An Appraisal of Farmer-Grazier Conflicts Resolutions in The Dairy Districts of Bui Division (DDBD)

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***Abstract*: Despite governments' efforts in Sub-Saharan Africa to solve land use crisis, farmer-grazier conflicts persist in localities where grazing is practiced. This paper aims at assessing farmer-grazier conflict resolutions in the Dairy Districts of Bui Division (DDBD) by the Tadu Dairy Cooperative Society (TDCS). A mixed research approach was used in this study; primary data was acquired via questionnaires, interview guides, and direct and indirect observations. It was realized that the cooperative crossbreed cattle of smallholders by way of artificial insemination (88%) thereby improving the variety and yield of cattle reared. Farmers' income has been boosted (94%). Rural women have been encouraged/integrated into the rearing of high-yielding new breeds (68%). The cooperative has been training graziers on the new practice of stall-feeding; and keeps smallholders' animals on its ranch (79.3%). Because of all these, the quest for more grazing land that usually caused conflicts between farmers and graziers has reduced. Nevertheless, governments should encourage the creation of dairy cooperatives in areas where cattle are reared to enhance the resolution of farmer-grazier conflicts that have often retarded sustainable development within communities due to loss of property and long-lasting enmity.**

***Keywords*: Conflict resolutions, Dairy Districts, Bui Division, Farmer-grazier conflicts, land use, Tadu dairy cooperative society**

I. INTRODUCTION

Land is a resource that is indispensable to humanity. land use concerns the functions or purpose for which land is used by the human population which can be defined by human activities directly related to land, making use of its resources, or having an impact on them [1]. Land is a very strategic socio-economic asset. Competition over its acquisition is often vigorous almost everywhere in Cameroon and particularly in the northwest region [2]. Land is recognised as a primary source of wealth, social status, and power in local and indigenous communities. It is the basis for shelter, food, and economic activities; it is the most significant provider of employment opportunities in rural areas. Landownership is often the primary cause of conflicts, and given that the survival of most Cameroonians depend on land, the struggle over its control engages people at all rungs of society [3]. While bearing in mind the socioeconomic significance of land, it is not surprising that social or ethnic conflicts over land are occasioned by inequitable control over it [4].

In the world, agricultural land use problems such as farmer-grazier conflicts contribute to low production and productivity of crops and animals. The causes of these conflicts are numerous such as land scarcity, lack of knowledge, absence of governing rules, and insufficient pasture. In the North West Region of Cameroon, the recurrent conflicts between farmers and cattle graziers over land ownership have their roots in land scarcity, climate change, and the poor application of statutory laws guaranteeing them [5]. According to [6], farmers compete with graziers for fertile lands that have abundant pastures for the feeding of cattle; this situation places the farmers in a difficult situation because as they are tilling the soil and planting crops for family sustenance, the cattle pasture and feed on their crops without compensation. This, however, results to conflicts between farmers and graziers. In this same line, [7] and [8], complement that the causes of farmer-grazier conflicts are, competition over land, land ownership, environmental factors, political ecology factors, changes in climatic conditions, and competition over water. Following this same line, [9] adds that farmer-grazier conflicts are caused by competition over land, cattle trespass, encroachment by farmers and conflict of culture.

In the DDBD, agricultural land use problems ultimately began following the promulgation letter n° 594/MINAGRI/DAG/SREE of 10/4/1973 on the total protection of Kilum mountain forest. It prohibited farming and grazing on all protected areas. This protection created agricultural land scarcity among agriculturalists. However, a glaring factor accounting for the occurrence of potential land conflicts in the DDBD are trespassing on land and land enclosure. The legal procedure for land acquisition is barely known to the community; talk less of its application within the Mbororo people of the DDBD [10]. Given that the settlement zone of the Mbororo community is predominantly pastoral, the enclosure of communal land reduces access to natural resources; hence, a resultant increase in competition over land resources giving rise to inevitable potential conflicts [11].

Farmer-grazier conflicts in Cameroon cause a drop in income and livelihood; negatively affects the schooling of children; have effects on legal and other costs; affect food security; and affect health [7]. The effects of these conflicts can be devastating and include loss of assets and human life, insecurity, food crises, and sustained poverty [12]. In addition, [13] in his study on, 'Friendship among Pastoral Fulbe in North West Cameroon', opined that conflict limits the ability of crop farmers and grazers (herders) to live in harmony in the same community. Local mechanisms of resolving conflicts over grazing land in the DDBD traditional mode of amicable dispute settlement by the traditional leaders have often been used to resolve conflicts arising on grazing land. The land consultative board has also been used where matters are reported to the Divisional Officers of the study area for their commission to examine and resolve disputes and litigations through a formal court system was also put in place to resolve farmer-grazier conflicts. Despite the promulgation of the 1978 law on farmer-grazier management in Cameroon, its functioning that stood as its symbol 'par excellence' was riddled with a lot of weakness which instead of reducing the incidence of these disputes rather complicated the solutions to their problems [14].

Farmer-grazier conflicts are crucial in most rural areas where alternative livelihood sustainability activities are insufficient [10]. According to [5], there cannot be peace, tenure, security, and stability in the region without some attempt at resolving this perennial phenomenon of land conflicts between farmers and cattle graziers. Resolving this problem will require the institution of land reform, and some proactive measures to address the region's land-related conflicts. In order to solve farmer-grazier conflicts as perceived by [7], the two parties can reach an amicable agreement. This process could involve the traditional leaders including the Fons or the Divisional Officers (DOs); but there is considerable disagreement about whether officials, the DOs, law enforcement agencies, gendarmes, or the Fons, favour farmers or graziers. There should equally be an improvement in alliance farming, grazing practice (improving pastures using better seeds), and water protection plus the use of biogas to help improve the relationships between farmers and graziers.

Overall, the local institutional arrangements are functional and a high percentage of conflicts are managed effectively at local levels. The ability of rural communities to prevent and manage farmer-grazier conflicts is based largely on the routes and strength of communication between herding and farming parties, respected community leaders, and leaders of neighboring communities [16]. As assessed by [8], for conflicts to be resolved, all stakeholders (government, non-governmental organizations, extension agencies, and rural institutions among others) should intensify efforts to build cooperative and peaceful coexistence between farmers and pastoralists through public enlightenment, education, and campaign in agrarian communities. Governments and NGOs should promptly intervene with aid/compensation to reduce vulnerability, persistence, and further spread of conflict of pastoralist-farmer conflicts in communities. In addition, policies that ensure strict compliance with grazing reserve and migration routes should be enforced as an imperative for the sustainable management of conflicts between graziers and farmers in agrarian communities.

However, [9] recommend that for farmer-grazier conflicts to be resolved, farmers should adopt viable techniques of cultivation such as the use of organic manure, the use of night paddocks, and ranching as forms of livestock rearing to minimize land pressure and reduce conflicts. Farmers should practice crop rotation and use of organic manure on their fields while graziers should produce hay and silage. Reference [17], argued that measures to avert farmer-grazier conflicts lie in the hands of the government and the community. Communal responsibilities lie on both local sedentary farmers and the pastoralists, and these rely not only on the interests of peace and harmony but on the economic perspective and trade alike. Children and young people should be encouraged to view Society as theirs and participate in global partnership efforts so that they can contribute to developmental efforts, knowledge, and innovation. Moreover, a symbiotic relationship between farmers and pastoralists should be enhanced. Many communities of farmers and pastoralists have built interdependent relationships with one another through processes of exchange.

Pastoralism and farming are two major land use types in the DDBD with very high population densities (Kumbo: 220 persons/km^2, Oku: 210 persons/km^2, and Jakiri: 145 persons/km^2). With increasing mouths to feed, there have been inherent cropland encroachment into grazing areas that accentuated after the economic crisis of the 1980s and early 90s. Farmers began switching from coffee farming, the main cash crop to food crop cultivation. Growth in cattle numbers and dwindling resource base in rangelands breeds conflicts among resource users. Evidence-based research shows that expanding human and animal populations, as well as agricultural needs, have led to the conversion of rangelands to farmland, deforestation, and land use conflicts between resident farmers and graziers [18], [19], [20], [21]. Despite all attempts put in place to resolve farmer-grazier conflicts in the DDBD, conflicts continued persisting until the TDCS came into existence and started carrying out dairying activities within the districts. Dairying activities carried out by the TDCS since its creation has been enhancing the resolution of farmer-grazier conflicts within the study area where cattle rearing and farming are prominent activities for livelihood sustainability.

II. RESEARCH METHODS

A. Location of the study area

Bui Division, located in the North West Region of Cameroon, is an extension of the Western lava plateau that diagonally cuts Cameroon from the Gulf of Guinea along the tectonic axis called the Cameroon Volcanic line. It is located between latitudes 6° 00′ and 6° 31′ north of the equator and Longitudes 9°45′ and 11° 51′ east of the Greenwich Meridian. It spans a surface area of about 2300 km^2. This area extends

above the height of 2000m. Bui-Division has six administrative Sub-Divisions; that is, Noni Sub-Division, Nkum Sub-Division, Kumbo Sub-Division, Mbven Sub-Division, Oku Sub-Division, and Jakiri Sub-Division (Fig. 1). It has a tropical montane climate with more than 1800mm of rainfall per annum with a dominantly Soudan savannah vegetation and montane forest.

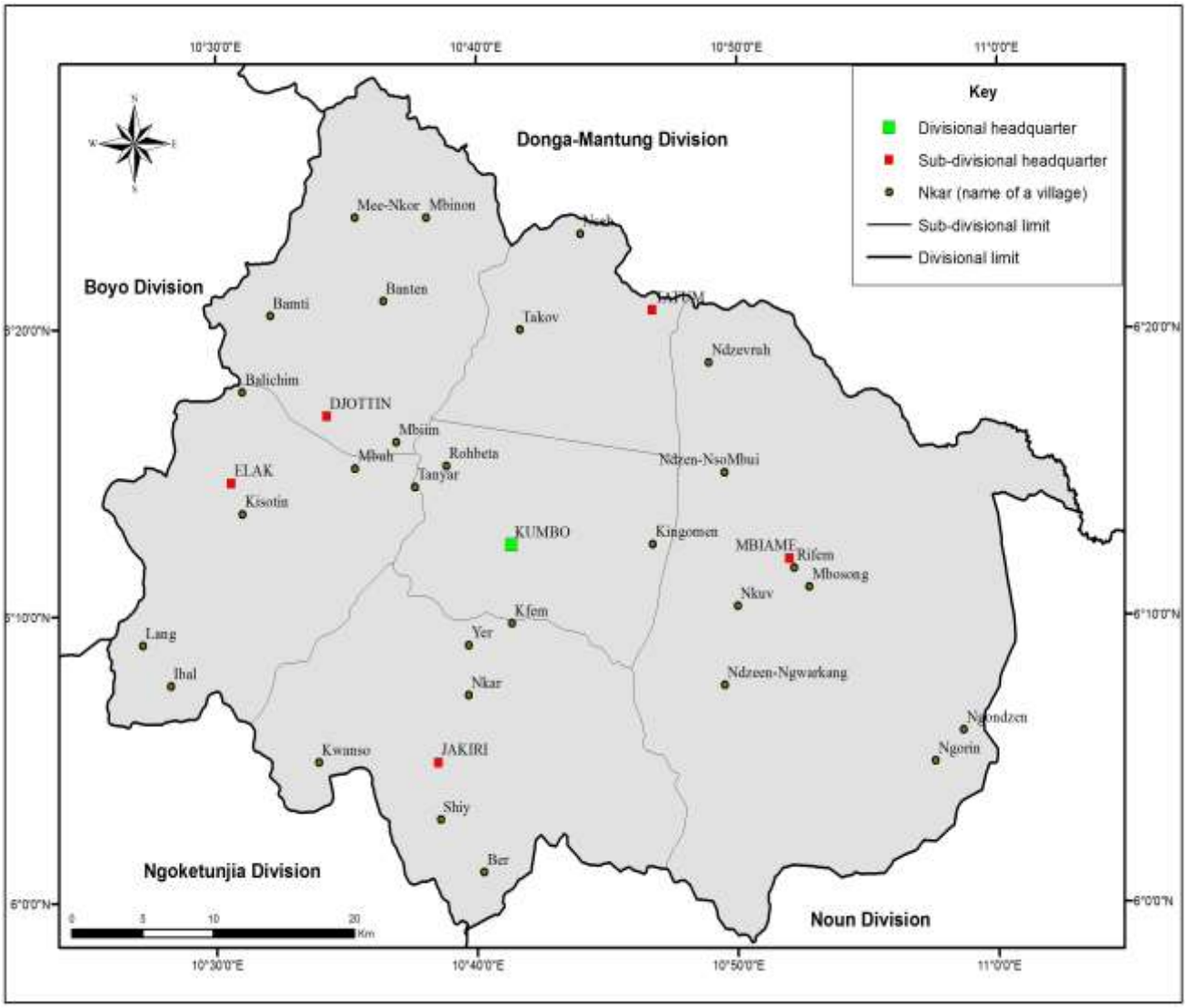

Fig. 1 Layout of the study area

Source: Geospatial Informatics Services Consulting, Yaoundé (2014)

B. Methods and techniques

A random sample survey was used in different households of the DDBD. Qualitative and quantitative have been used for this study; data were collected from farming households (rearers and food crop farmers). The research tools used were semi-structured questionnaires, in-depth interviews, and discussions in focus groups. The questionnaires were administered to 166 randomly selected farming households (table I). A total of 11 focus group discussions were held; One (1) with the multipurpose project group in Vekovi, two (2) with traditional authorities (one in Mvem and the other in Vekovi), four (4) with graziers, three (3) farmers' groups (women) and one (1) with ten members of the TDCS. Each focus group consisted of 8 – 10 members. The focus group discussions enabled us to gather information from persons with a common fostered interest. Structured interviews were also conducted with three (3) dairy cooperative society workers, two (2) shareholders of the cooperative, two (2) members of the multi-purpose dairy project group in Vekovi, three (3) traditional rulers who are farm landlords, and with one (1) woman who was involved in the rearing of new cattle breeds.

Table I: Surveyed Households In The Dairy Districts Of Bui Division (Ddbd)

N°	Surveyed villages	Number of households	9% of households
1	Ntur	38	3
2	Vekovi	662	60
3	Wvem	290	26
4	Taashem	16	2
5	Shuukov	16	1
6	Kai	20	2
7	Fonmboh	17	2
8	Tadu	245	22
9	Simonkov	145	14
10	Buh	278	25
11	Mbontovi	49	4
12	Mbonyar	60	5
Total	12	1835	166

Source: National population and housing census-Cameroon (2010), and fieldwork (2019).

As seen in table I, 9 % out of 1835 households were randomly selected from each village to serve as our sample size. This gave a sample size of 166 households.

III. RESULTS AND DISCUSSIONS

A. Introduction of a novelty (Artificial insemination) in the DDBD

In our world today, artificial insemination is increasingly becoming important in improving animal species; most especially cattle. It allows for faster and increased genetic improved herd performances and production [22]. Artificial insemination is a technique, in which sperms are collected from the male animal; the sperms are processed, stored, and artificially introduced into the female reproductive tract at a proper time for the purpose of conception. It is one of the technologies whereby offspring are generated by facilitating the meeting of gametes. In many developing countries, artificial insemination is being promoted as an answer to milk production. It should be given partial credit for the dramatic change in reducing the number of cows while increasing milk production [23]. A reduction in the number of animals reared with an increase in yields reduces the demand for more pastureland.

Artificial insemination was introduced by the TDCS around 1999 and its main aim was to increase dairy production. Research by [24] reveals that artificial insemination was the first great biotechnology applied to improve the reproduction and genetics of farm animals. It has had an enormous impact worldwide on many species, particularly on cattle. Artificial insemination was to help reduce the old Fulani species that were less productive by increasing new breeds that are more productive and profitable in the study area. In the Dairy Districts of Bui Division, only the Fulani specie of cattle was reared before the introduction of artificial insemination. According to [25], after independence, traditional grazing dominated in the study area with a majority of it carried out extensively. According to 89.6 % of respondents, the Fulani specie requires a large number in order to yield more profits as compared to the new breed recently introduced in the study area by the TDCS. These respondents argued that these species are not usually fat except when reared for a very long period; that is, from 3-4 years, and demand vast grazing lands for the animals. The species formerly reared included the Gudali, red and white Fulani species. These animals were reared purposely for beef production; milk production could give one (1) litter per cow daily. However, the quest for more grazing land as affirmed by 91 % of respondents resulted to farmer-grazier conflicts over land.

The TDCS created a milk factory and a ranch, Tadu ranch where milk was collected easily from animals. Milk was also gotten from smallholder cattle graziers in the community to increase the amount gotten from the ranch for processing/transformation into cheese, yogurts, and butter. The high demand for raw milk from smallholders encouraged the keeping of animals capable of producing more milk; thus encouraging the introduction of improved species of cattle. Through artificial insemination, the old Fulani species could reproduce improved species; thus reducing the quest for more grazing land and a reduction in farmer-grazier conflicts. In the DDBD, this process of artificial insemination has been highly favoured by climatic conditions. Artificial insemination provides good species of cows that produce an increased quantity of milk (a cow produces an average of 8 liters per day). Artificial insemination provides improved breeds such as Holstein (purposely for milk), Brahman, and Simmentals (purposely for beef and milk). These different species of improved breeds produce different amounts of milk as revealed in the field. Holstein produces 10 to 15 liters of milk daily depending on how they are fed; Brahman produces 4-8 liters of milk per day; and Semental 6-10 liters of milk per day. Sementals are very bulky and produce more beef as compared to other species. According to our respondents (84.3 %), stall-feeding of one bull is worth 4 Gudali (Fulani specie of cattle). It was disclosed by 94.5 % of smallholder cattle graziers that the number of animals reared has reduced but there is an increase in output and income; this has reduced the surface area formerly used for grazing. It is worth ascertaining that the TDCS via the introduction of improved breeds and artificial insemination in the DDBD indirectly enhanced the resolution of conflicts between farmers and graziers over land.

B. Social and economic security

Livestock, especially cattle, has historically played multiple roles both in the economic and socio-cultural traditions of African people. Cattle have been valued not simply as a source of food (milk, blood, and meat) and hide but also as a visible form of wealth and a source of social prestige. The economic importance of cattle has increasingly shifted to commercial milk production [26]. The dairy industry in Africa

accounts for about 5 % of the world's milk production [27]. As opined by [28], livestock provides food, income, manure, animal traction, and social security. It also provides potential food security among vulnerable groups such as females. This means less milk goes through the formal marketing and processing sector. In the DDBD, 87.57 % of grazier households enjoy many benefits from dairy such as food (milk, cheese), income, and manure for their food crop farms. This rendered 92 % of them socially secured and this reduced their quest for more grazing lands that could result in conflicts with food crop farmers. It was noticed that 89.56 % of smallholders were economically secured thanks to increased production of milk and cheese from cattle as a source of food, and increased household income thanks to training offered by the TDCS on the adequate supply of nutrients to cattle.

C. Creation of dialogue platforms

As established by [29], some herdsmen destroy fences around farms in order to direct cattle into farms to eat up corn tassels and beans flowers, which they consider vital for promoting fertility in cattle. This has not been the case with graziers in the DDBD; however, animals do stray into farms accidentally. It was revealed that about 95 % of cattle owners were Mbororos, advanced in age, and could not move around to feed their herds. As such, the herds were controlled by teenagers who had little or no experience with grazing skills; this tendency increased the number of cattle straying into farm plots and hence recurrent farmer-grazier conflicts as disclosed by 84.3 % of respondents. In a bid to solve this problem, the TDCS created dialogue platforms with farmers and graziers through partnership and buying of shares. Many graziers had lukewarm attitudes due to the fact that land was abundant in the forest for cultivation. However, when the portion of land reserved for agricultural purposes was reduced due to the introduction of land conservation policies, land scarcity became an issue causing numerous farmer-grazier conflicts in this community. The conflicts became disastrous and this made about 87 % of graziers seek refuge in the Tadu ranch by buying shares and becoming members; this reduced the occurrences of farmer-grazier conflicts in the districts.

Nevertheless, when the Tadu ranch was instituted, it formed a partnership with the Government and was later on transformed into a Cooperative that permitted individuals in the community to become members through their registration and buying of shares to become shareholders. The TDCS has a ranch where cattle are kept and catered-for, by veterinary technicians. As observed in the field, the TDCS carries out water projects within the ranch and the Dairy Districts as a whole, in order to provide water to animals within and out of their ranch. This has helped to keep the animals in place thereby reducing the breaking of enclosures in search of water for cattle. Hence, a reduction in farmer-grazier conflicts in the study area. As attested in the field by Ardor Tandai (Mbororo leader) in Taashem, the keeping of his cattle in the TDCS' ranch has helped to solve the problem of compensating individual crop cultivators who always accuse him of destroying their crops with stray cattle. He further affirmed that animals on the ranch receive treatment and medication free of charge.

This endeavour of partnership and selling of shares by the TDCS resulted in the formation of dialogue platforms where disputes between farmers and graziers were settled. The dialogue platforms comprised a team of trusted members of both parties (farmers and graziers) with a common interest in developing their community. These platforms were equally involved in the capacity building of both farmers and graziers. As discoursed by [30], dialogue platforms carry out negotiations successfully with graziers and farmers; they embrace alliance farming as a measure to curb hatred and conflicts. In the TDCS, alliance farming was practiced and helped farmers and graziers to live in harmony. The formation of dialogue platforms made rearers in this community have a spirit of unity and act as colleagues and not as protagonists; this helped to wipe out the hatred that existed between women and herdsmen. There have been noticeable tilts and tendencies toward alliance farming and harmony between pastoralism and farming in the DDBD as attested by 84.5 % of respondents.

D. Capacity building/empowerment

Cooperatives provide a good avenue for farmers to be trained on good husbandry and get services, which they could not get if they worked in isolation [31]. Like any successful enterprise, improved pasture must be planned for so that one knows how much one can reasonably spend on pasture to make it worthwhile. Smallholders of the TDCS were trained on Pasture improvement, which is the utmost economical method of ensuring that cattle have access to adequate supplies of nutrients. As discoursed by [30], the capacity of small-scale farmers to keep up with the continuous stream of changes defines their inclusion or exclusion in the evolving supply chain and thus the restructured market. Dairy cooperatives provide appropriate information and knowledge to smallholders and this can help them innovate and adapt to the changing market conditions [1]. In fact, 97 % of farmers were educated on better ways of rearing animals by the TDCS and HPI through their common project. The training received by farmers helped 92 % of respondents to understand better ways of rearing thus helping them to understand that they are colleagues and not enemies; 87 % got adequate information concerning the dairy market system. Through education, they understood that the key requirement for rearing is the fence. Fencing animals reduces the trespassing of animals on farms and as such, prevents conflicts. Moreover, the involvement of women in rearing according to 79.3 % of respondents helped to reduce farmer-grazier conflicts since these women were formally the brain behind conflicts. However, indigenes of the DDBD, especially Women made wealth through milk collected from cattle that are stall-fed (plate 1). Through the rearing of cattle, women made a lot of money that helped them provide for their needs. This helped to change their negative mentality towards animals and rearing as a whole, thus reducing numerous farmer-grazier conflicts in this community.

Plate 1: A grazier preparing animal feed

Photo 1

Photo 2

A – Animal feed;
B – New breed;
C – Prepared animal feed
D – Female animal grazier;
E – Fence

Photo 1 shows animal feed cultivated in a farm. Photo 2 illustrates how the new breeds are kept and stall-fed in a fenced environment. After harvesting the feed, the rearer cuts it into smaller sizes before giving it to the new breed of cattle.

As revealed in the field, 87.4 % of women ascertained that stall-feeding of improved breeds gives more money than cultivating vegetables and 88.8 % of respondents attested that rearing stall-fed cattle has increased their milk output. Reference [33], recognized that dairy cooperatives bring buyers and sellers together and can contribute to reducing price risk and enhancing the bargaining power of smallholders. In this same line, [34], in their study on coffee cooperatives, elucidated that cooperatives play an important role in the marketing of smallholder products. The TDCS plays an important role as a ready market for smallholders. This, however, reduces the risk of losses in the money value of smallholders.

E. Ready Market for smallholders' dairy products

According to [35], most farmers make use of all services provided by a dairy cooperative and improve their dairy farming. Dairy farmers are also well satisfied with cooperative services and perceive that their dairy farming management becomes better in almost all aspects. A dairy cooperative is instrumental in directly improving the income of its members; it is also indirectly beneficial to the rural region at large, by generating substantial employment and investment opportunities in the animal feed industry, bank, and other related activities. Cooperatives are often cited as one of the most effective ways of grouping small dairy farmers to deal with the challenges of producing and marketing milk. The unique characteristics of milk require special considerations in terms of linking producers to markets. These characteristics include its perishability, the daily nature of production, the lack of synchronization between demand and supply, and the inability to adjust supply to changes in demand. Even in countries such as the United States, dairy cooperatives handle a significant proportion of production [36].

Agreeing to [37], the dairy industry has a number of specific features that distinguish it from other Agricultural industries. Milk is a bulky commodity, highly perishable, and produced on daily basis. Therefore, milk requires time management and implies high transportation and transaction costs. Following this same school of thought, [38] said that dairy cooperatives reduce transaction costs. This makes milk valuable, and at the same time, a very expensive raw material. In this same line, [39], ascertains that the potential economic and social advantages of market-oriented smallholder dairy production in improving the welfare of farm households and its multiplier effects on other sectors of the economy are well known. However, to be effective, efforts to improve the productivity of smallholder dairy production and improve its market orientation need to be supported and informed by a detailed understanding of the current and dynamic conditions of production, marketing, processing, and consumption of milk and dairy products. Membership in a milk-marketing cooperative is the key determinant of decisions to sell and the quantities of milk and butter sold by the dairy producers.

Membership significantly increases the likelihood of households' production of milk/butter and the quantities of milk/butter sold. That is, Cooperatives practice direct marketing of dairy products with no formal vertical business linkages. The main point of dairy product sale by a cooperative is the cooperative's milk collection centre itself. The TDCS regroups dairy farmers in the DDBD and trains them on how to improve productivity, and improve market orientations. This cooperative plays an essential role as a ready market for smallholders' dairy products. Smallholder dairy farmers (94 %) in the study area disclosed that the TDCS is playing an indispensable role in the marketing of their dairy products thereby increasing their households' income; this has reduced their quest for more cattle, which, could lead to the quest of

more pastureland. This endeavour reduced conflicts with food crop farmers over land.

The role of the TDCS as a ready market for smallholders' dairy products has encouraged the creation of groups by graziers. Through these groups, problems of animal grazing and crop production are analysed thereby helping to look for solutions to these problems. One of these groups observed in the field was, the Integrated Farming Group (Mbitei-Vekovi). This group was made up of both women and men who obtained some of their breeds from Heifer Project International (HPI) and the TDCS acted as a ready market for raw milk produced by group members; the cooperative society collects/buys the produced milk on daily bases. Nevertheless, 98 % of group members who used to have conflicts with farmers revealed that they no longer have conflicts with food crop farmers because they now rear their animals on- the- spot and extract milk which is readily sold at the TDCS. This point of view was supported by [40] who opined that farmers' access to the market through dairy cooperatives stimulates milk production.

IV. CONCLUSION

The main aim of this research article was to evaluate the role of a dairy cooperative society in resolving farmer-grazier conflicts. This study aimed at assessing the resolution of farmer-grazier conflicts by the Tadu Dairy Cooperative Society in the Dairy Districts of Bui Division. Before the existence of this cooperative in the Dairy Districts, several attempts were put in place by the government and local authorities to resolve farmer-grazier conflicts that yielded little or no fruits; some measures even aggravated the conflicts and hatred between graziers and food crop farmers. The Tadu Dairy Cooperative Society in a bid to resolve the conflicts introduced new cattle breeds in the Dairy Districts, empowered graziers and food crop farmers, created dialogue platforms/common projects, served as a ready market for smallholders' dairy products, and assured the social and economic security of graziers and farmers. However, when the attempts of resolving farmer-grazier conflicts are not centered on ensuring the sustainability of the livelihoods of both parties, this will result in further conflicts because land, which is the ultimate cause of farmer-grazier conflicts, is inelastic and cannot be expanded. It can only be modified to suit or satisfy the desires of the users (graziers and food crop farmers) at a given time. This explains the reasons for failure in several attempts in the world at large to settle disputes between farmers and graziers. It should be recalled that governments should encourage the creation of dairy cooperatives in areas where cattle are reared to resolve or enhance the resolution of farmer-grazier conflicts that have often retarded sustainable development within communities due to loss in property and long-lasting enmity.

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