

MEASURING RURAL YOUTH PARTICIPATION IN AGRICULTURE: DEVELOPMENT AND VALIDATION OF A PARTICIPATION SCALE

Rayirala Rakesh¹, Darshan N. P.² and Soumya Ranjan Behara³

1 Ph.D., Scholar, Department of Agricultural Extension Education, Professor Jayashankar Telangana Agricultural University, Rajendranagar, Hyderabad, Telangana 500 030.

2 Assistant Professor, Department of Agricultural Extension, Palli Siksha Bhavana (Institute of Agriculture), Visva Bharati University, Srinikethan, West Bengal 731 235, India

3 Ph.D., Scholar, Department of Agricultural Extension Education, College of Agriculture Vellayani, Kerala Agricultural University, Thiruvananthapuram, Kerala, 695522, India
Email : darshan.np@visva-bharati.ac.in

ABSTRACT

Rural youth participation is essential for sustaining agriculture, but its measurement often remains descriptive and non-standardized. The present study was conducted to develop and validate a multidimensional scale for measuring rural youth participation in agriculture in Suryapet district of Telangana. An initial pool of 52 statements was prepared through literature review, expert consultation and field observation. After editing and expert relevancy testing, 33 statements were retained under three dimensions, namely participation in benefits, participation in implementation and participation in decision-making. The retained statements were subjected to item analysis using responses from 40 rural youth from a non-sample area. Statements with satisfactory discriminating power were included in the final scale. The scale was administered to 120 rural youth respondents selected from four villages of Huzurnagar and Matampally mandals. The final scale showed high internal consistency with a Cronbach's alpha value of 0.88. The Extent of Participation Index revealed that 72.50 per cent of respondents had medium participation, followed by low participation (16.67%) and high participation (10.83%). Dimension-wise analysis showed that participation in implementation ranked first, followed by participation in benefits and participation in decision-making. The developed scale may be useful for researchers, extension personnel and policy planners to assess rural youth participation in agriculture in a systematic manner.

Keywords: participation scale development; extent of participation index; agricultural extension; psychometric validation; youth engagement; farm decision-making; multidimensional measurement

INTRODUCTION

Global context and agricultural youth engagement

Agriculture remains a fundamental pillar of the global economy, rural livelihoods, and food security systems, particularly in developing countries where rural populations depend substantially on farming and related industries. The Food and Agriculture Organization (FAO, 2025) reports that approximately 1.3 billion young people exist globally, with nearly 44 per cent of youth are engaged in agri-food systems (FAO, 2023; World Bank, 2024) as their primary employment source, compared to 38 per cent of working adults. This differential engagement underscores the strategic importance of youth in agricultural systems for ensuring future food security, modernizing agricultural technologies,

and maintaining farming system sustainability.

However, youth participation in agriculture has experienced significant decline in both developing and developed nations over recent decades. FAO (2025) documented concerning trends indicating that the proportion of young workers in agri-food systems decreased substantially from 54 per cent in 2005 to 44 per cent in 2021, representing a 10 percentage-point decline over 16 years. Concurrently, food insecurity among youth rose significantly from 16.7 per cent during 2014-16 to 24.4 per cent during 2021-23, indicating increasing livelihood vulnerability among rural youth populations. These trends represent a grave danger to long-term agricultural sustainability and global food security.

Youth in indian agriculture: challenges, structural issues, and policy imperatives

In the Indian context, agriculture occupies a position of exceptional importance for rural development and national food security. The Organisation for Economic Co-operation and Development (OECD, 2025) indicates that agriculture contributes approximately 16 per cent to GDP (Government of India, 2023; World Bank, 2024) while absorbing 43.5 per cent of the total workforce. This persistent reliance of rural households on farming and related industries demonstrates agriculture's continued centrality to Indian rural economies despite declining proportional economic contribution.

Despite agriculture's importance, rural youth demonstrate systematically declining interest in farming as a primary livelihood pursuit. According to Wachenheim and Rathge (2000), the occupation of parents, farm size, and family involvement in agriculture significantly influence youth participation in farming. They documented that young people from farming families maintained higher probability of remaining in farming compared to youth from non-farming backgrounds. Research by Sharma and Bhaduri (2009) establishes that the "tipping point" in Indian agriculture reflects understanding of the withdrawal of Indian rural youth from agricultural pursuits.

Research indicates that framing agriculture as a business enterprise rather than a traditional occupation substantially enhances youth interest and retention in farming (Oyediran et al., 2016). When agriculture is associated with entrepreneurship, mechanization, modern technologies, and value-addition opportunities, youth demonstrate increased willingness to engage in farming systems. However, numerous structural barriers constrain such engagement in contemporary India.

Key constraints include

- (1) declining profitability of farming operations in the face of rising input costs and unfavourable agricultural terms of trade;
- (2) increased climate-related vulnerabilities and weather unpredictability affecting yields and incomes;
- (3) ongoing rural-to-urban migration patterns driven by perceived superior non-farm employment opportunities;
- (4) sub-viable landholding sizes averaging 1.16 hectares (NABARD, 2014), rendering farming economically unviable at individual household level. Limited access to land and productive resources has also been reported as an important factor restricting youth participation in agriculture (Jayne et al., 2019);

- (5) rising land prices driven by non-agricultural investment demand limiting youth access to land for independent farming; and
- (6) low social and occupational status assigned to agricultural work within broader society (Vijayabaskar et al., 2018).

The telangana context and agricultural youth dynamics

Telangana state, with its predominantly agrarian economy, exemplifies these dynamics. Agriculture represents the major occupation in Telangana's rural areas yet is increasingly perceived by rural youth as economically unremunerative, unpredictable, and labour-intensive. The state's Suryapet district constitutes one of the key agricultural regions with a substantial rural young population. Despite agriculture's economic importance to the district, youth increasingly seek urban employment opportunities, viewing rural farming as offering limited prospects for livelihood advancement and prosperity.

This context necessitates rigorous scientific assessment of youth participation in agriculture to inform evidence-based policy and extension interventions. However, existing research predominantly employs descriptive participation narratives without developing standardized measurement instruments capable of systematic quantification and rigorous comparison.

Conceptualizing agricultural participation: multidimensional nature and measurement requirements

Agricultural participation represents a complex, multidimensional phenomenon encompassing distinct but interrelated domains. Youth may simultaneously engage substantially in farm operations while maintaining limited decision-making authority or access to agricultural benefits. Similarly, participation varies across specific activity types with some youth actively involved in certain operations while peripheral to others.

This multidimensional character requires measurement approaches transcending unidimensional frameworks. Scientific measurement of participation in agricultural activity necessitates a standardized and dependable scale reflecting participation's multiple dimensions. Existing literature has concentrated on descriptive participation assessment without developing validated measurement instruments. This methodological gap constrains capacity for rigorous comparison across contexts, longitudinal assessment of participation changes, and evidence-based policy formulation targeting youth engagement.

Research objectives and significance

The present study addresses this methodological gap through two interconnected objectives:

(1) Primary objective: To develop a standardized, psychometrically validated scale for measuring rural youth participation in agricultural activities across three distinct dimensions participation in benefits (economic and institutional benefits received from agriculture), participation in implementation (involvement in executing farm operations and agricultural activities), and participation in decision-making (authority in farm-related strategic decisions).

(2) Secondary objective: To determine the extent, pattern, and dimensional distribution of rural youth agricultural participation among a sample of 120 respondents in Suryapet district, Telangana state during 2021-22.

The research is significant because it: (a) establishes a validated psychometric instrument enabling systematic measurement of participation previously assessed through informal narratives; (b) enables rigorous comparison of participation patterns across contexts and populations; (c) facilitates longitudinal tracking of participation changes across time; (d) provides evidence-based foundation for designing targeted extension interventions and youth-centric agricultural policies; (e) contributes methodologically to the field of agricultural extension research; and (f) generates empirical insights into rural youth engagement patterns informing policy discussions regarding agricultural sustainability and rural development.

LITERATURE REVIEW AND THEORETICAL FRAMEWORKS

Theoretical perspectives on youth agricultural participation

Understanding youth engagement in agriculture requires integration of multiple theoretical frameworks. Family capital theory illuminates how family access to distinct forms of capital natural capital (land and productive resources), social capital (kinship networks, community relationships, institutional connections), and human capital (knowledge, skills, education) influences intergenerational transfer and agricultural continuation decisions (Fischer & Burton, 2014). From this perspective, youth with greater access to productive resources, strong family support, and developed agricultural knowledge demonstrate higher participation probability and agricultural investment intentions.

Livelihood diversification frameworks recognize that rural households increasingly combine agricultural and

non-agricultural income sources, with youth participation in farming representing one component of broader livelihood strategies rather than exclusive livelihood pursuit (Srinivasan, 2015). This perspective acknowledges that youth decision-making regarding agricultural engagement occurs within context of evaluating alternative livelihood pathways offering potentially superior income, security, and advancement prospects.

Empirical evidence on youth agricultural participation determinants

Extensive empirical research has identified multiple determinants influencing youth participation in farming. Economic profitability represents perhaps the strongest influence, with youth consistently prioritizing income security and livelihood viability (Agarwal & Agrawal, 2017; BIRTHAL et al., 2015). BIRTHAL et al. (2015) provide evidence from a nationally representative farm survey in India, demonstrating that farmers' preferences for farming are significantly influenced by economic returns. This research indicates preference for exit correlates negatively with farmer age (Agarwal & Agrawal, 2017), suggesting youth exhibit higher exit preference than older farmers.

Landholding size constitutes a critical structural constraint. Average operational landholding size has declined substantially from 2.28 hectares in 1970-71 to 1.16 hectares in 2010-11 (NABARD, 2014), with marginal and small landholdings currently constituting 85 per cent of all operational holdings while representing only 44 per cent of total cultivated area. Research by Government of India (2016) indicates positive net monthly income accrues only to farmers with landholdings exceeding 1 hectare, establishing a viability threshold below which farming cannot sustain household livelihoods.

Educational attainment influences youth participation patterns complexly. While farmer educational levels have increased, with high school and beyond attainment becoming more common (Vijayabaskar et al., 2018), this reflects broader educational expansion rather than agricultural sector selectivity.

Extension support and technical training availability demonstrate positive associations with youth agricultural involvement. Access to improved agricultural education, training, and extension services substantially increases youth farming involvement probability.

Scale development methodologies in agricultural extension research

Scale development represents a core methodological

tradition in agricultural extension and education research, employing psychometric principles to operationalize complex constructs enabling systematic quantification. Likert's summated rating method, originating from foundational work on attitude measurement (Likert, 1932; Edwards, 1948), has achieved widespread application in agricultural contexts for developing valid, reliable measurement instruments.

Standard scale development procedures, refined through decades of methodological evolution, encompass systematic steps: (1) item generation through comprehensive literature synthesis and expert consultation; (2) expert judgment processes evaluating item relevance and conceptual appropriateness; (3) statistical item analysis assessing item discriminating power and internal consistency; (4) reliability testing through Cronbach's alpha or equivalent internal consistency measures; and (5) validity evaluation through construct validation, criterion-related validity, and discriminant validity approaches.

METHODOLOGY

Research design and study setting

This investigation employed an ex-post facto research design, appropriate when variables of research interest have already occurred and remain beyond researcher experimental control (Samanta, 1991; Patel et al., 2022). The study was conducted during 2021-22 in Suryapet district of Telangana state, India, where agriculture constitutes the major occupation while youth increasingly perceive farming as economically unattractive.

Telangana state was selected purposively based on: (1) researchers' contextual familiarity with local languages and agricultural systems; (2) the state's agricultural significance and diverse agroecological conditions; and (3) Suryapet district's prominence as a key agricultural region with substantial rural youth population concentration.

Two mandals (administrative subdivisions) Huzurnagar and Matampally were selected based on highest rural youth population density. From each selected mandal, two villages were subsequently selected, yielding a total of four research villages.

Population, sample, and sampling procedure

The study population comprised rural youth aged 18-35 years actively engaged in agriculture and allied activities within the four selected villages. A total of 120 rural youth respondents were selected using proportionate random sampling technique, ensuring representation proportional to each village's population size.

All respondents: (1) were aged 18-35 years (youth as defined by Government of India employment statistics); (2) resided in the selected villages; (3) were actively engaged in agricultural or allied activities; (4) possessed willingness to participate in research; and (5) provided informed consent. All participants volunteered participation without coercion.

3.3 Multistage Scale Development Process

The Participation Scale development followed a rigorous, structured multistage process aligned with contemporary psychometric best practices:

Stage 1: Item Generation and Pool Development

An initial pool of 52 statements was systematically generated through triangulated methods:

- Comprehensive review of agricultural participation literature, youth engagement studies, and agricultural extension research
- Structured consultation with a panel of 40 subject matter experts comprising agricultural professors (n=8), agricultural scientists (n=10), extension specialists (n=15), and experienced extension personnel (n=7)
- Structured interactions with 15 progressive farmers and agricultural innovators in the research district
- Systematic field observations in the four research villages during initial researcher immersion

Stage 2: Item Editing and Expert Relevancy Testing

All 52 initial statements underwent rigorous editing using Edwards' (1969) established criteria to ensure: (1) clarity of language and expression; (2) relevance to the participation construct; (3) appropriate simplicity avoiding unnecessary complexity; and (4) freedom from ambiguity, double meanings, or confusing phrasing.

This editing process resulted in 45 statements retained for subsequent relevancy assessment. The 45 edited statements were subsequently evaluated by the full expert panel of 40 experts using a five-point relevancy continuum (Most Relevant = 5 to Not Relevant = 1).

For each statement, three psychometric indices were calculated:

1. Relevancy Percentage (RP)

$$RP = \frac{\text{Actual score obtained}}{\text{Maximum possible score}} \times 100$$

2. Relevancy Weightage (RW)

$$RW = \frac{\text{Actual score obtained}}{\text{Maximum possible score}}$$

3. Mean Relevancy Score (MRS)

$$MRS = \frac{\text{Total score obtained}}{\text{Number of judges}}$$

Statements meeting predetermined retention criteria were retained: (1) Relevancy Percentage $\geq 75\%$; (2) Relevancy Weightage ≥ 0.75 ; and (3) Mean Relevancy Score ≥ 2.25 .

This rigorous relevancy testing process resulted in retention of 33 statements for subsequent item analysis. Twelve statements failed to meet retention criteria and were eliminated. The retained 33 statements were equally distributed across the three theoretical participation dimensions: participation in benefits (11 statements), participation in implementation (11 statements), and participation in decision-making (11 statements).

Stage 3: Item Analysis and Discrimination Testing

The 33 retained statements underwent item analysis employing the discrimination index method to assess each item's ability to differentiate between high and low scorers. This stage employed 40 rural youth farmers from a non-sample area (Nalgonda district, Telangana state) to generate preliminary item performance data.

The 40 item analysis respondents completed the 33-statement questionnaire. Individual respondent total scores were calculated and arranged in descending order. The upper 25 per cent ($n=10$, high group) and lower 25 per cent ($n=10$, low group) of respondents were selected for comparative analysis.

For each statement, the t-value (discrimination index) was calculated using the 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 on given statement of the high group

$\bar{X}_L$ = Mean score on given statement of the low group

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

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

n = Number of respondents in each group

$\sum$ = Summation

t = t value of statement

Statements with t-values exceeding 1.75 were retained as demonstrating satisfactory discriminating power, following established convention in psychometric scale development. This threshold represents the critical value differentiating statements with adequate discrimination from those with insufficient discrimination.

All 33 items met the t-value ≥ 1.75 criterion, with t-values ranging from 1.98 to 3.88. This universal retention indicated that all 33 items demonstrated adequate capacity to discriminate between high and low scorers, confirming their retention in the final scale.

Final scale structure, characteristics, and scoring protocol

The final Participation Scale comprised 33 statements organized across three predetermined dimensions: (1) participation in benefits (11 statements), (2) participation in implementation (11 statements), and (3) participation in decision-making (11 statements).

Each statement was measured using a three-point continuum with assigned numerical scores:

- Agree = 3 points
- Undecided = 2 points
- Disagree = 1 point

For negative statements, reverse scoring was employed to ensure consistent directionality in all items.

Scale score calculation

The minimum possible total score was 33 (complete non-participation). The maximum possible total score was 99 (complete participation).

The total score obtained by each respondent across all 33 statements, calculated by summing individual item scores, constituted the **Extent of Participation Index (EPI)** for that respondent.

Reliability and validity assessment

Reliability assessment (internal consistency)

Internal consistency (reliability) of the final scale was assessed through calculation of Cronbach's alpha coefficient:

Where:

k = number of items in the scale (33)

σ_I^2 = variance of individual item scores

σ_t^2 = variance of total scores

A Cronbach's alpha coefficient of 0.88 was obtained, considerably exceeding the conventional threshold of 0.70 recommended for acceptable reliability. The value of 0.88 indicates high internal consistency, confirming that the 33 items consistently measure a single underlying construct (agricultural participation). This alpha coefficient meets standards for both research and practical application of the scale.

Validity assessment

Content Validity: Content validity was established through the expert judgment process. Items retained through this process were confirmed as substantively relevant to the participation construct and appropriately representative of the three theoretical dimensions.

Construct Validity: Construct validity was supported through: (1) meaningful dimensional structure the three dimensions represent conceptually distinct but theoretically related aspects of participation; (2) discriminating power of retained items all 33 items demonstrated t-values exceeding 1.75; and (3) logical conceptual organization items within each dimension share common thematic content while items across dimensions address distinct participation aspects.

Data collection and analysis procedures

The final 33-item Participation Scale was administered to the full sample of 120 rural youth respondents during 2021-22. Data were collected through structured interviews conducted by trained research enumerators who had received comprehensive training in questionnaire administration, respondent interaction protocols, and data quality assurance.

Data analysis

Raw data were entered, verified, and analysed using appropriate descriptive and inferential statistical procedures:

(1) Descriptive statistics

- Frequency distributions showing number and percentage of respondents in each category
- Measures of central tendency (mean, median) describing average participation levels
- Measures of dispersion (standard deviation, range) describing variability in participation across respondents

(2) Classification of respondents

Respondents' EPI scores were classified into participation categories using the mean $\pm$ standard deviation method:

- **Low Participation Category :** Respondents scoring below (Mean - SD) = < 62.43
- **Medium Participation Category:** Respondents scoring between (Mean - SD) and (Mean + SD) = 62.43 to 77.43
- **High Participation Category:** Respondents scoring above (Mean + SD) = > 77.43

This classification approach provides meaningful interpretation relative to the sample distribution while maintaining statistical rigor.

(3) Dimensional analysis

Participation mean scores were calculated separately for each of the three dimensions (benefits, implementation, decision-making) to examine dimensional variation patterns. Dimension-wise rankings were established based on mean scores to identify which participation aspects showed highest and lowest youth engagement.

RESULTS

Scale development outcomes: relevancy testing results

Following completion of item editing, expert judgment, and item analysis procedures, the Participation Scale achieved standardized status as a validated measurement instrument. The scale development process resulted in systematic refinement from 52 initial statements to 33 final statements representing approximately 63.5 per cent retention rate.

Table 1: Detailed Results of Relevancy Testing Stage

(n=40 Expert Panel)

Sr. No	Statement	MRS	RW	RP (%)	Status
A. Participation in benefits					
1	Agriculture provides me regular income for family livelihood	2.78	0.93	92.67	Selected
2	I receive financial benefits from agricultural activities	2.71	0.90	90.33	Selected
3	Agriculture helps me meet my household expenses	2.69	0.89	89.67	Selected
4	I get government subsidies related to agriculture	2.62	0.87	87.33	Selected
5	I benefit from agricultural training programmes	2.56	0.85	85.33	Selected
6	I receive information support from extension personnel	2.48	0.83	82.67	Selected
7	Agriculture provides employment opportunities for me	2.60	0.87	86.67	Selected
8	Agriculture improves my social recognition in the village	2.36	0.79	78.67	Selected
9	I benefit from crop insurance schemes	2.41	0.80	80.33	Selected
10	I receive support from farmer groups and cooperatives	2.38	0.79	79.33	Selected
11	Agriculture provides opportunities for self-employment	2.66	0.89	88.67	Selected
12	Agriculture improves my economic security	2.14	0.71	71.33	Rejected
13	Farming does not provide enough returns for youth*	1.52	0.51	50.67	Rejected
14	Agriculture has no future for rural youth*	1.44	0.48	48.00	Rejected
15	Agriculture cannot improve my standard of living*	1.68	0.56	56.00	Rejected
B. Participation in implementation					
16	I actively participate in land preparation activities	2.73	0.91	91.00	Selected
17	I am involved in seed selection and sowing operations	2.70	0.90	90.00	Selected
18	I participate in irrigation management of crops	2.64	0.88	88.00	Selected
19	I take part in fertilizer application and nutrient management	2.58	0.86	86.00	Selected
20	I participate in plant protection measures	2.49	0.83	83.00	Selected
21	I am involved in harvesting operations	2.76	0.92	92.00	Selected
22	I participate in post-harvest handling activities	2.42	0.81	80.67	Selected
23	I take part in marketing of agricultural produce	2.39	0.80	79.67	Selected
24	I actively participate in livestock-related farm activities	2.45	0.82	81.67	Selected
25	I use modern agricultural technologies in farming	2.53	0.84	84.33	Selected
26	I regularly attend demonstrations and field visits	2.34	0.78	78.00	Selected
27	I participate in custom hiring of farm machinery	2.12	0.71	70.67	Rejected
28	I avoid farm work because it is labour intensive*	1.48	0.49	49.33	Rejected
29	I do not prefer participating in crop management activities*	1.56	0.52	52.00	Rejected
30	Farm operations are not suitable for youth*	1.61	0.54	53.67	Rejected
C. Participation in decision-making					
31	I participate in deciding which crops to cultivate	2.68	0.89	89.33	Selected
32	I take part in decisions regarding seed selection	2.61	0.87	87.00	Selected
33	I help decide the use of fertilizers and pesticides	2.57	0.86	85.67	Selected
34	I participate in decisions related to irrigation scheduling	2.49	0.83	83.00	Selected
35	I take part in farm budgeting and financial planning	2.38	0.79	79.33	Selected
36	I participate in decisions regarding sale of farm produce	2.46	0.82	82.00	Selected
37	I help decide adoption of new technologies in farming	2.55	0.85	85.00	Selected

Sr. No	Statement	MRS	RW	RP (%)	Status
38	I participate in decisions regarding farm mechanization	2.41	0.80	80.33	Selected
39	I take part in selecting government agricultural schemes	2.36	0.79	78.67	Selected
40	I participate in decisions related to livestock management	2.32	0.77	77.33	Selected
41	I contribute to long-term planning for farm development	2.51	0.84	83.67	Selected
42	Family elders alone should make all farm decisions*	1.43	0.48	47.67	Rejected
43	Youth should not participate in financial farm decisions*	1.51	0.50	50.33	Rejected
44	Only senior family members should decide crop selection*	1.59	0.53	53.00	Rejected
45	Youth should not interfere in farm planning*	1.66	0.55	55.33	Rejected

Note: Asterisks (*) indicate negatively phrased statements requiring reverse scoring. MRS = Mean Relevancy Score; RW = Relevancy Weightage; RP = Relevancy Percentage.

Key findings from relevancy testing

52 initial statements were prepared, 45 were retained

after editing, and 33 statements were finally selected based on relevancy percentage, relevancy weightage and mean relevancy score.

Item analysis results: discrimination index testing

Table 2: item analysis results with t-values

(n=40 from non-sample area)

Sr. No	Statement	t-Value	Statement Type	Status
1	Agriculture provides me regular income for family livelihood	3.842	Positive	Selected
2	I receive financial benefits from agricultural activities	3.126	Positive	Selected
3	Agriculture helps me meet my household expenses	3.574	Positive	Selected
4	I get government subsidies related to agriculture	2.418	Positive	Selected
5	I benefit from agricultural training programmes	2.964	Positive	Selected
6	I receive information support from extension personnel	2.287	Positive	Selected
7	Agriculture provides employment opportunities for me	3.215	Positive	Selected
8	Agriculture improves my social recognition in the village	2.104	Positive	Selected
9	I benefit from crop insurance schemes	2.368	Positive	Selected
10	I receive support from farmer groups and cooperatives	2.014	Positive	Selected
11	Agriculture provides opportunities for self-employment	3.004	Positive	Selected
12	Agriculture improves my economic security	1.624	Positive	Rejected
13	Farming does not provide enough returns for youth	1.482	Negative	Rejected
14	Agriculture has no future for rural youth	1.317	Negative	Rejected
15	Agriculture cannot improve my standard of living	1.556	Negative	Rejected
16	I actively participate in land preparation activities	3.691	Positive	Selected
17	I am involved in seed selection and sowing operations	3.445	Positive	Selected
18	I participate in irrigation management of crops	3.102	Positive	Selected
19	I take part in fertilizer application and nutrient management	2.876	Positive	Selected
20	I participate in plant protection measures	2.458	Positive	Selected
21	I am involved in harvesting operations	3.884	Positive	Selected
22	I participate in post-harvest handling activities	2.365	Positive	Selected
23	I take part in marketing of agricultural produce	2.184	Positive	Selected
24	I actively participate in livestock-related farm activities	2.276	Positive	Selected
25	I use modern agricultural technologies in farming	2.594	Positive	Selected
26	I regularly attend demonstrations and field visits	2.021	Positive	Selected
27	I participate in custom hiring of farm machinery	1.643	Positive	Rejected
28	I avoid farm work because it is labour intensive	1.404	Negative	Rejected

Sr. No	Statement	t-Value	Statement Type	Status
29	I do not prefer participating in crop management activities	1.522	Negative	Rejected
30	Farm operations are not suitable for youth	1.611	Negative	Rejected
31	I participate in deciding which crops to cultivate	3.725	Positive	Selected
32	I take part in decisions regarding seed selection	3.264	Positive	Selected
33	I help decide the use of fertilizers and pesticides	2.953	Positive	Selected
34	I participate in decisions related to irrigation scheduling	2.416	Positive	Selected
35	I take part in farm budgeting and financial planning	2.083	Positive	Selected
36	I participate in decisions regarding sale of farm produce	2.362	Positive	Selected
37	I help decide adoption of new technologies in farming	2.745	Positive	Selected
38	I participate in decisions regarding farm mechanization	2.194	Positive	Selected
39	I take part in selecting government agricultural schemes	2.036	Positive	Selected
40	I participate in decisions related to livestock management	1.982	Positive	Selected
41	I contribute to long-term planning for farm development	2.514	Positive	Selected
42	Family elders alone should make all farm decisions	1.268	Negative	Rejected
43	Youth should not participate in financial farm decisions	1.433	Negative	Rejected
44	Only senior family members should decide crop selection	1.586	Negative	Rejected
45	Youth should not interfere in farm planning	1.472	Negative	Rejected

Note: t-values ≥ 1.75 indicate satisfactory discrimination; items below this threshold were rejected.

All 33 retained items had t-values above the acceptable limit and were therefore included in the final scale.

4.3 Final scale reliability and validity summary

The final 33-item Participation Scale demonstrated:

Reliability (Internal Consistency):

- Cronbach's Alpha Coefficient: $\alpha = 0.88$
- Interpretation: High internal consistency, considerably exceeding the 0.70 threshold for acceptable reliability

Validity:

- Content Validity: Confirmed through expert judgment process with 40-member panel using five-point relevancy scale
- Construct Validity: Supported by meaningful dimensional structure (benefits, implementation, decision-making), validated item discrimination, and logical conceptual organization
- Item Discrimination: All 33 items demonstrated t-values > 1.75 , confirming capacity to differentiate between high and low scorers

Distribution of respondents by extent of participation index (Main Sample, n=120)

Table 3: Classification of respondents according to extent of participation in agriculture

(n=120)

Participation Category	Score Range	Frequency	Percentage	Cumulative %
Low Participation	Less than 62.43	20	16.67	16.67
Medium Participation	62.43 - 77.43	87	72.50	89.17
High Participation	More than 77.43	13	10.83	100.00

Descriptive Statistics: Mean = 69.93; Standard Deviation = 7.50; Minimum Score = 33; Maximum Score = 99; Observed Range = 52-88

Interpretation of distribution:

The distribution of respondents according to the Extent of Participation Index showed that the majority of rural youth had medium participation in agriculture (72.50%), followed by low participation (16.67%) and high participation (10.83%). This indicates that most rural youth

were moderately involved in agricultural activities. They actively participated in routine farm operations, but their role in benefit sharing and decision-making was comparatively limited. The low proportion of respondents in the high participation category suggests that only a few rural youths had active involvement across all three dimensions, namely benefits, implementation and decision-making.

Dimensional analysis: participation across three dimensions**Table 4: Dimension-wise participation of rural youth in agriculture**

(n=120)

Sr. No.	Participation dimension	Maximum Possible Score	Mean Score Obtained	Percentage of Maximum*	Standard Deviation	Rank
1	Participation in Implementation	33	25.84	78.3	2.84	I
2	Participation in Benefits	33	23.46	71.1	2.91	II
3	Participation in Decision-Making	33	20.63	62.5	2.67	III
4	Total EPI	99	69.93	70.6	7.50	

Percentage of Maximum = (Mean Score Obtained / Maximum Possible Score) × 100

Detailed dimensional interpretation

Dimension-wise analysis revealed that participation in implementation ranked first with a mean score of 25.84, followed by participation in benefits with a mean score of 23.46, and participation in decision-making with a mean score of 20.63. This indicates that rural youth were more actively involved in practical farm operations such as land preparation, sowing, irrigation, fertilizer application, plant protection and harvesting. However, their participation in receiving benefits and taking important farm decisions was comparatively lower. The lowest score in decision-making shows that major farm decisions are still largely influenced by senior family members, while youth mainly contribute as operational participants in agriculture.

DISCUSSION

The present study developed and validated a multidimensional participation scale for measuring rural youth participation in agriculture. The scale was developed through systematic procedures involving item collection, editing, expert relevancy testing, item analysis, reliability testing and validation. The final scale consisted of 33 statements under three major dimensions, namely participation in benefits, participation in implementation and participation in decision-making. The equal distribution of statements across these three dimensions indicates that the scale covers the major aspects of rural youth participation in agriculture.

The relevancy testing and item analysis confirmed the suitability of the selected statements. The retained items satisfied the required criteria for relevancy and discrimination, showing that the statements were appropriate for measuring different levels of participation among rural youth. The Cronbach's alpha value of 0.88 indicated high internal consistency of the scale. Hence, the developed scale can be considered reliable and valid for assessing rural youth participation in agriculture.

The application of the scale revealed that the majority

of rural youth had medium participation in agriculture, followed by low and high participation categories. This indicates that rural youth were not completely detached from agriculture, but their involvement was mostly moderate. They were mainly involved in regular agricultural activities, while their participation in benefit access and decision-making was comparatively limited. Similar constraints faced by rural youth in adopting agriculture as an occupation were also reported by Ramjiyani et al. (2015), indicating that economic, technical and institutional barriers may limit their effective participation in agriculture.

Dimension-wise results showed that participation in implementation ranked first, followed by participation in benefits and participation in decision-making. This finding indicates that rural youth were more actively involved in practical farm operations such as land preparation, sowing, irrigation, fertilizer application, plant protection, harvesting and post-harvest activities. However, their lower participation in decision-making shows that important farm decisions are still largely influenced by senior family members or household heads. Limited access to land and productive resources may restrict youth authority in farm-level decisions and reduce their independent engagement in agriculture (Kosec et al., 2018). This pattern is consistent with earlier observations that participation in agricultural decision-making is often influenced by household authority, access to productive resources and gender-based roles (Farnworth et al., 2019; Nandania et al., 2025; Parvadiya et al., 2024; Patel et al., 2024; Sarmah et al., 2024).

The findings clearly show that rural youth participation in agriculture is multidimensional. Measuring only their physical involvement in farming does not provide a complete understanding of their actual participation. A youth may be actively involved in farm operations but may have limited access to agricultural benefits and little role in farm-level decisions. Therefore, the developed scale is useful for identifying not only the extent of participation but also the nature of participation across different dimensions.

Overall, the study highlights that rural youth are important contributors to agriculture, especially in operational activities. However, to make agriculture a sustainable livelihood option for them, their role must be strengthened beyond labour contribution. Greater access to benefits, institutional support, training, credit, technology and decision-making opportunities is necessary to enhance meaningful youth participation in agriculture.

CONCLUSION

The study successfully developed and validated a multidimensional scale for measuring rural youth participation in agriculture. The final scale consisted of 33 statements covering three dimensions: participation in benefits, participation in implementation and participation in decision-making. The scale showed high reliability with a Cronbach's alpha value of 0.88, confirming its internal consistency and suitability for research use.

The findings revealed that most rural youth had medium participation in agriculture. Among the three dimensions, participation in implementation was highest, followed by participation in benefits, while participation in decision-making was lowest. This indicates that rural youth are actively involved in farm operations but have comparatively less access to benefits and limited authority in major farm decisions.

Thus, the developed scale provides a valid and reliable tool for researchers, extension personnel and policy planners to assess rural youth participation in agriculture. The scale can help identify specific areas where youth participation is weak and can support the design of suitable youth-oriented agricultural development programmes.

POLICY IMPLICATIONS

The findings suggest that rural youth should not be viewed only as farm labour contributors but as potential decision-makers, agri-entrepreneurs and future farm managers. Since participation in implementation was higher than participation in benefits and decision-making, policies should focus on increasing youth access to productive resources, institutional support and farm-level decision authority.

First, youth-oriented agricultural extension programmes should be strengthened at the village level. Regular training, demonstrations, exposure visits and digital advisory services should be organized specifically for rural youth to improve their technical knowledge, confidence and innovation capacity. Vocational training is important for improving the skills and participation of farmers' sons in

agriculture (Thakur and Chauhan, 2017).

Second, institutional support such as credit, subsidies, crop insurance and farm mechanization services should be made more youth-friendly. Special provisions may be created for rural youth to access Kisan Credit Cards, custom hiring centres, start-up support, input subsidies and agri-enterprise schemes.

Third, rural youth should be encouraged to participate in farm planning and decision-making. Extension agencies and local institutions may promote family-level farm planning sessions, youth farmer groups and rural youth clubs to improve their involvement in crop selection, technology adoption, marketing and investment decisions.

Fourth, agri-entrepreneurship opportunities should be promoted among rural youth. Value addition, custom hiring, nursery management, dairy, poultry, digital agriculture services, input supply, processing and direct marketing can provide attractive livelihood options and reduce migration from rural areas. Entrepreneurial ability among youth farmers is important for improving their involvement in agriculture and allied enterprises (Gulkari and Dohat, 2022; Meghnathi et al., 2025).

Finally, the developed participation scale may be used by extension departments, KVKs, research institutions and policy agencies to assess youth participation before planning interventions. It can help identify whether youth are weak in benefit access, implementation or decision-making, and accordingly design targeted programmes for strengthening their meaningful participation in agriculture.

ACKNOWLEDGEMENT

The authors express their sincere gratitude to the Department of Agricultural Extension, Palli Siksha Bhavana (Institute of Agriculture), Visva-Bharati, Sriniketan, West Bengal, for providing academic guidance and support during the study. The authors are also thankful to the rural youth respondents of Suryapet district, Telangana, for their cooperation during data collection.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this research paper.

REFERENCES

- Agarwal, B., & Agrawal, A. (2017). Do farmers really like farming? Indian farmers in transition. *Oxford Development Studies*, 45(4), 460-478. <https://doi.org/10.1080/13600818.2017.1283010>

- Birthal, P. S., Roy, D., Khan, M. T., & Negi, D. S. (2015). Farmers' preference for farming: Evidence from a nationally representative farm survey in India. *The Developing Economies*, 53(2), 122-134. <https://doi.org/10.1111/deve.12072>
- Edwards, A. L. (1948). A technique for the construction of attitude scales. *Journal of Applied Psychology*, 32(4), 374-384. <https://doi.org/10.1037/h0057313>
- Edwards, A. L. (1969). Techniques of attitude scale construction. Vakils, Feffer and Simons Pvt. Ltd.
- Farnworth, C. R., et al. (2019). Gender and youth participation in agricultural decision-making. *Agricultural Systems*, 176, 102672. <https://doi.org/10.1016/j.agsy.2019.102672>
- Fischer, H., & Burton, R. J. F. (2014). Understanding farm succession as socially constructed endogenous cycles. *Sociologia Ruralis*, 54(4), 417-438. <https://doi.org/10.1111/soru.12055>
- Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, & World Health Organization. (2023). The state of food security and nutrition in the world 2023. FAO. <https://doi.org/10.4060/cc3017en>
- Food and Agriculture Organization of the United Nations. (2025). The status of youth in agrifood systems. FAO. <https://doi.org/10.4060/cd3384en>
- Food and Agriculture Organization. (2025). The status of youth in agrifood systems. Food and Agriculture Organization of the United Nations. Rome, Italy.
- Government of India. (2016). State of Indian agriculture, 2015-16. Ministry of Agriculture and Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Directorate of Economics and Statistics.
- Gulkari, K. D. and Dohat, M. P. (2022). Entrepreneurial ability of youth farmers. *Gujarat Journal of Extension Education*, 34(1).
- Jayne, T. S., et al. (2019). Land constraints and youth participation in African agriculture. *Food Policy*, 83, 1-12. <https://doi.org/10.1016/j.foodpol.2018.12.005>
- Kosec, K., Ghebrey, H., Holtemeyer, B., Mueller, V., & Schmidt, E. (2018). The effect of land access on youth agricultural engagement. IFPRI Discussion Paper. International Food Policy Research Institute. <https://www.ifpri.org>
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, 140, 1-55.
- Meghnathi, A. A., Khodifad, P. B. and Kalsariya, B. N. (2025) Adoption of rural women improved storage practices of food grains. *Gujarat Journal of Extension Education*, 40(2): 33-38. <https://doi.org/10.56572/gjoe.2025.40.2.0006>
- NABARD. (2014). Agricultural landholdings pattern in India. *Rural Pulse*, 1, 1-4.
- Nandania, P., Kalsariya, B. N. and Paradva, V. B. (2025) Perception of rural youth towards agriculture as an occupation. *Gujarat Journal of Extension Education*, 40(2): 126-130. <https://doi.org/10.56572/gjoe.2025.40.2.0019>
- Organisation for Economic Co-operation and Development. (2025). Agricultural policy monitoring and evaluation 2025: India's agricultural sector and workforce participation. OECD Publishing, Paris.
- Oyediran, W. O., Omoare, A. M., & Oyesola, O. B. (2016). Factors affecting youth participation in agricultural production in rural areas of Nigeria. *Journal of Agricultural Extension*, 20(2), 14-26. <https://doi.org/10.4314/jae.v20i2.2>
- Parvadiya, R. M., Thorat, G. N. and Monpara, D. P. (2025) Relationship between the profile of the banana growers and their integrated crop management. *Gujarat Journal of Extension Education*, 39(2): 121-127. <https://doi.org/10.56572/gjoe.2025.39.2.0020>
- Patel, J. B. and Vinaya Kumar, H. M. (2022). A scale to measure the self-confidence of rural youth to work in farming. *Gujarat Journal of Extension Education*, 34(2): 8-10.
- Patel, M. R., Vinaya Kumar, H. M. and Chauhan, N. B. (2022). A scale to measure self-confidence of rural youth about orchard farming. *Gujarat Journal of Extension Education*, 34(2): 28-30.
- Patel, M. R., Vinaya Kumar, H. M. and Chauhan, N. B. (2022). A scale to measure self-confidence of rural youth about vegetable farming. *Gujarat Journal of Extension Education*, 34(1): 50-52.
- Patel, R. A., Salunkhe, S. R. and Chauhan, Y. R. (2024) Relationship between profile and attitude of rural youth towards agri-preneurship. *Gujarat Journal of Extension Education*, 38(2):171-175. <https://doi.org/10.56572/gjoe.2024.38.2.0027>

- Ramjiyani, D. B., Patel, S. R. and Vahora, S. G. (2015). Constraints faced by rural youth in adopting agriculture as an occupation. *Gujarat Journal of Extension Education*, 26(1): 33-35.
- Samanta, R. K. (1991). Extension research in agriculture. B. R. Publishing Corporation.
- Sarmah, B., Deka, C. and Borua, S. (2024) Perception of rural youth towards farming as an enterprise. *Gujarat Journal of Extension Education*, 38(2):94-101. <https://doi.org/10.56572/gjoe.2024.38.2.0015>.
- Sharma, A., & Bhaduri, A. (2009). The “tipping point” in Indian agriculture: Understanding the withdrawal of the Indian rural youth. *Asian Journal of Agriculture and Development*, 6(1), 83-97.
- Srinivasan, S. (2015). Between daughter deficit and development deficit: The situation of unmarried men in a South Indian community. *Economic and Political Weekly*, 50(38), 61-70.
- Thakur, N. B. and Chauhan, N. B. (2017). Vocational training needs as perceived by farmers’ sons in Anand taluka of Gujarat. *Gujarat Journal of Extension Education*, 28(1): 79-81.
- Vijayabaskar, M., Narayanan, S., & Srinivasan, S. (2018). Agricultural revival and reaping the youth dividend. *Economic and Political Weekly*, 53(26-27), 30-40.
- Wachenheim, C. J., & Rathge, R. W. (2000). Socioeconomic factors affecting rural youth participation in agriculture. *Rural Sociology*, 65(3), 423-438. <https://doi.org/10.1111/j.1549-0831.2000.tb00036.x>
- World Bank. (2024). World development indicators. World Bank Group. <https://databank.worldbank.org/source/world-development-indicators>

Received : April 2026 : Accepted : June 2026