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RESEARCH ARTICLE

Divulging the magnitude of socio-economic empowerment of dairy women in East district of Sikkim

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Abstract: Farm women are responsible for sustainable food and livelihood security. A study was undertaken to measure the socio-economic empowerment of dairy farm women in East district of Sikkim with sampling size of 200 on the year 2021. An index was prepared for measuring the empowerment scores of farm women. The criteria for selection of farm women were based on possession of at least one milch cattle. The study revealed that, 36.50 percent of the respondents possessed high empowerment scores, while 35.00 percent of the respondents possessed medium empowerment scores and only 28.50 percent possessed low empowerment score. There was a significant difference in the empowerment scores of socio-economic variables like, age, education, marital status, milk production per day (in lit), social status, farming experience in dairying, annual income through dairying and occupation. Young age category was having the highest empowerment scores with 81.48±1.16. Graduate and above category also possessed high empowerment scores with 87.56±1.96. In the case of social status, Other Backward Caste had high empowerment score with 81.46±2.68. Respondents whose occupation was government service+ dairy farming possessed high empowerment scores with 89.10±2.37 while, medium annual income category had the highest empowerment scores with 76.80. Variables like, age, education, marital status, farming experience in dairying, family size, occupation had a significant association with the empowerment score. The study suggests suitable reform in extension service of the state which will mobilize the potential of dairy farm women to adopt sustainable dairy technology and create a means for additional income.

Keywords: Farm women, Sustainable, Socio-economic empowerment**Introduction**

Empowerment refers to the authority given to the under privileged individual or a community in terms of social, economic, political aspect which enables them to make their own decisions and live life according to their own choices. Dairy farming is one of the ways to empower farm women by providing means of extra income for sustainable livelihood. Women's participation in economic activities increased after practising small scale dairy farming (Yasmin and Ikemoto, 2015). Sharma et al. (2015) have reported that women engaged in scientific dairy practices and milk production practices, showed increase in their income through the sale of milk and milk products. Small scale dairy farming women were able to make decision regarding household and personal care, gained self-confidence, and self-esteem, increased social participation and overall increased the empowerment of women in the area (Islam et al. 2019). Economic empowerment of farm women increased as a result of their increase in income and there was increase in social empowerment as the social status was enhanced after joining the dairy cooperative (Dash et al. 2020). Many studies have shown, dairy farming as a tool for achieving progress in empowerment of farm women. The objective of this paper is to measure the magnitude of socio-economic empowerment of the women dairy farmer in East Sikkim. Therefore, an ex-post facto study was conducted to measure the socio-economic empowerment among women dairy farmers and to view the magnitude of association of socio-economic variables on the empowerment scores in the state of Sikkim.

Materials and methods

The study was conducted in East district of Sikkim, where four blocks namely Nandok, Ranka, Rakdong Tintek and Khamdong was selected randomly. Under each block five villages each was randomly selected. Ten respondents each from the selected village possessing at least one dairy cattle were taken in to consideration.

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The total respondents were 200. Collection of data was proceeded through personal interview of prepared index for measuring the socio-economic empowerment.

For index development, five major dimensions, social, economic, freedom to mobility, technical knowledge possession and decision-making factor were used. Under each dimension items/ statements were selected based on secondary sources. For validity purpose, items/statements along with dimensions were sent for judges rating via google form to 150 judges. Scientist, subject matter specialist, assistant professor and expert in the field of women empowerment were selected as judges. Out of 150 judges 58 responses were taken into consideration. They were requested to allot appropriate weightage to the five dimensions, out of 100. The weighted scores were presented in (Table1). Under each dimension statements were provided with 3-point continuum i.e. "Most relevant", "Relevant" and "Irrelevant" for which scores provided were 3, 2, 1. The statements were also sent to the same judges in google form format via email to suggest the degree of relevancy of statements. Out of 150 judges, 58 responses were received and the means of the dimensions were calculated and weightage was taken. The relevancy weightage (RW)was calculated by using the given formula and the statement having more than 0.7 relevancy value were selected for index preparation. Total of 44 statements were taken in consideration under the five dimensions of empowerment

$$RW = \frac{\text{Most relevant responses} \times 3 + \text{Relevant responses} \times 2 + \text{Not relevant responses} \times 1}{\text{Maximum possible scores}}$$

The response of selected items/statements were provided with nominal values (Yes, 1 and No, 0) for measurement of empowerment. Weighted average method was applied to determine the empowerment scores. Weighted score for each dimension was calculated by multiplying the percentage scores of each dimension by their respective weights. Socio-economic empowerment index (SEI), was obtained by adding the weighted score of each of the dimension of a respondent and then divided by 100. Statistical tools like, ANOVA, Post hoc test and Chi-square test were used.

Results and discussion

It showed, post hoc analysis in empowerment score among various socio-economic variable of the respondent. Age ($p<0.05$) was having a statistical difference in the empowerment scores between the categories. Similar results were reported by (Batool and Jadoon, 2018). The empowerment scores of young aged and middle aged categories showed significant difference with that of old aged category. Younger generation were more empowered that the older generation due to technological advancement and educational reform. Education ($p<0.05$) showed significant difference in the empowerment scores between the level of education. Similar results were reported by (Das et al. 2019, Shanti and Murty, 2019). As the level of education increased, so did the empowerment scores of the respondents. Marital status of the respondents ($p<0.05$) displayed a significant difference in empowerment scores. Similar findings were observed by (Redzuan et al. 2010). The table also showed that married and unmarried women were possessing a higher empowerment score than widow. Widow were often neglected and viewed as outcast in the society. Milk production per day (in lit) ($p<0.05$) showed a significant difference in empowerment scores between the categories. The respondent belonging to medium milk production categories possessed higher empowerment scores. Social status ($p<0.05$) displayed a significant difference in empowerment scores between the categories. Other Backward Caste were more empowered than other communities. The social structure of OBC community were favouring empowerment of women in their community by encouraging them to actively participate in social activities, while the Scheduled Caste and Scheduled Tribe community were still having a traditional outlook toward empowerment of women. Farming experience in dairying ($p<0.05$) exhibited significant difference in empowerment scores between the group. The low experience category was more empowered as the respondents under this category were possessing knowledge about the advantage of dairy business and new technology in the field, while other categories were still following traditional dairy practices. Herd size ($p>0.05$) was having non significant difference in empowerment scores. Annual income ($p<0.05$) showed a significant difference in empowerment scores. Similar results were reported by (Shanti and Murty, 2019). The medium income and low income categories were more empowerment than high income category. The respondents under high income category were bound to maintain their high social status, leading to various restrictions in the society. Occupation ($p<0.05$) displayed a significant difference in their empowerment scores between the categories. The respondents under the govt service+ dairy farming category were more empowered that the other categories, as the respondents were employed and had exposure to various developmental activities.

The finding indicates the distribution of dairy farm women according to the empowerment scores and socio-economic variables. Age: It can be seen that, 21.00 percent of total respondents who fell under middle age group and 13.00 percent of total respondents who fell under young age group were possessing high empowerment scores as compared 2.50 percent of total respondents who fell under old age group. The table also

Table1 Weightage score given by the judges

Weightage to dimensions	Scores (out of 100)
(W1) Social dimension (SD)	19.67
(W2) Economic dimension (ED)	23.05
(W3) Freedom to mobility dimension (FMD)	24.57
(W4) Technical knowledge dimension (TKD)	16.06
(W4) Decision making dimension (DMD)	16.65

showed that 44 respondents, of total respondent under old age category were having low empowerment scores, which showed that old aged category and empowerment were having negative relation. Education: It can be seen that,18.50 percent of total respondents who fell under illiterate category were having low

Table 2 Difference in empowerment scores of dairy farm women with respect to socio-economic variables using ANOVA, post hoc test (n=200)

Sl.no	Variables	Categories	Empowerment Scores
			Mean ± SEM
1.	Age	Young (up to 35)	$81.48^{a}_{\pm}$ 1.46
		Middle (36-50)	$79.70^{a}_{\pm}$1.63
		Old (>50)	$63.35^{b}_{\pm}$ 1.71
2.	Education	Illiterate	$61.33^{a}_{\pm}$ 1.80
		Primary	$74.57^{b}_{\pm}$1.90
		Secondary	$80.64^{bc}_{\pm}$ 1.96
		Higher sec.	$81.99^{cd}_{\pm}$ 2.26
		Graduate and above	$87.56^{d}_{\pm}$1.96
3.	Marital status	Married	$74.81^{a}_{\pm}$ 1.20
		Unmarried	$75.30^{a}_{\pm}$ 2.50
		Widow	$61.74^{b}_{\pm}$ 0.92
4.	Milk production/day (in litres)	Low (<7 lit)	$74.62^{ab}_{\pm}$ 1.41
		Medium (7 -13.50lit)	$76.55^{b}_{\pm}$ 1.84
		High (>13.50lit)	$67.83^{a}_{\pm}$ 4.09
5.	Social status	General	$75.20^{ab}_{\pm}$1.62
		OBC	$81.46^{b}_{\pm}$2.62
		SC	$68.75^{a}_{\pm}$3.80
		ST	$73.51^{a}_{\pm}$1.10
6.	Farming Experience in dairying (In years)	Low (<13.08)	$79.87^{a}_{\pm}$ 1.41
		Medium (13.08-28.40)	$74.25^{b}_{\pm}$ 2.15
		High (>28.40)	$67.25^{c}_{\pm}$ 1.11
7.	Herd Size	Small (<3)	$71.43_{\pm}$1.52
		Medium (3-5)	$72.27_{\pm}$2.30
		Large (>5)	$68.37_{\pm}$4.83
8.	Annual income through dairying (in Rs)	Low (<0.99 lakhs)	$73.78^{a}_{\pm}$1.47
		Medium (0.99-4.19lakhs)	$76.80^{a}_{\pm}$1.60
		High (>4.19 lakhs)	$60.39^{b}_{\pm}$8.60
9.	Occupation	Dairy farming	$68.07^{a}_{\pm}$ 1.65
		Crop+ Dairy farming	$68.17^{a}_{\pm}$ 3.35
		Labour work + Crop+ Dairy farming	$76.70^{a}_{\pm}$ 2.18
		Govt service+ Dairy farming	$89.10^{b}_{\pm}$ 2.37

(Different superscript indicates significant difference at 5 percent level of significance)

empowerment scores, while respondents having primary and above education level were having high empowerment scores. Marital status: It can be seen that; 71 married respondents were highly empowered than unmarried and widow. Family type: It can be observed that, 25.50 percent and 23.50 percent of total respondents who fell under nuclear family type were having medium and high empowerment scores as compared to 9.50 percent and 13.00 percent of total respondents who fell under joint family. Family size: It can be observed that, 22.50 percent of total respondents who resided in large sized farming possessed high empowerment scores as compared to 14.00 percent of total respondents who fell under small family size. Milk production per day: It can be seen that, 23.50 percent and 23.00 percent of total respondents who fell under low milk production category were possessing medium and high empowerment scores, respectively. Social status: it can be observed, (17.00% of total

Table 3 Distribution of dairy farm women according to empowerment scores and socio-economic variable

Sl.no	Variables	Categories	Empowerment score			Total
			Low	Medium	High	
1.	Age	Young (up to 35)	3 (1.50)	25 (12.50)	26 (13.00)	54 (27.00)
		Middle (36-50)	10 (5.00)	24 (12.00)	42 (21.00)	76 (38.00)
		Old (>50)	44 (22.00)	21 (10.50)	5 (2.50)	70 (35.00)
2.	Education	Illiterate (0)	37 (18.50)	16 (8.00)	2 (1.00)	55 (27.50)
		Primary (1)	14 (7.00)	23 (11.50)	21 (10.50)	58 (29.00)
		Secondary (2)	6 (3.00)	13 (6.50)	23 (11.50)	42 (21.00)
		Higher sec. (3)	0 (0.00)	10 (5.00)	14 (7.00)	24 (12.00)
		Graduate and above (4)	0 (0.00)	8 (4.00)	13 (6.50)	21 (10.50)
3.	Marital status	Married (1)	49 (24.50)	59 (29.50)	71 (35.50)	179 (89.50)
		Unmarried (2)	2 (1.00)	11 (5.50)	2 (1.00)	15 (7.50)
		Widow (3)	6 (3.00)	0 (0.00)	0 (0.00)	6 (3.00)
4.	Family type	Nuclear (0)	36 (18.00)	51 (25.50)	47 (23.50)	134 (67.00)
		Joint (1)	21 (10.50)	19 (9.50)	26 (13.00)	66 (33.00)
5.	Family Size	Small Family (up to 4)	15 (7.50)	36 (18.00)	28 (14.00)	79 (39.50)
		Large Family (>4)	42 (21.00)	34 (17.00)	45 (22.50)	121 (60.50)
6.	Milk production/ day (in litres)	Low (<7 lit)	38 (19.00)	47 (23.50)	46 (23.00)	131 (65.50)
		Medium (7 -13.5 lit)	13 (6.50)	13 (6.50)	24 (12.00)	50 (25.00)
		High (>13.5lit)	6 (3.00)	10 (5.00)	3 (1.50)	19 (9.50)
7.	Social status	General	24 (12.00)	32 (16.00)	34 (17.00)	90 (45.00)
		OBC	4 (2.00)	5 (2.50)	10 (5.00)	19 (9.50)

		SC	12 (6.00)	3 (1.50)	9 (4.50)	24 (12.00)
		ST	17 (8.50)	30 (15.00)	20 (10.00)	67 (33.50)
8.	Farming Experience in dairying (In years)	Low (<13.08)	11 (5.50)	33 (16.50)	42 (21.00)	86 (43.00)
		Medium (13.08-28.40)	14 (7.00)	16 (8.00)	21 (10.50)	51 (25.50)
		High (>28.40)	32 (16.00)	21 (10.50)	10 (5.00)	63 (31.50)
9.	Landholding	Marginal (<1ha)	53 (26.50)	66 (33.00)	71 (35.50)	190 (95.00)
		Small (1-2ha)	4 (2.00)	4 (2.00)	2 (1.00)	10 (5.00)
10.	Herd Size	Small (<3)	34 (17.00)	45 (22.50)	47 (23.50)	126 (63.00)
		Medium (3-5)	17 (8.50)	18 (9.00)	19 (9.50)	54 (27.00)
		Large (>5)	6 (3.00)	7 (3.50)	7 (3.50)	20 (10.00)
11.	Annual income through dairying (in Rs)	Low (<0.99 lakhs)	35 (17.50)	44 (22.00)	38 (19.00)	117 (58.50)
		Medium (0.99-4.19lakhs)	18 (9.00)	24 (12.00)	34 (17.00)	76 (38.00)
		High (>4.19 lakhs)	4 (2.00)	2 (1.00)	1 (0.50)	7 (3.50)
12.	Occupation	Dairy farming	41 (20.50)	39 (19.50)	35 (17.50)	115 (57.50)
		Crop+ Dairy farming	10 (5.00)	11 (5.50)	7 (3.50)	28 (14.00)
		Labour work + Crop+ Dairy farming	6 (3.00)	16 (8.00)	22 (11.00)	44 (22.00)
		Govt service+ Dairy farming	0 (0.00)	4 (2.00)	9 (4.50)	13 (6.50)

(Figures in parenthesis indicates percentage)

respondents) falling under general category was having high empowerment scores. On the other hand, highest segment of ST respondents (15.00% of the total respondents) fell in medium category. It can be interesting to say that, a greater number of respondents (10 respondents) from OBC category fell in high empowerment category than that of low and medium empowerment category combined. Farming experience in dairying (in years) showed that 21.00 percent and 10.50 percent of total respondents who fell under low and medium farming experience category, respectively, were possessing high empowerment scores whereas 16.00 percent of total respondents who fell under high experience category were possessing low empowerment scores. Land holding: it can be observed that 66 and 71 respondents, falling under marginal land holding category were possessing medium and high empowerment scores, respectively, whereas only 4 and 2 respondents, falling under small land holding category were possessing medium and high empowerment score, respectively. Herd size: it can be observed that 45 and 47 respondents, belonging to small herd size category were having medium and high empowerment scores, respectively, followed by 18 and 19 respondents belonging to medium herd size category respectively. Under the large herd size category 7 respondents each were possessing medium and high empowerment scores. Annual income through dairying: from the table 2, it was observed that a significant portion i.e., 19.00 percent of total respondents falling under medium income category were possessing high empowerment scores while 17.00 percent of total respondents falling under the low income category were having high empowerment scores. It can be interesting to say that 0.50 percent of total respondents falling under the high income group were having low empowerment scores. Occupation: Table 2, exhibited that 4.50 percent of total respondents belonging to government

service + dairy farming category were possessing high empowerment scores, followed by 11.00 percent of total respondents belonging to "labour work +Crop +dairy farming" category were also having high empowerment scores. It can be seen that higher segment i.e. (20.50%) of total respondents belonging to dairy farming category were possessing low empowerment scores, while 5.00 percent of total respondents falling under "Crop+dairy" farming category were possessing low empowerment scores. It was also observed that under "government service + dairy farming" none of the respondents were possessing low empowerment scores.

The chi-square analysis showed that age ($p<0.01$) was having a significant relation with empowerment score at 1 percent level of significance. The findings are in line with the study of (Khan et al. 2008; Sheikh et al. 2016). Education ($p<0.01$) was significantly associated with empowerment scores at 1 percent level of significance. Similar findings have been reported by (Bharathamma et al. 2006; Kaushal and Singh, 2010; Sheikh et al. 2016). Education and empowerment have a direct relationship (Thapa and Gurung, 2010). Marital status($p<0.01$) had a significant association with empowerment score at 1 percent level of significance. Results are in line with the finding of (Sheikh et al. 2016) who reported marital status had a negative but significant relationship with empowerment. Farming experience in dairying ($p<0.01$) was also having a significant relation with empowerment score at 1 percent level of significance. Variables like family size ($p<0.05$) and occupation ($p<0.05$) were having a significant relationship with the empowerment scores at 5.00 percent level of significance. Kaushal and Singh (2010) and Damodar et al. (2016) reported that family occupation had a significant relation with empowerment. Family type, social status, land holding, annual income through dairying, milk production per day, herd size showed a non-significant relationship with the empowerment scores. Das et al. (2019) observed in their study that family type and social status had a non-significant relation with the empowerment scores. Since, most of the parameter under the study shows significant difference with the empowerment. It can be further strengthened by enhancement of institutionalised dairy intervention approaches in the state.

Block wise variation in the empowerment scores showed that there was no significant difference in the empowerment scores between the blocks. Dairy entrepreneurship programs can be organized in each block for the upliftment of women empowerment. Dairy campaign with the help of stakeholders can be organized in the blocks. Appropriate rewards can be provided to the farm women for encouraging dairy entrepreneurship.

It showed the distribution of respondents according to their overall socio-economic empowerment scores, 36.50 percent of the respondents possessed high empowerment scores, 35.00 percent possessed medium scores while 28.50 percent possessed low empowerment scores in the study area. Since, majority of

Table 4 Association of socio-economic variables with the empowerment scores

Sl. no	Socio-economic variables	Empowerment scoresChi-square value
1.	Age	73.84**
2.	Education	73.63**
3.	Marital Status	25.55**
4.	Family type	1.69^{NS}
5.	Family size	8.36*
6.	Milk production/ day (in lit)	7.17^{NS}
7.	Social status	12.53^{NS}
8.	Farming experience in dairying (in years)	30.21**
9.	Land holding	1.35^{NS}
10.	Annual Income through dairying (in Rs)	6.16^{NS}
11.	Herd size	0.41^{NS}
12.	Occupation	18.15*

*** Significant (p<0.01), * Significant (p<0.05)*

Table 5 Block wise variation in empowerment scores

Sl.no	Block	Empowerment scores
1.	Nandok	70.24 ± 2.48
2.	Ranka	71.62 ± 2.48
3.	Rakdong Tintek	70.47 ± 2.48
4.	Khamdong	73.05 ±2.48

Table 6 Distribution of respondents according to empowerment scores

Sl. no	Empowerment scores	Frequency	%
1.	Low (<59.74)	57	28.50
2.	Medium (59.74-80.74)	70	35.00
3.	High (>80.74)	73	36.50

the respondents have high to medium level of empowerment, reinforcement of appropriate strategies will strengthen the level of empowerment in the state. Encouraging the formation of SHGs and women dairy cooperatives among the young and educated farm women. Promotion of micro enterprise among farm women through hands on training on value additions and management skills. Exposure to innovative dairy practices. Stakeholders like KVKs, NGOs, state department can provide livestock assets for small herd size farmers. Target dairy schemes can be provided to the ST/SCs farm women. Training on capacity building, leadership development and confidence building measure can be organized by the state to elevate farm women empowerment.

Conclusion

The socio-economic empowerment of the majority of farm women was found to be moderate to high level. There was a significant difference in the empowerment scores of socio-economic variables like, age, education, marital status, milk production per day (in lit), social status, farming experience in dairying, annual income through dairying and occupation. Variables like, age, education, marital status, farming experience in dairying, family size, occupation had a significant association with the empowerment score. Thus, empowerment of farm women in the state can be enhanced by targeting the young aged, educated and married women by providing capacity building and knowledge through training on different advanced dairy technologies.

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