

Performance of Farmer Managed Societies in Dairy Industry in Sri Lanka: Farmers' Perception

R. V. K. ANURUDDHIKA¹, JAGATH EDIRISINGHE¹ and D. M. AUWARDT²

¹*Department of Agribusiness Management, Faculty of Agriculture and Plantation Management,
Wayamba University of Sri Lanka, Makandura, Gonawila (NWP).*

²*Milco (Private) Limited, Narahenpita, Colombo*

ABSTRACT

Farmer Managed Dairy Societies have been in operation for many years, but a proper evaluation has not yet been done. This study evaluates the farmers' perception on performance of Farmer Managed Societies in dairy industry in Sri Lanka. A structured questionnaire based survey was carried out with randomly selected 360 farmers from 90 Farmer Managed Societies in eight dairy regions named Anuradhapura, Ampara, Colombo, Kandy, Kurunegala, NuwaraEliya, Southern and Uva. Focus group discussions were carried out prior to the survey to identify the performance criteria. The Farmer Perception Index and Performance Index were developed. Multiple linear regressions were carried out to relate the characteristics of the farmers with their perception and performance of societies with their characteristics.

Results revealed that 90 percent of the societies performed well. The input and marketing sectors showed good performance while farmers were in different about performance of insurance and veterinary services. Credit facilities through farmer societies were weak. The highest expectation of the farmers was the sufficient price for milk but results indicated current farm gate price was not in satisfactory level. The farmers who practice intensive management systems and who receive higher prices for their milk have higher perception on societies. The young farmers valued the societies more than the old farmers did. But the education level of farmers showed negative relationship with their perception. Presence of credit schemes, higher Solid Non Fat value of the collected milk and higher number of members in the societies make farmer societies perform better than the others.

KEYWORDS: Dairy industry, Farmer Managed Dairy Societies (FMS), Farmers' perception, Performance.

INTRODUCTION

The dairy industry in Sri Lanka is important and has tremendous potential in developing the economy in the country. The contribution of the agriculture sector to the gross domestic product was 19% (Anon, 2003a) and the livestock sector contributed 0.83%. The formal dairy sector contributed 0.14% of the total GDP (Anon, 2003b).

Milk production has been a traditional industry that has survived thousands of years. For many reasons milk is an important food item for all ages in a community. It plays a key role in infant feeding and alleviating nutritional poverty in all other age groups. Milk production is important not only because of the nutrition it provides to the people, but also due to the extensive employment opportunities the industry offers.

Dairy farming in Sri Lanka is predominantly a small holder mixed crop-livestock farming operation. Farmers sell the milk through local milk contractors or middlemen. These traders have always exploited the milk producers. Farmers have very low or practically no bargaining power vis-à-vis those to whom they sell their products and from whom they buy their supplies. Consequently, they are exploited on both fronts i.e. selling their milk and buying their production inputs (Sing and Pundir, 2002). This heightens the need for government intervention in the sector through policies aimed at equalizing opportunities, at strengthening the bargaining power of milk producers in rural areas and at restraining the powerful from exploiting the weak. It has been long identified that organizing milk producers in to dairy

cooperatives is the best way to overcome their problems. The common need of milk producers is to obtain a fair price for their milk and this is fulfilled through collective marketing. Milk is considered to be one of the most sensitive agricultural commodities, requiring special and timely care and this can be provided conveniently as well through the collective operation of cooperative dairy societies. Apart from the collection and marketing milk other services such as dairy inputs, extension services, veterinary health care, artificial insemination services, provision of animal feed, fodder seed, planting material, fertilizer and credit and training and education can also be provided through cooperatives. These would act as business associations owned and operated by members for their entire benefit.

According to the available records, interest in organizing milk producers in to dairy co-operatives has been evident in Sri Lanka as far back as the 1930s. The first co-operative to be formed was the Bomiriya Dairy co-operative society in the Colombo district. It is evident that the dairy co-operative movement in Sri Lanka has been actively encouraged by the government agencies concerned with livestock development from 1977 onwards. This enthusiasm was generated by the successful achievement in neighboring India. The Ministry of rural industrial development, the department responsible for livestock development, has played a significant role in the development of milk producers' co-operatives since September 1978 (Anon, 1994). Thus, cooperative development in the dairy sector has been

occurring from a number of years particularly during the past three decades.

In 2002 two hundred and sixty five active primary dairy cooperatives and six cooperative unions were active with a total membership of around 60000 members out of which around 34000 were active members (including the dairy federation). Beside this MILCO (Pvt) Ltd. (now functions and operates as a fully government owned company under the purview of the ministry of Agriculture and Livestock) has formed around 800 "Farmer Managed Societies" (FMS) and functioning since 1999 to improve and promote milk collection at the village level (Anon, 2003b). Under this system of milk collection the quality of milk supplied by individual farmers is tested separately on a daily basis, and the payments are based on the Fat percentage and Solid Non Fat (SNF) percentage. This has resulted in an improvement in the quality of milk and an improvement in the incomes of the individual dairy farmers who supplied milk directly than through a middleman. Village milk producers now get quality based prices as a first step to provide a remunerative and year round market to them. As a result of this mode of payment by cooperative societies, milk producers have received 18 to 40% higher milk price. (Punjath and Khanna, 1997 cited in Lair). But today, only 16% of the farmers are members of such cooperatives (Bandara, 2000). Thus, it is vital to inquire into this downfall of FMS in recent years to help develop the dairy industry.

Approach here can be two fold. First what is the farmers' perception of such societies? Are their needs addressed through this system? Second, what make some societies perform better while others fail? Can we use information from better managed FMS to develop the poor managed? This study looks at these two important issues to help the dairy industry.

METHODOLOGY

Data collection

A pre tested questionnaire based survey was conducted in collaboration with Milco Private Limited, Narahenpita, from July to August 2006. The survey covered eight dairy regions in Sri Lanka viz Nuwaraeliya, Kandy, Anuradhapura, Kurunegala, Colombo, Southern, Uva, and Ampara. The sample consisted of 360 smallholding dairy farmers from 90 Farmer Managed Dairy Societies (FMS). A focus group discussion was carried out prior to the survey with small sample of farmers (n=20) from two FMS to identify what farmers expect from dairy societies.

Those identified expected characters (n=11) were ranked according to the farmers' expectations. In order to evaluate the current performance of FMS with respect to each character a Likert-scale was employed. Respondent were asked to give a score to each character based on their experience with the society they are attached to. This score was in a five-

point scale in which very weak is placed at one extreme and very good at the other.

Theoretical framework and Data Analysis

1. Farmers' perception

a. Perception Index (PI)

As described before, one of the objectives of the study is to assess dairy farmers' perception on Farmer Managed Societies (FMS) that exist. To do this, a Farmer Perception Index (PI) was developed as below.

$$PI = \sum W_i X_i / X_{max}$$

Where W_i denotes the weight for each expectation i ($i = 1, 2, 3, \dots, 11$) and X_i represents the score given to the expectation (from -2 to +2) by farmers and X_{max} is the "maximum potential score" that can be given by respondent. ($X_{max} = 2$)

In order to calculate the weight (W_i) for each expectation a Friedman test was used. By using the sum of ranks produced by the Friedman test, the subsequent multiple comparisons were carried out using the following inequality (Siegel and Castellan, 1988 cited in wijesuriya et al., 2003)

$$|R_i - R_j| \geq Z_{\alpha} * \sqrt{\frac{nk(k+1)}{6}}$$

Where,

R_i = Rank sum of i^{th} expected character

R_j = Rank sum of j^{th} expected character

n = number of farmers (block)

k = number of characters (treatment)

Here, α^* is calculated as;

$$\alpha^* = \frac{\alpha}{k(k-1)}$$

Where,

α = experiment wise error rate (0.05)

k = number of treatment groups

According to the results of the above inequality, the expectations were categorized into groups. Similar weights were given for the statements that are categorized into the same group. These weights were used to calculate the perception index.

b. Perception against characteristics of farmers

The empirical model 1 was constructed to find out whether farmers' perceptions on societies depend on characteristics of farmer.

$$PI_i = \alpha_1 + \alpha_2 \text{ age}_i + \alpha_3 \text{ gen}_i + \alpha_4 \text{ edu}_i + \alpha_5 \text{ exp}_i + \alpha_6 \text{ mgtsyt}_i + \alpha_7 \text{ avgp}_i + \epsilon \quad (1)$$

Where,

PI_i = value derived from PI for i th farmer

α_1 to α_8 = coefficients

age = age of the farmer

gen = gender (dummy)
 1 = male
 0 = female
 edu = education level of the farmer (dummy)
 1 = no schooling
 2 = up to O/L
 3 = up to A/L
 4 = higher education
 exp = experience in dairy farming in years
 mgtsyt = type of farming
 1 = intensive
 2 = semi intensive
 3 = extensive
 avgp = average milk price that farmer received
 ε = error term

3. Feed at a lower cost (Feed)
4. Animal drugs at a lower cost (Drugs)
5. Veterinary services through societies (Veterinary)
6. Continuous supervision (Supervision)
7. honesty of officials (Officials)
8. Insurance and pension schemes (Insurance)
9. Regular meetings (Meetings)
10. Credit facilities with sufficient pay back period (Credit and payback)

The results of Friedman test is given in table 1

2. Performance of FMS

a. Performance Index (PFI)

Then by using the average value of perception index of farmers in each FMS, the Performance Index (PFI) was developed for FMS as below.

$$PFI_i = \sum PI_i / n_i$$

Where,

PFI_i = performance index value of ith FMS
 PI_i = perception index value of ith FMS
 n_i = number of respondent of ith society

b. performance against characteristics of FMS

In order to find out what makes some FMS perform better, the following regression model (2) was developed.

$$PFI_i = \alpha_1 + \alpha_2 D_i + \alpha_3 mem_i + \alpha_4 com_i + \alpha_5 SNF_i + \alpha_6 fat_i + \alpha_7 loan_i + \epsilon \quad (2)$$

Where,

PFI_i = value derived from PFI
 α₁ to α₇ = coefficients
 D_i = regional Dummy
 mem = number of members in the society
 com = number of committee meetings in year 2005
 SNF = average value of solid non fat (SNF) of milk collected in the society
 fat = average fat value of milk collected in the society
 loan = presence of loan schemes in the society
 1 = presence
 0 = absence

RESULTS AND DISCUSSION

Farmers' expectations

During the focus group discussions held, farmers identified followings as what they expect from a good dairy society.

1. A sufficient price for milk (Price)
2. A permanent market (Market)

Table 1 - Sums of ranks of expectations:

Expectation	Sum of Ranks	Priority
Price	1107.5a	High
Market	882.5b	Moderate
Feed	847.5b	Moderate
Drugs	841.5b	Moderate
Veterinary	659.0c	Low
Supervision	608.0ce	Low
Officials	564.0cde	Low
Insurance	551.0cde	Low
Meetings	448.5de	Low
Credit and pay back	441.0d	Low

*means with same letters are not statistically different

According to the results farmers' expectations were categorized in to three groups as high, moderate and low. The farmers' expectations of obtaining a sufficient price for milk were significantly high and it was prioritized as high. The expectations of obtaining a permanent market, feed and drugs at a lower cost were not significantly different from each and were prioritized as moderate. Although the expectations with significantly lower ranks were prioritized as low, the expectations that containing letter "c" such as veterinary services through FMS, Continuous supervision, honesty of Officials and Insurance and pension schemes were important than meetings and credit facilities. The priority "low" does not mean that they are unimportant. Farmers have highlighted these only because they expect these from societies. But in comparison to others these receive a little attention. The results indicate that the farmers' main expectation from the societies is a sufficient price for their milk while the permanent market, feed and drugs at lower cost are the following expectations (Table 1). It means farmers have highly concerned about the economical aspects than other services.

1. Farmers' perception

a. Perception Index (PI)

The perception index showed farmers' perception on dairy societies. The index value -1 denotes very weak, -0.5 weak, 0 average condition, 0.5 good and 1 denotes very good condition.

The distribution of the perception index among the farmers ranged from the -0.66 (the minimum) to 1

(the maximum) with a mean of 0.34 and standard deviation of 0.29. The distribution was left skewed with value of 0.33 (Figure 1). If the average perception of farmers about the FMS is good, the mean value of perception index should lie on or above 0.5. However, since the obtained mean value, which is 0.34 lies below the critical value 0.5. Farmers' perception of performance of FMS is somewhere between "average" and "good".

b. Perception against characteristics of farmers

The model with perception index (model 1) was significant with the probability value of 0.008. Age of the farmer, education level, management system and the average price of milk that farmer received show significant effect on their level of perception regarding FMS (Table 2).

Table 2 – Result for the regression of the model 1:

Variables	Coefficients	Std. Error	t value	Significances
(constant)	0.202	0.175	1.156	0.248
Age	-0.004	0.002	-2.701	0.007*
Gen	0.005	0.037	0.137	0.896
Edu	-0.042	0.022	-1.930	0.055**
Exp	0.002	0.002	1.325	0.186
Mgtsyt	0.052	0.026	2.025	0.044*
Avgp	0.015	0.007	2.219	0.027*

*significant at 5% level ** significant at 10% level

Young farmers valued the societies more than the old farmers did. It is a good aspect with regard to the sustainability and the wellbeing of the societies. Farmers practicing the intensive farming systems have better perception than who practiced extensive farming systems. The need for supplements like vitamin, minerals and concentrates is high in intensive farming systems and these services are well fulfilled through the societies (Figure 2). This results in a better perception of those farmers. The average

price level that farmers received was one of the main factors that affect their perception as it was the main expectation of them.

The interesting and somewhat controversial finding is the negative relationship with education. Some farmers doubt the transparency of the payments which depend on the measurements of SNF and Fat, and this may be a reason for the educated farmers to have bad perceptions. However, Gender and the experience level did not show significant impact on perception.

2. Performance of FMS

According to the scores given by the farmers, if the performance was very good the rank should be +2 and if it was good it would be +1. Value 0 denotes average performance while -1 and -2 for the weak and very weak performance respectively, as the scale varies from -2 to +2.

The performance of FMS was best observed in marketing of milk followed by honesty of officials and provision of farm inputs such as animal feed and drugs. There was good level of supervision by the officials also. Price for the milk, conducting of meetings, veterinary services and insurance facilities showed average performance while credit facilities showed weak performance (Figure 2).

Although the main expectation of the farmers was the sufficient price for milk, the actual performance of price in FMS was moderate. Therefore the farmers were not satisfied about the payment of the societies. The current average price farmers received was twenty rupees per liter while their expectation was thirty rupees per liter. Since the level of veterinary services showed relatively low it is not complied with the farmers expectations.

Although there were some differences between the expectations and the actual performance, the positive mean rank of the level of performance of expected services represents the farmers' satisfactory view towards the societies.

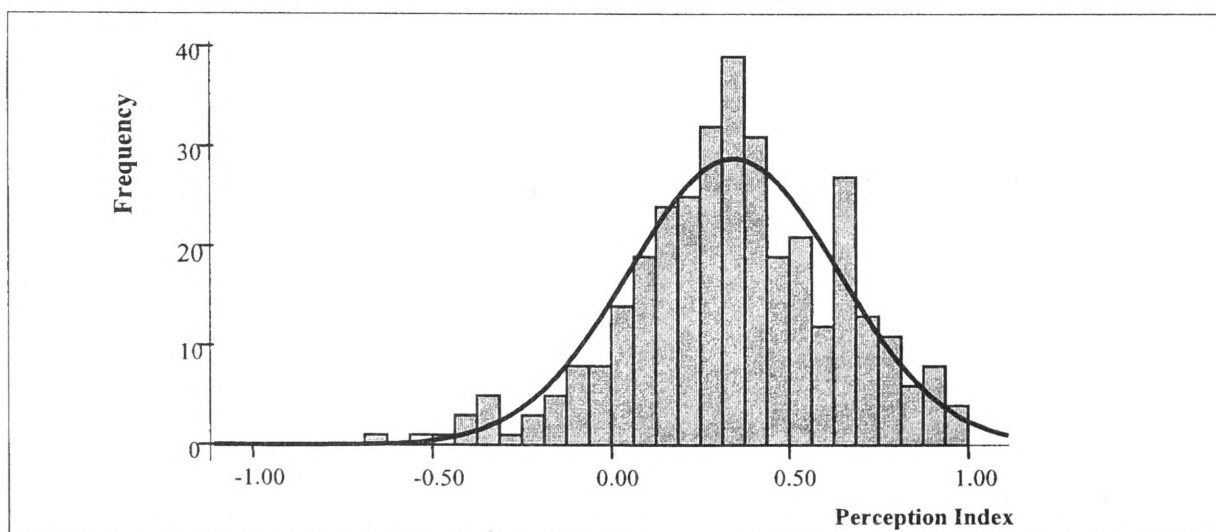


Figure 1 - Distribution of the Perception Index values:

However the farmers' satisfaction is reduced by the weak performance of credit facilities.

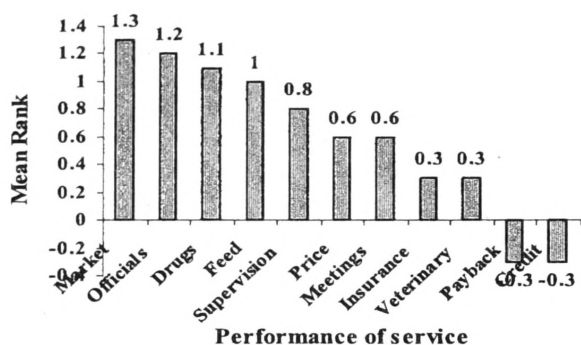


Figure 2 - Level of performance of services:

a. Performance index (PFI)

The distribution of performance index among the FMS ranged from the -0.26 (the minimum) to 0.92 (the maximum) with a mean of 0.35 and standard deviation 0.24. The distribution was left skewed with the value of 0.21 (Figure 3).

Majority of the Farmer Managed Dairy societies (90%) has positive values for the index.

If the average performance of the FMS in a dairy region is good, the mean index value of the region should lie on or above 0.5. Since mean index values of NuwaraEliya and Colombo region were closer to 0.5; it showed their performance was good. Anuradhapura, Kurunegla, Southern and Kandy regions were also above average. Uva and Ampara regions showed average performance (Table 3).

Table 3 – Mean performance index value for dairy Regions:

Dairy Region	Mean Index value	Min value	Max value
NuwaraEliya	0.49	0.40	0.92
Colombo	0.47	0.21	0.71
Anuradhapura	0.39	-0.13	0.83
Kurunegala	0.37	-0.01	0.73
Southern	0.37	0.28	0.44
Kandy	0.31	-0.19	0.65
Uva	0.27	-0.19	0.59
Ampara	0.15	-0.26	0.67

b. Performance against the characteristics of FMS

The regression model with the performance index was significant with the probability value of 0.008. The SNF values of milk of the societies, presence of loan schemes and the number of members significantly affected the performance while number of committee meetings and the fat percentage had no effect (Table 4).

Having a loan scheme in place was significant in the model implying that in farmers' point of view such facilities in a society is important for performance of the society. In farmers point of view the higher SNF values of the collected milk in the

society leads to the higher performance. Higher SNF values for the milk means comparatively higher price for the milk. It indicates that for the better performance of a society, it is necessary to have better payments.

Table 4 – Result for the Multiple Linear Regression of the model 2:

Variables	Coefficients	Std. Err.	t value	Significances
(Constant)	-3.952	1.977	-1.999	0.050*
Cmb	0.372	0.132	2.819	0.006*
Sthn	0.203	0.145	1.404	0.065**
Uva	0.288	0.130	2.210	0.031*
Kgl	0.141	0.118	1.195	0.067**
NEliya	0.505	0.155	3.254	0.002*
Kdy	0.274	0.131	2.084	0.041*
Anp	0.200	0.106	1.886	0.064**
Com	0.001	0.003	0.190	0.850
SNF	0.437	0.231	1.889	0.064**
Fat	0.048	0.086	0.561	0.577
Mem	0.072	0.025	2.942	0.005*
Loan	0.169	0.079	2.150	0.036*

*Significance at 5% level

R² = 0.34

**Significance at 10% level

The model indicates that the societies with a higher membership perform better. When a considerable amounts of members get together for a common goal they would feel that they have a higher power. Then the farmers' perception regarding the performance of the societies increases. The performances of other seven regions were significantly higher than the Ampara region. The highest difference of the mean performance was showed between the Ampara and NuwaraEliya regions (Table 3). The average SNF values of milk, number of members per FMS and the price paid for milk were not much different between these two regions.

But there were more active loan schemes in FMS in NuwaraEliya region than in Ampara region. It may be one of the main effects for their higher performance.

The performance of the FMS was measured from the perception of the farmers. The model 1 shows that the perception differed with the characteristics of the farmers. Therefore, the performance differences among the regions are affected not only by the features of its societies but also on the characteristics of the farmers in these regions.

CONCLUSION AND POLICY IMPLICATIONS

This study looks two important issues to help the dairy industry in Sri Lanka. They are; what is the farmers' perception on FMS in Sri Lanka and what makes some societies perform better than others. Result revealed that the 82% of the farmers have favorable perception on Farmer Managed Societies.

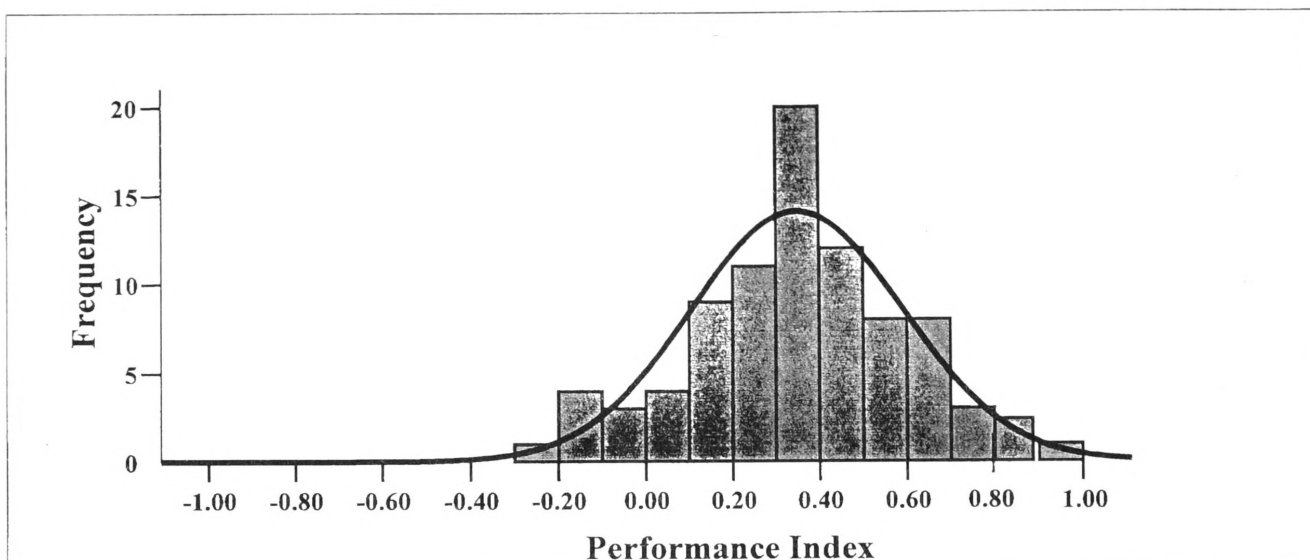


Figure 3 –Distribution of the Performance Index values:

Marketing and input sector have well established in the societies. At the same time veterinary services through FMS should be further improved since farmers expect active contribution of FMS on veterinary services. If it is possible, it will be an effective way to improve the productivity.

The main expectation of farmers from the societies is to get a sufficient price for their milk and the current price is not in the satisfactory level. Marketing won't be a problem for the farmers as there is high competition in the market for raw milk. For the sustainability of the FMS and for the well being of the farmers, authorities should concern more on farm gate price of the milk.

Overall performance of Farmer Managed Societies in dairy industry in Sri Lanka is better. Out of eight dairy regions, NuwaraEliya is the best region and Ampara region performs relatively less. The higher SNF level of the milk, high number of members and the presence of facilities like credit schemes make some societies perform better than the others.

Other than that, the young farmers and the farmers who practiced intensive farming systems have better perception on the performance of the societies. This promises the sustainability of the societies. However it is negatively affected by the fact that more educated farmers have a bad perception on FMS than other farmers. This should be rectified by the relevant authorities with appropriate measures so that it will help the future of the dairy industry.

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