31	4.26	0.00	2.76		
85	18.92	4.27	0.01	2.77		
60	15.13	4.30	0.03	2.80		
79	13.24	4.31	0.02	2.81		
67	-1.46	4.36	0.05	2.86		
102	14.16	4.38	0.02	2.88		
69	10.17	4.45	0.07	2.95		
66	-2.53	4.50	0.05	3.00		
51	2.31	4.70	0.20	3.20	3.20	VIII
100	3.60	4.71	0.02	3.21		
1	14.54	4.84	0.12	3.34		
59	1.60	5.26	0.42	3.76		
3	0.39	5.50	0.24	4.00	3.60	IX
					4.00	X

Selection of items

The final attitude items were selected based on the universe of content, uniform distribution of scale values along with the psychological continuum and high "scale values" and smaller "Q" values and more or less equal number of favourable and unfavourable attitude items. The scale values were arranged in descending order of magnitude and the difference between the successive scale values and the cumulative total of the computed differences were worked out. Since the selected scale values should have equal appearing interval and distribute uniformly along the psychological continuum it was necessary to form ten compartments to select ten statements with one statement from each of the compartments. The basis for forming the compartments was that each compartment should be equally spaced in the continuum. For this purpose, the cumulative value (4.00) was divided by ten, which worked out to 0.40 and this formed the width of the first-class interval. The second interval was worked out by adding the value with the width of the first-class interval. Subsequently, all the ten intervals were worked out (Presented in Table 2.).

Table 2: Calculation of class intervals

S. No.	Compartments	Interval values
1.	I	0.40
2.	II	0.80
3.	III	1.20
4.	IV	1.60
5.	V	2.00
6.	VI	2.40
7.	VII	2.80
8.	VIII	3.20
9.	IX	3.60
10.	X	4.00

To select the items from the each compartment the scale (S) and interquartile range (Q) values were considered. Based on the criteria, items having high scale values and low interquartile range values were selected as one item from the each compartment. Thereby ten items were selected with equal appearing interval and with uniform distribution along the psychological continuum. Final constructed attitude statements are given in Table 3.

Table 3: Constructed attitude statements to measure the tribal towards bio-diversity conservation

Items	Statements	S value	Q value	Nature of statement
87	Corporate environmental responsibility does not help in conservation of bio-diversity	1.50	0.50	Unfavourable
42	Religiously protected areas are rich in bio-diversity	2.25	11.23	Favourable
13	Development of tribal regions leads to gradual depletion of bio-diversity	2.72	9.83	Favourable
41	Scientific investigation of indigenous knowledge on plant resources helps in conservation of bio-diversity.	3.11	22.83	Favourable
04	Conservation of bio-diversity is possible by collaborative effort of various organizations.	3.50	4.40	Favourable
49	Migration of younger people causes the lesser management of bio-diversity	3.93	7.00	Favourable
67	Development of forest areas for recreation purpose is helps in conserving bio-diversity.	4.36	-1.46	Favourable
100	Conservation of bio-diversity is possible without participation of tribal people	4.71	3.60	Unfavourable
1	Tribal people are the first victims of bio-diversity degradation	4.84	14.54	Favourable
3	Displacement of indigenous tribes from the forest helps in conservation of bio-diversity	5.50	0.39	Unfavourable

Reliability of the scale

The reliability score was obtained through split half method. Ten selected attitude statements were divided into two equal groups by odd even methods. The two sets of statements were

administered separately with the tribal respondents, which yields two sets of scores. The scores were subjected to correlation test to find out the reliability of the half test by using SPSS software. The half test reliability coefficient was

0.567 which was significant at one per cent level of probability. Further, the reliability coefficient of the whole test was computed using the Spearman Brown prophecy formula. The whole test reliability was 0.657 According to Singh (2008) [4], when the mean scores of the two groups are of a narrow range, a reliability coefficient of 0.50-0.60 would suffice. Hence, the constructed scale is reliable as the reliability coefficient value is greater than 0.60.

Content validity of the test

According to Anastasi (1968) [1] content validity involves essentially the systematic examination of the test content to determine whether it covers a representative sample of the behaviour domain to be measured. Content validation was carried out by subjecting the selected ten attitude statements to the judge's opinion. Judges were requested to indicate the presumed relevance to which the attitude items covered the different aspects of bio-diversity conservation. The responses were obtained on a four-point continuum of 'most adequately covered', 'more adequately covered', 'less adequately covered', and 'least adequately covered'. Scores of 4, 3, 2 and 1 were given for the points on the continuum respectively. Totally 30 judges responded by sending their judgments. The mean score 2.5 was fixed as the basis for deciding the content

validity of the scale. If the overall mean score of the attitude items as rated by the judges was above 2.5 the scale will be declared as valid and if not otherwise. In the present case, the overall mean score was worked out as 3.25 and therefore the constructed attitude scale is said to be valid.

Administration of the Scale Value

The ten attitude items selected were arranged randomly to avoid biased responses. The scale was administered on a five-point continuum as strongly agree, agree, undecided, strongly disagree and disagree. The score obtained for each statement was summed up to arrive at the attitude score for the respondents. The score ranged from 50 (maximum) to 10 (minimum). Maximum score revealed a favourable attitude, while a minimum score indicated unfavourable attitude towards bio-diversity conservation. The responses were grouped into unfavourable, moderately favourable, and highly favourable based on the cumulative frequency method.

Levels of attitude of tribal respondents towards bio-diversity conservation

The classification of tribal people based on their attitude towards bio-diversity conservation and the corresponding frequency distribution have been presented in Table 4.

Table 4: Distribution of respondents based on their attitude towards bio-diversity conservation: n=182

S. No.	Category	Number	Percentage
1.	Less favourable (< 36.53)	50	27.48
2.	Moderately favourable (36.53- 42.69)	64	35.16
3.	Highly favourable (> 42.69)	68	37.36
	Total	182	100.00

From the Table 4. It could be inferred that more than one third (37.36 per cent) of the tribal respondents have highly favourable attitude towards bio-diversity conservation, next to that 35.16 per cent and 27.48 per cent of the tribal respondents possess moderate and less favourable attitude towards bio-diversity conservation. The findings are in line with Sashmitha (2019) [3].

It could be understood that less than three-fourth (72.52 per cent) of the tribal respondents possess highly favourable to moderately favourable attitude towards bio-diversity conservation.

Conclusion

Attitude is the most indispensable concept in social psychology and plays an important role in behaviour leading into social action. The statements were prepared to analyse tribal people's behaviour towards bio-diversity conservation by using the equal appearing interval method. The reliability and validity of the items show that the items were highly reliable and valid.

The introduction of new crop varieties and urbanization of tribal areas leads to depletion of bio-diversity. Therefore, their attitudinal inclination towards bio-diversity conservation must be understood in the context itself. The results show that the majority of the tribal respondents show a high favourable to moderately favourable attitude towards bio-diversity conservation, the result shows that high to moderate hence it could be understood that their attitude towards bio-diversity conservation become slightly modified due to certain reasons like urbanization, migration, etc. To avoid this kind of slight modification motivate the tribal people to involve in traditional cultural practices.

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