

Development and Standardization of Scale to Analyze the Degree of Modernization among Tribal Farmers

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Received : October 2023
Accepted : December 2023

ABSTRACT

Modernization pertains to individuals utilizing technologies to manage environmental resources, aiming to enhance individual income and consequently quality of life. This present study focuses on the conceptualization, development and validation of a comprehensive scale aimed at analyzing the degree of modernization in the context of tribal farming communities. The scale developed measures the modernization level among tribal farmers across diverse dimensions encompassing agricultural, political, cultural, economic, social, technological and lifestyle. The scale, which consisted of 50 statements, was found to be highly reliable (0.925) and valid (0.961). It was administered to 32 farmers in Banavadi village, Chamrajnagara district, Karnataka state during 2022-23. The results indicated that majority of the tribal farmers (78.13%) fell into the medium and high levels of modernization, while 21.88 per cent belonged to low level category of modernization.

Keywords : Modernization, Tribal farmers, Scale, Reliability, Validity

MODERNIZATION gained popularity in the 20th and 21st centuries has undergone significant changes across its journey. Presently, almost all countries are consciously or unconsciously undergoing some form of modernization, with many embracing it as a development goal (Martinelli and He, 2015). In India, the modernization of tribal farmers holds significant importance for the country's agricultural landscape. India is home to a diverse range of tribal communities, each with its own distinct socio-cultural identity and traditional farming practices. According to the International Work Group of Indigenous Affairs, India is home to approximately 104 million Indigenous Peoples, constituting about 8.6 per cent of the total population. Officially, there are 705 recognized ethnic groups categorized as 'Scheduled Tribes' in

the country and referred to as Adivasis in central India, these tribal communities predominantly inhabit remote rural areas and encounter multiple difficulties in adjusting to technological progress, globalization and changing socio-economic circumstances (IWGIA, 2023; Thapa and Gaiha, 2011).

As India progresses economically, it becomes crucial to understand how these changes impact the livelihoods, traditions, and overall well-being of tribal communities. Most tribal respondents viewed modernization positively for their economic and social benefits. However, a few expressed concerns about potential cultural value loss. Modernization is driven by increasing needs, but some have adopted mainstream culture, losing their originality. Each tribe must navigate modernization while preserving

their identity, with government support in their development and cultural preservation (Ekka, 2013).

The need for studying the degree of modernization among tribal farmers will allow us to understand how individuals within society are modernized, a perspective often overlooked in developing countries. Gaining precise knowledge about how individuals modernize and the personality traits crucial for embracing modern ways of life is crucial for comprehending the broader modernization process (Gomej, 1969). By studying modernization among tribal farmers, we can design targeted strategies for sustainable development, empower tribal communities, preserve their cultural heritage, promote inclusive growth, enhance livelihoods, ensure food security, formulate effective policies, foster social inclusivity and assess the environmental impact of modernization practices. This comprehensive understanding enables informed decision-making and resource allocation, fostering equitable and harmonious societal development while respecting the unique identity and traditional knowledge of tribal communities.

Due to the absence of an existing scale for gauging the degree of modernization among tribal farmers, the current research was conducted with the purpose of developing and standardizing such a scale. This scale aimed to analyze the degree of modernization in various aspects, encompassing agricultural, political, cultural, economic, social, technological and lifestyle. The specific objectives of the study are as follows:

1. To develop and standardize a scale to analyze the degree of modernization among the tribal farmers
2. To measure the degree of modernization among the tribal farmers

METHODOLOGY

The present study was carried out during 2022-23 for developing and standardizing a scale to analyze the degree of modernization of tribal farmers. The developed scale was used to analyze the degree of modernization of Soligas tribal farmers residing

in Banavadi village, Chamrajnagara district of Karnataka. Thirty-two farmers were personally interviewed for the purpose. Based on the cumulated score, the respondents were categorized as low, medium and high levels of modernization considering mean (136.53) and half standard deviation (11.17) as a measure of check.

RESULTS AND DISCUSSION

Development of Scale to Analyze the Degree of Modernization among the Tribal Farmers

Modernization among the tribal farmers is operationally defined as 'the process of progressive transition of tribal farmers from a traditional to alleviate way of living with respect to agricultural, political, cultural, economic, social, technology and lifestyle dimensions', an attempt was made to develop a scale to measure modernization of tribes. The method of summated rating suggested by Likert (1932) and Edwards (1969) were followed in the development of scale by following the five stages *i.e.*, (1) collection and editing of statements, (2) relevancy analysis, (3) item analysis, (4) reliability; and (5) validity.

Collection and Editing of Statements : In constructing a modernization scale for tribal farmers, seven key components were identified: agricultural, political, cultural, economic, social, technological and lifestyle modernization. A comprehensive list of 119 statements representing these aspects was compiled through extensive literature review and expert consultations. The statements were meticulously refined and edited using 14 criteria as recommended by Edwards (1969) and Thurstone and Chavue (1929) to ensure accuracy and quality.

Relevancy Analysis : A total of 83 statements were distributed to 120 judges from various institutions, including State Agricultural Universities, Central Agricultural Universities, Indian Council of Agricultural Research Institutions and Meghalaya State Department of Agriculture, Block officers etc. The judges were requested to critically evaluate each statements relevance in analyzing tribal modernization

and provide their responses on a five-point continuum: most relevant (MR), relevant (R), some what relevant (SWR), less relevant (LR) and not relevant (NR), with corresponding scores of 5, 4, 3, 2 and 1. Out of the 120 judges, 77 judges responded within the specified time. The relevancy score for each statement was determined by adding up the scores given by all 77 judges. Based on the data collected, the 'Relevancy Percentage', 'Relevancy Weightage' and 'Mean Relevancy Score', were computed for all 83 statements. These calculations involved applying specific formulas to each statement to obtain the respective values.

- i) Relevancy Percentage (RP) : The relevancy percentage was determined using the following formula:

$$R. P. = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1)}{\text{Maximum possible score}} \times 100$$

- ii) Relevancy Weightage (RW) : The relevancy weightage was determined using the following formula:

$$R.W. = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1)}{\text{Maximum possible score}}$$

- iii) Mean Relevancy Score (MRS) : The mean relevancy score was worked out using the following formula:

$$M.R.S = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1)}{\text{Number of judges responded}}$$

The relevancy of each individual statement was assessed based on the three criteria mentioned. Accordingly, statements having a 'relevancy percentage' of 75 per cent or higher and a mean relevancy score of 3.75 and above were considered for final selection. Through this process, 18 statements were eliminated and 65 statements were retained.

These selected statements were then appropriately revised and written in accordance with the feedback provided by the judges, whenever applicable (Table 1).

Item Analysis : A total of sixty-five statements were subjected to item analysis to delineate the statements based on the degree to which they can differentiate the respondents responses with respect to different facets of modernization. A pilot study was carried out in a non-sample area and a total of 32 Soligas tribal farmers that belong to Banavadi village of Chamrajnagara district of Karnataka were interviewed for the study. The respondents were asked to indicate their degree of agreement or disagreement with each statement based on the five-point continuum ranging from 'strongly agree' to 'strongly disagree.' Based upon the total scores, the respondents were arranged in descending order. The participants were categorized into two groups: the high group comprising the top 25 per cent of respondents based on their total scores and the low group consisting of the bottom 25 per cent. These groups served as the criterion to evaluate each individual statement. Out of the 32 tribal farmers who participated in the item analysis, eight with the highest scores and eight with the lowest scores were used as the criterion groups to evaluate the individual statements. The critical ratio, also known as the 't' value, was computed to analyze how well a particular statement distinguishes between the higher-performing and lower-performing groups of respondents. The critical ratio was calculated using the following formula:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum X_H^2 - \frac{(\sum X_H)^2}{n}}{n(n-1)} - \frac{\sum X_L^2 - \frac{(\sum X_L)^2}{n}}{n(n-1)}}}$$

Where,

\bar{X}_H = Mean score of the higher group

\bar{X}_L = Mean score of the lower group

$\sum X_H^2$ = Sum of squares of the individual score on a given statement for high group

TABLE 1
Selected statements based on the Relevancy Percentage, Relevancy Weightage and Mean Relevancy Score

Statements	RP	RW	MRS
I. Agricultural modernization			
Improved varieties are being used for cultivation in my land	85.19	0.85	4.26
I follow recommended chemical fertilizer to improve growth and crop yield	77.14	0.77	3.86
I employ micro irrigation techniques to efficiently water my crops	80.52	0.81	4.03
I practice integrated farming, which involves cultivating grain crops, horticulture crops, trees, livestock, and other allied enterprises	82.08	0.82	4.10
I opt for disease and pest-resistant varieties to increase crop yield	81.04	0.81	4.05
I utilize farm machinery and equipment for various activities such as land preparation, transplanting, weeding, harvesting, threshing, and winnowing	80.78	0.81	4.04
I practice intercropping as it boosts the yield and helps in efficient utilisation of all the resources.	83.12	0.83	4.16
I store my produce in warehouses and cold storages to reduce loss	76.36	0.76	3.82
I adopt post-harvest techniques to obtain better prices for my produce	87.27	0.87	4.36
I change the cropping pattern based on the recommendation of the scientist	87.27	0.87	4.36
I regularly conduct soil and water testing before commencing crop cultivation	81.82	0.82	4.09
II. Political modernization			
I accept any eligible person as the village head, regardless of their gender	83.90	0.84	4.19
I believe that electing the right candidate rest with the people than the candidate	84.42	0.84	4.22
Both I and my family members above 18 years old possess valid voter's ID cards.	89.61	0.90	4.48
I am proficient in using Electronic Voting Machines, having acquired the necessary knowledge and skills	85.71	0.86	4.29
I take an independent decision to cast my vote	89.35	0.89	4.47
I possess an Aadhar Card and is linked to my voter's ID card	85.97	0.86	4.30
I feel voting should be done based on election agenda	77.92	0.78	3.90
I prefer electoral system over king rule	85.97	0.86	4.30
III. Cultural modernization			
I do not consider remaining single or taking divorce as a taboo	80.00	0.80	4.00
I treat all children equally regardless of their gender.	87.79	0.88	4.39
I visit religious places only during festivals	76.62	0.77	3.83
I am open to choosing a life partner from within or outside my community.	80.26	0.80	4.01
I actively participate in modern festivals such as cherry blossom festivals, autumn festivals, and city concerts.	80.78	0.81	4.04
For festive occasions or weddings, I prefer wearing western outfits, shoes, and ornaments.	76.62	0.77	3.83
I have legally registered my marriage and believe it is important for all couples to do so.	81.30	0.81	4.06

Continued....

Table 1 Continued....

Statements	RP	RW	MRS
IV. Economic modernization			
I find an ATM card more handy for cash withdrawals as it allows me to access money anytime and anywhere.	88.83	0.89	4.44
UPI payments are more convenient for me when it comes to transferring money.	93.51	0.94	4.68
Starting my own business offers several financial benefits compared to working for a fixed wage or salary.	85.19	0.85	4.26
I own various smart cards or plastic cards such as Pan card, Kisan Credit Card, Smart Health Card, and Credit Card.	84.42	0.84	4.22
I am adding value as well as do branding of my produce	76.10	0.76	3.81
I find selling my produce at the local market more convenient as it is hassle free (-)	77.40	0.77	3.87
I prefer using online platforms for buying and selling products.	90.13	0.90	4.51
I do not have any outstanding loans or debts.	80.78	0.83	4.04
V. Social modernization			
I prefer a nuclear family instead of a joint family.	78.44	0.78	3.92
I encourage the active involvement of my family members in the decision-making process.	88.83	0.89	4.44
I consistently engage in various social activities within my community.	89.35	0.91	4.47
I am affiliated with self-help groups, farmer's organizations, or other similar organizations.	76.88	0.89	3.84
I take part in training programs offered by government, NGOs, or private organizations.	85.97	0.82	4.30
I regularly participate in social gatherings such as weddings and funerals of friends and neighbours.	82.60	0.66	4.13
I strongly oppose the practices of dowry and child marriages.	89.35	0.86	4.47
VI. Technological modernization			
I rely on smartphones for everyday communication.	95.58	0.96	4.78
I prefer using 5G sim card over 4G sim for fast internet connection	91.43	0.91	4.57
Our family possesses both a computer and a laptop.	92.73	0.93	4.64
I prefer to get news and entertainment through TV and YouTube.	89.61	0.90	4.48
I choose two and four-wheelers for my commuting needs.	85.97	0.86	4.30
LED lighting is our preferred choice at home due to its energy efficiency.	89.61	0.90	4.48
Our family owned a refrigerator for storage of food	85.71	0.86	4.29
Cooking in our household involves the use of LPG fuel, biogas, microwaves, and solar energy.	89.09	0.89	4.45
The teachers in our school use smart board with projector for teaching	80.00	0.80	4.00
Online platforms are preferred for booking bus, taxi, train, or flight tickets.	88.83	0.80	4.44
I received most updated information through mobile phones	91.69	0.89	4.58
I am subscribing newspaper regularly	81.56	0.92	4.08

Continued....

Table 1 Continued....

Statements	RP	RW	MRS
The land records of my family have been digitized.	82.08	0.82	4.10
VII.Lifestyle modernization			
I ensure a gap of two to three hours between dinner and bedtime.	82.60	0.83	4.13
I prioritize getting seven or more hours of sleep per day.	84.94	0.85	4.25
I take bath regularly (daily)	88.05	0.88	4.40
I go for medical check-up regularly	80.78	0.81	4.04
Red tea with a bowl of rice/ traditional snacks is my preferred food for breakfast (-)	78.18	0.78	3.91
I am proficient in speaking more than two languages.	84.42	0.84	4.22
Our residence is a concrete house with proper amenities, providing a healthy living environment.	88.57	0.89	4.43
I prefer using bar soap, body wash, shampoo, and synthetic luffa for bathing	87.79	0.88	4.39
Stainless steel or non-stick utensils are the preferred choice for cooking.	84.42	0.84	4.22
We are using glass wares and modern utensils for eating	83.64	0.84	4.18

RP (Relevancy Percentage), RW (Relevancy Weightage) and MRS (Mean Relevancy Score)

$\sum x_L^2$ = Sum of squares of the individual score on a given statement for low group

n = Number of respondents in each group

Σ = Summation

t = Degree to which a given statement differentiate between the high and low group.

The resulting correlation coefficient was found to be 0.860. After applying the Spearman Brown formula, the resulting reliability coefficient (r) was found to be 0.925, signifying high significance at one per cent level. This outcome strongly indicates that the modernization scale constructed is highly reliable. In conclusion, the scale effectively measures modernization in a reliable manner.

$$r_{1/2} = \frac{N(\sum XY) - (\sum X)(\sum Y)}{\sqrt{(N\sum X^2 - (\sum X)^2)(N\sum Y^2 - (\sum Y)^2)}}$$

a) Half test reliability formula

Where,

$\sum X$ = Sum of the scores of the odd number statements

$\sum Y$ = Sum of the scores of the even numbers statements

$\sum X^2$ = Sum of the squares of the odd number statements

$\sum Y^2$ = Sum of the squares of the even number statements

Following the computation of the ‘t’ value for all 65 statements, a total of 50 statements were selected for inclusion in the final scale to analyze the degree of modernization among the tribal farmers. The criterion for selection was that the ‘t’ value should be equal to or greater than 1.66. These fifty statements were distributed across different categories of modernization as follows: nine statements for agricultural modernization, six statements each for political and cultural modernization, seven statements each for economic and social modernization, and nine statements for technological and lifestyle modernization (Table 2).

Reliability : To assess the reliability of the scale in this study, the split-half method was employed.

TABLE 2
Selection of statements based on the 't' values for the final scale

Statements	't' values
I. Agricultural modernization	
Improved varieties are being used for cultivation in my land	2.87 **
I follow recommended chemical fertilizer to improve growth and crop yield	2.44 **
I employ micro irrigation techniques to efficiently water my crops	1.80 *
I practice integrated farming, which involves cultivating grain crops, horticulture crops, trees, livestock, and other allied enterprises	2.26 *
I opt for disease and pest-resistant varieties to increase crop yield	2.26 *
I utilize farm machinery and equipment for various activities such as land preparation, transplanting, weeding, harvesting, threshing, and winnowing	2.76 **
I practice intercropping as it boosts the yield and helps in efficient utilisation of all the resources.	1.64 NS
I store my produce in warehouses and cold storages to reduce loss	1.21 NS
I adopt post-harvest techniques to obtain better prices for my produce	2.16 *
I change the cropping pattern based on the recommendation of the scientist	2.26 *
I regularly conduct soil and water testing before commencing crop cultivation	2.26 *
II. Political modernization	
I accept any eligible person as the village head, regardless of their gender	2.03 *
I believe that electing the right candidate rest with the people than the candidate	1.43 NS
Both I and my family members above 18 years old possess valid voter's ID cards.	2.26 *
I am proficient in using Electronic Voting Machines, having acquired the necessary knowledge and skills	2.40 **
I take an independent decision to cast my vote	2.76 **
I possess an Aadhar Card and is linked to my voter's ID card	1.42 NS
I feel voting should be done based on election agenda	2.39 **
I prefer electoral system over king rule	1.73 *
III. Cultural modernization	
I do not consider remaining single or taking divorce as a taboo	1.82 *
I treat all children equally regardless of their gender.	3.03 **
I visit religious places only during festivals	1.07 NS
I am open to choosing a life partner from within or outside my community.	2.15 *
I actively participate in modern festivals such as cherry blossom festivals, autumn festivals, and city concerts.	3.03 **
For festive occasions or weddings, I prefer wearing western outfits, shoes, and ornaments.	2.35 *
I have legally registered my marriage and believe it is important for all couples to do so.	3.03 **
I treat the guest properly whenever they visited	1.66 NS

Continued....

Table 2 Continued....

Statements	't' values
IV. Economic modernization	
I find an ATM card more handy for cash withdrawals as it allows me to access money anytime and anywhere.	4.31 **
UPI payments are more convenient for me when it comes to transferring money.	2.61 **
Starting my own business offers several financial benefits compared to working for a fixed wage or salary.	2.18 *
I own various smart cards or plastic cards such as Pan card, Kisan Credit Card, Smart Health Card, and Credit Card.	2.40 *
I am adding value as well as do branding of my produce	1.13 NS
I find selling my produce at the local market more convenient as it is hassle free (-)	3.03 **
I prefer using online platforms for buying and selling products.	3.27 **
I do not have any outstanding loans or debts.	3.93 **
V. Social modernization	
I prefer a nuclear family instead of a joint family.	3.92 **
I encourage the active involvement of my family members in the decision-making process.	3.27 **
I consistently engage in various social activities within my community.	7.20 **
I am affiliated with self-help groups, farmer's organizations, or other similar organizations.	1.91 *
I take part in training programs offered by government, NGOs, or private organizations.	3.74 **
I regularly participate in social gatherings such as weddings and funerals of friends and neighbours.	3.81 **
I strongly oppose the practices of dowry and child marriages.	5.64 **
VI. Technological modernization	
I rely on smartphones for everyday communication.	4.15 **
I prefer using 5G sim card over 4G sim for fast internet connection	1.28 NS
Our family possesses both a computer and a laptop.	2.65 **
I prefer to get news and entertainment through TV and YouTube.	2.55 **
I choose two and four-wheelers for my commuting needs.	1.89 *
LED lighting is our preferred choice at home due to its energy efficiency.	2.76 **
Our family owned a refrigerator for storage of food	3.00 **
Cooking in our household involves the use of LPG fuel, biogas, microwaves, and solar energy.	3.56 **
The teachers in our school use smart board with projector for teaching	1.28 NS
Online platforms are preferred for booking bus, taxi, train, or flight tickets.	2.65 **
I received most updated information through mobile phones	1.28 NS
I am subscribing newspaper regularly	1.53 NS
The land records of my family have been digitized.	2.35 *

Continued....

Table 2 Continued....

Statements	't' values
VII. Lifestyle modernization	
I ensure a gap of two to three hours between dinner and bedtime.	2.65 **
I prioritize getting seven or more hours of sleep per day.	1.85 *
I take bath regularly (daily)	0.92 NS
I go for medical check-up regularly	1.04 NS
Red tea with a bowl of rice/ traditional snacks is my preferred food for breakfast (-)	2.76 **
I am proficient in speaking more than two languages.	1.91 *
Our residence is a concrete house with proper amenities, providing a healthy living environment.	3.86 **
I prefer using bar soap, body wash, shampoo, and synthetic luffa for bathing	0.92 NS
Stainless steel or non-stick utensils are the preferred choice for cooking.	3.00 **
We are using glass wares and modern utensils for eating	1.12 NS

b) Whole test reliability formula:

$$r_{1/1} = \frac{2r_{1/2}}{1+r_{1/2}}$$

Where,

$r_{1/2}$ = Half test reliability

Validity : In this study, the validity of the developed scale to analyze the degree of modernization among the tribal farmers was examined through statistical analysis, resulting in a validity coefficient of 0.962.

This high validity coefficient indicates that the tool is suitable and appropriate for its intended purpose. Consequently, the developed scale can be deemed feasible and effective for evaluating the modernization process among tribal farmers. Table 3 depicted summary of statements retained across the different domains in different stages of the scale construction. Statements identified initially were 83 and after item analysis based on t-test 50 statements were retained finally.

TABLE 3
Details of construction and standardization of modernization scale

Components/ Dimensions	Total statements	Statements retained after relevancy analysis	Statements retained after item analysis
Agricultural modernization	14	11	9
Political modernization	11	8	6
Cultural modernization	11	8	6
Economic modernization	11	8	7
Social modernization	8	7	7
Technological modernization	14	13	9
Lifestyle modernization	14	10	6
Total	83	65	50

Administration of Modernization Scale and Method of Scoring

The final scale consists of 50 statements out of which 48 statements are positive and 2 statements are negative (Table 4) for analyzing the degree of modernization of tribal farmers with respect to the seven dimensions. The response was collected on five-point continuum representing ‘strongly agree’, ‘agree’, ‘undecided’, ‘disagree’ and ‘strongly disagree’ with weightage of 5, 4, 3, 2 and 1 respectively for positive statements and a reverse scoring *i.e.*, 1, 2, 3, 4 and 5 for negative statements. The modernization score of the respondents could be calculated by adding up the scores obtained by him/ her on all the fifty statements. The overall modernization scores possible for this scale ranges from 50 to 250. Based on the mean and half standard deviation, the respondents could be categorized into three

categories, *viz.*, low, medium and high. Higher scores on the scale indicate that the respondents are more inclined to change and are considered more modernized. On the other hand, lower scores suggest that the respondents are highly resistant to change and are less modernized, preferring to hold on to traditional practices.

Degree of Modernization Among the Tribal Farmers

The modernization scale developed was administered to 32 tribal farmers belonging to Soligas tribe residing in Banavadi village, Chamrajnagara district of Karnataka during 2022-23. The results presented in Table 5 indicates that more than half (56.25%) of the tribal farmers had a medium level of modernization, with 21.88 per cent each exhibiting low and high levels of modernization, which is similar to the findings of Kalita and Chabukdhara (2014).

TABLE 4
Scale to analyze the degree of modernization among tribal farmers

Statements	Response				
	SA	A	UD	DA	SD
I. Agricultural modernization					
Improved varieties are being used for cultivation in my land					
I follow recommended chemical fertilizer to improve growth and crop yield					
I employ micro irrigation techniques to efficiently water my crops					
I practice integrated farming, which involves cultivating grain crops, horticulture crops, trees, livestock, and other allied enterprises					
I opt for disease and pest-resistant varieties to increase crop yield					
I utilize farm machinery and equipment for various activities such as land preparation, transplanting, weeding, harvesting, threshing, and winnowing					
I adopt post-harvest techniques to obtain better prices for my produce					
I change the cropping pattern based on the recommendation of the scientist					
I regularly conduct soil and water testing before commencing crop cultivation					
II. Political modernization					
I accept any eligible person as the village head, regardless of their gender					
Both I and my family members above 18 years old possess valid voter’s ID cards.					
I am proficient in using Electronic Voting Machines, having acquired the necessary knowledge and skills					

Continued....

Table 4 Continued....

Statements	Response				
	SA	A	UD	DA	SD
<p>I take an independent decision to cast my vote</p> <p>I feel voting should be done based on election agenda</p> <p>I prefer electoral system over king rule</p>					
<p>III. Cultural modernization</p> <p>I do not consider remaining single or taking divorce as a taboo</p> <p>I treat all children equally regardless of their gender.</p> <p>I am open to choosing a life partner from within or outside my community.</p> <p>I actively participate in modern festivals such as cherry blossom festivals, autumn festivals, and city concerts.</p> <p>For festive occasions or weddings, I prefer wearing western outfits, shoes, and ornaments.</p> <p>I have legally registered my marriage and believe it is important for all couples to do so.</p>					
<p>IV. Economic modernization</p> <p>I find an ATM card more handy for cash withdrawals as it allows me to access money anytime and anywhere.</p> <p>UPI payments are more convenient for me when it comes to transferring money.</p> <p>Starting my own business offers several financial benefits compared to working for a fixed wage or salary.</p> <p>I own various smart cards or plastic cards such as Pan card, Kisan Credit Card, Smart Health Card, and Credit Card.</p> <p>I find selling my produce at the local market more convenient as it is hassle free (-)</p> <p>I prefer using online platforms for buying and selling products.</p> <p>I do not have any outstanding loans or debts.</p>					
<p>V. Social modernization</p> <p>I prefer a nuclear family instead of a joint family.</p> <p>I encourage the active involvement of my family members in the decision-making process.</p> <p>I consistently engage in various social activities within my community.</p> <p>I am affiliated with self-help groups, farmer's organizations, or other similar organizations.</p> <p>I take part in training programs offered by government, NGOs, or private organizations.</p> <p>I regularly participate in social gatherings such as weddings and funerals of friends and neighbours.</p> <p>I strongly oppose the practices of dowry and child marriages.</p>					

Continued....

Table 4 Continued....

Statements	Response				
	SA	A	UD	DA	SD
<p>VI. Technological modernization</p> <p>I rely on smartphones for everyday communication.</p> <p>Our family possesses both a computer and a laptop.</p> <p>I prefer to get news and entertainment through TV and YouTube.</p> <p>I choose two and four-wheelers for my commuting needs.</p> <p>LED lighting is our preferred choice at home due to its energy efficiency.</p> <p>Our family owned a refrigerator for storage of food</p> <p>Cooking in our household involves the use of LPG fuel, biogas, microwaves, and solar energy.</p> <p>Online platforms are preferred for booking bus, taxi, train, or flight tickets.</p> <p>The land records of my family have been digitalised.</p>					
<p>VII. Lifestyle modernization</p> <p>I ensure a gap of two to three hours between dinner and bedtime.</p> <p>I prioritize getting seven or more hours of sleep per day.</p> <p>Red tea with a bowl of rice/ traditional snacks is my preferred food for breakfast (-)</p> <p>I am proficient in speaking more than two languages.</p> <p>Our residence is a concrete house with proper amenities, providing a healthy living environment.</p> <p>Stainless steel or non-stick utensils are the preferred choice for cooking.</p>					

SA-Strongly Agree, A-Agree, UD-Undecided, DA- Disagree, SDA- Strongly Disagree

These figures suggest that a significant portion of the tribal farmers have integrated various aspects of modern technology, practices and lifestyles into their traditional agricultural practices and way of life. However, it is important to recognize that the low level of modernization observed could be influenced by several interconnected factors. Each tribal community is unique and the reasons contributing to their lower level of modernization

may vary based on historical, social, economic and cultural contexts. As observed in a study of Ranganath and Narayana Gowda (2010), approximately 70.00 per cent of tribals still employ traditional indigenous farming methods.

The preference for such practices can be attributed to their ease of implementation, affordability, reduced risk and familiarity, which motivate tribal farmers to

TABLE 5
Distribution of tribal farmers based on their degree of modernization (n=32)

Categories	No.	%
Low modernization level (<125.36)	7	21.88
Medium modernization level (125.36-147.70)	18	56.25
High modernization level (>147.70)	7	21.88
Total	32	100
Mean : 136.53 and SD : 11.17		

continue using traditional methods regardless of the size of their land holdings. A study by Arularasan and Narayana Swamy (2012) revealed that more than half of tribal farmers prefer a lifestyle pattern in harmony with nature. This inclination towards nature-oriented living may be a contributing factor to the observed low level of modernization among tribal farmers. Their deep-rooted connection with the environment and traditional agricultural practices aligns with their cultural beliefs and sustainable living practices, influencing their choice to maintain close ties with nature and continue using traditional methods.

This study successfully developed and validated a modernization scale tailored to analyze the degree of modernization among tribal farmers. The findings show that a significant majority (78.13%) of the tribal farmers had a medium to high level of modernization. This under scores the scale's effectiveness in capturing the nuances of modernization among this demographic. The modernization scale not only provides a structured framework for analyzing the modernization levels of tribal farmers but also sheds light on their socio-economic progress and their adaptation to contemporary practices. By offering a comprehensive assessment across various dimensions encompassing agricultural, political, cultural, economic, social, technological and lifestyle. The scale contributes to a deeper understanding of the transformation within tribal farming communities. As such, this study not only addresses the need for a reliable and valid tool to measure modernization but also presents insights that can inform policies and interventions aimed at promoting sustainable development and improved livelihoods with in tribal farming communities. The modernization scale stands as a valuable resource for researchers, policymakers and practitioners seeking to enhance the well-being and progress of tribal farmers while preserving their cultural heritage and traditional practices.

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