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ECONOMIC EMPOWERMENT OF SMALL SCALE FARMERS THROUGH DAIRY CHILLING HUB SERVICES: A CASE OF CHEPALUNGU DAIRY PLANT IN BOMET COUNTY, KENYA

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Abstract

Dairy business hub was developed to provide vital services to dairy farmers such as marketing, financial and extension services to small scale dairy farmers. Dairy business hubs are considered an effective approach in facilitating dairy business development in African countries such as Kenya. This study sought to establish the economic empowerment of small-scale farmers through dairy chilling hub service. The specific aim of the study was to assess relationship between marketing, financial and extension services on economic empowerment of Chepalungu small scale dairy farmers in Bomet County, Kenya. A sample of 10% of all the 1000 small scale traders was selected using stratified random sampling technique. Data was collected using a questionnaire which was developed by the researcher and analysed using descriptive statistics, regression and correlation analysis. Pearson correlation analysis revealed that marketing, financial and extension services, have no significant relationship with economic empowerment in terms of constant income, access to dairy hub services and access to financial services. Regression analysis indicated that transport service, storage services and marketing services positively affect economic empowerment whereas financial services and extension

services negatively impacts economic empowerment of the small scale farmers. Using financial services as economic empowerment measure showed that marketing services, financial services and extension services positively affect economic empowerment of the small scale farmers. Thus, to enhance economic empowerment of small scale dairy farmers, there is need to strengthen the dairy hub services.

Keywords: Dairy business, hub, Economic empowerment, Storage, Marketing, Financial services, Extension services

INTRODUCTION

The dairy hub model was developed as a solution to the milk marketing problem, and also to the need of training, services and supplies to increase farm productivity in response to the market opportunity created by the Hub (Odame *et al.,* 2008). In principle, government, donor projects, NGO's, and the private sector are available to support farmers with training, services, and input supply. In practice, when these essential support services for more productive agriculture are supplied from sources outside the community, they tend to be unreliable, expensive, and unsustainable. The beauty of a dairy hub model is that it enables the farming community to manage the supply of all these essential services from their own resources with local management that is responsive to the farmers. In the process, it diversifies the local economy, creates jobs, and develops management skills that can be applied to the other needs of the community.

As long as farm productivity is sufficient only for local consumption, essentially raising a subsistence standard of living above the poverty line, marketing and sales of farm products to neighbours and local markets poses new problems (Kilelu *et al.,* 2017). However, once a large number of small farmers begin to produce surplus of milk, marketing began to pose a real challenge. In the Kenya highlands, it was estimated in 2010 that around 800,000 smallholder farmers gain a significant share of their household income from the sale of cow's milk. Total milk production in the country was estimated roughly as 5,000,000 tons, of which half was used on farm or locally, and half went to distant markets, through either formal (20%) or informal (80%) channels (Gitau, 2013). Clearly, dairying is a very important activity for rural households in Kenya, and marketing of surplus milk is important to the well-being of rural communities. Successful milk marketing can bring significant income into the community from outside, further raising living standards and transforming local economy. The milk chilling business must be profitable to justify shareholder's investment. The dairy hub secures the commitment of

dependable and trustworthy shareholder and milk suppliers through a variety of business strategies and social relationships that serve the interest of the smallholder dairy farmers. It was therefore prudent to study how economic empowerment of small-scale farmers is affected by dairy chilling hub in Chepalungu, Bomet County, Kenya. The study was guided by the specific objectives namely; find out the relationship of marketing services with economic empowerment of dairy small scale, establish the relationship of financial services with economic empowerment of dairy small scale farmers and to find out the relationship of extension services with economic empowerment of dairy small scale farmers.

LITERATURE REVIEW

Marketing of milk surplus is the real challenge the farmers face in their everyday life (Kruse, 2012; Mwas, 2006; PDD, 2013). Marketing challenge was already being faced in the other neighboring regions which border the area. Finding the market for the surplus milk and the processed products is the critical function on the business hub that if successful, the hub is considered a success. Marketing models that will ensure all the products are sold is also key to financial stability of the hub. Enough markets will ensure the growth of the farmers' production, which will lead to expansion of the hub itself. The success of the business hub model relies on the milk supply. Enough milk supply is therefore, the key determinant of the hub development. The milk supply is vital in chilling plant; the higher the supply, the higher the chilling volume, the lower the cost of production. According to Kruse (2012), every other factor is only important if it is steered towards enhancing the milk supply. The study reveals the research that prior to execution of the business model, the main concern among the farmers and farmers group was the need of an assurance of enough milk supply from farmers for the hub. According to Mutinda *et al*. (2015), hub official engage dairy farmers of the bulked milk through contracts, for instance, contracts with processors and transporters, if any. Therefore, efficient handling of issues such as milk quality, and transport and contractual arrangements with buyers are important for continued utilization of the hubs by farmers in a collective effort.

To improve dairy production, farmers will require access to credit to make productivity-enhancing on-farm investments. Business hub officials are encouraged either to initiate savings or credit programs for farmers. One tested strategy that a business hub official can use to satisfy all the above-mentioned requirements is by developing payment arrangements that enable farmers to meet their livelihood needs while gaining access to inputs on credit as well as other dairy-related services. With such support systems in place and working efficiently, it is expected that farmers would increase production. An increase in production would give farmers

more collective bargaining power and hence they should progress into negotiating for these other hub related services collectively thus being economically empowered.

Extension services by definition are the initiatives taken by the government to aid resource-poor farmer household with a view to improving the productive capacity of their livestock (Genius, Koundouri, Nauges, & Tzouvelekas, 2013; Wambugu, 2001). Extension services are basically involved in dissemination of information necessary in improving the feeding of dairy cattle. In agricultural production services, extension services have been more on crop production than on livestock production (Peterman *et al.,* 2014). In Chepalungu, extension services are based on newer technologies on for soil conservation site, which in pretence acted as the sites for growing Napier grass, which are mainly fodder for farmers' livestock (Mwas, 2006).

Extension workers ensures periodical visitation of the farm to ensure that farmers manage animals properly. Besides, some farmer, a sample is often taken to training centre to learn more on dairy cattle husbandry. By extension, extension services sought to ensure an effective transfer of new agricultural technologies from research to extension staff and farmers by strengthening linkages between research functions and extension services. Small scale dairy farmers are recording increases in sales for feeds and other animal inputs because the innovation has linked farmers to the services enabling them to purchase the products or take on credit and pay through their daily milk deliveries (USAID, 2017). Dairy farmers have developed confidence in the innovation because it is helping them generate more income and has eased access to financial services and animal health inputs.

Dairying farming is profitable enterprises which have become viable businesses in their own right (Kruse, 2012 and Mwas, 2006). They include agro-vet shop for farm supplies, animal health assistants, a veterinarian, and AI services. Each of these activities generates employment and income for people with very diverse levels of skills and education. In some cases, such as the agro-vet shop, the activity is a profit center of the hub. Other services are provided to the suppliers through the mediation of the hub, such as veterinary services or AI. The Hub will guarantee payment to the service provider based on the farmer's milk deliveries, a process known as "check off," thus making it easy for a farmer to get the service they need when they need it, and for the professional service provider to be assured of payment for services even in a poor rural community. Many goods and services that could enhance the quality of life in remote rural areas are generally lacking (Kruse, 2012 and Mwas, 2006). Over time, successful business hub tends naturally to diversify in to other business lines, such as health insurance, water supply, mixed feeds, and financial services. When these business lines can be operated profitably, they serve both to strengthen the business hub financially, and to

build social capital through valuable services to shareholders and to the community. Obviously, profitability is essential. In some cases, it makes more sense for the business hub to encourage others, for example banks, pharmacies, or clinics to come into its area and do business independently. Through payment guarantees based on the check-off system the business hub can provide an incentive for the businesses to invest in the community. The steady flow of income generated by milk sales attracts all types of businesses to the community.

Theoretical Review

The study was guided by institutional theory. According to institutional theory, the environment and the cognitive, normative and regulative structures that surround marketing, financial and extension services is the most important if economic empowerment is to be realized (Greenwood, Oliver, Lawrence, & Meyer, 2017).

The theories explain how the actions by marketing, financial and extension services affect economic empowerment of farmers in the region. These structures provide stability to actions, routines and cultures; define legitimacy and constrain action (Suddaby, Seidl, & Lê, 2013). The theory focuses on how institutions created by Chepalungu dairy business hub, Chepalungu farmers' hub and dairy plant services change to provide one goal to the dairy farmers in area. Institutional theory has provided stronger theoretical rather than empirical contributions to strategic management.

RESEARCH METHODOLOGY

The study utilized descriptive survey design where farmers gave opinions on how different aspects of chilling hub affect their economic empowerment. The population comprised of dairy farmers, milk transporters, service providers and the Chepalungu dairy plant shareholders. The sample population was randomly picked from the targeted respondent. The primary data was collected through the use of questionnaires designed and administered by the researcher to 89 key players in the dairy value chain. The Cronbach's alpha value of the research instruments was 0.7 which showed that the instruments were reliable. Validity of the data was determined by looking the previous research results on the rating of the services by chilling hub.

RESEARCH FINDINGS

The study focused on finding the correlation between milk storage services and economic empowerment. Table 1 shows that all the Pearson correlation and covariance values are +ve showing positive linear relationship and, the relationship is very strong.

Table 1: Correlation between functions of Chepalungu dairy farmers' hub and economic empowerment

Storage	Pearson Correlation
Milk bulking	.099
Milk cooling	.043

From Table 1, the linear relationship in the regression model is expected to impact the economic well-being of the study positively, which is in line with the theoretical expectation. Although the relationship might be weak in both cases as evident in the low values of Pearson's correlations values, the fact remains that the results exhibits the expected outcome.

The study also focused on finding the correlation between marketing activities performed by Chepalungu plant services such as marketing of milk, contracted sales and quality test and economic empowerment of the small scale dairy farmers in Chepalungu. Table 2 shows that all the Pearson correlations values are positive showing strong linear relationship.

Table 2: Correlation between marketing services and economic empowerment

Storage	Pearson Correlation
Milk marketing	.159
Contracted sales and quality test	.215

Proper marketing services are the main drivers of the economic empowerment of small scale dairy farmers. Consequently, their impact on the economic empowerment of the farmers was resounding during this survey.

Among the marketing services of interest in the study was marketing of milk, contracted sales and quality test. Results on the study of milk marketing indicated that it has very strong positive correlation 15.9% with economic empowerment of the farmers in Chepalungu. This can be attributed by the fact that at the inception of the plant, the plant served main storage of the milk produced by the farmers. It is therefore, expected that the milk storage in the plant is well advance hence serves the farmers well. The main function of Chepalungu dairy plant service is to preserve milk either in processed or raw form to prolong its shelf life. Once the shelf life of the milk is prolonged, dairy products can be sold at any given time without incurring losses related to quality resulting to economic benefits to the Chepalungu dairy farmers and the business hub.

Table 3: Correlation between dependent and independent variables activities

		Access to dairy hub services	Access to financial service	constant income
Milk collection	Pearson Correlation	.031	.023	.048
	Sig. (2-tailed)	.776	.828	.658
	Covariance	.038	.038	.077
Milk bulking	Pearson Correlation	-.190	.099	-.138
	Sig. (2-tailed)	.075	.356	.197
	Covariance	-.189	.130	-.177
Milk cooling	Pearson Correlation	.043*	-.034	-.042
	Sig. (2-tailed)	.046	.750	.694
	Covariance	.037	-.038	-.046
Milk marketing	Pearson Correlation	.068	.125	.159
	Sig. (2-tailed)	.526	.242	.138
	Covariance	.078	.189	.234
Quality test and contracted sales terms	Pearson Correlation	-.212*	.013	.215*
	Sig. (2-tailed)	.046	.906	.043
	Covariance	-.139	.011	.182
Loans and credit	Pearson Correlation	-.054	-.118	-.155
	Sig. (2-tailed)	.614	.271	.148
	Covariance	-.061	-.175	-.224
Small scale farmers training	Pearson Correlation	.145*	-.068	-.091
	Sig. (2-tailed)	.026	.529	.395
	Covariance	-.127	-.078	-.103
Agro-vet services	Pearson Correlation	.184	.123	.080*
	Sig. (2-tailed)	.084	.249	.034
	Covariance	.155	.137	.087

It was also vital to investigate among the dependent variables, which variable affects the economic variables greatly. Table 4 shows the effect of every independent sub variable against every dependent sub-variable. From the table, milk collection, milk marketing and agro-vet services positively affect access to dairy hub services, access to financial service and constant income. Quality test and contractual sales terms have strong and linear positive relationship with constant income. Agro-vet services have strong and linear positive relationship with constant income. Small scale farmers training services have strong and linear positive relationship with access to dairy hub services. Proper milk storage have a strong and linear

positive relationship with savings. Milk cooling services have strong and linear positive relationship with access to dairy hub services.

Table 4: Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1.447	.903		1.603	.113	-.350	3.244
	Milk collection	.070	.108	.079	.647	.520	-.145	.285
	Milk cooling	.006	.154	.005	.041	.968	-.300	.312
	Quality test and contracted sales terms	.296	.198	.175	1.492	.140	-.099	.690
	Loans and credit facilities	-.095	.107	-.096	-.886	.379	-.308	.118
	Agro-vet services	-.110	.154	-.084	-.718	.475	-.417	.196

a. Dependent Variable: constant income

From Table 4, at 95% confident level the slope of the true regression line is somewhere between –.145 and .285 for milk collection, -.3 and .312 for milk cooling and -.099 and .69 for quality test and contracted sales terms.

DISCUSSION

The main reason why Chepalungu dairy business hub was developed was for marketing, financial and extension services. Besides, the hub supports the network of milk business. The farmers in return get the essential facilities that can help them run their farms. Among the essential facilities that farmers cannot buy and if they do, would be expensive, are the extension services, farmers training and agro-vet service. Financial services are also key factors of results of a good hub. To achieve the desired goals, the hub is subdivided into categories, with each having a specific objective. In each section of the hub, farmers have unique roles.

Chepalungu business hub is subdivided into the business hub; dairy farmers; and plant services. In the business hub, the main activities are the bulk purchasing of milk, which encourages surplus milk production. Marketing of the milk is also done within the business hub. Marketing ensures that the milk produced is sold and profits gains. The successful business hub is visible in profits gains, which implies that there are improved financial services' regarding loans and huge savings for the farmers. The fact, as outlined in the literature, farmers sales are

accumulated for 30 days, also ensures that at any given point there is floating cash for farmers for short-term loans.

The farmers, who are the epicentre of the hub, plays a key role in the second category of the hub. Farmers' cooperation is very critical in the sense that they should not cooperate with the brokers who buy milk cheaply. Collaboration entails ensuring that all the milk are supplied to the hub only. When farmers cooperate within the hub, other services like organized transport services, which also reduces the cost of production becomes easier. Proper milk supply ensures stability of the hub since the cogent function of the chilling hub buying and selling of milk from farmers.

The third aspect of the chilling hub is the plant services. The plant's main features are a collection, processing, and storage of the milk. Farmer business services as one of the main function of the plant entail a reduction of the cost of production and productivity. This is achievable by improving infrastructures and expansion of the transportation services. The farm business services also reduce the cost of production by ensuring farmers obtain other farming facilities at lower prices. Farmers cannot afford agro-vet service and other extension services since they are either expensive or unavailable if brought by business people, thus can organize such at affordable prices for the farmers.

CONCLUSION AND RECOMMENDATIONS

The research established that the chilling hub in Chepalungu has three main sections, with each being unique in functionality and expectation; the business hub, farmers and plant services. The study indicated that the major percentages of small scale dairy farmers are men with the majority being the active population in the community. The study noted that there was a positive correlation and covariance in the all the activities except bulk processing.

The main roles played by the dairy business hub were initially played by the government through KCC. It is therefore not surprising to find the most of the operations of the chilling hub has been directly copied from the collapsed KCC. This might negatively impact the farmers, who might not see the difference no matter how much the chilling hub works on improving its efficiency and service delivery. Based on the study findings, there seems uncertainty between extension services and financial service in relation to economic empowerment. Dairy business hub needs to revise their operations and place more emphasis on service provision than on profit maximization.

LIMITATIONS AND FURTHER RESEARCH

The main limitation of this study was that most small-scale farmers in Siongiroi area rarely had time to respond to the questionnaire. This may have affected the final analysis of the results. To overcome this, a number of questions in the questionnaires were reduced and the researcher gave them enough time of one week to respond, thereby increasing the response rate. Considerations were also made by sending a personalized pre-notification text via phones to the respective respondents at least a week earlier, before collection of the questionnaire. The researcher won the confidence of the respondents giving them the reasons for the research and assuring them of confidentiality of their responses.

Further research is also inevitable based on different genders since, in most African set-up, poverty alleviation is measurable based on the number of women whose social status has improved. The recommended area for further research is on the dairy value chain of both formal and informal market which is fragmented with a large number of players at each step, and a low level of vertical integration.

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