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DEVELOPMENT STUDIES

DESCRIPTIVE ANALYSIS OF MILK PRICE AND SMALL-SCALE DAIRY FARMING IN KENYA: CASE OF CHEBUNYO WARD, BOMET COUNTY

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ABSTRACT

Purpose of the study: Dairy farming is an important agricultural subsector supporting almost 900 million people globally. India, Europe, USA, New Zealand and Australia are among the top dairy producers. East Africa region leads in Africa with Kenya among the top producers. The Kenya Dairy Master Plan (2010) envisions an innovative, commercially-oriented, globally competitive chain. Being agriculture focused county, Bomet envisages agro-processing and value addition key as per their County Integrated Development Plan (CIDP 2018). However, most small-scale dairy farmers, a majority in Kenya, have failed to transition from subsistence to commercialization. The study thus sought to investigate the influence of milk price on small-scale dairy farming in Chebunyo Ward, Bomet County.

Methodology: Descriptive survey research design was used. The target population was 1,122 small-scale dairy farmers. Primary data was collected using questionnaires and analysed using descriptive analysis.

Findings: Milk price does influence small-scale dairy farming. Better milk prices mean more farmers are likely to increase production, hence better household well-being.

Conclusion: Milk price is an important factor that influences small-scale dairy farming in Chebunyo Ward, Bomet County, Kenya. Better milk prices are likely to lead to increased production and improved household well-being for farmers.

Recommendations: Extensional officers should hold frequent meetings and training with farmers in the field to educate them on the importance of value addition in the dairy farming business. Farmers should be exposed to different successful concepts of value addition as they have been applied in other sectors and countries. This will help them to gain adequate knowledge on how to incorporate value addition within their dairy business and thus gain more income to boost their standards of living.

Keywords: *Descriptive Analysis, Milk Price, Small-Scale, Dairy Farming, Chebunyo Ward*

INTRODUCTION

The process of raising the economic value and economic appeal of an item is known as value addition. It may entail modifying a commodity's form, color, taste, and other similar measures to extend its shelf life, or even ensuring that it reaches the appropriate market on time (Odero-Wanga, 2009). Value added is defined by the US Department of Agriculture as incremental value a producer achieves from an agricultural commodity or produce as a result of some change in its physical state, differentiated production or marketing, product segregation, and economic benefit realized from the production of farm- or ranch-based renewable energy. The producer may obtain incremental value through either an increase in value to buyers (and, inversely, an increase in price or return to seller) or by expanding the overall market size for the product. It is anything that can be distinguished from the competition to the point where buyers are willing to pay extra for the product as a result of that distinction (Cornelisse, 2021).

According to Achchuthan (2012), value addition in dairy sector can help boost livelihoods of small-scale farmers, a need arising from dairy farmers drawing minimal benefits from the chain. Low price of milk is just but one factor in many other issues in the chain. It is often common to find that farmers and even cooperatives have little control or say in the milk prices because they are not involved in the processing aspect of the chain. Instead, other actors in the value addition such as buyers and brokers are given more power in setting milk prices (Resti, Baars, Verschuur & Duteurtre, 2017). Dairy farming refers to farmers who practice dairy farming at smaller scale keeping between one to five cows. It is characterized by lack of broad-based application of modern farm technologies or practices and improved breeds (Bingi & Tondel, 2015). And it is well recognized that Kenya dairy sub-sector is driven and dominated by smallholder farmers, owning one to three cows, and contribute over 80% of the total milk production annually (Omunyin, 2014; Vernooij, 2016). That means significant number of households depend on it for subsistence- employment, nutrition and economic wellbeing.

In Sri-Lanka, Achchuthan (2012) asserts that value addition in dairy sector can help boost livelihoods of small-scale farmers, a need arising from dairy farmers drawing minimal benefits from the chain. Low price of milk is just but one factor in many other issues in the chain. It is often common to find that farmers and even cooperatives have little control or say in the milk prices because they are not involved in the processing aspect of the chain. Instead, other actors in the value chain such as buyers and brokers are given more power in setting price (Resti et al., 2017).

While looking at value chain in the context of Ethiopia, Doti (2018) noted the need to identify factors that help shape upgrading of the dairy value chain and help overcome challenges of low marketability of Milk and its products. Locally, value addition has also been looked into in the agricultural sector. For instance, Koyi (2017) in Bungoma County, found a few ranked factors influential in shaping market choice and participation by dairy farmers to include price, access to market, access to information, age and education. Furthermore, Rademaker (2016) stated that the Kenya dairy value chain is complicated, with a diverse set of actors and a plethora of inputs, services, and dairy products. It is acknowledged as a significant difficulty as most smallholder farmers regard dairy as subsistence farming rather than a business, resulting in a poverty trap or vicious cycle of poverty. Low productivity leads to inadequate revenue, which prevents investment in adequate feeds and health for livestock, and the cycle continues (TechnoServe, 2008).

In Kenya, the agriculture sector, including the dairy subsector, plays an important role in promoting economic growth from direct contribution of 26% to the Gross Domestic Product (GDP) and indirect contribution of 25%, according to the government's Agriculture Sector Development Support Program (ASDSP, 2016). This underscores the importance of the sector to many households for survival. The industry has the ability to contribute significantly to the government's National Big Four goal, which includes security of nutrition and food, Production and health care for everyone, and housing (KDB, 2019). It accounts for around 4% of national GDP, 14% of agricultural GDP, and provides livelihoods for over 1.8 million smallholder dairy farmers, as well as approximately seven hundred thousand direct and five hundred thousand indirect employment opportunities (Kenya Dairy Board, 2019).

STATEMENT OF THE PROBLEM

Kenya's demand for milk products is projected to grow by 2.8 percent annually due to an increasing population and urbanization (USAID-KAVES, 2015; Auma, Omondi &

Baltenweck, 2018). The Kenya Government envisions a market-oriented dairy sector with value addition and modern farming practices (Dairy Master Plan 2010-2030, 2010). Though the dairy sector in Kenya is a viable economic activity and crucial for rural development, poverty reduction, and nutrition, there are constraints such as unfair milk prices, and thus its potential remains underexploited (Odero-Waitituh, 2017; Bingi & Tondel, 2015). The majority of smallholder farmers are unable to transition from subsistence to commercial farming due to factors such as high transactional costs and bottlenecks in accessing inputs and services (Kilelu, 2017). In Bomet County, despite the efforts made by the County government to promote dairy value addition by providing cooling plants for farmers (County Government of Bomet), there is still a gap in it bearing fruit among small-scale farmers. This study investigated the influence of milk price on small-scale dairy farming in Chebunyo Ward, Bomet County, Kenya.

THEORETICAL REVIEW

The Value-added theory is associated with Neil J. Smelser (1962), whose book, Theory of Collective Behavior sees this theory as a complex analysis framework that can be used to explain factors driving collective actions in a social system. He saw collective action as non-institutionalized mobilization for action so as to change one or more strains. The theory maintains that collective actions are a response to a strain or numerous strains in a system (Saffer, 2018). Smelser identified the original six determinants of his value-added theory. They included structural conduciveness, structural strain, generalized beliefs, trigger events (precipitating factors), mobilization of participants, as well as social control (Saffer, 2018). Structural conduciveness is about elements in the social system that provide possibility of collective action to occur. The structural strain refers to existence of deprivation or impairment that is collectively recognized by a group. Generalized belief refers to group giving meaning to a situation and possible solution thus creating a group consciousness.

Trigger events (or precipitating factors) is according to Smelser, events that initiate the beginning of collective action events. Mobilizing of participants on the other hand happens when the collective (the group) decides to act and this is determined by leadership. The social control is about the counter determinants to the group (or collective) and this seeks to divert, deter or redirect the collective action mobilized. The Social control elements include authorities (police), media and regulatory/ governing bodies. The theory further points out five types of likely collective actions namely craze, panic, hostile outburst, norm-oriented and value-oriented. The latter is based on morals and seeks to re-shape the larger social values by questioning existing culture or beliefs (Staffer, 2018). This collective action would be close to

the current study in relation to dairy farmers seeking to reshape the outcomes of their dairy ventures.

EMPIRICAL REVIEW

The Kenya dairy sub-sector has attracted a fair deal of interest and study among key international actors and scholars as noted in chapter one above. Studies led by major international institutions including FAO, ILRI and USAID as well as individual scholars and experts, have been done. A survey of the literature on the subsector reveals a number of salient issues that most scholars agree or capture as issues that affect the dairy industry both in Kenya and to a large extend the Eastern Africa region. The key issues that challenge the sub-sector as noted by FAO and ILRI (2015), include lack of economies of scale due to the small-scale nature of the dairy operations, lack of production and management skills, inadequate and inefficient dairy cooperative groups, lack of adequate qualified personal throughout the value chain, poor quality feeds, poor dairy breeds, poor animal husbandry, lack of quality data on dairy, poor linkages between smallholder dairy farmers and the markets and lack of storage and processing facilities (Muriuki, 2011; ILRI, 2015). Bingi and Tondel (2015) however, sum it in two major points, low dairy farm productivity and inadequate milk quality.

Vernoiji (2016) core aim was to find out how to increase milk production among small-scale dairy farmers in Nandi and Bomet. The study was set in the context of the challenge of climate variability and environmental degradation. These environmental forces are diminishing the capacity of agricultural lands to produce. Since livestock is a key source for generating income among a majority of the rural people in Kenya, there is a need to understand how to boost milk production and yield to secure the livelihoods of these people. In connection to boosting milk production, this study aimed to understand how the incomes of such farmers might be enhanced. A value chain analysis applied to understand how the economic benefits were distributed along the value chain. Among the research questions raised included what is the structure of the value chain in Bomet and Nandi counties and what potential exists to upgrade the value chain. The methodology applied was a mixture of a survey method and interviews. The survey targeted n=240 small-scale dairy producers in Bomet and Nandi counties. The specific research questions include: how is the value chain structured in Bomet and Nandi counties; which factors shape participation in formal markets; and what is the potential for upgrading in the value chain?

On the dairy value chain, key findings include the factors that the average daily production of milk was 5kg, and the chief ways to boost production was to produce or buy more feed. What limited production was lack of resources to buy more feed and lack of land to produce own feed. About 96% of production is for household consumption. The four percent of farmers, who sold milk to formal markets, did so mainly to farmers' organizations (43%) and processors (7.6%). For those who sold to the informal market, 43% did so to individual customers and middlemen (28%). Significant factors affecting the sale of milk to the formal market include gender of household, number of cows, distance to cooler, land size, and occasion of grazing. The number of cows a farmer has and the distance to a cooling plant are significant factors influencing sale of mil to the formal market. On milk prices, the average price milk farmers get from individual customers is 40 per liter, middlemen Ksh.32.4, processors Ksh.29.5, and farmers' organizations Ksh.30.3. For farmers' organization, there is a need to focus on developing capacity to process milk, including *mala* and yoghurt, and target small and medium-sized businesses. It is worth noting, however, that formal producers buy milk at higher prices than the figure indicated above based on volume. Further research could examine how farmers can improve production practices.

METHODOLOGY

The study applied descriptive survey research design. The target population was 1,122 small-scale dairy farmers. The sample size was 293 respondents derived using Yamane's formula. Simple random sampling technique was utilized in selecting the study sample size. Primary data was collected using questionnaires and analysed using descriptive analysis. The findings were presented in tables and graphs.

RESULTS AND DISCUSSION

Questionnaires were distributed to 293 respondents. All of them were able to fill in and return back the instruments for analysis. This was made possible with the help of the research assistants who took their time to provide appropriate guidance to the respondents hence achieving maximum cooperation from the respondents.

Influence of Milk Price on Small-Scale Dairy Farming

The study sought to examine the influence of milk price on dairy farming in Chebunyo Ward, Bomet County. In order for this objective to be answered, the respondents were given some statements on milk price and value addition of dairy products and asked to indicate their responses (see Table 1).

Table 1: Influence of Milk Price on Dairy Farming

Statement	SA	A	UD	D	SD	M	Std.
The prices of milk given to the farmers are good.	20.7	33	4.4	30.3	11.6	2.78	1.37
Value addition has contributed a lot to the increased value of milk price being supplied.	25.5	56.1	15	3.1	0.3	1.96	0.74
Better milk prices will encourage farmers to increase their dairy production.	41.5	50.3	3.1	2.7	2.4	1.74	0.83
Dairy farmers in our area are well appreciated by the cooperative through extra tokens given to the quality of milk provided.	13.9	45.9	15	20.7	4.4	2.55	1.09
I am satisfied with the milk price offered.	8.8	41.2	15	22.8	12.8	2.88	1.21
Being part of the value addition chain has contributed to the increased prices of the milk I offer.	18.7	47.6	17.7	12.9	3.1	2.34	1.02
My dairy farming is not motivated by the price I get in the market.	10.9	34.7	6.1	27.6	20.7	3.12	1.37
Average						**2.48**	**1.05**

When asked to indicate whether the prices of milk given to the farmers are good, 33.0% and 20.7% of the participants agreed and strongly agreed with the statement. On the other hand, 30.3% disagreed and 11.5% strongly disagreed whereas the remaining 4.4% were undecided. The statement had a mean score of 2.78 with a standard deviation of 1.37. This demonstrate that whereas there are some of the farmers who consider the milk prices to be good, there are others who are not satisfied with the prices. A majority (56.1%) of the respondents were agreed whereas 25.5% strongly agreed that value addition has contributed a lot to the increased value of milk price being supplied. A few (15%) were not decided whereas the remaining 4.4% were in disagreement. The statement had a mean score of 1.96 with a standard deviation of 0.74. This implies that value addition has increased the price of milk supplied in the market.

An overwhelming majority (41.5% & 50.3%) strongly agreed and agreed that better milk prices will encourage farmers to increase their dairy production. On the other hand, a few disagreed (2.7%), strongly disagreed (2.4%) or remained undecided (3.1%) respectively. The statement had a mean score of 1.74 with a standard deviation of 0.83. This shows that providing better prices for the milk goes a long way in encouraging the farmers to continue with the dairy farming activities. When asked to indicate whether dairy farmers in the area are well

appreciated by the cooperative through extra tokens given for the quality of milk provided, 13.9% strongly agreed, 45.9% agreed, 20.7% disagreed, 4.4% strongly disagreed and the remaining 15% were undecided. The statement had a mean score of 2.55 with a standard deviation of 1.09. This shows that whereas there are those farmers who are appreciated by the cooperatives for their milk products some feel not appreciated and hence may feel discouraged or demotivated.

In terms of satisfaction with the prices offered for the milk supplied, half (8.8% and 41.2%) of the participant agreed and strongly agreed whereas 20.7% disagreed and 15% were undecided. The statement had a mean score of 2.88 with a standard deviation of 1.21 meaning that the respondents were moderately in agreement with the statement. This clearly shows that whereas half of the respondents show some level of satisfaction on the milk prices offered, there are others who are not satisfied and would wish for the prices to be increased. When asked to indicate whether being part of the value addition chain (i.e. farmer co-op) has contributed to the increased prices of the milk offered, 47.6% agreed and 18.7% strongly agreed. On the other hand, a few of the respondents were in disagreement (disagree (12.9%) and strongly disagree (3.1%)) whereas 17.7% remained undecided. The statement had a mean score of 2.34 with a standard deviation of 1.02 meaning that the respondents were in agreement with the statement. This shows that most of the participants are in agreement that value addition has contributed to the increased prices of milk offered.

Whereas 27.6% and 20.7% of the respondents disagreed and strongly disagreed to the statement that their dairy farming is not motivated by the price they get in the market, 34.7% agreed and 10.9% strongly agreed. The remaining 6.1% were undecided. The statement had a mean score of 3.12 with a standard deviation of 1.37 meaning that the respondents were moderately in agreement with the statement. This shows that majority of participants' engagement in dairy farming is motivated by the price offered.

In addition, the respondents indicated the extent to which milk price influence dairy farming towards value addition among the small-scale farmers in Chebunyo Ward.

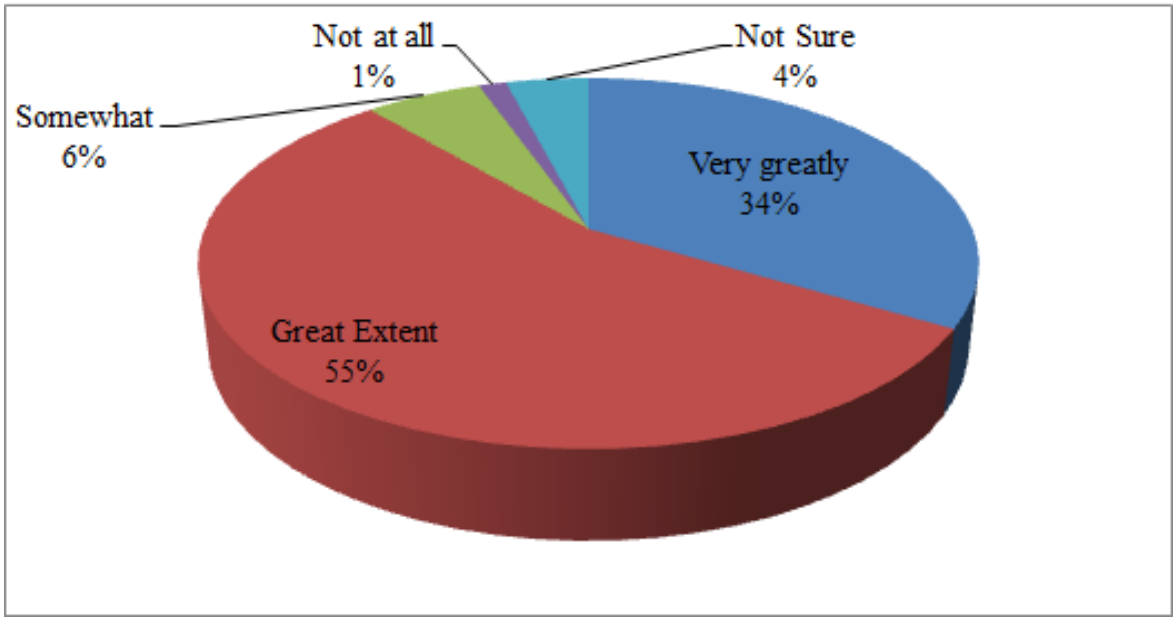

Figure 1: Extent to Which Milk Price Influence Dairy Farming Towards Value Addition

As shown in the Figure 1, slightly more than half (55%) of the respondents indicated that the milk price influence dairy farming to a great extent. This was further strengthened by 34% who indicated to a very greatly extent. A few (6%) indicated somewhat whereas the remaining 5% were either not sure or indicated not at all.

From the presented findings on milk price and small-scale dairy farming; it is evident that a majority of the respondents positively supported the notion that milk prices had a critical role in the small-scale dairy farming towards value addition. Moreover, they also highlighted that value addition, being part of a larger group in the industry helped them to have a higher bargaining power which helped to increase the milk prices which in turn encouraged them to further their activities in dairy farming. In line with these observations, Wairimu *et al*. (2021) asserts that by using different groups to sell milk, farmers get the opportunity to get their milk products to the market throughout the year. Furthermore, Kilelu et al. (2017) noted in multiple research articles that collective action among small-scale farmers within the establishment of associations of producers and cooperatives that deal with farmers tend to produce economies of scale, lowering the cost of transactions, and improving the capacity of farmers to bargain, thereby increasing milk prices. This in the long run promotes some level of satisfaction among them.

In an early observation made in the study, most of the respondents were of the idea that the price of milk is what motivated them to continue with the dairy farming activities. Hence, increasing milk prices could provide them with a sense of inspiration so as to continue engaging

in dairy activities. In supporting this observation, a previous study by Barney and Hasterly (2008) showed that the quality of dairy farming yield is what motivated the farmers to initiate their dairy farming projects. Therefore, by increasing the price of milk it is likely that the farmers will continue with their dairy farming activities and improve their quality through value addition.

CONCLUSION

From the observations made, the price of milk that farmers receive has influence on the small-scale dairy farming and value addition. Moreover, not all farmers in the ward are satisfied with the prices offered for the milk that they supply.

RECOMMENDATIONS

There is a need for the extensional officers to hold frequent meetings and training with the farmers in the field. Through these workshops the officers may educate the farmers on the importance of value addition in the dairy farming business. They can also be exposed to different successful concepts of value addition as they have been applied in other sectors and countries. Hence, the farmers will have adequate knowledge on how they can incorporate value addition within their dairy business and thus gaining more income that will boost their standards of living.

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