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A Double-Hurdle Model of Socio-Economic Factors Affecting Dairy Farmers' Participation in Small Scale Milk Chilling Plants in Nandi County, Kenya

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Abstract:*Sustainability of chilling plants is based on active participation by its members. Despite government and non-governmental organizations' support of chilling plants in dairy organizations, some farmers are still reluctant to participate in dairy organizations, and some of the farmers who participate in small-scale chilling plants are not loyal and end up supplying their milk to middlemen and other traders. This study sought to model the dairy farmers' participation in small-scale milk chilling plants in Nandi County by computing the double hurdle regression model, where nine variables, both socio-economic and institutional factors, were hypothesized to influence the dairy farmer's participation in dairy organizations. These variables, both socioeconomic and institutional, were identified from previous studies under review and assessed to find out their effect on farmer's decision to join and the extent they will participate. The findings revealed that the factors influencing a farmer's decision to join a dairy organization were unassociated* ***with the decision in the second hurdle on the intensity of participation, which is measured by the quantity of milk delivered to the organizations.****This study has extended the literature on farmer participation in milk chilling facilities by aiming to ensure maximum participation by farmers, in that both participating and non-participating dairy farmers were taken into account and investigations were done to ensure maximum participation of members and also the inclusion of non-partisan farmers to register as members in order to participate.*

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I. Introduction

Kenya's dairy industry is dynamic and plays an important economic and nutrition role in the lives of many people ranging from farmers to milk hawkers, processors andconsumers(KDB, 2014).Chillingplants offer a suitable way for dairy farmers to enhance the growth of the industry andis mostly done by farmer-ownedand managed dairy organizations which also provide extension services, financial servicesand inputs to increase farm productivity (EADD, 2013). These organizations remain the most effective link between the producer and the processor, and smallholder dairy farmers should therefore be active members of milk chilling plants as these plants play a vital role in access to inputs and markets.However, findings from Food and Agriculture Organization (2010),showed that an extensive dataset on Kenyan farmers and their co-operatives shows participation in milk chilling plants is not automatically the case. Sustainability of these milk chilling plants is based on active participation by its members.Participation in this study meant whether a farmer utilizes the services offered by the dairy organizations. Milk delivery to such organizations for chilling is the main aspect of participation, which is in turn subordinated by other services that are meant to influence and boost the farmer's willingness to deliver their milk. However, a farmer cannot just utilize these services without first being a member of a dairy organization. A farmer first decides whether they will join a dairy organization, whereas some farmers have no interest at all in joining dairy farmer organizations, this presents the first hurdle. Of those who have expressed their interests in joining the dairy organizations, they then will decide the extent to which they will participate, more so the quantity of milk they will supply for chilling, thus our second hurdle. The study aims to assess the factors affecting dairy farmers' participation and extent of participation in small-scale milk chilling plants in Nandi County,in order to inform policy makers on how to improve farmer's participation in milk chilling plants.

II. Material And Methods

This study was carried out on dairy farmers in Nandi County, **from November 2014 to November 2015.**A total of 392 respondents(both male and females) of aged ≥ 18, years were in this study.
Study Design: An explanatory research design was adopted.
Study Location: The study targeted the dairy farmers in Nandi County.

Study Duration:November 2014 to November 2015.
Sample size: 392 farmers
Sample size calculation: The sample size was estimated by use of Yamane (1967) simplified formula. The target population was considered 21,520 registered farmers in Nandi County (County agriculture director office, 2013).Thus we were able to estimate our sample size as below:

$$n = {}^{N}/_{1 + N_{e^2}} = {}^{21520}/_{1 + 21520_{(0.05)^2}} = 392$$

Considering our study area was divided into four main regions: Nandi North, Nandi Central, Nandi East and Nandi South. Farmers were stratified according to the different regions and a Neyman allocation formula, which is a sample allocation method, was used to distribute the sample size among the strata.

$$n_h = n * (N_h * S_h) / [\Sigma (N_i * S_i)]$$

Where $n_h$is the sample size for stratum*h*, n is total sample size, $N_h$is the population size for stratum*h*, and $S_h$is the standard deviation of stratum*h*.

$$n_{h=} \left(\frac{N_h}{N}\right) n$$

Where,n_h is the sample size for stratum h, n is total sample size, N_h is the population size for stratum h andN is the total population. Table no. 1 below shows the sample allocation for the for difference regions within the County.

Table no 1: Sample Size Allocation

Population Category	Target Population	Sample Size $n_{h=} \left(\frac{N_h}{N}\right) n$
Nandi North	6356	116
Nandi Central	5456	99
Nandi East	4449	81
Nandi South	5259	96
Total	21520	392

Source of Target Population: Survey Data (2012)

Subjects & selection method: A chance selection was applied to ensure freedom from selection bias and farmers were randomly selected from each strata, which were the four different regions within Nandi County **from November 2014 to November 2015.** This was to ensure the highest statistical precision in the estimates for this study, given a fixed sample size.

Procedure methodology

After obtaining a written informed consent for the study, a well-designed questionnaire was used to collect the data of the dairy farmers in Nandi County. This questionnaire included socio-demographic characteristics of farmers such as location, age, gender, education level, number of children, marital status and economic characteristic that were in relation to farmers participation in the milk chilling organizations; these were such as membership to dairy organization, land size, reliability of the market, accesses to transport, extension services, credit and inputs from the dairy organizations.

The model adopted for this study was the double hurdle regression model. This model was adopted since it allows the possibility that a variables influencing the initial decision to participate, be different than the variables affecting the extent of participation.

The double hurdle model consists of the following (unobserved) structural process:

$$y_i^{s_*} = \beta^{s'} x_i^s + \varepsilon_i^s \quad \text{…….. (1)}$$

$$y_i^{o_*} = \beta^{o'} x_i^o + \varepsilon_i^o \quad \text{…… (2)}$$

Where $y_i^{s_*}$ is the realization of latent value of the selection "tendency" for the individual i, and $y_i^{o_*}$ is the latent outcome.x_i^s and x_i^o are explanatory variables for the selection and outcome equation, respectively. x^s and x^o may or may not be equal. We observe

$$y_i^s = \begin{cases} 0, & if y_i^{s_*} < 0 \\ 1, & otherwise \end{cases} \quad \text{…… 3)}$$

$$y_i^o = \begin{cases} 0, \ if y_i^s < 0 \\ y_i^{o*}, \ otherwise \end{cases} \quad \text{……………………………………………………} (4)$$

i.e. we observe the outcome only if the latent selection variable y_i^{s*} is positive. The observed dependence between y^o and x^o can now be written as

$$\in (y^o | x^o = x_i^o, x^s = x_i^s, x^s = x_i^s, y^s = 1) = \beta^{s'} x_i^o + \in \left(\varepsilon^o \middle| \varepsilon^s \geq -\beta^{s'} x_i^s\right) \text{……..} (5)$$

Estimating the model above by OLS gives in general biased results, as $\in \left(\varepsilon^o \middle| \varepsilon^s \geq -\beta^{s'} x_i^s\right) \neq 0$, unless ε^o and ε^s are mean independent (in this case $\varrho = 0$ in equation (6) below).
Assuming the error terms follow a bivariate normal distribution:

$$\begin{pmatrix} \varepsilon^s \\ \varepsilon^o \end{pmatrix} \sim \mathrm{N}\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \varrho \\ \varrho & \sigma^2 \end{pmatrix}\right) \text{…………………………………………….…} (6)$$

Employ the following simple strategy: find the expectations $\in \left(\varepsilon^o \middle| \varepsilon^s \geq -\beta^{s'} x_i^s\right)$ also called the control function, by estimating the selection equations (1) and (3) by probit, and thereafter insert these expectations into equation (2) as additional covariates (Greene 2002). Accordingly, we may write:

$$y_i^o = \beta^{o'} x_i^o + \in \left(\varepsilon^o \middle| \varepsilon^i \geq -\beta^{s'} x_i^s\right) + \eta_i \equiv \beta^{o'} x_i^o + \varrho\sigma\lambda\left(\beta^{s'} x_i^s\right) + \eta \text{ ………..…} (7)$$

Where $\lambda(.) = \frac{\phi(.)}{\Phi(.)}$ is commonly referred to as inverse Mill's ratio, $\phi(.)$ and $\Phi(.)$ are standard normal density and cumulative distribution functions and η is a new disturbance term, independent of x^o and x^s. The unknown multiplicator $\varrho\sigma$ can be estimated by $\mathrm{OLS}(\hat{\beta}^\lambda)$. Essentially, we describe the selection problem as an omitted variable problem, with $\lambda(.)$ as the omitted variable. Since the true $\lambda(.)$s in equation (7)are generally unknown, they are replaced by estimated values based on the probit estimation in the first step.

An estimator of the variance of ε^o can be obtained by

$$\hat{\sigma}^2 = \frac{\hat{\eta}'\hat{\eta}}{\eta^o} + \frac{\sum_i \hat{\delta}_i}{\eta^o} \hat{\beta}^{\lambda 2} \text{………………………………….……………..……….......} (8)$$

where $\hat{\eta}$ is the vector of residuals from the OLS estimation of (7), η^o is the number of observations in this estimation, and $\hat{\delta}_i = \hat{\lambda}_i\left(\hat{\lambda}_i + \hat{\beta}^{s'} x_i^s\right)$. Finally, an estimator of the correlation between x^s and x^o can be obtained by $\hat{\delta} = \hat{\beta}^\lambda / \hat{\sigma}$. Note that $\hat{\sigma}$ can be outside of the [-1,1] interval.
Since the estimation of (7) is not based on the true but on estimated values of $\lambda(.)$, the standard OLS formula for the coeficient variance-covariance matrix is not appropriate (Cragg 2006). A consistent estimate of the variance-covariance matrix can be obtained by

$$\widehat{VAR}(\hat{\beta}^o, \hat{\beta}^\lambda) = \hat{\sigma}^2 \left(X_\lambda^{o'} X_\lambda^o\right)^{-1} \left(X_\lambda^{o'}(I - \hat{\varrho}^2 \widehat{\Delta}) X_\lambda^o + Q\right) \left(X_\lambda^{o'} X_\lambda^o\right)^{-1} \text{………………..………….} (9)$$

where

$$Q = \hat{\varrho}^2 \left(X_\lambda^{o'} \widehat{\Delta} X^s\right) \widehat{VAR}(\hat{\beta}^s) (X^{s'} \widehat{\Delta} X_\lambda^o \text{……………………………………………} (10)$$

X^s is the matrix of all observations of x^s, X_λ^o is the matrix of all observations of x^o and λ,
I is an identity matrix, $\widehat{\Delta}$ is a diagonal matrix with all $\hat{\delta}_i$ on its diagonal, and $\widehat{VAR}(\hat{\beta}^s)$is the estimated variance covariance matrix of the probit estimate (Greene 1981, 2002).
This is the original idea by Cragg (1971). As the model is fully parametric, it is straightforward to construct a more efficient maximum likelihood (ML) estimator. Using the properties of a bivariate normal distribution, it is easy to show that the log-likelihood can be written as

$$\ell = \sum_{\{i: y_i^s = 0\}} \log \Phi\left(-\beta^{s'} x_i^s\right) + \text{………..} (11)$$

$$+\sum_{\{i:y_i^s=1\}}[\log\Phi\left(\frac{\beta^{s'}x_i^s+\frac{\varrho}{\sigma}\left(y_i^o-\beta^{o'}x_i^o\right)}{\sqrt{1-\varrho^2}}\right)-\frac{1}{2}\log 2\pi-\log\sigma-\frac{1}{2}\frac{\left(y_i^o-\beta^{o'}x_i^o\right)^2}{\sigma^2}]\text{........ (12)}$$

The two-step solution allows certain generalizations more easily than ML and is more robust in certain circumstances. This model and its derivations were introduced in the 1970s and 1980s. The model is well identified if the exclusion restriction is fulfilled, i.e. if x^s includes a component with a substantial explanatory power but which is not present inx^o. This means essentially that we have a valid instrument. If this is not the case, the identification is related to the non-linearity of the inverse Mill's ratio$\lambda(.)$. The exact form of it stems from the distributional assumptions. During the recent decades, various semi parametric estimation techniques have been increasingly used (Powell 1994, Pagan and Ullah 1999, and Li and Racine 2007).

One parameter estimation issue in estimating double hurdle models concerns the choice of regressors for participation and consumptions equations. The theory provides no guidance as to which explanatory variables should be included in the first and second hurdles. Since the inclusion of the same set of regressors in each hurdle makes it difficult to correctly identify the parameters of the model, exclusion restrictions must be imposed; however, hypothesizing that a given variable affects only extent of farmers' participation and not consumption or vice versa is very difficult. An underlying assumption is that the first hurdle is a function of non-economic factors determining household's decision to participate in the market, so that farmers' characteristic variables are excluded from the equation, Gragg*et al.,* (2006).

The model specification for the double hurdle model is as follows:

The participation stage:

$y*_{i1}=\beta_1X_{i1}+\varepsilon_{i1}$ Participation decision

$y*_{i2}=\beta_2X_{i2}+\varepsilon_{i2}$ Extent of participation

$y_i=\beta_ix_1+\beta_ix_2+\beta_ix_3+\beta_ix_4+\beta_ix_5+\beta_ix_6+\beta_ix_7+\beta_ix_8+\beta_ix_9+\varepsilon_{i2}$ … (13)

If $y*_{i1}>0$ and $y*_{i2}>0$

$y_i=1$if dairy farmer participates in small scale milk chilling plants and 0, Otherwise

Where:

$y*_{i1}$: Latent variable describing whether or not participation occurs

$y*_{i2}$: Latent variable describing households' extent of participation

y_i*: Observed dependent variable

β_i: Vector of variables explaining the participation decision

ε_{i1} ,ε_{i2}: respective error terms assumed to be independent

x_1 : Age of the household head

x_2 : Gender of the household head

x_3 : Education level attained by the household head

x_4 : Farm size in acres

x_5 : Access to market

x_6 : Access to extension services

x_7 : Access to inputs

x_8 : Access to credit

x_9 : Access to transport facilities

The first equation defines the participation decision and non-participation decision model where $y*_{i1}$takes the value of one if a household made a decision to participate and zero if no participation. The second equation defines the intensity of participation where $y*_{i2}$ is the extent of participation. β_1 and β_2 define socio-economic and institutional factors that affect the discrete probability of participation or non-participation and intensity of participation respectively. $\varepsilon_{i1}$and ε_{i2} are the error terms of estimation in the participation and intensity of participation functions respectively.

Table no 2: Description of the Variables used in the Double Hurdle Model and their expected Signs

Variable		Measurement description/units	Expected Sign
		Dependent variable	
Dependent Variable	D_i (Participating in chilling plant) Yi (Extent of participation)	participated = 1, has not participated = 0	
Independent Variables	Age of the farm family head	Age in years	+
	Gender of the farm family head	Male=1, Female=0	+

Education level attained by the farmer	Number of years of formal education	+
Farm size	Number of acres owned by family	+
Access to market	$\begin{cases} 0, \text{If have access} \\ 1, \quad \text{otherwise} \end{cases}$	+
Access to extension services	$\begin{cases} 0, \text{If have access} \\ 1, \quad \text{otherwise} \end{cases}$	+
Access to inputs	$\begin{cases} 0, \text{If have access} \\ 1, \quad \text{otherwise} \end{cases}$	-
Access to credit	$\begin{cases} 0, \text{If have access} \\ 1, \quad \text{otherwise} \end{cases}$	-
Access to transport facilities	$\begin{cases} 0, \text{If have access} \\ 1, \quad \text{otherwise} \end{cases}$	+

Statistical analysis

The double hurdle regression model was generated using STATA 11. Categorical dependent variables require an understanding of their nature for a reliable successful statistical analysis to be performed. The larger the number of categories used for each variable in the model, and the more variables that are being interrelated, the greater the number of cells and sub cells and thus the more complex the analysis becomes.Data inadequacies due to non-responses and design imperfections are likely to result in high-order interactions. Measures have been taken to ensure that such fallacies do not occur.

III. Result

Table no 3 below shows the results of the regression model for the variable tested for both hurdles, with the coefficients (Coef), and Standard Error terms for each variable in both hurdles presented.The independent double hurdle regression model assumes that the two error terms from the two hurdles are normally distributed and uncorrelated; this is to mean that the two decisions, joining and participating in the dairy organization, are done independently by the respondents. To test independence, the relationship between the error term in the first hurdle and the second hurdle of our model was investigated. The result revealed that the error terms were uncorrelated. This finding revealed that the factors influencing a farmers decision to join a dairy organization were unassociated with the decision in the second hurdle to participate in this organizations. This result confirmed the relevance of the double hurdle model used in this study.93.5% of the data used in the regression model could be accounted for in the regression model (pseudo R Square = 0.935), thus suggesting a strong linear relationship between the mean values of the variables and the hurdles in the model. While the comparison of the model was significant to imply that the model had been correctly computed for bounded outcomes (p = 0.000). Hurdles concerns bounded outcomes but assume that unbounded outcomes are as a result of removing a hurdle. To investigate these variables the study first had to test if their effect was significant to warrant an investigation under the hurdles. A further look into the coefficients of the variables gave a more informative account of how they influence membership and the quantity of milk delivered for chilling.

Table no 3: Double Hurdle Regression Model for Factors Influencing Participation in Small scale chilling plants.

Variable	Probit estimates N = 392 Pseudo R^2 = 0.935		Truncated regression estimates N = 294 Prob > Chi^2 = 0.000	
Socioeconomic factors	Coef	Std. Err.	Coef	Std. Err.
Gender	0.0959**	0.030	0.2672	0.089
Age	0.0002	0.930	-0.0270	0.802
Education	0.0752***	0.000	0.0550	0.348
Land size	0.0233**	0.016	-0.4170**	0.017
Institutional Factors	Coef	Std. Err.	Coef	Std. Err
Reliability of the market	0.0660***	0.004	-0.1040	0.241
Access to transport	0.0068	0.701	-0.3100***	0.000
Access to extension services	-0.0168**	0.034	0.1172	0.485
Access to credit (Loan facilities)	0.0704**	0.020	0.0026	0.983
Access to inputs	-7.53 e-07	0.528	0.1423***	0.002
Constant	0.0806	0.877	0.6375	0.255
Sigma			1.1900***	0.010

Notes: ** and *** denote significance at the 5%, and 1% level, respectively.

IV. Discussion

Explanatory Variables that were Significant from the Probit Regression (First hurdle) – Decision to join a dairy organization:

From the included regressors, Table no.3 above, the coefficients of six variables (for both socioeconomic and institutional factors) were found to have a significant effect on a farmer's willingness to join these organizations, of which their regression coefficients signify a partial effect of each explanatory variable on the response probability of the dependent variable (participation) when all other factors are kept constant.

Gender of the farmers was found to be significant to influence the decision to join a dairy organization. With a coefficient value of 0.0959, which was the highest among all other coefficients, when all other variables are fixed. This is to mean that a change in gender will result in a 0.0959 change in the mean farmer's willingness to join a dairy farmer organization for chilling. These findings care to suggest that male farmers, who were greater in number than the females, are more likely to join a dairyorganization than their female counterparts. Many reasons can attribute to this, however, both the social and economic position of a female-headed household does contribute to this.

The education level of farmers in Nandi County had a positive and significant relationship, at a 1% level of significance, with the probability of joining a dairy organization. This implies that an educated farmer is more likely to join a dairy farmer's organization than those who are not educated. This may be due to how educated farmers can assess information and also adopt them much easier than the others.These findings are in agreement with Vijay et al., (2009) who noted that education has a significant positive influence on dairy market participation. Education enhances managerial competencies and successful implementation of improved production, processing and marketing practices and this makes it possible for farmers to take new agricultural innovations. This is because; the higher the education level achieved,the higher the chances of adopting a new marketing channel due to new knowledge exposure. With a coefficient value of 0.0752, when all other variables are held constant, a change in a farmer's education level will result in a 0.0752 change in mean farmers' willingness to join a dairy farmer organization for chilling.

Land size: The size of land owned by the farmers hasa significant positive relationship on the farmer's willingness to join a dairy organization, at 1% level of significance, when all other factors are held constant. A change in the size of land can result in a 0.0233 increase in the dairy farmer's willingness to joining a dairy organization. Since most farmers did have moderate pieces of land, they were more confident in joining a dairyorganization since they have the capacity to adapt dairy farming.

Access to market: As expected, access to market had a significant positive relationship at 1% level of significance with a probability of joining a dairy organization. A reliable market is vital for farmers since milk is a perishable product. Dairy organizations serve as a market to the farmer's dairy produce, considering the kind of advertisement and market exposure that farmers enjoy from their organizations. According to Awuduet al., (2009), marketing channels that have streamlined structures of market information flow encourage farmer participation. This implies that market reliability by the producer organizations was an incentive to participate in the organizations. The findings agree withAwuduet al., (2009) who in his study of milk marketing channel choice found that dairy farmers sold their milk depending on the source of market information.

Access to extension services and training by farmers had a significant effect at 5% level of significance in influencing the farmer's decision in joining a dairy organization. However, this was a negative effect in that, when all other variables are held constant, there seems to be a -0.0168 mean change in the farmer's willingness to joining a dairy organization.

Access to credit has a significant positive relationship at 5% level with 0.020 probability of a farmer joining a dairyorganization, keeping the effects of other variables constant, when credit to farmers is available. This finding is in line with Kibaara, 2005 who acknowledged the potential of access to financial services in improving the participation by farmers in small-scale milk chilling plants.

Explanatory Variables that were Significant from the Truncated Regression estimates (Second hurdle) – Extent of participation in these organizations:

This section focuses on the factors determining the extent of farmer's participation; conditional on the services utilized and their effect on the milk delivered to these organizations for chilling. Truncated regression, in this second stage of the double hurdle regression, is used to analyze the problem.

A significant variable in influencing the extent of farmer participation in their dairy organizations is land size. The result of the size of land occupied by a farmer was significant at 5% level of significance, with a negative effect on the mean extent of farmer participation of – 0.4170 on the extent of farmer participation in this organizations. These findings disagree with those of Sheng 2011, who cited a positive relationship between farm size and productivity. The most substantial reason for this is that farm sizes of dairy farmers in Nandi County does not necessarily increase when they are joining a dairy organization, but the farmers land size may be reducing. Most of the land owned by farmers is ancestral,and division among siblings as well as the sale of it may be the leading causes of this.

Another significant variable in the truncated model is access to transportwhich did have a significant negative relationship at 1% level of significance. Access to transport plays an important role especially in linking the farmers milk produce to these dairy organizations, and it has more to do with the distance between the farmer and their dairy organization. Keeping the effect of the other variables constant, access to transport did have a –0.3100 effect on the mean extent of farmer's participation. This negative effect may be because, once a farmer decides to join a dairy organization, the issue of transportation of their milk is something that has already been thought of beforehand. Hence, any issue that may arise is that of an inefficient transport system which does constitute a negative effect. These findings are in line with Kibaara 2005, who acknowledged poor infrastructure including poor rural roads, markets and transport systems that result in high transaction costs for farmers and FSD, 2012 that acknowledged the state of poortransport facilities in Nandi County.

Access to inputs by the farmers at 1% level significantly affected the extent of farmer participation. As expected, access to inputs positively influenced the quantity of milk supplied to the organizations for chilling. Inputs are very important in improving the farmer's productivity at the farm. The results of this study show that a farmer will participate more if they are assured of accessing the necessary inputs for their farm. From the coefficients, when all other variables are constant, any change in inputs is likely to trigger a 0.1423 change in the mean quantity of milk supplied to these organizations for chilling.

V. Conclusion

The extentof participation in these dairy organizations varies among farmers, but it is first by a farmer's willingness to register as a member. The results of this study agreed with that of Vijay *et al.,* (2009) who concluded that membership of farmers' organizations significantly determines smallholder dairy producers' participation in modern markets.The majority of farmers in this study, those who delivered their milk for chilling, were beneficiaries of other services that were offered by their preferred organization: High milk prices, reliable market, timely payments, milk collection, vet services, and purchasing of inputs, among others. Hence the extent of farmer participation was found to be high. However, non-membership by some farmers was attributed mostly to mismanagement of the dairy organizations that was highly influenced by the history of collapse and poor leadership by these organizations and hindered some of the farmers from joining them. Despite the challenges, still farmers do acknowledge the benefits of such organizations for their trade.

The double- hurdle regression model employed to identify factors influencing a farmer's decision to join, and the extent they will participate in the dairy organizations show that among the nine variables used in the analysis under both hurdles: Gender, education level, land size, access to market, access to extension services and training, and access to credit do have a significant effect on a farmers initial decision to join a dairy organization, whereas once a farmer is a member: Land size, access to transport and inputs are the only factors influencing the quantity of milk they supply to these organizations for chilling. These findings do extend the literature as one is now able to distinguish between participations, and how the various factors are significant on either joining or involvement with the dairy organizations.

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