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A tool to measure socio-economic status of dairy farmers

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Socio-economic development is multi- dimensional construct having 3 important factors: enhancement of social state of living (or quality of living), class (or occupation) and habitation (status of economic independence). Socio-economic status of the farmers plays a pivotal role in differentiating the individuals from each other for transfer of technology. The situation in the rural society shows that the individual has considerable differentiation and a few are acclaimed as important person. Distinguishing the farmers on socio-economic parameters has gained importance for their target-specific development purposes. Moreover, for assessing the impact of different developmental projects, it is necessary to measure the socio-economic status of the dairy farmers. Following steps were followed for development and validation of the SES scale.

1. Identification and selection of socio-economic status indicators
2. Judges' rating for ranking the socio-economic status indicators
3. Assigning weightage to different socio-economic status indicators
4. Reliability testing of the scale
5. Validity testing of the scale
6. Final structure of the socio-economic status scale
7. Categorization of the socio-economic status scale

1. Identification and selection of socio-economic status indicators

The indicators of socio-economic development of farmers were identified on the basis of relevant literature especially published on the dairy farmers in reputed journals. The officials, social workers, dairy co-operative societies and the personnel from various government and non- government organization were consulted for identification of parameters. The SES of farmers has special adjunct to the specific tradition and culture. So, due consideration was given for selecting all the following 17 major indicators and relevant sub-indicator against each main indicators were also identified. Thus a total of 50 sub -indicators were prepared and arranged logically for the detailed analysis, to get the accurate indication of SES. The major indicators and sub-indicators under each main item were enlisted below:

1. *Occupation*: (a) Major occupation of the family, (b) Occupation of spouse and other dependent
2. *Land holding* :(a) Farm size, (b) Ownership of land, (c) Source of irrigation, (d) Cropping pattern, (e)Type of cultivation, (f) Contingency paid to workers yearly
3. *Animal Holding*: (a) Exotic cow, (b) Cross-bred cow, (c) Buffalo, (d) Non-descript cow
4. *Annual income*: (a) Service and/or business, (b) Agriculture, (c) Dairying
5. *Material possession*:(a) Farm implements and equipments,(b) Transport, (c) Household equipments, (d) Farm structure,(e) Dairy equipments and appliances
6. *Investment*: (a) Investment on agriculture,(b) Investment on livestock,(c) Investment on agricultural machinery, (d) Investment on farm building, (e) Investment on equipments and other appliances
7. *Household*: (a) Ownership of house, (b) Type of house,(c) Other facilities, (d) Lightening facility,(e) Room in the house, (f) Storage room available, (g) Condition of the house
8. *Milk production*:(a) Cross-bred cow, (b) Buffalo, (c) Non-descript cow, (d) Other
9. *Family education*:(a) Respondent's education,(b) wife's education, (c) Dependents' education
10. *Decision making*: (a) Agriculture activities, (b) Family welfare related activities, (c) Dairy activities
11. *Social participation*
12. *Communication pattern*: (a) Extension contact, (b) Mass media exposure,(c) Personal localite sources used
13. *Milk sale*
14. *Employment generation (hours/day)*: (a) Dairy enterprise, (b) Agriculture operation
15. *Milk consumption*
16. *Other attributes*
17. *Social category*

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The above main and sub-items were then put for further analysis for identifying relevant items in each of the sub item. Thus a total of 50 items were identified which are indicative of the SES. These were arranged logically for further analysis.

2. Judges' rating for ranking the socio-economic status indicators

(a) The selected indicators of proposed socio-economic status scale were referred to the experts, researchers, social scientists and experts of government organization working in the field of agricultural and dairy development. In all 80 judges were contacted. Out of 80 judges to whom the indicators of the scale were sent, only 60 of them could respond despite reminders. Thus 75% responses from the judges could be obtained which was quite satisfactory in this regard to draw the valid conclusion.

(b) The ratings given by the judges were used to work out mean relevancy score of each item with the help of the following formula.

$$MRS = \frac{\Sigma Sji}{Nj}$$

where, MRS,mean relevancy score; Sji, total of score given by judges to each item; Nj, total number of judges.

Out of 17 main items, two items were eliminated because those were considered to be less important and sometimes irrelevant to the SES of farmers. These two items obtained mean relevancy score less than overall mean relevancy score (9.53) at serial no. 16 and17 of Table 1. Therefore, 15 items were finally selected. The judges were further asked to rank the main items and give relevant score to sub-items under each main item and mini-items under each sub-item according to their importance in measuring the SEU of farmers. After receiving the judges' responses, the rank averages were calculated for each main item (Table 2) and then these were rearranged. The indicator to which most of the judges ranked first was placed at rank one and in the same manner other indicators were arranged in descending order as per their respective ranks suggested by judges. The final scores of mini-items under each sub-item were worked out by taking the average of judges' scores given to each item.

Table 1. Mean relevancy scores of main indicators of SES scale

S.no	Main indicators	Mrs
1	Occupation	12.73
2	Land holding	12.65
3	Animal holding	12.45
4	Annual income	10.93
5	Material possession	10.90
6	Investment	10.23
7	Household	9.98
8	Milk production	9.90
9	Family education	9.83
10	Decision making	9.80
11	Social participation	9.78
12	Communication pattern	9.75
13	Milk sale	9.68
14	Employment generation (hours/day)	9.67
15	Milk consumption	9.55
16	Others attributes	2.10
17	Social category	2.01
	Over all mean relevancy score	9.53

Table 2. Rank score, difference in rank score and cumulative weightage of main indicators of SES scale

S.no.	Main indicators	Rank score	Difference in rank score	Cumulative weightage
1	Occupation	1.23	0.97	14.77
2	Land holding	2.20	1.25	13.80
3	Animal holdings	3.45	0.93	12.55
4	Annual income	4.38	0.80	11.62
5	Material possession	5.18	1.30	10.82
6	Investment	6.48	1.05	9.52
7	Household	7.53	1.05	8.47
8	Milk production	8.58	0.72	7.42
9	Family education	9.30	1.20	6.70
10	Decision making	10.50	1.08	5.50
11	Social participation	11.58	0.90	4.42
12	Communication pattern	12.48	1.15	3.52
13	Milk sale	13.63	0.85	2.37
14	Employment generation (hours/day)	14.48	0.52	1.52
15	Milk consumption	15.00	0.00	1.00
	Summation of cumulative weightage	114.00		

3. Assigning weightage to different socio-economic status indicators

Raw scores *per se* have limited utility. The raw scores assigned to an individual or a particular group can not indicate relative position of that individual or that group in the total population. Cumulative weightage to each main item was calculated for its importance and contribution to the socio-economic status (Table 3).The cumulative weightage of each main item was used to calculate the weighted score of the indicator. The weighted score of each SES indicators was calculated by using following formula.

$$SES = \frac{\Sigma wisi}{\Sigma wi}$$

where, SES, socio-economic status; si, raw score of i th items; wi, weightage of i th item, Σwi, summation of cumulative wt. of the ith item (114).

Table 3. Minimum and maximum weighted score of SES indicators

1. Occupation	
Minimum raw score= a+b=1 +1=2	Maximum raw score= a+b=90 +90=180
Minimum weighted score = 2×14.77=29.54	Maximum weighted score = 180×14.77=2658.60
2. Land holding	
Min. R. S.= a+b+c+d+e=1+1+0+1+1+0=4	Max. R. S.= a+b+c+d+e+f=14+2+20+27+5+1=63
Minimum weighted score = 4×13.8=55.2	Maximum weighted score = 63×13.8=952.20
3. Animal holding	
Min. R. S.= a+b+c+d+e+f+g+h=0 +0+0+0+0+0+0+0=0	Max. R. S.= a+b+c+d+e+f+g+h= 24+28+28+6+9+9+2+6=112
Minimum weighted score = 0×12.55=0.00	Maximum weighted score =112 x12.55=1405.60
4. Annual income	
Min. R. S.= a+b+c=1+1 +1=3	Max. R. S.= a+b+c=20 +20+20=60
Minimum weighted score = 3×11.62=34.86	Maximum weighted score = 60×11.62=697.20
5. Material Possession	
Min. R. S.= a+b+c1+c2+c3+d1+d2+e= 0+0+0+0+0+0+0=0	Max. R. S.= a+b+c1+c2+c3+d1+d2+e= 59+25+10+14+64+3+3+2+1 =199
Minimum weighted score = 0×10.82=0.00	Maximum weighted score =199×10.82=2153.18
6. Investment	
Min. R. S.= a+b+c+d+e=0+0+0+0+0=0	Max. R. S.= a+b+c+d+e=15+15+15+15+15=75
Minimum weighted score =0×9.52=0.00	Maximum weighted score =75×9.52=714.00
7. Household	
Min. R. S.= a+b+c+d+e+f+g= 1+1+1+1+1+0 +1=6	Max. R. S.= a+b+c+d+e+f+g=5+14+5+5+5+1+9=44
Minimum weighted score =6 x8.47=50.89	Maximum weighted score =44×8.47=372.68
8. Milk production	
Min. R. S.= a+b+c+d+e=1 +1+1+1+1=5	Max. R. S.= a+b+c+d+e =14 +14+14+14+14=70
Minimum weighted score =5×7.42=37.10	Maximum weighted score =70×7.42=519.40
9. Family education	
Min. R. S.= a+b+c=0 +0+0=0	Max. R. S.= a+b+c=28 +28+28=84
Minimum weighted score = 0×6.7=0.00	Maximum weighted score =84×6.7=562.80
10. Decision making	
Min. R. S.= a+b+c=1+1 +1=3	Max. R. S.= a+b+c=35+35+35=105
Minimum weighted score =3×5.50=16.50	Maximum weighted score =105×5.50=577.50
11. Social Participation	
Min. R. S.=0	Max. R. S.= 21
Minimum weighted score =0 x4.42=0	Maximum weighted score =21×4.42=92.82
12. Communication pattern	
Min. R. S.= a+b+c=1+1 +1=3	Max. R. S.= a+b+c=33+38+9=80
Minimum weighted score =3×3.52=10.56	Maximum weighted score =80 x3.52=281.60
13. Milk sale	
Min. R. S.= 1	Max. R. S.= 14
Minimum weighted score =1 x2.37=2.37	Maximum weighted score =14 x2.37=33.18
14. Employment generation (hours/day)	
Min. R. S.= a+b=0+0=0	Max. R. S.= a+b=15+15=30
Minimum weighted score = 0 x1.52=0	Maximum weighted score =30×1.52=45.6
15. Milk consumption	
Min. R. S.=1	Max. R. S.= 5
Minimum weighted score =1x1=1	Maximum weighted score == 5x1=5

$$\text{SES Score} = \frac{1+2+3+4+5+6+7+8+9+10+11+12+13+14+15}{114}$$

Minimum average weighted score =224.22/114 =1.96
Maximum average weighted score =11230.06/114 =98.50

4. Reliability of the scale

The reliability of the scale indicates that it is stable or accurate and it measures the variables consistently from one time to another. For assessing the reliability of present SEU scale the following methods were used.

a. Test-retest method

b. Inter-judge reliability

a. Test-retest method

For testing the temporal reliability of the SEU scale, test-retest method was used. The scale was applied to the 20 respondents of non-sample area and the scale was re-administered to the same group of respondents after an interval of 15 days. The correlation co-efficient of the scale scores, taken at two different times was observed to be 0.82. It proves a quite high temporal reliability and stability of scale.

b. Inter-judge reliability

For testing the stability of scale, it was administered to 20 randomly selected respondents by the 2 independent judges. The rank order correlation between the scores obtained by 2 independent judges was very high (0.86). This established the reliability of the scale as far as the interviewer bias was concerned. The results of test and retest method and inter-judge reliability test in present case have established reliability of SEU scale in terms of its stability in measurement of SEU of farmers.

5. Validity testing of the scale

The validity is property of scale that ensures that the obtained SEU score correctly measures variable they are supposed to measure. In the present case the validity of the scale was established by the using content validity.

Content validity

Content validity is also called face validity (Garrette and Woodworth 1967). Content or face validity is the validity when it appears to measure whatever the author had thought to measure. Judgement of face validity is very helpful in helping the author to decide whether the items are relevant to some specific situation. Therefore, the choice of the item in content validity depends upon the judgement of competent person about its suitability for the purpose of the test.

The content validity of the present scale was established on the basis of incision of the appropriate indicators of SEU of farmers. The selection of items was based on careful examination of literature and judgment of specialists of the government, non- government personnel working for agricultural, dairy and rural development. The selection of items and assessment of their importance was also decided on the basis of the judgments of the experts. Although there is no numerical way to express content validity, but the contents in it established the content validity.

6. Final structure of the socio-economic status scale

Sl. No.	Item/Indicator	Score Cumulative weight
1.	Occupation	14.77
(a)	Main occupation of respondent	
(b)	Occupation of spouse and other dependent	
	Weighted Score = Raw Score×14.77=	
	(score a + b) ×14.77	A
2.	Land holding	13.8
(a)	Farm size	
(b)	Ownership of land	
(c)	Source of irrigation	
(d)	Cropping pattern	
(e)	Type of cultivation	
(f)	Contingency paid to workers yearly	
	Weighted Score = Raw Score×13.8 =	
	(score a+b+c+d+e+f) ×13.8	B
3.	Animal holding	12.55
(a)	Cross bred cow	
(b)	Buffalo	
(c)	Non descript cow	
	Weighted Score = Raw Score×12.55 =	
	(score a+b+c) × 12.55	C
4.	Annual income	11.62
(a)	Service and/or business	
(b)	Dairying	
(c)	Agriculture	
	Weighted Score = Raw Score×11.62=	
	(score a+b+c) × 11.62	D
5.	Material Possession	10.82
(a)	Farm implements and equipments	
(b)	Transport	
(c)	Household equipments	
(c.1)	Grain storage	
(c.2)	Furniture	
(c.3)	Other household equipments	
(d)	Farm structure	
(d.1)	Cattle shed	
(d.2)	Implement shed	
(e)	Dairy equipments and appliance	
	Weighted Score = Raw Score×10.82=	
	(score a+b+c1+c2+c3+d1+d2+e)×10.82	E
6.	Investment	9.52
(a)	Investment on agriculture	
(b)	Investment on Livestock	
(c)	Investment on agriculture machinery	
(d)	Investment on farm building/cattle shed	
(e)	Investment on equipments and Appliance	
	Weighted Score = Raw Score×9.52=	
	(score a+b+c+d+e) × 9.52	F
7.	Household	8.47
(a)	Ownership of house	
(b)	Type of house	
(c)	Other facilities	
(d)	Lightening facility	
(e)	Rooms in the house	
(f)	Storage room available	
(g)	Condition of the house	
	Weighted Score = Raw Score×8.47=	

	(score a+b+c+d+e+f+g)x8.47	G
8.	Milk Production	7.42
(a)	Cross bred cow	
(b)	Buffalo	
(c)	Non-descript cow	
	Weighted Score = Raw Score×7.42= (score a+b+c)x7.42	H
9.	Family education	6.7
(a)	Respondent's education	
(b)	Wife's education	
(c)	Dependent's education	
	Weighted Score = Raw Score×6.7= (score a+b+c)x6.7	I
10.	Decision making	5.5
(a)	Dairy activities	
(b)	Family welfare related activities	
(c)	Agriculture activities	
	Weighted Score = Raw Score x5.5= (score a+b+c)x5.5	J
11.	Social Participation	4.42
	Weighted Score = Raw Score×4.42=	K
12.	Communication pattern	3.52
(a)	Extension contact	
(b)	Mass media exposure	
(c)	Personal localite sources use	
	Weighted Score = Raw Score×3.52= (score a+b+c)×3.52	L
13.	Milk sale	2.37
	Weighted Score = Raw Score×2.37	M
14.	Employment generation (hours/day)	1.52
(a)	Dairy Enterprise	
(b)	Agriculture operation	
	Weighted Score = Raw Score×1.52= (score a+b)x1.52	N
15.	Milk consumption	1.0
	Weighted Score = Raw Score×1=	O

7. Categorization of the socio-economic status scale

The categorization of SES scale has been done into 5 categories on the basis of minimum and maximum obtainable score, keeping an equal interval.

While categorizing respondents on SES, the class interval between different categories was decided using following formula:

$$\text{Class interval} = \frac{\text{Maximum weighted average score- Minimum weighted average score}}{5}$$

$$\frac{98.50–1.96}{5} = \frac{96.54}{5} = 19.30 + 1.96 = 21.26$$

Minimum weighted average score is further added to the obtained formula value to ascertain the final class interval.

The class interval was used to categorize the socio-economic status weighted scale into very low, low, medium, high and very high.

SUMMARY

The socio-economic status (SES) of the farmers referred to the position of an individual or his family member held in the society. The socio-economic status scales developed earlier are not exactly suitable in the present changed socio-economic scenario and rural situation. The need for appropriate socio-economic status measuring tool has been felt with relevant indicators to suit the present scenario. The selected indicators of the socio-economic status scale were referred to 80 judges to get the mean relevancy score. The correlation co-efficient of the scale was observed to be 0.82. It proves a quite high temporal reliability and stability of scale.

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