

A Study of Socio-Economic Conditions of Farmers across Talukas of Narmada District, Gujarat

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ABSTRACT

This study examines the socio-economic condition of farmers in Narmada District, Gujarat, with particular attention to differences across talukas, educational status and farm size. Primary data were collected from 400 farmer households selected through a multistage sampling procedure. A composite Socio-Economic Condition Index was used to assess household conditions, while one-way ANOVA was applied to compare group means. Pearson's correlation and simple linear regression were used to examine the relationship between annual household income and SECI. The results showed no significant difference in SECI across talukas or farm-size groups. Educational status was associated with significant differences in SECI. Annual household income also showed a positive and statistically significant relationship with SECI. The findings point to education and income opportunities as relevant areas for improving farmers' socio-economic conditions.

Keywords: *Farmers, Socio-Economic Condition, Socio-Economic Condition Index, Farm Size, Educational Status, Household Income*

Agriculture remains an important source of livelihood for rural households in Gujarat, but the socio-economic position of farmers is not uniform across locations. Differences in education, landholding, household income, occupation and access to basic facilities can shape the living conditions of farming families. These differences may also become visible within the same district because agricultural resources and livelihood opportunities vary from one area to another.

Narmada District provides a useful setting for examining these differences. Farmers in its different talukas operate under varying agricultural and socio-economic conditions. A comparison across talukas can therefore provide a clearer picture than an overall district-level average alone.

The present study assesses the socio-economic condition of farmers in Narmada District through a composite Socio-Economic Condition Index. It compares the index across talukas and examines whether educational status and farm size are associated with differences in farmers' socio-economic condition. The study also examines the relationship between annual household income and the overall socio-economic condition of farmers.

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Study Objectives

1. To assess the socio-economic condition of farmers in Narmada District, Gujarat.
2. To compare the socio-economic condition of farmers across the talukas of Narmada District.
3. To examine whether farmers' socio-economic condition differs according to educational status and farm size.
4. To examine the relationship between annual household income and farmers' socio-economic condition.

Null Hypotheses

1. H₀₁: "There is no statistically significant difference in the mean socio-economic condition scores of farmers across the talukas of Narmada District, Gujarat".
2. H₀₂: "There is no statistically significant difference in the mean socio-economic condition scores of farmers across different educational-status groups in Narmada District, Gujarat".
3. H₀₃: "There is no statistically significant difference in the mean socio-economic condition scores of farmers across different farm-size groups in Narmada District, Gujarat".
4. H₀₄: "There is no statistically significant relationship between annual household income and the socio-economic condition of farmers in Narmada District, Gujarat".

REVIEW OF LITERATURE

Shirpurkar (2024) examined socio-economic status among farm families and developed a scale based on different household characteristics. The study provides support for assessing socio-economic status through a combination of indicators rather than relying on income alone.

Deshmukh et al. (2023) developed a socio-economic status scale for agroforestry farmers in South Gujarat. Education, occupation, landholding and income were among the characteristics considered in their assessment. The regional context makes this study particularly relevant to the present research.

Das and Ganesh-Kumar (2018) examined the relationship between farm size, livelihood diversification and farmers' income in India. Their findings indicate that farm size and livelihood sources need to be considered together when examining farmers' economic position.

Birthal et al. (2014) examined the sources and distribution of farm-household income in India and found that non-farm activities formed an important part of household income. This suggests that agricultural income alone may not adequately represent the economic position of farm households.

Ravita et al. (2020) examined "the level and distribution of farmers' income across farm-size groups in rural Punjab". Their findings showed differences in household and per-capita income across farm-size categories, providing a basis for considering farm size in studies of farmers' socio-economic conditions.

Shukla (2026) examined "income sources and inequality among agricultural households in Gujarat". The study reported substantial variation in household income and examined the contribution of different income sources, providing recent evidence from the state.

Research Gap

The studies reviewed above have dealt with socio-economic status, education, farm size and household income, but they have generally examined these aspects separately or in different geographical settings. A comparative assessment of farmers' overall socio-economic condition across the talukas of Narmada District is less evident in the existing literature. The present study therefore brings these aspects together through a common Socio-Economic Condition Index and examines the differences across talukas, educational groups and farm-size groups, along with the relationship between household income and SECI.

RESEARCH METHODOLOGY

Study Setting and Research Approach

The study examined the socio-economic conditions of farmers in Narmada District, Gujarat, using a descriptive and comparative research approach. The descriptive component was used to document the demographic, agricultural, economic and living characteristics of the sampled farmers. The comparative component focused on differences in socio-economic condition across the talukas of the district.

Narmada District was selected as the study area. The 2011 Census identifies Tilakwada, Nandod, Dediapada and Sagbara as the four sub-districts of Narmada District. These four geographical units formed the basis of the sampling design. Census village-level records were used as a reference for identifying the villages within the study area. (Census of India, 2011).

Identification of the Study Population

The target population comprised farmer households engaged in agricultural cultivation in Narmada District. The household was treated as the sampling unit, while an adult farmer who was substantially involved in the household's agricultural activities was selected as the respondent.

The study did not use the district's total population as the farmer population. Instead, farmer households were identified through the eligibility criteria applied to the field listing in the selected villages. This approach allowed the study to focus directly on the population relevant to the research question.

Sample Design and Allocation

A multistage sampling design was used to obtain the sample. The four sub-districts of Narmada District were treated as the geographical strata. Five villages were selected from each taluka, resulting in 20 selected villages. Twenty eligible farmer households were then selected from each selected village. The final sample therefore consisted of 400 farmer households, with 100 households allocated to each taluka.

The equal allocation across talukas was adopted to provide comparable representation of the four geographical units because one of the principal purposes of the study was to examine differences in farmers' socio-economic conditions across talukas.

Selection of Villages

Village selection was carried out separately within each taluka. The village-level Census framework was used to identify the villages belonging to each sub-district. Villages were selected using a probability-based procedure, with Probability Proportional to Size (PPS) used where the available village-level size measure permitted such selection.

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Five villages were selected from each of the four talukas. The Census of India 2011 Primary Census Abstract provides village-level records for Narmada and identifies the four sub-districts and their constituent locations.

Selection of Farmers within Villages

After the villages had been selected, an updated list of eligible farmer households was prepared in each village. Twenty households were selected from each village using systematic random sampling.

The sampling interval was calculated as:

$$k = N_v / n_v$$

where k represents the sampling interval, N_v represents the number of eligible farmer households in the selected village, and n_v represents the required number of households to be selected, fixed at 20.

A random starting number was selected from the first sampling interval. Thereafter, every k^{th} household was selected until the required number of 20 households was reached. The procedure was repeated independently for each selected village. The resulting allocation was: **4 talukas $\times$ 5 villages $\times$ 20 farmer households = 400 farmer households.**

Field Data and Instrument

Primary data were collected during Jan-Feb. 2026 through a structured household questionnaire. The questionnaire covered demographic characteristics, educational status, occupation, landholding, annual household income, agricultural income, irrigation, agricultural equipment, livestock ownership, credit access, housing conditions, electricity, drinking water, sanitation, healthcare access, financial access, government or agricultural scheme access and agricultural extension services.

The respondent was an adult aged 18 years or above who was familiar with the household's agricultural activities, landholding, income and living conditions. The completed questionnaires were checked before coding and statistical analysis.

Construction of the Farmer Socio-Economic Condition Index

A composite Socio-Economic Condition Index (SECI) was constructed to assess the socio-economic position of the sampled farmer households. Ten dimensions were included: educational status, occupation or employment, landholding, housing condition, electricity access, drinking water, sanitation, healthcare access, financial access and government or agricultural scheme access.

Each dimension was assigned a score from 0 to 4. Higher scores represented relatively better conditions. Annual household income was not included in the SECI because income was examined separately as an explanatory variable in one of the hypotheses.

Derivation and Interpretation of SECI

The SECI score for each household was obtained by summing the scores assigned to the ten dimensions:

$$SECI = S_1 + S_2 + S_3 + \dots + S_{10}$$

With ten dimensions scored from 0 to 4, the theoretical range of the index was 0 to 40. For descriptive interpretation, the resulting scores were grouped into three categories.

Table.1

SECI Score	Socio-Economic Condition
0–13	Low
14–27	Medium
28–40	High

Source: Author's own construction and calculation.

Analytical Strategy

The data were coded and analyzed using SPSS 25. Frequencies and percentages were used to describe categorical variables, while means and standard deviations were used for quantitative variables.

For H_{01} , one-way analysis of variance was used to compare the mean SECI scores of farmers across the four talukas. For H_{02} , one-way analysis of variance was used to examine differences in mean SECI scores across educational-status groups. For H_{03} , one-way analysis of variance was used to compare mean SECI scores across farm-size groups. For H_{04} , Pearson's correlation coefficient was used to examine the relationship between annual household income and SECI. A simple linear regression model was also estimated to assess the extent to which household income statistically accounted for variation in SECI.

Where an overall ANOVA result was statistically significant, Tukey's HSD procedure was used for pairwise comparisons.

Statistical Assumptions and Decision Rule

For the ANOVA procedures, the homogeneity of variance assumption was assessed using Levene's test. Statistical significance was evaluated at the 5 per cent level, with $\alpha = 0.05$. A p-value below 0.05 was treated as evidence against the corresponding null hypothesis. Where the p-value was 0.05 or greater, the null hypothesis was not rejected.

Data Processing and Research Ethics

The completed schedules were checked for completeness, consistency and coding errors before data entry. Numerical codes were assigned to categorical responses, and the same SECI scoring rules were applied to all households. Participation was voluntary. Respondents were informed about the academic purpose of the study, and household-level information was treated confidentially.

DATA ANALYSIS & INTERPRETATION

Socio-Economic Condition across Talukas

To examine whether farmers' socio-economic conditions differed across the four talukas of Narmada District, a one-way analysis of variance was conducted using SECI as the dependent variable and taluka as the grouping variable.

H_{01} : “There is no statistically significant difference in the mean socio-economic condition scores of farmers across the talukas of Narmada District, Gujarat”.

Table 2. Differences in Mean SECI across Talukas Groups

Taluka	N	Mean SECI	SD	F	P
Tilakwada	100	25.01	3.192	.503	.681
Nandod	100	25.21	3.134		

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Taluka	N	Mean SECI	SD	F	P
Dediapada	100	24.81	2.901		
Sagbara	100	25.32	3.452		
Total	400	25.09	3.170		

The mean SECI scores were closely distributed across the four talukas, ranging from 24.81 in Dediapada to 25.32 in Sagbara. The difference in mean scores was relatively small. The assumption of equal variances was also satisfied, as Levene's test was not statistically significant, $F = 1.199$, $p = 0.310$.

The one-way ANOVA did not show a statistically significant difference in mean SECI scores across the four talukas, $F(3,396) = 0.503$, $p = 0.681$. Since the p-value was greater than 0.05, there was insufficient evidence to reject H_{01} . The results therefore suggest that the socio-economic condition scores of the sampled farmers did not differ significantly across Tilakwada, Nandod, Dediapada and Sagbara.

The Tukey HSD comparisons also did not identify a statistically significant difference between any pair of talukas. Thus, although small differences in average SECI scores were observed, these differences were not statistically significant in the present sample.

Educational Status and Socio-Economic Condition

To assess whether the socio-economic condition of farmers varied according to their educational status, a one-way analysis of variance was used. In this analysis, SECI was taken as the dependent variable and educational status was considered the grouping variable.

H_{02} : “There is no statistically significant difference in the mean socio-economic condition scores of farmers across different educational-status groups in Narmada District, Gujarat”.

Table 3. Differences in Mean SECI across Educational-status Groups

Educational status	N	Mean SECI	SD	F	P
No formal education	30	22.50	3.598	22.127	0.001
Primary	87	23.76	2.728		
Secondary	145	24.91	2.855		
Higher Secondary	98	26.39	2.899		
Graduate and above	40	27.38	2.638		
Total	400	25.09	3.170		

Table 4. Tukey HSD Post-hoc Comparisons across Educational-status Groups

Significant pairwise comparison	Mean Difference	p-value
No formal education – Secondary	-2.410	<0.001
No formal education – Higher Secondary	-3.888	<0.001
No formal education – Graduate and above	-4.875	<0.001
Primary – Secondary	-1.152	0.028
Primary – Higher Secondary	-2.629	<0.001
Primary – Graduate and above	-3.616	<0.001
Secondary – Higher Secondary	-1.477	0.001
Secondary – Graduate and above	-2.465	<0.001

Note: Tukey's HSD; only statistically significant pairwise differences are presented.

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The average SECI score was not the same across the five educational groups. Farmers with no formal education had the lowest mean score at 22.50. The mean increased to 23.76 for primary education, 24.91 for secondary education and 26.39 for higher secondary education. The highest mean was recorded among farmers with graduate and above education (27.38). Thus, the difference between the lowest and highest mean scores was 4.88 points.

The ANOVA result shows that these differences were statistically significant, $F(4,395) = 22.127$, $p = 0.001$. Therefore, H_{02} was rejected. In the present sample, educational status was associated with differences in farmers' socio-economic condition scores.

The Tukey HSD comparisons show that farmers with no formal education differed significantly from those with secondary, higher secondary, and graduate-and-above education. Farmers with primary education also differed significantly from the secondary, higher-secondary, and graduate-and-above groups. Significant differences were further found between secondary and higher secondary education and between secondary and graduate-and-above education. Overall, the pairwise results show that the more noticeable differences occurred between farmers belonging to lower and higher educational categories.

Farm Size and Socio-Economic Condition

To examine whether the socio-economic condition of farmers differed across farm-size groups, a one-way analysis of variance was conducted. In this analysis, SECI was taken as the dependent variable and farm size was used as the grouping variable.

H₀₃: “There is no statistically significant difference in the mean socio-economic condition scores of farmers across different farm-size groups in Narmada District, Gujarat”.

Table 5. Differences in Mean SECI across Farm-size Groups

Farm-size group	N	Mean SECI	SD	F	P
Marginal	68	24.84	2.894	.493	.741
Small	145	25.27	3.217		
Semi-medium	126	24.94	3.206		
Medium	51	25.08	3.387		
Large	10	26.00	2.981		
Total	400	25.09	3.170		

Table 6. Tukey HSD Post-hoc Comparisons across Farm-size Groups

Farm-size comparison	Mean Difference	p-value
Marginal – Small	-0.431	0.888
Marginal – Semi-medium	-0.106	0.999
Marginal – Medium	-0.240	0.994
Marginal – Large	-1.162	0.817
Small – Semi-medium	0.325	0.919
Small – Medium	0.191	0.996
Small – Large	-0.731	0.956
Semi-medium – Medium	-0.134	0.999
Semi-medium – Large	-1.056	0.850
Medium – Large	-0.922	0.918

Note: Tukey's HSD post-hoc test; none of the pairwise comparisons were statistically significant at the 5 per cent level.

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The mean SECI scores were relatively close across the five farm-size categories. The average score was 24.84 for marginal farmers, 25.27 for small farmers, 24.94 for semi-medium farmers and 25.08 for medium farmers. Large farmers recorded the highest mean score at 26.00, although this group included only 10 respondents.

The one-way ANOVA did not indicate a statistically significant difference in mean SECI across the five farm-size groups, $F(4,395) = 0.493$, $p = 0.741$. Since the p-value exceeds the 0.05 significance level, H_{03} was not rejected. The observed differences in group means therefore do not provide sufficient statistical evidence of variation in socio-economic condition according to farm-size category.

The Tukey HSD results were in line with the overall ANOVA finding. None of the pairwise comparisons between the farm-size categories reached statistical significance. Thus, despite the slightly higher mean observed for large farmers, the available evidence does not establish a significant difference in SECI across the farm-size groups.

Household Income and Socio-Economic Condition

The relationship between annual household income and SECI was examined using Pearson's correlation, with both variables treated as continuous measures. A simple linear regression was also estimated to determine how much of the variation in SECI was associated with household income.

H₀₄: “*There is no statistically significant relationship between annual household income and the socio-economic condition of farmers in Narmada District, Gujarat*”.

Table 7. Relationship between Annual Household Income and SECI

Variable	Mean	SD	Pearson's r	p-value
Annual household income	209,268.50	79,261.827	0.314	<0.001
SECI	25.09	3.170	—	—

Table 8. Simple Linear Regression of SECI on Annual Household Income

Model	R	R ²	Adjusted R ²	F	p-value
Income □ SECI	0.314	0.099	0.096	43.593	<0.001

The correlation coefficient was $r = 0.314$ ($p < 0.001$), indicating a positive association between household income and SECI. In practical terms, farmers reporting higher annual household income tended, on average, to have higher SECI scores. The relationship is statistically reliable but its magnitude is moderate rather than large.

The regression model was statistically significant, $F(1,398) = 43.593$, $p < 0.001$, and produced an R^2 of 0.099. Thus, income was associated with approximately 9.9% of the variation in SECI in this model. The remaining variation cannot be explained by annual household income alone and is likely connected with other characteristics not included in this single-predictor model.

The estimated income coefficient was positive ($B = 1.257 \times 10^{-5}$, $p < 0.001$), which is consistent with the direction of the correlation. The evidence therefore leads to rejection of H_{04} . The result establishes a statistically significant positive association between annual

household income and SECI in the sampled farmers; it should not, however, be interpreted as evidence that income by itself determines socio-economic condition.

Findings

1. The study included 400 farmer households from the four talukas of Narmada District. The overall SECI mean was 25.09, with a standard deviation of 3.17.
2. The SECI scores of farmers from the four talukas were quite close. Dediapada had the lowest mean (24.81) and Sagbara the highest (25.32). The difference was not statistically significant ($F(3,396) = 0.503$, $p = 0.681$). The first null hypothesis was therefore retained.
3. Education showed a different pattern. The mean SECI was 22.50 for farmers without formal education and reached 27.38 among graduates and above. The difference between the educational groups was statistically significant ($F(4,395) = 22.127$, $p = 0.001$). The second null hypothesis was rejected. Tukey's test further showed significant differences in several comparisons involving the lower and higher educational groups.
4. The farm-size groups had very similar SECI scores. The means ranged from 24.84 among marginal farmers to 26.00 among large farmers. Despite this difference in the observed means, the ANOVA result was not significant ($F(4,395) = 0.493$, $p = 0.741$). None of the Tukey comparisons was significant, so the third null hypothesis was not rejected.
5. Annual household income was positively related to SECI. The correlation was 0.314 ($p < 0.001$). The regression analysis also produced a significant result ($F(1,398) = 43.593$, $p < 0.001$), with $R^2 = 0.099$. This means that income was related to SECI, although it explained only a relatively small part of the variation. The fourth null hypothesis was rejected.

Suggestions

1. **Strengthen educational opportunities:** Adult education, functional literacy and practical agricultural education should be given greater attention, particularly among farmers with lower educational attainment.
2. **Improve agricultural extension services:** Farmers should receive timely information on improved farming practices, government schemes, markets and available support services.
3. **Promote supplementary income opportunities:** Since household income was positively associated with SECI, opportunities in livestock, allied activities, small-scale processing and other rural enterprises should be encouraged.
4. **Improve access to institutional finance:** Easier access to formal credit, savings facilities and suitable financial services can help farmers manage both agricultural and household requirements.
5. **Improve basic household facilities:** Continued attention should be given to housing, sanitation, drinking water, electricity and healthcare, as these form important dimensions of farmers' socio-economic conditions.

CONCLUSION

The study assessed the socio-economic condition of farmers in Narmada District by considering farmers from four talukas and examining differences across selected socio-economic characteristics. The results indicate that the overall socio-economic condition of the sampled farmers was fairly similar across the talukas, and farm size also did not produce a statistically significant difference in SECI scores.

Educational status showed a clearer association with socio-economic condition. Farmers with higher educational attainment generally recorded higher SECI scores, and the differences among the educational groups were statistically significant. Annual household income was also positively related to SECI, although the strength of the relationship was limited.

The findings suggest that improving farmers' socio-economic condition requires attention beyond agricultural landholding alone. Education, income opportunities, access to financial services and basic household facilities remain relevant areas for improving the living conditions of farming households in Narmada District. The study therefore provides a district-level picture of farmers' socio-economic conditions and identifies education and household income as the factors showing the clearest statistical association with SECI.

REFERENCES

- Birthal, P. S., Negi, D. S., Jha, A. K., & Singh, D. (2014). Income sources of farm households in India: Determinants, distributional consequences and policy implications. *Agricultural Economics Research Review*, 27(1), 37–48. <https://doi.org/10.5958/j.0974-0279.27.1.003>
- Census of India. (2011). *Primary census abstract at town, village and ward level, Gujarat: Narmada district*. Office of the Registrar General & Census Commissioner, India.
- Das, V. K., & Ganesh-Kumar, A. (2018). Farm size, livelihood diversification and farmer's income in India. *Decision*, 45(2), 185–201. <https://doi.org/10.1007/s40622-018-0177-9>
- Deshmukh, H., Dobriyal, M., Tandel, M. B., Gunaga, R., Sharma, O. P., Garde, Y. A., Thakare, U., Kunwar, R., Chavan, S., Salunkhe, S., Thakur, N. S., Singh, N., Chinchmalatpure, U., & Mevada, R. (2023). Development and standardization of an innovative scale for measuring the socio-economic status of agroforestry farmers in South Gujarat, India. *Sustainability*, 15(3), 2691. <https://doi.org/10.3390/su15032691>
- Ravita, Kaur, M., & Singh, G. (2020). Levels, pattern and distribution of income of farmers in rural Punjab: An empirical analysis. *Indian Journal of Economics and Development*, 16(2s), 112–119. <https://doi.org/10.35716/ijed/NS20-050>
- Shirpurkar, G. R. (2024). The construction and standardization of scale for measuring socio-economic status of farm families. *Indian Journal of Extension Education*, 3(1&2), 16–24. <https://epubs.icar.org.in/index.php/IJEE/article/view/159915>
- Shukla, V. (2026). Examining income sources and inequality among agricultural households in Gujarat. *Margin: The Journal of Applied Economic Research*, 20(1), 138–155. <https://doi.org/10.1177/00252921261436534>

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Conflict of Interest

The author(s) declared no conflict of interest.

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