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Research Article

Measuring The Perceived Constraints Of Milk Cooperative Society By Small Farmers

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ABSTRACT

This study aims to explore the perception of small farmers with the cooperative societies engaged in milk business in Haryana in order to assess the factors for analyzing the perception of farmers with cooperative societies. The study has employed the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) statistical tools to establish the validity and reliability of the proposed instrument. The results supported the five components of the proposed instrument, demonstrating a high level of reliability, validity, and uni-dimensionality for each construct. The study revealed that the cooperative societies are unable in achieving their objectives for which they are formulated in Haryana. The tool can offer decision-makers valuable insights for small farmers' perception with cooperative societies. The study's societal and scientific significance is discussed, considering its real world and implications.

Keywords; Small Farmers, Milk, Cooperative Societies, AMOS, EFA, CFA

1. Introduction

Between 9000 and 7000 BC, animals were raised for meat and milk production. Milk is one of the oldest and most universal foods, replacing meat as the main food source (Kurlansky, 2018; Velten, 2010). Milk production supports livelihoods, nutrition, and food security. About 150 million households work in the milk industry. Small farmers produce most of it in developing nations, which account for a large share of global dairy output. Some countries have a long history of milk production as an important economic activity, while others have just started commercial milk production (Milk Production, 2023). India produces 23% of the world's milk (Milk production in India, 2022). Milk is considered holy and prestigious in Indian culture due to its nutritional value. After launching 'operation flood' in the 1970s to boost the milk-based economy, India became the world's largest milk producer. Since this initiative, formal and informal milk production has increased. Modern infrastructure developed quickly. Privatization of the dairy industry began in 1991 (Milk production in India, 2022). Eliminating licensing requirements was meant to boost the dairy industry, benefiting producers and consumers. Private sector investments increased with milk sector licencing removal and modern technology adoption (Ibrahim, 2014). These investments increased value addition and boosted dairy industry growth. The Indian dairy industry produces 50-55% Traditional Indian Dairy Products, according to Bandyopadhyay and Khamrui (2007). India's dairy industry includes milk products and liquid milk. Singh (2007) states that organized liquid milk producers include cooperatives and traditional private channels. Some domestic and international private companies sell dairy products beyond milk. After the 1991 New Economic Reforms, private players entered this sector, according to Shah et al. (1995). This inclusion boosted sector growth.
Since Haryana includes milk in its primary diet, milk is important. Haryana is known as "dudh dahi ka khana" (milk, curd, and other milk products are prized). Fertile land, reliable irrigation, and high-yielding animal breeds make Haryana a milk production hotspot. Farmers are open to new ideas and have adopted advanced milk technologies early. Since they could meet urban milk demand, cooperatives gained a large share of the dairy industry (Singh et al., 1998). Haryana is a major livestock producer in India despite its small size. It

produces over 5.6 percent of the nation's milk, 98.09 lakh tons. Haryana has only 2.5% of India's cattle population, but its per-capita per-day milk availability is nearly 1005 grams, compared to 375 grams nationally (Department of Animal Husbandry and Dairying Ministry of Fisheries, 2020). However, milk marketing is difficult. Milk spoils quickly and cannot be stored for later sales. However, cooperatives' cooling tanks allow farmers to collect and preserve milk for more than a day, making it available to processors. Milk is harvested twice a day, and demand and supply occur countercyclically year-round (Hovhannisyan et al., 2005). Farmers founded the popular milk cooperative society. These societies were founded to secure financial stability, reputation, and milk price stability (Franks, 2002). By providing farmers with stable markets and services, dairy cooperatives helped grow the dairy industry (Liebrand and Ling, 1991). Later, as the dairy industry matured and private players entered, the cooperative society concept changed. Private organizations prioritized economic factors, while dairy cooperative members valued ownership (Jitmun et al., 2019). The basic concepts or term concerned with the Cooperative Societies:

Producer: 'Producer is a person busy in dairy farming.'

Primary Dairy Co-operative Society: 'A dairy cooperative Society is an autonomous association of dairy farmers, united voluntarily to meet their everyday economic needs.'

Milk Vendor: 'Milk is collected from the farmers by this person and then further distributed to customers on a door-to-door basis.'

Consumer: 'The last individual in this chain is the consumer, who purchases milk from the milk union at a fixed price (Saikia *et al.,* 2020).'

The term "small farmer" encompasses low-income individuals engaged in agricultural, livestock, and aquatic activities, including landless laborers and tenants. This classification is based on four criteria prevalent in rural areas: income level, the quantity of productive assets like land, animals, equipment, and other related factors (Food and agriculture organisation, 1978). Based on the research results, small farms emerged as the primary milk producers (Huang *et al.,* 2012).

2. Literature Review

Cooperative societies promote rural development and provide additional income. These cooperatives improve food security and poverty in their countries (Sevinc, 2021). Milk was marketed through multiple channels (Bui et al., 2013). These cooperatives have slow growth due to low institutional capacity, insufficiently trained staff, a lack of entrepreneurial skills, limited financial resources, inadequate market information, and low member participation. Together, these factors limit cooperative societies' ability to drive rural development (Benson, 2014).

2.1 Cooperative society and Pricing

The literature on milk and related topics focuses on what leads farmers to form cooperative societies, sell their milk to them, and do business through them. Primary dairy cooperative societies offer fair prices, so farmers sell milk there. Farmers chose cooperative societies for milk sales because of their reasonable prices (Saikia, 2020; Jitmun et al., 2019), but Forney and Häberli, (2017), Kunte and Patankar, (2015), Radder and Bhanj, (2011), and Sulaiman and Pillai, (2006) were dissatisfied. Farmers were also unwilling to join cooperatives due to low milk production. The milk price was crucial to milk business volume. Price is crucial to farmers' cooperative membership (Gamit et al., 2021).

2.2 Benefits and problem of Dairy Cooperatives in Milk Marketing

Dairy farming generates income, so farmers must be empowered and trained to increase productivity (Kingori, 2022). Rural cooperative societies improved milk marketing, but most farmers were dissatisfied with organizations' efforts to improve milk marketing. Only when market access was unavailable did some farmers choose cooperative society (Singh, 2012). This study found that farmers valued the dairy cooperative's marketing services and market facilities (Birthal et al., 2017; Rathod, 2012). Farmer views of the milk market are positive. Market participant households were viewed more favorably than non-participant households in cooperative societies. The research area had low milk market participation, but a small supplier supplied over 50% of the milk. To increase smallholder market participation, milk supply volume, and farmer perception, the research area must create and expand milk markets, improve milk production, and raise milk prices (Kehali, 2022).

2.3 Financial issues with cooperative society

Most farmers sold milk through cooperatives (Hovhannisyan et al., 2005). Farmers choose dairy cooperative societies to sell milk because they get a ready market and program information (Saikia, 2020). Farmers lack financial support (Surkar et al., 2014; Wani, 2016). Access to commercial services like financing is crucial to cooperative viability (Bekele, 2021). The milk industry and milk processing industry depend on milk collection centers for operational and financial support, but farmers were unhappy with credit services (Jitmun et al., 2019). However, dairy marketing cooperative members have better credit (Bekele, 2021).

2.4 Input support by cooperative society

Lack of green forage, cattle infertility, high medicine costs, inadequate treatment services, unfavorable weather, veterinary services, high dairy animal costs, and high feed costs are problems for dairy farmers (Gamit et al., 2021). This study found that dairy producer farmers are more likely to join dairy cooperatives if they receive fair-priced input (khal, binola, etc.), fodder seed supply, veterinary services, advisory services, and other benefits. Thus, dairy marketing cooperatives' amenities and services will encourage dairy farmers to join (Bekele, 2021). Farmers were also limited by a lack of milk quality knowledge, milk testing, animal screening facilities, nutritious feed, cooperative societies, and scientific dairy farming. These factors caused low cooperative society participation (Surkar et al., 2014; Wani, 2016). Lack of feed and concentrate, veterinarian and diagnostic facilities, and information and technology understanding continue to plague farmers (Sulaiman and Pillai, 2006, Kunte and Patankar, 2015). Inputs, technical support, and business services are scarce for dairy farmers (Bekele, 2021). Milch animal households cited technical and other constraints as the lack of emergency veterinary services, improved equipment, and irregular and insufficient cattle feed (Saran et al., 2020). Creating and expanding milk markets and veterinary services is crucial (Kehali, 2022).

2.5 Cooperative society and intermediaries

Milk collection centres (MCC) help farmers market their milk (Jitmun et al., 2019). Small farmers sell milk to dairy collectors, who deliver it to processors (Bui et al., 2013). Raw milk traders dominated milk marketing, followed by traditional milk processors (Kumar et al., 2010). Milk vendors made huge profits as intermediaries in milk marketing (Singh et al., 1998). Farmers sold a little to markets and neighbors. Much has been sold through Gowalla. Goingla buys fresh milk from various households. They then mix it with water and milk powder for profit. Local Gowallas delivered milk to urban markets. Farmers sold only extra milk to Gowalla after meeting family consumption needs (Ghosh et al., 2002). Marketing challenges included value-added product marketing and middleman exploitation (Saran et al., 2020).

3. Research Design

This study aims to create and validate a comprehensive tool for assessing small farmers' perceptions of cooperative societies. An in-depth analysis of milk cooperative society literature provided valuable insights into how small farmers perceive and engage with cooperative societies. In the beginning, 29 items from the literature were chosen to assess small farmers' perceptions. There were no tools or conceptual models to fully represent small farmers' views of cooperative societies. Thus, the literature review guided the instrument statement pool creation. The preliminary stage included quantitative research to better understand rural areas and improve the tool. This survey combines review and quantitative study findings to create a reliable and effective tool for assessing small farmers' perceptions of cooperative societies.

3.1 Preliminary study

A preliminary investigation selected thirty-four specialists with prior experience selling milk in Haryana cooperative societies in winter 2022. Three stages were used to select experts. The first step was to find cooperative milk sellers. We invited experts to step two. After participating, they were asked to suggest more specialists. Finally, we assembled an expert panel with the most relevant work field diversity. Only 25 of 34 experts who requested semi-structured interview supervision were appointed. The panel's experts had diverse backgrounds. These experts knew cooperative societies well. Three phone interviews and most face-to-face interviews were conducted in the experts' homes in each location. We explained the study's goals to each panelist before asking open-ended questions. Open-ended questions reduce the risk of investigators missing important information (Nworie, 2011). Open-ended questions give experts time to respond honestly and share their thoughts on the topic (Pereira and Alvim, 2015). Three questions about small farmers' perceptions of cooperative societies were chosen, such as "Explain the difficulty related to the price decided." The questions "What basic facilities are provided by cooperative societies?" and "What challenges have you faced when selling milk in these societies?" asked subjects about their perception of cooperative societies. Deciphering the massive data set was a crucial and difficult part of the study. The qualitative analysis of the questions revealed 29 keywords describing small farmers' views of cooperative societies. In particular, the initial question (explain small farmers' perceptions with cooperative societies) allowed experts to answer openly based on their perception and add important details to define the theme and items. Based on qualitative results, we created 29 items about small farmers' cooperative society perceptions.

3.2 Statements and instrument development

After reviewing experts' opinions and literature, we included 29 questionnaire components to assess small farmers' views of cooperative societies. The survey was in English and Hindi. Based on the literature review and quantitative study, the researcher created a preliminary structured, closed-ended questionnaire with 29 statements. Small farmers were asked to rank 29 factors in order of importance and necessity to determine their perception of cooperative societies. This ranking process helped us determine each factor's relative impact on small farmers' perception on a 5-point Likert scale: “1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree”.

Also, respondents were asked about the items' uncertainty, clarity, language, and content. Only 21 experts who were contacted for open-ended interviews agreed to refine the scale items. Instrument statements were chosen with respondents' consent. Respondents considered all 29 elements important and relevant to the research. By mistake, 25 items were chosen, leaving four. In the next round of evaluation, respondents agreed 23 items were appropriate and necessary and the questionnaire needed no changes. Respondents' opinions were sought throughout questionnaire development. The survey instrument improved gradually as a result. Multiple respondent reviews ensured the instrument's face and content validity.

3.3 Pilot testing

"Questions that have been used frequently before must have gone through substantial piloting," Dornyei and Taguchi (2009) noted. We plan a final pilot survey with a small sample size to assess small farmers' perception toward cooperative societies and further validate the tool before collecting real data. The questionnaire received 35 responses. A questionnaire was used to collect data, and factor analysis was performed using SPSS 22 (Statistical Package for Social Sciences). The primary goal of factor analysis was to narrow the pool of items. A variety of techniques and approaches can be used to perform factor analysis (Field, 2013). According to Costello and Osborne (2005) and Kaiser (1974), the loading value more than 0.5 is considered "reliable," irrespective of the sample size. Following the initial component analysis, four statements were removed from the analysis due to their construct levels were not deemed essential (Kaiser, 1974), and we at last settled to go with 19 items. The final version of the questionnaire had two sections. Section 1 consisted of questions designed to elicit information about the respondent's characteristics. Section 2 contained 19 elements that were used to assess small farmers' perception toward cooperative societies. The statements were distributed at random in the questionnaire. The instrument's content and faces validity confirmed through experts.

3.4 Data Collection

We used quantitative and exploratory methods in this study. Research relies on primary data. Primary data came from cooperative society milk-selling households. The data was collected using convenience and purposive sampling. Non-probability sampling is more common and suitable for fieldwork research (Bryman and Bell, 2015). We interviewed illiterate farmers and distributed the questionnaire to literate farmers. Our sample started with 350 farmer questionnaires. Requiring correct questionnaire completion narrowed the 350 respondents. Few questions were answered quickly and many had missing data. After filtering, 305 responses were valid for analysis. In this study, 305 responses were satisfactory. With 130 respondents, we got 305 (Bryant and Yarnold, 1995; Bentler and Chou, 1987). We discussed the study's motivation and benefits using its results. We could continue scale development and analysis. Each item was measured on a five-point Likert scale, "1-strongly disagree, 2- disagree, 3- neutral, 4- agree, and 5-strongly agree", based on previously available research directions (Boulding *et al.,* 1993; Babakus and Boller, 1992).

4. Demographic Profile

Table 1 Demographic Profile of the Respondents

Demographics	*Characteristics*	*Frequency*	*%*
Age	18-30	101	33.1
	30-50	108	35.4
	50 and above	96	31.5
Social Category	General 170	55.7	
	OBC 116	38.0	
	SC/ST 19	6.2	
Education	Illiterate	99	32.5
	1st to 8th 70	23.0	
	9th to 12th 51	16.7	
	More than 12th	85	27.9
Marital Status	Married 221	72.5	
	Unmarried	84	27.5
Annual Income	Up-to 1, 00,000	75	24.6
	1, 00,000 to 3, 00,000	180	59.0
	3, 00,000 to 5, 00,000	34	11.1
	5, 00,000 and above	16	5.2

Source: *Survey data*

Table 1 shows respondent demographics. Of the total participants, 101 (33.1%) were 18–30 years old and 108 (35.4%) were 30–50. Additionally, 96 (31.5%) respondents were over 50. According to social category, 170 (55.7%) respondents were general, 116 (38%) were OBC, and 19 (6.2%) were SC/ST. According to education, 99 (32.5%) respondents were uneducated, 70 (23%) had completed 1st–8th grade, and 51 (16.7%) had completed 9th–12th grade. Additionally, 85 (27.9%) respondents were educated beyond 12th grade. There were

221 (72.5%) married respondents and 84 (27.5%) unmarried. In terms of annual income, 75 (24.6%) respondents earned up to 1,00,000 rupees, 180 (59%) earned between 1,00,000 and 3,00,000, and 34 (11.1%) earned between 3,00,000 and 5,00,000. Additionally, 16 (5.5%) respondents earned over 5,000,000 rupees annually. Most respondents worked in agriculture and allied activities.

5. Results and data analysis

To examine the collected primary data, various established statistical methods and procedures were used. Among the essential phases and sequences required for the establishment of scale measurement were confirmation of internal consistency and construct dependability. Following that, the collected data was subjected to factor analysis. Furthermore, CFA "Confirmatory Factor Analysis" was used to certify the validity of the measuring scale. We applied SPSS 22 "Statistical Package for Social Sciences" for EFA (Exploratory Factor Analysis), and AMOS 21 for CFA.

5.1 Instrument Reliability

The dependability of a questionnaire can be used to assess its quality (Broadbent et al., 2006). The reliability of a tool is also required to certify scale validity. The analysis dependability of a tool refers to how stable and consistent test results are. As a result, maintaining the instrument's dependability is essential for developing a dependable instrument. There are several methods for determining an instrument's dependability; however, internal reliability and consistency are easy to measure and have frequently been shown to be useful in field research (Rust and Cooil, 1994). A set of objects or claims that are uniform or homogeneous to varying degrees is referred to as internal consistency. An instrument's internal consistency and reliability can be evaluated using Cronbach's alpha (Sun and Hong, 2002). According to Cronbach (1951), an alpha value of more than 0.7 is considered to be acceptable, more than 0.8 is considered good, and more than 0.9 is considered to show exceptional internal consistency. The overall Cronbach's alpha score for the 19 items in this survey was 0.725, indicating the reliability of the statements.

5.2 Exploratory factor analysis

A statistical technique called exploratory factor analysis (EFA) divides the information from many variables into fewer components. Lewis et al., (2005) and Straub et al., (2004) provided validation criteria indicating that factor analysis be performed using EFA. This will enable you to identify the location of and the dimensions of the objects you are measuring. Usually, EFA comes first when setting up scales. EFA is used to establish a theoretical construct's dimension (Iacobucci, 2010). Data eligibility for factor analysis was assessed using the Bartlett's tests and KMO (Kaiser-Meyer Olkin). To comprehend the pattern and structure of data, use principal components analysis (PCA) and a varimax rotation. The chi-square value calculated was 2034.754 with 171 degrees of freedom, indicating a level of significance of 0.05. The KMO value of 0.779 is also adequate. As a result, the factor analysis performed here can be considered a valid method for further data analysis. Tables 2 and 3 display the EFA results as well as the component definition. The study discovered five factors that accounted for 66.146 percent of the variance. Factor 1 was labeled "society makes extra profit" due to the high loadings of a statement such as; the prices received from cooperative society are lower than market prices, they take milk with lower prices from households and sell to higher prices in market, different cooperative societies decide different rates of milk. The first factor was resilient and explained 16.333 percent of the variance, with an Eigen value of 3.872. Factor 2 was designated as "society unreliable" due to the following goods' heavy loading: they take a larger quantity of milk as a sample, the fat contents of the milk that you sell to cooperative society keep varying, you are dissatisfied with cooperative society's fat measurement, and you are dissatisfied with the price that cooperative society decides on the basis of fat. The Eigen value of the factor was 2.556 and factor 2 stated 14.148 percent of the variation. Factor 3 recognized "no financial support" because a high loading of the following items: the cooperative society does not provide loan facilities, the cooperative society does not provide faster milk payment, and the cooperative society is not always ready to buy milk. With an Eigen value of 2.367, component 3 indicated 13.547 percent of the variation. Factor 4 was referred to as "lack of input support" because of the high loading with the following items: cooperative society does not provide a secure market, cooperative society does not provide inputs (khal, binola) at a fair price, cooperative society does not provide frequent milk quality inspection, cooperative society does not provide advisory service, and cooperative society does not provide training and education services. With an Eigen value of 1.992, this component stated 11.192 percent of the variance. Similarly, factor 5 was referred to as "biased approach" because the high loading with the following items: cooperative societies are held by some influential people; they make differences when taking milk, making payments, and measuring fat. With an Eigen value of 1.780, this component indicated 10.926 percent of the variance. The five elements have been formulated to enhance understanding and illustrate the implications of their statements. F1: Society Makes Extra Profit (SMEP): The components in this factor are related to the cooperative society taking milk at lower price and earning more profits. F2: Society Unreliable (SU): The elements in this component are related to the cooperative societies are unreliable. F3: No Financial Support (NFS): The elements in this component are related to the financial Issue with cooperative society. F4: Lack of Input Support (LIS): The components in this factor are related to the lack of input support. F5: Biased Approach (BA): The components in this factor are related to the biased approach of cooperative society owners.

Table 2 Items loading and Reliability

Construct	Description	Standard Factor loading	Composite reliability	Average variance extracted (AVE)	Maximum shared variance (MSV)
Society Makes Extra Profit	The prices received from cooperative society are lower than market prices.	0.71	0.768	0.524	0.022
	They take milk with lower prices from household and sell to more prices in market.	0.72			
	Different cooperative societies decide different rate of milk.	0.75			
Society Unreliable	They take more quantity of milk as a sample.	0.72	0.832	0.553	0.056
	The fat contents of the milk that you sale to cooperative society keep vary.	0.74			
	You are dis-satisfied with the fat measurement by cooperative society.	0.75			
	You are dis-satisfied with price which decided on the basis of fat.	0.77			
No Financial Support	Cooperative society does not provide faster milk payment.	0.72	0.770	0.527	0.062
	Cooperative society does not provide loan facilities.	0.73			
	Cooperative society is not always ready to buy milk.	0.72			
Lack of Input Support	Cooperative society does not provide a secured market.	0.74	0.840	0.513	0.062
	Cooperative society does not provide inputs (khal, binola) at a fair price.	0.70			
	Cooperative society does not provide frequent milk quality inspection.	0.74			
	Cooperative society does not provide advisory service.	0.70			
	Cooperative society does not provide training and education services.	0.70			
Biased Approach	Cooperative societies are hold by some influential people.	0.71	0.811	0.518	0.014
	They are make differences while taking milk.	0.74			
	They make difference while making payments.	0.72			
	They make difference while measure the fat.	0.71			

***Source**: Survey data*

5.3 Confirmatory factor analysis

The indicated model was investigated using CFA and AMOS 21. Before delving into the relationships between the constructs in the structural model, ensure that the measurement model has the necessary construct validity and reliability (Ifinedo, 2006; Fornell and Larcker, 1981). The final measuring model shows the various variables affecting small farmers' anticipated perception with cooperative societies, is displayed in Fig. 1. Three, four, three, five, and four indicator items, respectively, show the concepts of "Society Makes Extra Profit," "Society Unreliable," "No Financial Support," “Lack of Input Support”, and "Biased Approach". The structures depicted in Fig. 1 were created using empirical research (closed-ended questions), and the EFA and CFA confirmed the structure. As a result, 19 indicators were used to assess the five constructs that indicate small farmers' perception toward cooperative societies. The measuring models' convergent and discriminant reliability were gauged to measure the psychometric qualities (see Table 2). Composite reliability (CR) can be

used to gauge the construct reliability and convergent validity of a measurement model. It determines the regularity of the factor, which includes its firmness and similarity, and takes a more introspective approach to overall reliability (Hair *et al.,* 2010). Scale dependability is sufficient if the CR value is greater than 0.7 (Nunnally and Bernstein, 1994; Fornell and Larcker, 1981). According to Table 2, the composite reliability of the "Society Makes Extra Profit," "Society Unreliable," "No Financial Support," "Lack of Input Support", and "Biased Approach" is 0.768, 0.832, 0.770, 0.840, and 0.811, respectively. As a result, it is possible to conclude that the suggested model's overall reliability for each construct is greater than 0.70, indicating that all constructs illustrating small farmers' perception with cooperative societies taken into account in the model have a high degree of dependability. The degree of item convergence is indicated by a construct's convergent validity (Hair *et al.,* 2010). Standardized construct loadings are also used to test the convergent validity. The components of the construct are likely significant and representative if the standardized construct loading values are high. Their observed variables' standardized construct loadings ought to be higher than 0.50 (Hair *et al.,* 2010). Table 2's variable loadings were found to range between 0.70 and 0.77. The findings revealed that the observed items captured their constructs successfully and significantly. As a result, we know the constructs are rationally convergent.

Table 3: Correlation matrix and roots of AVE's

	F1	F2	F3	F4	F5
F1	**0.724***				
F2	0.150	**0.744***			
F3	0.136	0.236	**0.726***		
F4	0.132	0.207	0.249	**0.716***	
F5	-0.005	-0.119	-0.046	-0.082	**0.720***

* "The diagonal represents the square root of average variance extracted from observed variables (items)"; "The off diagonal represents correlations between constructs".

***Source**: Survey data*

The degree to which one construct differs from another indicates discriminant validity (Hair *et al.,* 2010). We analyze discriminant validity using two methods. The first is the measurement model's correlation coefficient between the various pairs of constructs, which should be low because they are theoretically different. This is because various constructs can be measured using various sets of items. These variables should not be overly correlated because it is expected that they are distinct from one another (Trochim, 2006). Second, the average variance extracted (AVE) indicates whether each of the measurement model's individual constructs is greater than its maximum shared variance, the square root of AVE, and should be greater than the construct correlations. Table 3 demonstrates that "F1" has a weak correlation with "F2", "F3", "F4", and "F5" (0.150, 0.136, 0.132, and -0.005). However, "F2" has a small correlation with "F3", "F4", and "F5" (0.236, 0.207, and -0.119). Similarly, "F3" has low correlation with "F4" and "F5" (0.249 and -0.046). Finally, "F4" has a little negative correlation with "f5" (-0.082). All of the constructs in the model are independent because there is low correlation between them. Additionally, according to the AVE estimates (See Table 2), the individual constructs are larger than their combined variances. In addition, Table 3 shows that for diagonal constructs, the square root of the AVE is higher than for non-diagonal constructs. These results show that each construct in the measurement model has a strong relationship with its items when compared to other constructs in the measurement model. As a result, the suggested measurement model has discriminant validity.

Table 4 Goodness of fit indicators for the measurement model

Model fit Index	chi-square/ Degree of freedom	CFI	GFI	NFI	TLI	RMSEA	
Model	1.522		0.961	0.932	0.896	0.953	0.041

***Source**: Survey data*

To assess the overall validity of the model, model fit indicators such as the NFI "Normed Fit Index", GFI "Goodness of Fit Index", RMSEA "Root Mean Square Error Approximation", CFI "Comparative Fit Index", and TLI "Tucker-Lewis Index" were used (Hair et al., 2010). The metrics for the measurement model are listed in Table 4. The corresponding results for the chi-square/degree of freedom (1.522), CFI (0.961), GFI (0.932), TLI (0.953), NFI (0.896), and RSMEA (0.041) are shown in Table 4. All of the values, with the exception of the NFI, were within acceptable bounds. Acceptable values include NFI, GFI, CFI, and TLI > 0.9, CMIN/DF < 5, and RMSEA < 0.8 (Gefen et al., 2000; Gefen and Keil, 1998). The Normalized Fit Index (NFI) values are below the cutoff of 0.90 but are close enough to it, so they also show a good model fit. Table 4 makes it abundantly clear how well-fitting the measurement model is.

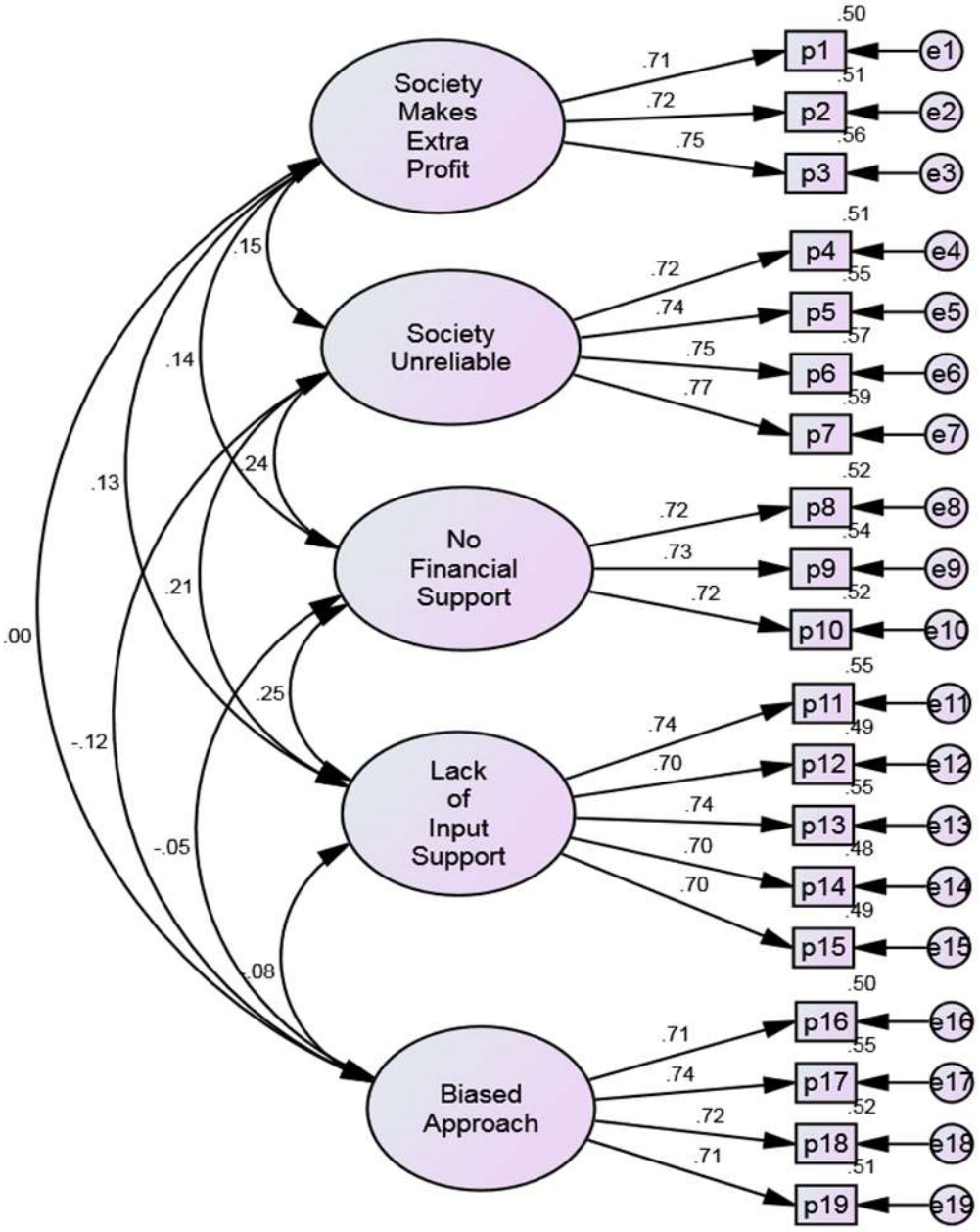

Fig I Measurement Model

Table 5 Mean and standard deviation of the constructs

Constructs	N	Mean	Std. Deviation
Society Makes Extra Profit	305	3.6568	.99977
Society Unreliable	305	3.7172	.97341
No Financial Support	305	3.5388	1.07267
Lack of Input Support	305	3.9482	.89887
Biased Approach	305	4.0730	.78286

Source: *Survey Data*

Table 5 presents the mean scores of the constructs, indicating the level of agreement, disagreement, and neutrality expressed by the respondents towards the statements. A five-point scale with options from (1) strongly disagrees to (5) strongly agree was used to collect the responses. A mean score close to 5 indicates

strong agreement, while a score near 4 signifies agreement, and 3 represents a neutral or no opinion response. On the other hand, a score close to 2 suggests disagreement, and 1 indicates strong disagreement with the constructs. Regarding the constructs, the most of respondents agreed with the items "Society Makes Extra Profit" (SMEP), with a mean score of 3.6568. For the construct "Society Unreliable" (SU), the respondents expressed their agreement with a mean score of 3.7172. Similarly, the respondents agreed with the statement "No Financial Support" (NFS) with a mean score of 3.5388, while they showed agreement with the construct "Lack of Input Support" (LIS) with a mean score of 3.9482. Finally, the respondents strongly agreed with the construct "Biased Approach" (BA) and gave it a mean score of 4.0730.

6. Discussions

For centuries, milk and milk products have provided food worldwide, especially in Haryana. They are now major sources of income in the state. Rural Haryana farmers keep many cows and buffaloes in large dairies. These businesses traditionally made and sold butter and ghee. Farmers now sell their milk to milk processing companies that package and sell milk products due to increased commercialization. Milk processing units in Haryana are mostly cooperative societies. Selling milk and milk products through cooperative societies has driven farmers' economic success. Small and large-scale milk producers can now sell their surplus to cooperative societies. Thus, this scenario has become a key financial support system for rural populations, especially in developing nations like India. This economic matrix must be thoroughly investigated to ensure the well-being and success of all stakeholders, including livestock farmers and cooperative societies. Scientific and systematic research on small farmers' views of milk cooperative societies can be useful. This survey-based study uses factor analyses to analyze and model all relevant concepts and factors related to this system.
For centuries, milk and milk products have provided food worldwide, especially in Haryana. They are now major sources of income in the state. Rural Haryana farmers keep many cows and buffaloes in large dairies. These businesses traditionally made and sold butter and ghee. Farmers now sell their milk to milk processing companies that package and sell milk products due to increased commercialization. Milk processing units in Haryana are mostly cooperative societies. Selling milk and milk products through cooperative societies has driven farmers' economic success. Small and large-scale milk producers can now sell their surplus to cooperative societies. Thus, this scenario has become a key financial support system for rural populations, especially in developing nations like India. This economic matrix must be thoroughly investigated to ensure the well-being and success of all stakeholders, including livestock farmers and cooperative societies. Scientific and systematic research on small farmers' views of milk cooperative societies can be useful. This survey-based study uses factor analyses to analyze and model all relevant concepts and factors related to this system. After reviewing the literature, we created an instrument to measure small farmers' perceptions of milk cooperative societies. We surveyed the literature and had discussions to ensure practical relevance and expert-informed questionnaire design. This combined approach identified 29 items by supplementing the literature review with qualitative research. After iterative instrument design and purification, 19 of 29 items were significant. We grouped the statements into five categories: "Society Makes Extra Profit," "Society Unreliable," "No Financial Support," "Lack of Input Support," and "Biased Approach." These constructs were created using appropriate concepts and scale-building methods. We found several aspects of Haryana's small farmers' perceptions of milk cooperative societies in primary data. Our findings illuminate how small farmers view these cooperative structures. Exploratory and Confirmatory Factor Analysis (EFA and CFA) were used to reduce data and ensure instrument reliability and validity. These methods measured and verified the identified items, allowing us to accurately calculate small farmers' milk cooperative society perception. The majority of small farmers had a negative perception of these cooperatives, possibly due to a lack of market alternatives and improper regulation and monitoring, which harassed uneducated small farmers. Identifying such factors can help farmers understand their perceptions and inform improvement interventions, improving marketing options. Our findings showed that most respondents couldn't get fair prices from cooperatives and had payment delays. Radder and Bhanj (2011) found cooperative prices unsatisfactory for farmers. However, Saikia (2020) found that cooperative societies selling milk were chosen for their reasonable prices. Farmers worried about the cooperative society's fat measurement, which determined milk prices, because they suspected the cooperative bought milk from them at a lower price and sold it at a higher price. Many facilities have encouraged cooperative societies, but farmers reported a lack of credit, milk inspection, advisory services, training, and cattle feeds like Khal, Binola, and Churi. These villages were ruled by powerful people, but they did not treat everyone equally. In general, cooperative milk society management and monitoring have shaped farmers' perceptions and problem-solving. Strategies can promote milk production and management at the household level and encourage rural milk selling as an income-generating activity to reduce poverty and create jobs.

7. Conclusions

We developed 19 items with the help of the experts which were further reduced to 5 factors using factor analysis. During pilot testing, a high level of concept and content validity was discovered. According to the study's analyses and findings, the instrument used to assess farmers' perception toward milk cooperative societies is quite accurate and exhibit construct validity by achieving both discriminant and convergent validity. The

combination of practical and theoretical application yields both social and technical value for this study. The study also revealed that, despite selling milk to cooperative societies, farmers' primary perception was negative; the reason for this could be lack of alternate and improper monitoring of these cooperatives to harass uneducated small farmers. These extracted factors and the research model framed to conceptualize and measure farmer perception regarding milk cooperatives can provide a better understanding and suggestions for their improvement.

8. Limitations of the study

The initial limitations of the research are its small sample size and geographical scope. While 305 respondents provided validation data for the instrument, this number limits the results' generalizability. Data from a specific developing country were also used to empirically analyze and validate the instrument. Future research could investigate the veracity of the claims made in the case study. This makes it harder to generalize the results. International testing would broaden and improve the applicability of the instrument. More research is needed to demonstrate the validity and generalizability of the conclusions of this research. This instrument can be used in future studies on cooperative society problems and their relationships with other demographic variables.

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