



Development and standardization of a qualitative tool to measure the attitude of farmers towards the conservation of Nattukuttai cattle

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Nattukuttai cattle are mostly reared under zero input system, predominantly by farmers belonging to schedule caste in North Eastern agro-climatic zone of Tamil Nadu namely Villupuram, Kancheepuram, Chengalpattu and Tiruvallur districts (Vinothkumar 2014, Athilakshmy *et al.* 2021a). Zero input system is operationally defined as the practice of rearing animals only on grazing, without supplementary feed and housing. The mean annual income obtained through Nattukuttai cattle nearly was around ₹28,000 (Athilakshmy *et al.* 2021a). Though milk yield is low in this breed, the male calves possess great demand for draught and meat purpose. In the recent years, the population of the Nattukuttai cattle has been dwindling owing to many reasons (Athilakshmy *et al.* 2021b). Attitude of the farmers which is one of the key factors for *in situ* conservation, needs to be assessed in order to develop strategies to conserve these animals. Several tests and scales developed to measure the attitude of the farmers towards conservation of native breeds were mostly evoking a set pattern of responses missing a large part of the behaviour which are qualitative in nature, hence, need to be explored using appropriate tools. Projective techniques are questioning techniques that do not personalize the question to the respondent, thereby desensitizing the respondent to the answer they give and deactivating their conscious defenses about the answer they give (Ramsey *et al.* 2006). Projective techniques are often referred as one means of securing hard-to-get data. The theory of planned behaviour suggests that the most important determinant of a person's behaviour is his/her intention to engage in that behaviour which is in turn influenced by attitudes, subjective norms and perceived behavioural control (Fishbein and Ajzen 2010). In this backdrop, a study was designed to develop and standardize a qualitative tool using projective techniques to measure the attitude of the farmers towards conservation of Nattukuttai cattle in Tamil Nadu.

An *ex-post facto* research design was adopted in this

study. Out of the four districts in the North Eastern agro-climatic zone of Tamil Nadu, comparatively large number of Nattukuttai cattle were being reared in Villupuram and Kancheepuram districts, hence, these two districts were purposively selected for the study. From each of the two selected districts, two blocks with high Nattukuttai cattle population were identified and a total of 60 Nattukuttai cattle farmers (30 from each block) were selected as respondents for the present study from the selected blocks. For the purpose of checking the validity of the tool, a total of 30 non-Nattukuttai cattle farmers from the study area were also selected. A qualitative tool comprising four projective techniques namely Sentence Completion Test (Dunkel *et al.* 2021), Verbal Projection Test (Ray and Mondal 1999), Story Completion Test (Das 2018) and Thematic Apperception Test (Maurer 2017) to measure the attitude of farmers towards conservation of Nattukuttai cattle was developed and standardized through judges relevancy rating method, focus group discussion with the Nattukuttai cattle farmers and Subject Matter Specialist and perusal of literature (Edwards 1957). The validity of the tool was assessed by content validity (Guilford 1954) and concurrent validity method (Bhatnagar 1981). For assessing the concurrent validity, the total attitude scores obtained from the Nattukuttai cattle farmers as well as non-Nattukuttai cattle farmers were analyzed using independent sample Mann-Whitney U test (Pravin and Kulkarni 2017). The reliability of the developed tool was assessed by test-retest method (Ray and Mondal 1999) in a monthly interval and the scores were subjected to Spearman's Rank Correlation (Pravin and Kulkarni 2017).

Development of tool: Universe of items consisting of 25 sentence completion test items, six verbal projection test items, four story completion test items and Thematic Apperception Test (TAT) to measure the attitude of farmers towards conservation of Nattukuttai cattle was generated through perusal of literature and in consultation with experts. The developed universe of items was sent to 70 judges for relevancy rating on a three-point continuum, viz. relevant, somewhat relevant and not relevant with a score of 3, 2 and 1 respectively. The responses from 20

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Table 1. Projective technique tool to measure the attitude of the Nattukuttai cattle rearers

Test	Relevancy mean score	Selection status
Sentence Completion Test		
Nattukuttai Cattle -----	2.92*	Selected
The quality milk means -----	2.76*	Selected
The saviour of my family is -----	2.66*	Selected
Fortune to the family is -----	2.84*	Selected
My wealth is-----	2.86*	Selected
It is my fate-----	2.18	Not selected
I like my -----	1.72	Not selected
If I am deciding to buy a cattle, -----	2.9*	Selected
Nattukuttai cattle is farmer's-----	2.82*	Selected
The cattle which is close to my heart -----	2.76*	Selected
My ancestral property is -----	2.78*	Selected
The programmes to conserve Nattukuttai cattle -----	1.64	Not selected
The role of government -----	1.6	Not selected
If I have capital to invest -----	2.92*	Selected
My next generation -----	2.76*	Selected
For my family situation -----	2.94*	Selected
Protecting Nattukuttai cattle-----	2.94*	Selected
The farmer rearing Nattukuttai cattle -----	1.48	Not selected
In future, Nattukuttai cattle -----	2.96*	Selected
The population of Nattukuttai cattle-----	2.68*	Selected
Identity of my neighbourhood people is-----	2.86*	Selected
My livelihood depends on -----	1.08	Not selected
Rearing Nattukuttai cattle -----	2.92*	Selected
Rearing male calf-----	2.92*	Selected
If I get a better job, I -----	2.34	Not selected
Verbal Projection test		
Vinnarasi sold her 15 Nattukuttai cattle and purchased two crossbred cattle. Why?	2.98*	Selected
Vignesh owned 10 Nattukuttai cattle. Out of 10 cattle, five were pregnant cows nearing parturition. He prayed god that all five pregnant cows should deliver male calves. Why?	2.16	Not selected
Gopal owned 10 Nattukuttai cattle. Due to personal problems, he sold all the Nattukuttai cattle and going to the nearby industry as labourer. Why?	2.82*	Selected
Sudha owned 20 Nattukuttai cattle. She always ends up in fight with the agriculture farmers in the village. Why?	1.94	Not selected
Ramu said that he wasted all his time and energy in rearing Nattukuttai cattle. Why?	1.66	Not selected
Though Kesavan knows that the Artificial Insemination in Nattukuttai cattle will decrease its population, he continues to adopt Artificial Insemination in Nattukuttai cattle. Why?	2.92*	Selected
Story Completion test		
Dhanapal is the father of two sons and one daughter. He owns twenty Nattukuttai cattle. He may be an agricultural labourer but he loves to rear Nattukuttai cattle. He wants his sons to continue rearing Nattukuttai cattle in future. But What happened ?	2.92*	Selected
Once in a village lived a livestock farmer named Ramasamy with his beautiful family including his wife Kamatchi, daughter Sudha, son Arivunathan and father Kuppasamy. Though he is an agricultural labourer, his desire is to impart college education to his children. His family reared nearly 100 Nattukuttai cattle generation after generation. But currently they owned only five Nattukuttai cattle that too due to his father's wish. His wife didn't have interest in Nattukuttai cattle rearing and hence she insisted her husband to sell Nattukuttai cattle and buy crossbred cattle. In this situation, ----- What happened?	2.82*	Selected
Kumar is the youngest of the three siblings in his family. His father Thangavelu reared 100 Nattukuttai cattle, but he sold 40 cattle towards his sons education and well being. On his death bed, he equally shared his Nattukuttai cattle stock among his sons. Apart from Kumar, his brothers sold their Nattukuttai cattle and working as industrial labourers for their livelihood. His brothers got married and living in nuclear families. Only Kumar is still rearing Nattukuttai cattle in the memory of his father. But he couldn't able to find a life partner for himself. What happened?	2.92*	Selected

Table 1 (Contd...)

Test	Relevancy mean score	Selection status
Story Completion Test		
Ramesh, a lovable father of two girls, lived in a small village of Tamil Nadu. He was in the process of gathering money for his elder daughter's marriage. He sought the help of Kannan who was a money lender in his village. Kannan said Ramesh that he would lend money only if Ramesh sells all his Nattukuttai cattle to him. What happened?	1.76	Not selected
Thematic Apperception Test	2.68*	Selected
		

*Selected statements

judges were omitted due to Leniency error, Halo error, Similarity error and Contrast error. The responses obtained from the remaining 50 judges were analyzed and the relevancy mean score was calculated, which was found to be 2.52. The items with a mean relevancy score equal to or greater than 2.52 were selected for final tool. The selected items were adapted through triangulation with the panel of judges through focus group discussion. Thus, the developed projective technique tool consisted of 18 Sentence Completion Test items, three questions of Verbal Projection Test items, three questions of Story Completion Test items and one Thematic Apperception Test item (Table 1).

Scoring procedure: The scoring procedure followed by Sacks and Levy (1958) was used with slight modifications in the present study. The maximum score for each item was four and minimum score was one. The score was given to each response based on experts' judgement. The words, context, intensity, theme, way of expression, characters of the story, ending of the story were considered while scoring the responses. The total score was calculated using the following formula.

$$\text{Total score} = \frac{\text{Sum of Scores of Sentence Completion Tests}}{25} + \frac{\text{Sum of Scores of Verbal Projection Tests}}{25} + \frac{\text{Sum of Scores of Story Completion Tests}}{4} + \frac{\text{Score of TAT}}{1}$$

Validity and reliability of the tool: The difference between the attitude score of Nattukuttai cattle farmers and Non-nattukuttai cattle farmers was found to be highly

significant (Table 2). This showed that the tool has the ability to discriminate two groups and hence it proved to be highly valid.

A positive and highly significant correlation existed between the test and retest attitude scores which helped infer that the developed tool had strong reliability (Table 2).

Attitude score: The attitude of the farmers towards conservation was assessed using the developed tool and the results were documented. Majority (61.67%) of the farmers rearing Nattukuttai cattle had favourable to most favourable attitude towards the conservation of Nattukuttai cattle as revealed in Table 3. Demand for male calf for meat and draught purpose, high heat tolerance, high disease

Table 3. Distribution of farmers according to their level of attitude towards conservation of Nattukuttai cattle

Attitude level	Nattukuttai cattle farmers	
	Frequency (f)	Percentage (%)
Unfavourable	9	15.00
Least favourable	14	23.33
Favourable	19	31.67
Most favourable	18	30.00
Total	60	100.00

resistance, milk for household consumption, farm manure and zero input farming might be the major reasons for the favourable to most favourable attitude of the respondents towards conservation of the Nattukuttai cattle.

In the tool developed, the implicit attitude of the farmers

Table 2. Validity and reliability of the tool

Variable	N	Mean Rank	Test statistic	Standardized test statistic	Significance
Validity of the tool					
Attitude score of Nattukuttai cattle farmers	60	56.71	1572.500	5.757	.000
Attitude score of Non-Nattukuttai cattle farmers	30	23.08			
Reliability of the tool					
Variable	N	Spearman's rank correlation		Significance	
Attitude score of Nattukuttai cattle farmers (Test)	30	0.96		.000	
Attitude score of Nattukuttai cattle farmers (Retest)	30				

towards the conservation of Nattukuttai cattle was reflected more in Verbal Projection Test, Story Completion Test, Thematic Apperception Test and Sentence Completion Test. Majority of the farmers rearing Nattukuttai cattle had favourable to most favourable attitude towards conservation of Nattukuttai cattle. As the validity and reliability of the tool is high, it could be inferred that the projective technique tool to measure the attitude of the farmers should comprise of all the four types of projective techniques. The developed tool could be used discretely or in combination with other scaling techniques to get a holistic data about the attitude of livestock farmers and pet owners.

SUMMARY

Indigenous breeds of cattle play a significant role in the livelihood of resource poor farmers in rural areas of India. Nattukuttai cattle are short and stout cattle reared under zero input system in North Eastern agro-climatic zone of Tamil Nadu. A qualitative tool consisting of four projective techniques, viz. Sentence completion test, Verbal projection test, Story completion test and Thematic Apperception Test (TAT) to measure the attitude of the farmers towards the conservation of Nattukuttai cattle was developed and standardized as per the standard protocol. The study was carried out for a period of one year 2021-22 in the selected districts of North Eastern agro-climatic zone of Tamil Nadu. Nearly two third of the respondents had favourable to most favourable attitude towards the conservation of Nattukuttai cattle breed. This study discusses the methodology of developing projective tools and their importance in measuring the attitude of farmers towards conservation of Nattukuttai cattle.

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