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THE ROLE OF DAIRY COOPERATIVE SOCIETIES IN SUSTAINABLE DAIRY DEVELOPMENT IN KENYA: AN ASSESSMENT OF STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

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Abstract: *Dairy cooperative societies play a significant role in the sustainable development of the dairy sub-sector, particularly in empowering communities. However, the distribution of benefits to smallholder farmers from these cooperatives is not even. While milk marketing and collection services are widely offered, access to information, the ability to save and budget, and cow insurance services are less provided. To improve the performance of dairy cooperatives, there is a need to identify constraints affecting their performance and the available options to enhance their benefits.This study aimed to assess the role of dairy cooperative societies in sustainable dairy development in Kenya. A descriptive survey design was used, and data was collected from dairy co-operative managers, livestock production officers, co-operative officers from the County Government, and dairy cooperative members. Results showed that interaction between dairy cooperatives and other actors in the dairy value chain is crucial in achieving sustainable dairy development in Kenya. Strengths, Weaknesses, Opportunities and Threats Analysis of dairy cooperatives in Kenya revealed that despite the existence of weaknesses and threats such as importation of dairy products and inadequate infrastructure, exploiting existing opportunities using inherent strengths among dairy cooperatives would enhance sustainable development of the dairy sub-sector.The study highlights the potential of dairy cooperatives to improve productivity in the smallholder sector, enhance market participation by farmers, and contribute to poverty reduction, food security, and women's empowerment. The study recommends that development interventions target improving production, productivity, and marketing activities of smallholder farmers by addressing constraints in the sector through collective organizations such as farmer cooperatives and associations.*

Keywords: Dairy cooperative societies, sustainable development, Kenya, strengths, weaknesses, opportunities, threats, smallholder farmers, poverty reduction, women's empowerment.

INTRODUCTION

The livestock sector in developing countries plays an important role in contributing to rural livelihoods, particularly those of the poor. The sector is estimated to constitute approximately a third of the agricultural GDP in developing countries and this share is rising (World Bank, 2017). The rapid increase in livestock production in these countries is attributed to a fast-growing demand for livestock products, resulting especially from an increasing urban population as well as a rising consumer income. Dairy production forms part of the livestock sector and is regarded as an important farming activity, especially in the developing world, providing supplementary income, employment and nutrition to a number of people, particularly in rural areas (International Fund for Agriculture Development, 2018).

Co-operatives have the potential to improve productivity in the smallholder sector as well as enhance market participation by farmers (Birthal, Joshi & Gulati, 2015). Organizing farmers through dairy co-operatives has many advantages over individual farming and marketing. It improves or facilitates access to market information, reduces costs of marketing, increases producers' access to technology, extension and related

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services, thereby enhancing efficiency in production and marketing of milk as well as dairy products (Lapar, TrongBinh, Tuan Son, Tiongco, Jabbar & Staal, 2016). In this regard therefore, development interventions should target improving production, productivity and marketing activities of smallholder farmers by addressing constraints in the sector. This can be achieved through collective organizations such as farmer cooperatives and associations.

Dairy Cooperatives have ability and governance structure to help members achieve Sustainable Development Goals (SDGs). Dairy farming involves high market dependency and socio-economic values wherein Dairy Cooperatives facilitate dairy farmers to vertically integrate to countervail power against oligopolistic powers in distribution and retailing (Sudan, 2018). This is done by organizing dairy supply chains with better strategic logistics between production, processing and distribution in emerging markets (D'antoni and Mishra 2012). It is also achieved by reducing financial risks and economic uncertainty faced by members in a mature market caused by increasing volatility in milk and feed prices and paying dairy farmers the milk price at levels that far exceed market prices, when markets are volatile or even depressed (Yoo, Buccola and Gopinath, 2013); all these through democratic governance structure controlled by dairy farmers and managed by employees with appropriate skill sets, which help maximize returns and minimize costs of processing inputs, thereby reducing transaction costs (Labrecque, Dulude and Charlebois 2015).

The cooperative enterprises are best suited to meet economic dimensions of SDGs such as reducing poverty and exclusion by identifying economic opportunities for their members, empowering the disadvantaged to defend their interests, providing food, nutritional and health security to the poor. This is done by allowing cooperatives to convert individual risks into collective risks and mediating member access to assets that they utilize to earn a living (Di Gregorio et al., 2008).Dairy Cooperatives are value-based and principle driven sustainable and participatory organizations. They lay emphasis on democratic practices, social inclusion, gender equality, job security, better working conditions, competitive wages, additional income via profit-sharing and distribution of dividends. Also emphasized is poverty reduction, food, nutritional and health security; women empowerment and increased decision making and self-help community facilities and services to support achievement of SDGs. Poverty alleviation or reduction was one of the goals of Dairy Cooperatives through mobilizing self-help mechanisms to create opportunities and social protection by facilitating empowerment of unprotected dairy farmers, achieved through joint, equitable and democratic ownership and management of resources and also via enhanced resilience by reducing financial and economic uncertainty based on the principles of mutuality, solidarity and reciprocity (Mwangi &Markelova, 2009).

In the United States of America (USA), dairy farming is large scale and highly mechanized with milk marketing mostly done through cooperatives. Thus in the USA, cooperatives have afforded dairy farmers the organizational size that is necessary for exercising countervailing power to effectively bargain and deal with other market participants (Deininger, 1995). The rise of dairy cooperatives in Europe has been explained by both technological and institutional innovations. The availability of dairy technology and the institutional support through cooperative legislation are, however, not sufficient explanations for the establishment and sustainability of cooperative dairy enterprises. Dairy cooperatives have existed in the Netherlands for more than 130 years. They hold a joint market share of more than 80% since the 1950s. This suggests that cooperatives are durable organizations in the dairy industry of the Netherlands (Bijman, 2018).

Dairy co-operatives are an integral part of the milk marketing and dairy development Programme in India, popularly known as "operation flood" launched by the government of India in collaboration with the world food Programme of the United Nations in July 1970. The bedrock of operation flood has been village milk

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producers' co-operatives, which procure milk and provide inputs and services, making modern management and technology available to members. The first dairy cooperative in Indonesia was established in Pujon, Malang, and East Java in 1962. Purposes of cooperative establishment were to eliminate the problems of unfair competition among the dairy farmers in pricing of milk, poor quality of cows, undiversified products, low milk production and low quality of milk (Sulastri & Maharjan, 2012).

In Africa, a distinct advance in the development of the cooperative movement was made in the 1960's, after most of the countries were freed from colonial rule. In 1969, the membership of cooperative societies in the African countries reached 3.5 million. The cooperative movement is relatively advanced in the following African countries: in East Africa—Tanzania, Kenya, and Uganda; in West Africa—Nigeria, Ghana, Sierra Leone, Cameroon, and the Ivory Coast; and in North Africa—Egypt. In Central Africa the cooperative system is developing at a considerably slower rate, while in Southern Africa, Zambia, and South Africa represent more advanced countries (Holmén, 2009).

Kenya has a long history of cooperative development that has been characterized by strong growth, thus making a significant contribution to the overall economy. Cooperative societies are recognized by the government to be a major contributor to national development, as cooperatives are found in almost all sectors of the economy. In Kenya, the first Co-operative Society, Lumbwa Co-operative Society, was formed in 1908 by the European Farmers with the main objective of purchasing fertilizer, chemicals, seeds and other farm inputs and marketing of their produce to take advantage of economies of scale. The African smallholder farmers fought for formation of their own Cooperative societies and later the dairy cooperative society was formed in 1928 in Nanyuki known as Nanyuki Cooperative Creameries and later an enactment of the Kenya Cooperative Ordinance of 1930 leading to the registration of KCC and KFA in 1931. In 1931 all the cooperative creameries were united under the Kenya Cooperative Creameries.

Githunguri Dairy Farmers Co-operative Society in Kiambu County, Kenya is one of the prime cases in this regard. Formed in 1961 through state initiative, its membership grew from 31 to about 9,000 by 1998. The collapse of the Kenya Co-operative Creameries (KCC), the dairy cooperative union that monopolized the marketing of milk for cooperative societies in the early 1990s severely affected Githunguri's milk collection activities, as it did not have its own milk processing plant. With difficulties in marketing members' milk, which was its principal activity, the active membership of the cooperative dropped to just about 600. However, the liberalization of the cooperative movement in 1997 helped to improve the fortunes of Githunguri for at least three reasons (Wanyama, 2008).

First, liberalization afforded the management committee of Githunguri the freedom and power to hire professional staff to steer the day-to-day management activities. Second, the management committee used its new power to borrow using collateral from the cooperative's property in order to get a loan of approximately 70 million Kenya shillings (about $1 million USD) from OIKO Credit of the Netherlands in 2003 to build a dairy processing plant. Third, Githunguri acquired the freedom to sell its produce to any willing buyer on the market. This was a radical departure from the past, when cooperatives were only allowed to sell milk to the ailing KCC. Located on the outskirts of Nairobi, Githunguri found a ready market for its products in the city (Wanyama, 2013). Nabiswa, Wakhungu, Siamba and Wanyama (2016) indicated that dairy Cooperative Societies play an integral role such as milk collection, grading, bulking and cooling of milk and value addition. These societies also enhance access to dairy production support services like breeding, feeds, extension and credit provision among others. Records held by the Bungoma County Cooperatives department indicated the initiative to establish more cooperatives had taken root with notable progress. Value addition initiatives such as chilling of milk and/or processing into specialized products like UHT

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milk, cheese, butter and instant milk powder is being done minimally. For example, Kitinda Dairy Cooperative Society processes only Yoghurt, Mala and Cheese and pasteurizes and sells fresh milk manually. Naitiri and Kaptama Dairy Cooperative Societies do chilling and storage of fresh milk for onward transmission to processors. About four dairy cooperatives had acquired and installed coolers by 2016, namely, Kikai Dairy Society, Kitinda Dairy Cooperative Society, Kaptama Dairy Coop Society and Naitiri Dairy Cooperative Society out of fourteen existing ones (translating to 28.6%). Today (2020), over 20 cooperative societies have been able to install and are operating milk coolers with plans to undertake value addition.

Nabiswa, Wakhungu and Siamba (2017) indicated the capacities of these societies to handle large quantities of milk during rainy seasons are inadequate (low processing capacity). This has been occasioned by poor infrastructure and fluctuating volumes of milk delivered to these societies. Most of these societies have been grappling with liquidity problems and poor financial management among other challenges. Results from interviews of the managers of the dairy cooperatives and the officials from the Ministry of Livestock Fisheries Agriculture and Cooperatives show that most of the dairy societies have gone under as a result of poor financial management. This has culminated in late payment of the farmers resulting in majority of them resorting to selling to informal retail traders who apparently pay promptly.

Problem Definition

Dairy farming plays a key role in the socio economic status of a large percentage of rural people especially in developing countries through provision of employment opportunities as well as supplementary income to the rural poor. However, evidence indicates that the proportion of dairy farmers engaged in subsistence agriculture in the developing world is still high despite the rapid increase in demand for livestock products (Simelane, 2011). As a result, many countries are attempting to increase milk production by assisting small-scale farmers to integrate in markets since they are the most numerous and poorest of the farmer population as a whole (Delgado, 2014). This has an impact on the provision of rural employment, increase in income and diversification away from traditional production to modern systems of production. Therefore, the co-operative system has proved to be an effective vehicle for dairy development, particularly in rural areas (Lapar, et al., 2006). It has featured prominently in dairy development worldwide because of the range of skills involved in milk production and marketing which require a number of activities that can best be provided through collective action, hence the importance of co-operative Societies. However, Koyi and Wakhungu (2018) discovered that membership in cooperative societies is still low, implying that farmers who are not members of these cooperatives seek their own markets despite the fact that dairy cooperative societies are key drivers to sustainable dairy development.

Purpose of the Study

Assessing the role played by co-operatives, especially in the smallholder sector, is cardinal to the improvement of milk production and marketing in the country. Therefore, the purpose of this study is to examine the role of dairy co-operatives in the sustainable development of dairy subsector in Kenya. Specifically the study sought to answer the following questions:

i. Dairy cooperative with regard to returns and sustainability of smallholder dairy farming, do farmers view dairy cooperatives as best option for their livelihood development? ii. Does interaction of dairy cooperatives with other actors in the dairy value chain enhance sustainability of dairy sub sector in Kenya?

Justification of the Study

Dairy production and productivity is important to Kenya's economy. It is a source of income both directly and indirectly and is a major source of nutrition. Cooperatives can play a major role in sustainable

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development of the dairy sub-sector. Since independence, the government has been advocating for smallholder farmers to join cooperatives in order to improve their bargaining power, get access to inputs, trainings and increase productivity. Further, the government has identified cooperative societies as special purpose vehicle to achieve Sustainable Development Goals (SDGs), Vision 2030 and the Big 4 Agenda. This is further accentuated by cooperative policy of 2019 (GOK, 2019) which appreciates the role of cooperative societies in achieving various development goals. However, local production of milk/dairy products has not adequately served the market due to unsustainability of the dairy sub sector. This has resulted in importation of milk and dairy products that further negatively affected sustainable development of dairy subsector in Kenya. Furthermore, barriers to improved market competitiveness of the dairy cooperatives for improved economic fortunes to farmers need understanding. Therefore, the study would have practical, policy and scholarly implications.

Both County and National governments can use the findings of this study for policy formulations and develop support strategies for implementation of the various reforms regarding dairy and dairy cooperative societies in Kenya. The dairy cooperative societies and other sectors in the dairy value chain would use the report to enhance linkages and identify areas of collaboration, training and capacity building to enhance sustainable development of dairy sub-sector. The study would provide empirical findings on the role of dairy cooperatives in dairy development and form basis for further research by other scholars.

Theoretical Framework

The study was guided by Neoclassical Theory of Cooperatives. According to Royer (2014), theory is a tool used by economists to study various aspects of the economy such as the flow of goods and the functioning of economic institutions. Many theorists have tried to explain the functioning of cooperative societies using diverse models and theories. The Neo-classical theory of cooperatives as advanced by Royer (2014) explains the ideal functioning of cooperatives and explains what motivates the basic functioning of these cooperatives. Viewed in this way, the neoclassical economies hold that importance during the production process, is attached to factors such as customer taste and preferences. Accordingly Sawyer (2014) asserts that the core objective of the cooperative societies is not for own economic gains but rather for the benefit of the members who subscribe to them. On the other hand, Tvaronavičienė and Lankauskienė (2013) differentiates classical and neo-classical theories by stating that neoclassical theory generally centers on human beings as opposed to having them at the periphery.

Similarly, Masuku et al. (2016), agrees that the service objective of cooperatives is to serve its members as opposed to profitability. In a bid to explain the centrality of cooperative members in informing the cooperative policy, it would be prudent to look at the main objectives of cooperatives in favor of the common citizen including elimination of brokers and or middlemen, abating the effects of capitalism, elevating the general wellbeing of communities and elimination of the socially constructed inequalities. In general, cooperatives have to provide a conducive environment in order for its members to realize positive change including financial education, credit access at low rates, informed investment and provision of incentives. In a rejoinder, Marwa (2014) alludes to the fact that cooperatives as organizations have their members acting as the owners and users of the services provided by the entities with a sole aim of improving the member's welfare. Accordingly then, there has to be due consideration and balance between the operations and the needs of the members that are often informed by rational choices. This is in total contrast to the standardized type of firms owned by investors (Investor Owned Firms) whose sole aim is maximization of profits at the expense of member welfare.

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This theory affirms the fact that cooperative functioning just like the underlying cooperative principles stresses on service other than profit. This theory helped the researcher best establish the role of dairy cooperatives in sustainable dairy development in Kenya.

Dairy Cooperative Societies in Sustainable Dairy Development

The role of co-operatives in dairy production is evident in the following ways:

Improvement in milk production

Co-operatives have played a vital role in fostering dairy development in a number of countries in the developing world, particularly by providing a stable market environment and delivering necessary farmer services for smallholder dairy farmers (Mumba et al., 2013). This has been made possible through the development of informal or traditional marketing channels which cooperatives have contributed to and markets dominated by smallholder farmers. They control approximately 80 % of marketed milk in many countries in SSA, South Asia and Latin America (FAO, 2001), examples of which include Kenya (86 %), Tanzania (98 %) and India (83 %). Dairy development through cooperatives is considered the most effective strategy for supporting smallholder dairy farmers, which is made possible by providing a guaranteed market for milk; supplying feed at reasonable prices as well as provision of other services such as milk collection, provision of credit, veterinary aid, and artificial insemination (Solomon, 2014). Access to necessary inputs and services is a major contributor to increase and sustain milk production. An increase in milk production has a positive influence in income generation which encourages farmers to invest in better dairy technology, such as improved dairy breeds and better feed, resulting in milk production being more profitable. Farmers produce better feeds and improve housing and care for their livestock, which contribute to dairy development and hence an increase in milk production.

In addition, many smallholder farmers still practice or use low levels of technology. They are unable to adopt new production technologies that demand higher investment, given their limited financial resources and skills. Although the adoption of improved production technologies has a positive effect on milk production, it does require high investment. Cooperatives have played a pioneering role in introducing modern technologies to help farmers increase production and maximize their returns (Lapar, et al., 2006). They have facilitated and participated in, the dissemination and adoption of new technologies through education and training provided to farmers. The adoption of modern technologies for milk preservation, transportation and processing, has benefited smallholder farmers through the maximization of their returns from increased milk production and productivity.

Improvement in milk marketing

The marketing of milk presents serious challenges for smallholder dairy farmers because of its unique features that require special co-ordination in markets as compared to other agricultural products. According to Simelane (2011), milk has three special attributes that distinguish its marketing from other agricultural products. Firstly, milk is a perishable product and, unlike other agricultural products, it can only be stored for a few days in its liquid state. Secondly, most agricultural products are harvested once a year and can be stored for later sales whereas milk is normally harvested twice/thrice a day. Thirdly, the supply and demand of milk is counter-cyclical over the year. These attributes are evidence that milk requires a secure market and cooperative Societies have proven to be a provider of such an assured milk market, as observed in countries like India, Nigeria and Uganda (Staal, Thorpe, Muriuki, Omore,&Owango, 2000).

Moreover, these special attributes of milk contribute to high transaction costs in dairy production and marketing because of the high marketing costs for fluid milk, scattered nature of fluid milk markets and the risk attached to marketing milk as a perishable product (Simelane, 2011). Because of its perishable nature,

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milk requires rapid transportation to the market in order to avoid losses arising from spoilages. Farmers lack post-harvest infrastructure such as chilling facilities to keep milk in good condition hence the need for rapid transportation of milk to the market. This results in high transaction costs which negatively affect farmers' decision to participate in markets, thus limiting them from accessing markets (Alemu & Adesina, 2015). In this regard, co-operatives play a central role in minimizing transaction costs in dairy production and marketing because they improve market participation by overcoming barriers to assets, information, necessary services and, most importantly, by overcoming barriers to markets within which smallholders wish to sell their milk (Lapar, et al., 2006).

Co-operatives therefore improve the marketing of milk through the minimization of transaction costs associated with selling milk as a perishable product. Co-operatives provide a reliable market outlet to dairy farmers and they have the advantage in the collective marketing of milk which significantly lowers transaction costs among the smallholder farmers (Kolleh, 2016). The provision of a reliable market outlet that is sufficiently rewarding for farmers acts as a stimulator for milk production and cooperative Societies provide more marketing options to farmers. This in turn brings about major improvements in the production and marketing of milk as well as changes in consumption behaviour of smallholder households since they consume a higher percentage of their produce (Simelane, 2011). Co-operatives also enable value addition through the processing of milk into less perishable products which assists farmers in selling directly to final consumers, thereby earning more profit.

Improvement in market access encourages more intensive dairy production in the form of improved dairy breeds and improved feed technologies that enable smallholder farmers to increase their income and employment, which in turn leads to improvement in the welfares of families, including those of women and children (Staal, et al., 2000). An example of successful cooperatives in the dairy industry is found in India. More than 70% of India's milk is produced by households owning only one or two dairy animals and these producers form part of a nationwide network of dairy cooperatives (FAO, 2004).

Nabiswa and Siamba (2017), revealed that some dairy farmers in Bungoma County sold their milk to cooperative societies which later sold it to milk processors or processed it to other dairy products through value addition. The importance of cooperative marketing gives farmers strong bargaining power to get high returns from dairy produce. The cooperative provides its members with a platform upon which they can run their dairy business with members' interests at heart. Further, cooperative societies were found to assist farmers in provision of information about the market, breeds, feeds and credit, which is important for sustainability and increased milk production and productivity. However, the study noted that some cooperatives would offer dairy farmers prices below market value or impose hidden levies at the expense of the farmer. This discouraged the farmers from supplying milk to cooperative societies and preferred to sell it directly to consumers especially those offering better prices.

Improving food safety and standards

Increasing food safety concerns over the effects on health and recent global concerns have led to a growing interest among consumers in food safety assurances and traceability of products offered by farmers (Francesconi &Wouterse, 2015). As one of their advantages, co-operatives have made it possible for dairy farmers to produce good quality milk and dairy products as independent farmers are often unable to meet food safety and quality control requirements because of poor milk handling techniques and technology used. Smallholders do not usually have chilling or processing facilities because of extreme poverty, low asset base and no access to finance. Co-operatives can thus provide farmers with such facilities. To ensure good quality

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products and safety, milk from farmers is tested on a daily basis, which forces farmers to use appropriate milk handling techniques for which they are given appropriate training.

In addition, co-operatives have played a role in undertaking more farmer-oriented research which has expanded dairy education and extension services, and enhanced government role in integrated dairy development (Sulastri &Marhajan, 2002). They have played an important role in providing a base for farmer service delivery and for generally stable agricultural knowledge systems. In short, co-operatives play a major role as a source of market information for dairy farmers.

Access to market information improves decision making by farmers and enhances market participation. Access to such information improves production practices to prevent, eliminate or reduce food safety hazards on the farm. According to Valeeve (2005), these practices include particularly husbandry and management practices such as feed production; cattle movement and traceability; health and treatment, milking procedures, maintenance of milking equipment; dairy cattle housing, water management, hygiene level on the farm; as well as transport of raw milk to selling points. Evidence suggests that farmers with limited access to this information are less likely to adopt standards.

Research Framework

The research strategy involves desk research, and survey obtains information about dairy value chain and cooperatives performance. The research collected both quantitative and qualitative data which was analyzed to generate conclusions and recommendations.

Desk research: Desk study involves literature review done before going to the field for data collection to get detailed information about dairy value chain and farmer cooperative concept. This literature was accessed from libraries, books, internet, journals and reports.

Survey: To collect data, surveys were conducted with cooperative members and cooperative board members and management. This method was also used by Modderman, (2010) in research to explore future prospects for three dairy cooperatives in Musanze district Rwanda. The study sampled Dairy co-operative managers, livestock production officers, co-operative officers from County Government and dairy cooperative members.

FINDINGS AND DISCUSSION

Benefits of cooperatives to the smallholder farmers

Benefits of cooperatives are difficult to measure. Some are tangible or direct as in the case of net margins or savings. Others are intangible or indirect such as cooperatives' effect on market price levels, quality, and service. Most benefits are evaluated in economic terms but some also may be social. Some benefits derived from cooperatives also spill over to non-cooperative members (Calkins & Ngo, 2005).

Table 1: Benefits of Dairy Cooperative Societies

Benefits	Percentage
Assured market	59.0%
Improved incomes	57.0%
Assured payment	46.0%
Source of incomes	44.0%
Help in upgrading breeds	42.0%
Training	40.0%
Better prices	37.0%
Acquired business skills-recommendation	23.5%

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Improvement in milk handling	23.5%
Better access to social support services`	19.8%
Better access to outside support services	15.5%
Access to information	12.4%
Able to save and budget	9.0%

In this study, farmers stated the benefits they derived from being cooperative members. From the results presented in Table 1, the main benefit of being a cooperative member is the assurance of a stable and reliable market at 59%. The cooperative has no limit on the amount of milk that their members can deliver to the cooperatives in addition to having a reliable market. Provision of an assured market is paramount in milk marketing due to its nature in that it is perishable, harvested two to three times a day and its supply and demand is counter cyclic in nature (Staal et al., 2007). Koyi and Wakhungu (2018) indicated that in terms of accessibility to credit, most dairy farmers prefer selling milk through cooperative societies as opposed to individuals, middlemen, and hawkers because cooperative societies offer credit facilities such as short term loans.

Source of income was also one of the benefits stated by the farmers accounting for 57%. This is because the cooperative farmers receive the income on a monthly basis that acts as collateral in case one needs a loan from the bank. Farmers also stated that milk marketing through the cooperative ensured them a steady income flow. Farmers also stated that the fact that cooperatives paid them on a monthly basis enabled them to save and be able to budget for the lump sum income received from the cooperative.

Some farmers also stated that their incomes improved because marketing their milk through cooperative saw an increase in their milk prices as compared to when they were not members of the cooperatives and the fact that they were assured of payment provided them with an incentive to improve production. Farmers also stated that they benefited from the training and information offered by cooperatives. Cooperatives provide vital information to members on farm production and management practices.

Simelane (2011) found out that the main benefits that farmers, in Swaziland, who were members of dairy cooperatives got were secure marketing outlet for milk, improvement of income, provision of market information, access to credit and acquisition of new techniques and ideas. Gasanga (2011) found out that cooperative helped members access market for their milk, access services such as subsidized AI services, veterinary services, training opportunities. Birchall and Simmons (2009) found out that in Tanzania and Sri Lanka, cooperatives helped their members to access knowledge and training, provided technical information, supplied inputs to their members and helped members to sell their outputs such as milk from their members. The same study also showed cooperatives also lobby local governments to build roads, provide money for infrastructural development, mediate with road construction companies and contractors and play an intermediary role between the governments and the farmers

Dairy Cooperative Services

The study further sought to establish services offered by cooperative societies in Kenya. The results are as shown in Table 2.0. **Table 2: Dairy Cooperative Services**

Services	**Percentage**
Milk Marketing	56.7
Milk collection (both national and county have tried to support)	56.7
Artificial insemination	49.5
Calf raising	41.6

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Feed supply and cost are impediments	39.5
Training-coordinate and prioritize for their members	37.7
Extension employ or work with government	37.7
Veterinary Services-they have to make arrangement to establish their own vet service	28.3
Value addition areas focus	23.4
Credit services	20.7
Cows insurance	16.7

Farmers use the milk collection service provided by cooperatives and sell their milk to them (cooperatives). The advantage of joining milk collection service is that the farmers get routine payment for their milk. This was shown by 56.7% of the respondents.

Koyi and Wakhungu (2018) revealed that cooperative marketing strategies in Bungoma County had significant moderate effect on food and nutrition security. Marketing through this strategy gives farmers strong bargaining power in dictating the price of their products unlike selling individually. Dairy cooperative marketing presented long term gains to farmers more as an organized group rather than as individuals. Dairy cooperatives have the capacity to perform value addition on milk thereby increase the product diversity offered to customers. The cooperative societies in partnership with bulk processors would be able to facilitate adoption of various technologies in dairy value chain such as breeding, feeding and health. However, there are few members in these cooperative societies who would prefer to sell it directly to consumers for immediate returns on their produce. Some of the farmers revealed that their colleagues with low income returns from other sources were found to be less involved in cooperative societies as they were not willing to wait for a fortnight to be paid their dues.

Other services offered include milk marketing, Value addition, Artificial insemination, Calf raring, Feed supply, Extension, Training, Veterinary, Credit provision and livestock insurance. The basic dairy cows feeding system is grazing with concentrate supplementation. Concentrates are an essential part of the rations in addition to dry matter roughages to increase the capacity of milk production per cow. Farmers have the desire to increase milk production, especially by increasing green fodder that would result in lowering the cost and increase the profit. Hence, 39.5% of farmers make use of this service given by the cooperatives. When the cooperative society promotes the use of quality animal feed, fodder supply for dairy cows comes mainly from agricultural waste products such as garbage, soybean hulls, sweet potato vines, young corn leaves and sugarcane tops.

The livestock diseases cause economic loss in dairy business. Bae (1993) mentioned that while preventive care is necessary, it would still be economical to treat the animals due to their high value. It was also observed that treatment of diseased animal was costly and hence, the veterinary aid service is aimed at the preventive measures in order to reduce the economic losses and the cost of treatment. Cooperatives employ the veterinarians and trained stockmen to ensure that every member obtains veterinary aid/service at his doorstep for his animals. Artificial insemination obtains a better result by improving genetic quality for the next generation and contributes to increased milk production. It is also regarded as easier method for conceiving than natural mating with one successful pregnancy in every four artificial inseminations.

Dairy cattle insurance serves as a measure to decrease the number of inferior cows and increase investment on high quality animals. Removal of the risk of loss on invested capital dairy animals would encourage farmers to raise more cows.The extension program has a great importance in the dairy development in the

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adoption of better dairy production technologies and business. The extension services in the focus area of the cooperatives by undertaking activities such as; animal health campaign (preventive vaccination, pregnancy diagnosis and treatment of infertility), milk yield (improving the productivity and maintaining high yielding cow), feeding practices, propagation of fodder cultivation (advantages and methods of cultivation of fodder crops) and breeding improvement (artificial insemination in order to promote a good breed). Training was designed to address priority needs of members and aimed at giving the members the proper orientation on scientific dairy management and the role of cooperatives.

Most of the farmers (37.7%) mentioned that the training has helped them to acquire new information related to their dairy activities. They hoped that the cooperatives organize the training monthly for more information. Strong research-extension-Farmer linkages and support services are essential for sustainable dairy development. Field Training programs and demonstration centres are essential for providing education on all aspects of feed ration formulation, improved methods of feeding and management of the dairy animal, thereby exposing the role of cooperatives in knowledge and information sharing. According to Devendra (2013), for inputs to be used to the advantage of, and for proven and successful technology transfer, extension assistance needs to be engaged in demonstration work that not only proves the point, but also motivates the farmers into participation, adoption and progress. Self-reliance is implicit, and the motivation of farmers is also enhanced by periodic training, timely inputs supply and creation of marketing opportunities. Proven Successful and appropriate technologies are those that would allow the fullest possible use of local resources while contributing to particular development objectives for dairy production.

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Interaction between Dairy Cooperatives and other actors in the Dairy Value chain

For dairy cooperative societies to play effective role in sustainable development of the dairy sub sector in Kenya, other actors in dairy value chain are inevitable. Table 3 shows the interactions between dairy cooperatives and other actors in dairy value chain in Kenya.

Table 3: Interaction between Dairy Cooperatives and other actors in the Dairy Value chain

Actor	Service to Cooperative	Service offered by cooperative to others
Financial Institutions	Provide affordable credit to cooperatives and selected members; maintain loan and saving accounts for the same.	Coordinate services to members the financial institutions Recruit clients for the financial institutions
Input suppliers	Supply inputs at affordable rates, sometimes on credit to cooperatives for their members	Buy inputs and coordinate market for suppliers' goods among their members
Veterinary services	Attach Vet officers and provide capacity building services to cooperatives and their members.	Facilitate services (e.gA.I& treatment) and employment
Livestock production officers	Collaborate and provide cooperatives with capacity building and extension services	Collaboration and employment
Kenya Dairy Board	Provide capacity building for cooperative management teams and farmers and enforce quality standards for dairy products	Coordinate services by other actors (vendors and Transporters) with KDB
National Government	Provide technical, Financial and coordination services cooperatives, including policy guidelines to all the actors	Facilitate and coordinate services to members
County Government	Provide technical, financial, capacity building and formulation and dissemination of policy cooperatives and all the actors	Facilitate and coordinate services to members
Dairy Farmers	Produce and ensure steady supply of milk to the milk collection centres.	Coordinate all services to farmers
NGOs and Donors	Technical and financial support in the milk value chain; capacity building of cooperative management and members	Negotiate for funding programmes and provides platform for all services of the actors
Research centers (KALRO, Universities)	Offer consultancy on dairy development; Dairy Technology generation, Dissemination, research and capacity building	Collaborate and coordinates dissemination of research information to members
Retailers/milk vendors	Buy milk from cooperatives	Supply milk to actors

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Transporters	Transport milk from collection centres to processors and to market outlets	Provide opportunities for participation by actors and pays for services
Milk Processors	Transport and process milk from cooperatives	Provide opportunities for participation by actors and pays for services

Strengths Weaknesses Opportunities and Threats Analysis (SWOT)

The results obtained after performing the SWOT analysis of dairy cooperatives by using focused group discussion and interview schedule were then converted into mean percent scores (MPS) and are presented as under:

Strengths of Dairy Cooperative Societies

Strengths are those factors that make an organization more competitive than its market place peers. Strengths are what the company has a distinctive advantage at doing or what resources it has that is strategic to the competition. The Strengths of dairy cooperatives as rated by the participants are presented in Table 4.

Table 4: Strength of Dairy Cooperative Societies

Strengths	**Score**	**MPS**
Expandable membership	4.12	82.4
Dairy is a valued source of livelihood	4.04	80.5
Dairy cooperatives are registered and operate as limited companies and they can access finance from various sources	4.02	80.4
The hierarchy between cooperative members and board members responsible for decision making is narrow promoting full participation of farmers in decision making (everything is done on democratic decisions)	3.85	77.0
Meetings are held at regular intervals to discuss issues to do with the cooperative.	3.59	71.8

The important strengths of dairy cooperatives were the "Expandable membership (82.4%)", "Dairy as a source of livelihood (80.5%)" and "Dairy cooperatives are registered and operate as limited companies and they can access finance from various sources (80.4%)". Apart from these the " The hierarchy between cooperative members and board members responsible for decision making is narrow promoting full participation of farmers in decision making (77.0%)", were ranked subsequently as the strengths of the cooperatives. The above findings are further supported by the findings of Rathod et al., (2011), who reported that the strength of Gokul dairy cooperatives in Western Maharashtra was its membership scope. Further Neven et al (2016) revealed that dairy sector had strengths like effective network of animal husbandry department, increasing consumption of milk, proven technologies, free marketing system and regular income from sale of milk. The dairy cooperatives in Kenya should utilize these strengths to increase returns and enhance sustainability of dairy farming.

Weaknesses of Dairy Cooperative Societies

A weakness is a limitation, fault, or defect within the organization that will keep it away from achieving its objectives; it is what an organization does poorly or where it has inferior capabilities or resources as compared to the competitors. Weaknesses of dairy cooperatives based on our study are presented in Table 5 below.

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Table 5: Weakness of Dairy Cooperative Societies

Weakness	Score	MPS
The cooperatives have no adequate infrastructure in place to process diverse milk products to reduce market risk of relying on single product.	4.12	82.4
Lack of structured and clear benefit packages available to sustain the motivation of member farmers	3.99	79.8
Farmers have low knowledge on dairy farming that would promote production of high volumes of quality milk if all farmers get dairy cows.	3.94	78.8
The cooperatives cannot consistently supply local market with the products to buyers resulting in market losses.	3.85	77
Existing Milk collection centres are inadequate and not well equipped	3.77	75.4
Most farmers do not have high yielding dairy cows resulting in low milk volumes being supplied to the cooperatives.	3.74	74.8
Some cooperative members are side selling milk reducing processing capacity of the plant.	3.59	71.8
Most dairy farmers are old and this will cause low production in the future since there are very few young farmers to produce milk for the cooperatives.	3.01	60.2

The major weakness which was ranked first was "The cooperatives have no adequate infrastructure in place to process diverse milk products to reduce market risk of relying on single product (82.4%)". The next in the series of weaknesses includes "The cooperatives are selling one product of low quality posing a market risk of relying on single product (80.4 %)" and "Lack of structured and clear benefit packages available to sustain the motivation of member farmers (79.8%)". The above findings are supported by the findings of Eshetu (2008) who reported the weaknesses of dairy cooperatives in central Ethiopia including lack of well-structured and clear benefit packages for motivation of dairy farmers to join cooperatives and lack of proper and timely animal health services to the member farmers. He also reported insufficient advertisement and promotional works to attract new farmers or potential customers as other weaknesses. Further the work of Rathod et al., (2011) reported low price of milk as compared to other market players in the study area as other weakness of the dairy cooperatives. Wani et al., (2013) reported that non remunerative price of milk, less membership and lack of adequate infrastructure facilities were the serious problems faced by the cooperative societies. From the observation of the weaknesses of dairy cooperatives in Kenya, it is clear that there is a good scope to turn the weaknesses into strengths of the organization. The weaknesses like "low productivity of animals and high cost of production", "lack of structured and clear benefit packages", "low price of milk" and "absence of support services" could be improved upon by suitable policy interventions. For that purpose, dynamic leadership in the organizations and the government support are of prime importance.

Collaborative approach should be adopted with the line departments of the state to strengthen the extension services to the dairy farmers.

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Opportunities of Dairy Cooperative Societies

Opportunities include any favourable current prospective situation in the organizations' environment, such as trend, market, change or overlooked need that supports the demand for a product or service and permits the organization to enhance its competitive position.

Table 6: Opportunities of Dairy Cooperative Societies

Opportunities	Score	MPS
Growing milk demand and expandable market share.	4.11	82.2
NGOs and Donors are supporting cooperative members by giving them dairy heifers to increase their dairy breeds and offering them training to improve their skills and knowledge.	4.01	80.2
More producers willing to join the cooperative societies.	3.96	79.2
Existing financial institutions have the capacity to provide funds for Developing infrastructure like processing equipment, bulk milk coolers, chilling centres and feed manufacturing units	3.76	75.2
Research centres and universities are ready to improve breeding and expand feed technologies	3.45	69
Governments are ready to improve existing dairy and cooperative policies	2.48	49.6

Close look at the results presented in Table 6 above showed that the important opportunities for the dairy cooperatives in Kenya were: "Growing milk demand and expandable market share (82.2%)", which was ranked first." NGOs and Donors are supporting cooperative members by giving them dairy heifers to increase their dairy breeds and offering them training to improve their skills and knowledge (80.2%)" and "More producers willing to join the cooperative societies (79.13%)", were ranked second and third by the officials/participants respectively.

The examination of this table revealed that there were bright prospects for the organizations, as the demand of milk was growing in the state and the current infrastructure was in the process of continuous upgrading like processing equipment, chilling centres and feed manufacturing units, which would overcome their weaknesses and facilitate tapping into the opportunities in the way of dairy cooperatives in Kenya. Rathod et al., (2011) revealed that in Western Maharashtra, the dairy cooperatives were harnessing the opportunities of the increasing production and better market coverage by improving the quality of input services and by reducing the cost of milk production. Rajendran and Samarendu (2004) also concluded that the milk quality, product development, infrastructure support development, and global marketing were found to be emphasized in India's milk marketing. Wani and Wani (2010) revealed in their study based in J&K, that dairying offers a vast potential for development in the state. Integration of dairying with processing/value addition had ample scope in the state and can help to boost milk production and increase income and employment of producers and urban consumers with regular supply of quality milk and its products at reasonable prices. The producers willing to join the cooperative societies, is the biggest opportunity for dairy cooperatives to extend its support and services to the milk producers to cover them under the cooperative structure.

Threats of Dairy Cooperative Societies

A threat includes any unfavourable situation, trend or impending change in an organization's environment that is currently or potentially damaging or threatening to its ability to compete. It may be a barrier, or anything that might inflict problems, damages, harm or injury to the organization.

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Table 7: Threats of Dairy Cooperative Societies

Threats	Score	MPS
Farmers losing interest in dairy farming	4.28	85.6
There is stiff competition from cheap milk products from neighboring countries and local products.	4.12	82.4
Competitors are selling high quality milk products causing serious market problems for low quality product of the cooperatives.	4.08	81.6
Cooperatives have not established good agreements with input/service providers, to buy animal feed and medicine at reduced prices.	4.01	80.2
The cooperatives have no formal agreements with banks for facilitating members' access to credit; Policy arrangement with banks for facilitating accessibility of credits is lacking	3.93	78.6

The threats faced by the dairy cooperatives were rated and presented in Table 7 which showed that "losing interest of farmers in dairying owing to high cost of production and un-remunerative price (85.6%)", "There is stiff competition from cheap milk products from neighboring country and local products (82.4 %)" Competitors are selling high quality milk products causing serious market problems for low quality product of the cooperative (81.6%)" were ranked as first, second and third threats of dairy cooperatives respectively.

The Table-4 highlights the other threats like "Cooperatives have not established good agreements with input providers, to buy animal feed and medicine at reduced prices (80.20%) " and The cooperatives have no formal agreements with banks for facilitating members' access to credit (78.6%) faced by dairy cooperatives in Kenya.

From the observation it appears that these threats could be minimized if not totally removed by proper tapping of strengths and opportunities of dairy cooperatives in Kenya. Rathod et al., (2011) also have reported the lack of appropriate policy favouring the dairy sector and challenge of waste disposal as the threats to dairy cooperatives. Milk vendors and other unorganized sector players, occupying prime place in dairy sector today were mentioned as threats to organized sector of milk marketing in India (1997). Further, prohibitive banks' policy for collateral requirement and unorganized and weak dairy related associations were also reported to be threats to the dairy cooperatives by Eshetu (2008), in his study in Ethiopia. Singh and Pundi (2002) also stated that the major threat to the dairy cooperatives was unregulated competition from national and multinational private companies and unethical practices by unscrupulous private dairy operators.

Implication of the Study

The findings from this research present a number of issues that have implications for the academic, policy and the practice. The research has policy implications in relation to sustainable development of dairy sub-sector and role of dairy cooperatives. It is worth to note that there are inadequate policies in regard to dairy cooperative roles in Kenya. Most of the benefits and services provided by dairy cooperatives require policy backing. Further, for dairy cooperatives to adequately achieve their roles there is need for effective interaction with other actors in the value chain. However, existing National cooperative policy does not present framework for interaction between cooperatives and other actors. This implies that cooperatives cannot derive maximum benefits from their interactions with other actors' especially financial institutions, donors and research centers. Further, recounting SWOT analysis revealed various policies implication in regards to strengthening dairy cooperatives so as to exploit existing opportunities and at the same time

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mitigating prevailing threatens which may weaken their roles in sustainable dairy development. Therefore, government should be compelled to come up with enabling environment that would enhance beneficial interface between cooperatives and other actors in the dairy value chain.

The study has also implications related to practice as derived from findings. This is specifically directed toward dairy cooperatives and dairy farmers who are significant to development of dairy sub sector in Kenya. Accordingly, the first major practical contribution of the present research is that it provides much needed empirical data on the role of dairy co-operatives in the sustainable development of dairy subsector in Kenya. This information is important given that the there is no other comparable studies in Kenya given that sustainable dairy development sub sector is important for the achievement of Big Four Agenda, Vision 2030 and SDGs. Recounting the benefits and services offered by dairy cooperative, their management should strengthen their capacities by using their economies of scale and existing resources to establish market linkage, input linkages, financial linkage and research linkages. Another practical implication is borne out of interaction with actors in the value chain as there exists dual linkage between cooperative societies and other actors such as farmers and transporters. This implies that their role in sustainable dairy development is not debatable and adequate support is need to upscale their services and enhance their services to their members.

CONCLUSION

The study established that dairy cooperatives in Kenya have supported development of sustainable dairy development to some extent. For instance, inadequate and relatively poor services such as veterinary services, lack of access to credit, low payment to farmers, reduce motivation for participation in cooperative activities. Their role has constrained enhancement of robust development in the dairy sector. However, the contribution of dairy cooperatives to sustainable dairy development varied from region to region depending on impacting factors.

The cooperatives are operating below capacity because their members are producing low volumes of milk which is further worsened by side selling. It is also suffering stiff competition since the cooperatives are processing low quality products as compared to the imports and local products. Inadequate entrepreneurial, management and technical skills of cooperative members and employees are affecting the performance of the cooperatives since the board members are not performing their task efficiently and technical staff could not process diverse milk products. The cooperatives used to have diversified client base which is declining due to its failure to meet standard requirements for some supermarkets which are now rejecting their products due to the absence of barcodes. The selling of limited dairy products is posing market risk to the cooperatives. The survey findings depicted that inadequate entrepreneurial skills and costs and marketing are the main challenges hindering efficient performance of dairy cooperatives. These challenges are barriers to improved market competitiveness of the dairy cooperatives for increased income generation to farmers.

RECOMMENDATIONS

The study identified a number of weaknesses and threats which hinder the successful performance of the cooperatives in the light of their strengths and opportunities. In order to overcome these challenges and contribute to improved market competitiveness of the dairy cooperatives for increased income generation to farmers, the following recommendations need to be considered.

To all cooperatives

- The cooperatives should process diverse milk products to reduce market risk of relying on single product. They can improve the quality of their products by adding flavours and other ingredients in order to compete with milk and dairy products imports and local products thus getting higher income. This should be

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enhanced by consistently supplying the product and meeting selling requirements of supermarkets such as barcodes.

- Cooperatives should establish rational agreements with input providers, to buy animal feeds and drugs at reduced prices.
- Cooperatives should establish formal agreements with banks for facilitating members' access to credit. The banks should clearly explain terms of payments to the cooperative members to make them capable of deciding whether or not, to take a loan.
- Cooperatives should liaise with other actors in the dairy value chain such as financial institutions, National and County governments, to ensure they adequately offer livestock insurance services to their members as an emerging need within sustainable dairy development.

To the cooperative board members

Cooperative board members should undergo management training courses offered by recognized institutions especially Universities and Government institutes to improve their management skills. Board members are in need of training on entrepreneurial skills; negotiation skills and cost containment and marketing to improve the market competitiveness of the cooperatives.

To the cooperative members

- Members should offer full support to cooperatives in order to strengthen performance for their own benefits.
- Cooperative members should increase their dairy herds and adopt high yielding breeds. Enhanced quality dairy breeds will result in high milk production hence more profits as more volumes will be supplied to the cooperatives.
- Since most dairy farmers are old they should train and motivate young people to be dairy farmers to produce milk for the cooperative in the future.

To the ministry of Agriculture (Both County and National Government)

- There is need for capacity building to improve the performance of extension workers. Both governments to strongly facilitate policy implementation at cooperative level so that the farmers' participation and benefits are increased.
- Non state actors in the dairy sector have to consolidated their effort and resources in supporting cooperatives to perform

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