Innovation and inclusive Industrialisation in agro-processing: The Tanzanian dairy value chain

Innovation & Inclusion in Agro-processing

Working paper v1, November 2021

Dr. Hoseana Bohela Lunogelo, Prof. Makene Fortunata Songora, and Mr. Jovin Lasway

THE UNIVERSITY of EDINBURGH

CCRED CENTRE FOR COMPETITION REGULATION AND ECONOMIC DEVELOPMENT

ESRF

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Authors: Dr. Hoseana Bohela Lunogelo, Prof. Makene Fortunata Songora, and Mr. Jovin Lasway, Economic and Social Research Foundation, Tanzania.

Email correspondence: Prof. Makene Fortunata Songora, fmakene@esrf.or.tz

Funding: This working paper was written for the Innovation and Inclusive Industrialisation in Agro-Processing project (IIAP), funded by the Global Challenges Research Fund (ES/S0001352/1). Further details at www.iiap.info

Acknowledgements:

Innovation & Inclusion
in Agro-processing

Executive Summary

Background

This paper analyses the Tanzanian dairy industry to determine how the structures and dynamics of the dairy value chain (DVC) and its institutional environment shape opportunities for inclusion and capability upgrading of agro-processing micro, small and medium enterprises (MSMEs). It identifies factors that promote or hinder the inclusion of SMEs in dairy processing; and recommends the required pro-SMEs industrial policies and strategies for policy makers. The paper is based on the review of secondary information from different reports as well as firsthand account from industry actors along the value chain, involving smallholder dairy farmers, small, medium, and large-scale dairy processors, academics, and policy makers.

The Influence of Institutional Environment in Shaping Opportunities for SMEs inclusion and Upgrading of Operations

Nationwide less than 15 percent of produced milk is processed by around 91 factories. Among these factories about 88 percent have installed capacity of less than 5,000 litres per day and only four have capacities above 50,000 litres per day. The factories normally depend on milk supplied by smaller cooperatives and informal milk traders/mobile vendors who buy the product from farmers. Most of the large and medium dairy processing firms have labelled products using popular brand names depicting their companies. On the other hand, micro and small factories produce and sell non-labelled products. That challenge of obtaining supplies of milk persists and seems more serious to medium and large-scale firms that are compelled to operate at between 40 and 65 percent of their installed processing capacity.

SMEs seem to be at the mercy of informal traders/milk vendors who buy milk from farmers and sell to the factories at a profit. It is noteworthy that 95 percent of raw milk is sold through informal traders. The informal traders seem to yield some significant power in the marketing relations because most farmers are weakly organized and small/medium scale factories lack the necessary networking to have a stable supply relationship with farmers. The informal market involves traders who buy raw milk from collection or bulking centres, cooperatives, or directly from farmers at higher prices to sell to small and medium factories, restaurants and small shops/kiosks and homes. However, when it comes to price bargaining, larger firms tend to get at their preferred price levels by operating through farmers' cooperatives. The farmers' cooperatives tend to have some limited bargaining power because the producer prices they agree with processors is far lower than that offered by informal traders, compelling some of their members to engage in side-selling their raw milk.

Factors that have facilitated or hindered SMEs technological capabilities

The government has progressively taken measures to adopt modern technologies in production and value addition processes of the dairy sector value chain. This has included establishing (i) animal breeding centres to supply improved breeds and distribution to small scale farmers at subsidized prices or as part of revolving grants (often in collaboration DPs and international NGOs (INGOs) such as Heifer International); (ii) sponsoring the construction of animal health facilities such as cattle dips for control tick-borne diseases; (iii) encouraging the establishing of privately-owned Veterinary Centres and Agro-input shops that stock animal health goods including animal feed formulations; and, (iv) providing public sponsored and private sector owned mobile services for Artificial Insemination (AI) to upgrade the existing cattle stock. Farmers have also been trained on the cultivation and management of cattle fodder. Such interventions have led to a gradual increase of the improved herds of dairy cattle such that although they are about 3 percent of total cows, they produce 30 percent of raw milk.

Despite those developments in the sector, SMEs were still facing some challenges that hinder the adoption and upgrading processing technologies. These are mostly related to high cost of finance for investing upgrading processing, packaging, k and transport systems. They also lack affordable skilled and experienced manpower for operating the modern machines and processes. Compliance with government's standards on hygiene and the challenge of under-utilized capacity for medium and large-scale processors is partially due to the prevalence of the informal milk marketing system, which encourages producers to sell their unprocessed milk directly to informal traders/milk vendors (as middle-agents or intermediaries). One of the approaches SMEs could use if they had enough capital would have to assume the role off-takers by supporting the expansion of dairy farms to supply them with adequate milk.

How industrial policies have supported SMEs growth in the dairy sector

The government has at various stages of the sector's development invested efforts to ensure dairy processing factories obtained adequate supply of raw milk (mostly through farmers using improved dairy cattle breeds) and that machinery and equipment are obtained at reasonable costs. The government has also encouraged SMEs to join cooperatives and association to allow ease of collective actions in demand of services and delivery of some services and trainings by supporting institutions. Associations such as Tanzania Milk Processors Association (TAMPA), have been instrumental in advancing concerns of the dairy industry for consideration by the government.

Among the policy challenges that persist include bureaucratic procedures in starting new dairy processing factories; getting certifications and labels for dairy products; complying with gazetted safety and health standards; inadequate support by Local Government Authorities (LGAs) to establish milk collection centres. Unpredictable business environment through frequent changes in policies and regulations was also mentioned as challenge in making business decisions. Weak sector governance is manifested by the prevalence of informality in dairy marketing system, with consequences of risking consumer health by using unpasteurized milk. Furthermore, informal traders seem to yield some untamed influence and power in dictating the pricing system, thus affecting milk availability to dairy processing factories.

Conclusion

A common feature throughout the post-independence period has been the dominance of micro and small-scale enterprises along the dairy sector value chain. It starts with production by smallholder dairy keepers, followed by milk marketing, which mostly undertaken by informal milk traders/vendors who mostly sell directly to dairy processing SMEs, restaurants, and homes in unprocessed milk form. The fact that these informal traders can by-pass factories to sell unprocessed milk directly to final consumers is regarded as a hinderance to the operational efficiency of SME dairy processors as they cannot access adequate raw milk for processing resulting to losses. This was one of the reasons given for the collapse of 13 firms that collapsed between 1990 and 1995, and the death of 5 firms between 2005 and 2011 that tried to compete with TDL. Currently, although there are 99 registered dairy firms in 2020, about 8 of them were not operating. A few factories have ventured in extra products such as cheese as they are still preoccupied with common products such as fermented milk, pasteurized fresh milk, and yogurt with large-scale firms investing in UHT milk as well.

The challenges observed by SME dairy processors included (a) low capacity utilization caused by inadequate supply of milk to the processing plants; and entrenched practice where farmers sell their milk through agents who take the raw milk direct to the final consumers (e.g., homes, hotels and restaurants); (b) about one half of SMEs had the perception that large-scale firms outcompeted them in getting adequate supply of milk from producers because of their investment in transport facilities; (c) common habit by the majority of consumers who cared less about how the milk is handled before reaching their dining tables, one of the reasons being avoiding the relatively more costly processed and packaged milk (d) less aggressive technological advancements by SMEs due to uncertainty of raw milk supplies; (d) inability to meet terms related to trading arrangements with supermarkets and established institutions, who normally delay payments and require some consistent supply of stock.

Recommendations

To enhance sustained productivity and adoption of modern technology in dairy processing it is paramount that:

- Tanzania Dairy Board (TDB) should collaborate with cooperative unions and private sector umbrella organisations to influence stability and predictability of policies that govern the sector.
- TDB should take a more proactive role to promote and protect private sector investments in the sector, by ensuring that factories obtain adequate supplies of quality raw milk and streamline the operations of informal milk market promoting trading of products that adhere to minimum quality and safety standards.

- The government should improve its information system so that private sector operators can make the right decisions on the required processing capacity of machines when establishing new factories or contemplating to scale up existing operations.
- Technological upgrading of dairy processing SMEs will depend on continued policies to lower or remove import taxes and duties on dairy-related machinery and equipment.
- The government should invest in training of specialized professionals for the dairy sector to address the noticed shortage of dairy technicians a
- The government should intervene in streamlining financial sector regulations to accommodate affordable development loans for the dairy sector.
- The establishment of formal channels of milk trading should be given priority to protect the health of consumers.
- The LGAs should support the establishment of well-functioning milk collection centres and milk trading centres where it can also oversee issues of quality and safety standards.
- The government should continue to encourage dialogue with formal stakeholder associations and platforms bringing together milk producers (e.g., Cooperatives and MVIWATA) and milk processors (e.g., TAMPA and TCCIA) and continue to implement business regulatory reforms that aim at encouraging the role of private sector investors in industrial development including the dairy sector.

Innovation & Inclusion
in Agro-processing

Table of Contents

Innovation & Inclusion
in Agro-processing

List of Figures

List of Tables

List of Abbreviations

ADGG	African Dairy Genetic Gain
AI	Artificial Insemination
ASDP	Agricultural Sector Development Programme
ATM	Automated Teller Machine
BMF	Bill and Melinda Gates Foundation
CDIL	Coastal Dairy Industries Limited
CODAFA	Coastal Dairy Farmers Association
DAFCO	Dairy Farming Company
DBM	Dairy Business Model
DCC	Dairy Development Conference
EAC	East African Community
EADD	East Africa Dairy Development
EADRAC	East Africa Dairy Regulatory Authorities Council
ESADA	Eastern and Southern Africa Dairy Association
ESRC	Economic and Social Research Council
ESRF	Economic and Social Research Foundation
FAO	Food and Agriculture Organization
FCC	Fair Competition Commission
FYDP	Five Year Development Plan
GDP	Gross Domestic Product
HI	Heifer International
LGAs	Local Government Authorities
LIDA	Livestock Development Authority
LTPP	Long Term Perspective Plan
MC	Municipal Council

MLF	Ministry of Livestock and Fisheries
MLFD	Ministry of Livestock and Fisheries Development
MoA	Ministry of Agriculture
NAIC	National Artificial Insemination Centre
NDB	National Dairy Board
NFCC	National Food Control Commission
NPLD	National Policy on Livestock Development
PAID	Public Private Partnership for Artificial Insemination Delivery
RALG	Regional Administration and Local Government
SDC	Swiss Development Cooperation
SDSP	Smallholder Dairy Support Programme
SIDO	Small Industries Development Organization
SMEs	Small and Medium Enterprises
SUA	Sokoine University of Agriculture
TADB	Tanzania Agricultural Development Bank
TALIRI	Tanzania Livestock Research Institute
TAMPA	Tanzania Milk Processors Association
TAMPRODA	Tanzanian Milk Producers Association
TBS	Tanzania Bureau of Standards
TDB	Tanzania Dairy Board
TDCU	Tanga Dairy Cooperative Union
TDL	Tanzania Dairies Limited
TDDP	Tanga Dairy Development Programme
TDV	Tanzania Development Vision
TFDA	Tanzania Food and Drug Agency
TFNC	Tanzania Food and Nutrition Centre
TLMI	Tanzania Livestock Modernization Initiative
TMDA	Tanzania Medicines and Devices Agency
TZS	Tanzanian Shillings
URT	United Republic of Tanzania
VAT	Value Added Tax
WFP	World Food Programme
ZDB	Zonal Dairy Boards

I- INTRODUCTION

1.1 Objectives of this Paper

This paper analyses the Tanzanian dairy industry to determine how the structures and dynamics of the dairy value chain (DVC) and its institutional environment shape opportunities for inclusion and capability upgrading of agro-processing micro, small and medium enterprises (MSMEs). It also identifies areas that will require policy support for encouraging inclusive dairy agro-processing growth. The importance of investing in the dairy processing sector in Tanzania is reflected in all key national plans and strategies.

1.2 Institutional Role of the Government in Promoting the Dairy Sector

The Agricultural Sector Development Programme II (ASDP II) has set targets to improve the dairy sector in the country through (i) enhancing inclusive and sustainable dairy MSMEs through improving dairy farmers and processor organizations, milk collection centers, cooperatives and grouped marketing and financing mechanism; (ii) supporting agricultural research, especially for dairy breeding and animal feeds to improve production and productivity among dairy farmers and processors; and (iii) promoting compliance on dairy standards through advocacy seminars and training to dairy stakeholders (URT, 2016). The Tanzania Livestock Modernization Initiative (TLMI), Sustainable Industrial Development Policy (1996-2020), Small and Medium Enterprises Development Policy-(SMEDP)- (2003)[1] and ASDPII are all anchored on the country's medium team planning frameworks as provided in the five-year development plans (FYDPs) (MOFP, 2016; 2021). The FYDPs are instruments in achieving national development goals specified in the Tanzania Development Vision (TDV) 2025 (URT,1999).

1.3 Overview of the Status of Dairy Production in the Country

According to the Ministry of Livestock and Fisheries Development (MLFD) the number of cattle in 2020 had reached 32.2 million, with the sub-sector in general (livestock and fisheries) contributing 7.4 percent to national Gross Domestic Product (GDP), 30 percent of which is from the dairy industry (WMU, 2020). The raw milk production level is still dominated by indigenous cows (WMU, 2015)[2]. The dairy processing industry is dominated by small and medium-scale private sector owned dairy processing and marketing companies, with only four factories with capacity above 50,000 litres per day. The factories are linked to dairy cooperatives, which supply milk, and they sell to consumers using their own marketing companies and through wholesale and retail agents. About 3 percent of the national cattle herd comprises improved dairy breeds (MLFD, 2016), which produce about one third of milk produced, and 70% of the milk that is

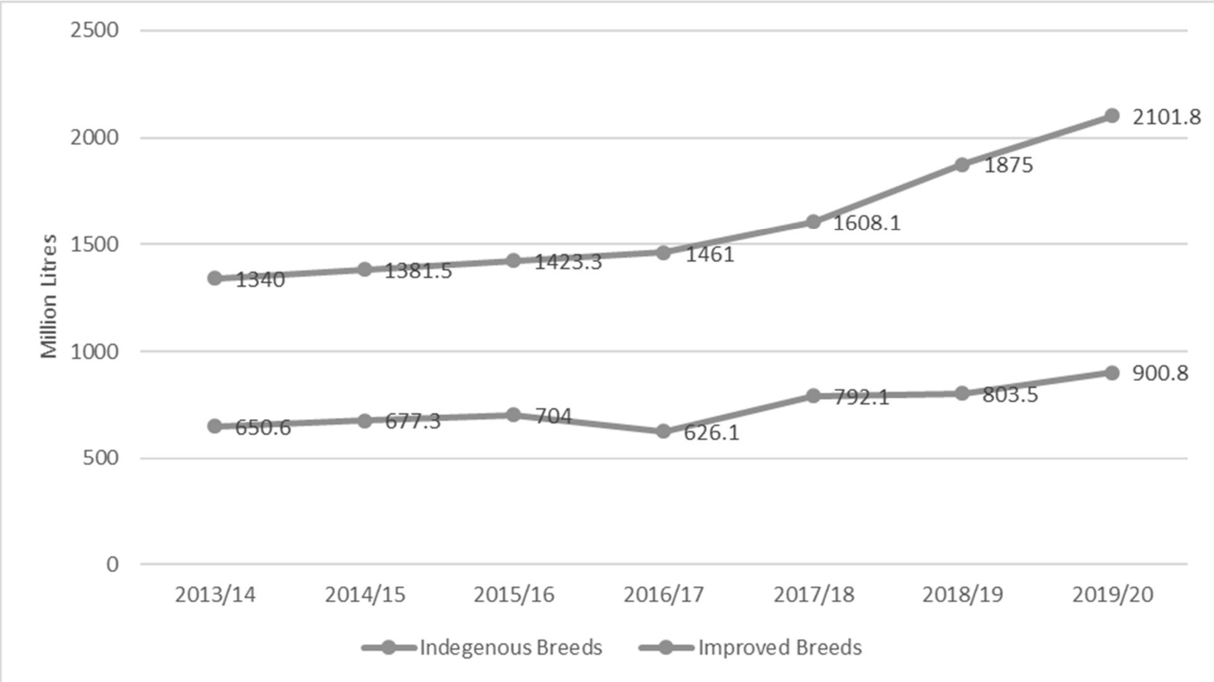
[1] The policy aims at creating conditions to encourage informal micro and small enterprises to move into formal sector, with support measures to enable the survival and expansion of formal small and medium enterprises; and promoting the creation of new SMEs and improving the performance and competitiveness of existing SMEs
[2] WMU (2015) - A report written in Kiswahili with some analysis livestock sector and projections for the 2016/2017 - 2031/2032. Wizara ya Mifugo na Uvuvi (WMU) for the Ministry of Livestock and Fisheries Development (MLFD)

marketed. Milk production has been on the increase with recent data showing a 11.1 percent from 2.7 billion litres in 2018/2019 to 3.0 billion litres in 2019/2020, with improved dairy cows contributing about 0.9 billion litres (WMU, 2020). There are some negligible amounts of imported milk compared to total domestic production, mostly visible in supermarkets that serve some high-income consumers with tastes for foreign brands. The country in 2019/20 allowed the importation of 11.73 million litres of milk worth TZS 15.2 billion from countries including South Africa, Uganda, Kenya, United Arabs Emirates, Holland and Ireland. This amount was lower by 42 percent compared to 2018/19 (18.62 million litres) due to improved local production of milk and stricter control of imports to safeguard the domestic dairy processing industries (*ibid*).

1.3.1 The Observed Growth of the Dairy Industry

The reforms undertaken by the government of Tanzania to support the development of dairy industry has resulted in some observed gradual but slow increase in milk produced from improved dairy cows, which have historically accounted for slightly more than a half of the total milk produced. The observed increase in milk from traditional cattle breeds has been at a slightly higher rate compared to that from improved breeds (Figure 1).

Figure 1: Trend of Milk Production in Tanzania 2013/14 to 2019/20 Seasons

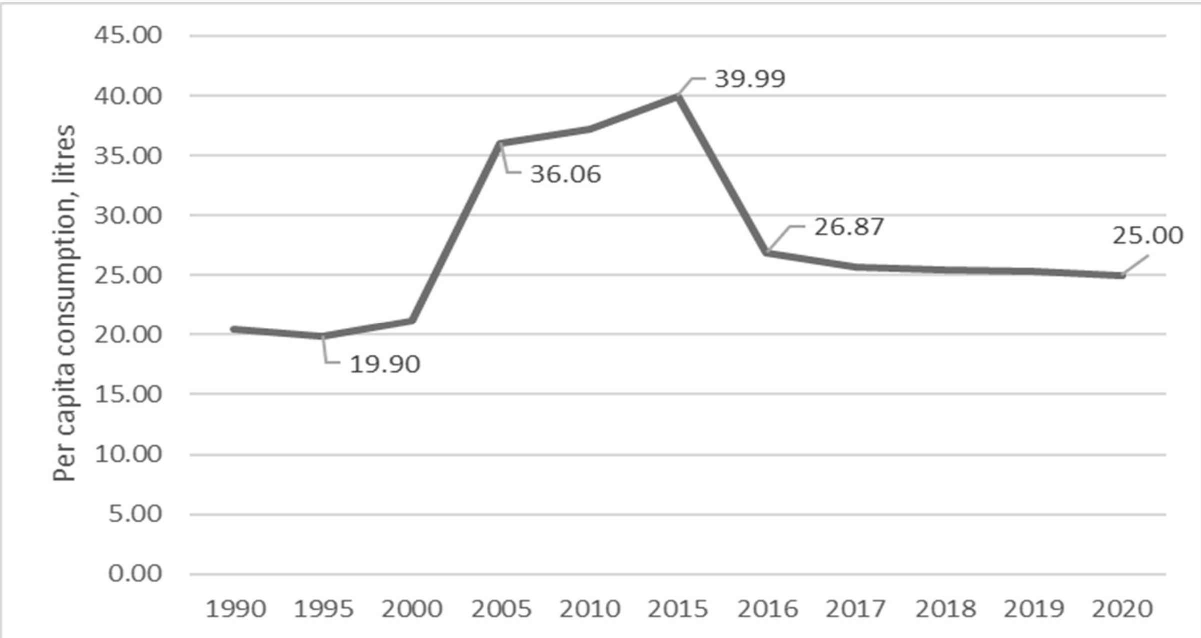


Source: MLFD (2020). Minister's 2020/21 Budget Speech for the Ministry of Livestock and Fisheries Development. June 2020.

In recent years, the amount of raw milk that was received by 91 processing plants/factories[3] increased by 4.8 percent from 70.9 million litres in 2018/2019, to 74.3 million litres in 2019/2020 (WMU, 2020). In addition to packaging of the pasteurized milk, the factories make different products such as yoghurt, sour milk, and cheese. The increase in number of factories serving dairy farmers has been gradual, starting in the early 1990s when the government decided to private state-owned enterprises that were operated by Tanzania Dairies Ltd (TDL)[4] encourage private sector companies to establish factories and complement efforts by cooperatives. Local and foreign private sector investors responded by initially setting up 35 small to medium size processing facilities. However, between 1990 and 1995 some 13 closed after incurring operational losses due to inadequate supply of raw milk from farmers who preferred to sell through informal channels, and commercial imports for reconstitution of milk. The number of active factories increased to 50 by 2012. (Nell, et.al. 2014)

The per capita consumption of milk per capita has been characterized by episodes of increasing and declining milk consumption trend. For example, after a period of around 20 litres per capita between 1990 and 2000, there was some recorded improvements from 2001 to 2015, peaking at about 40 litres per capita, which was followed by a phase of sharp decline reaching 26.8 litres per capita in 2016, and thereafter stabilizing at around 25 litres per capita from 2017 to 2020 (Figure 2).

Figure 2: Trend of Milk Consumption per Capita



[3] Data based on 91 factories from 99 registered factories in the country.

[4] Up to 1990 almost all processing capacity was in the hands of the Tanzania Dairy Limited (TDL) one of the parastatal companies of government-owned LIDA (Livestock Development Authority). The factories received milk from cooperatives and other commercial dairy farmers (Nell, Arend Jan, et.al (2014)

Source: WMU, 2020

Among the reasons that promoted the increase of dairy consumption in 2000s was a result of deliberate efforts by the Tanzania Dairy Board which embarked on deliberate efforts to encourage the private sector to invest in increased production of dairy products; as well as embarking on mass education campaigns on the importance of drinking milk. The campaigns penetrated to the community level, particularly public and private institutions such as hospitals, schools, etc. This resulted in increased dairy consumption rate from 2002 and reached its peak in 2015. It is not very clear the reasons for declining per capita milk consumption from 2016 (Figure 2) against a background of increased milk production as shown in Figure 1. The ministry's report attributes the decline in per capita consumption to, among others[5], "declining purchasing power" (MLFD,2016). However, this assertion is not supported by GDP per capita data suggesting an improvement over time, leading to Tanzania's entry into lower middle-income status (MOFP, 2020). Could it be an indicator for unreliable reporting system, which relies on formal institutions to provide data on sold milk? This seems to be a plausible reason given that the bulk of milk is sold through the informal channels.

1.3.2 Historical Developments of the Dairy Sector

The sector has undergone a series of policy reforms and legislations, starting with those that promoted state monopoly in economic management during colonial and post-colonial periods, to the current times, especially after 1985, where the private sector was recognized and promoted as the engine of growth for the sector. The main thrust of government policies from 1985 was to reverse historical attempts by the state to engage in production and marketing of milk[6]. It is noted that the nationalization of privately owned dairy farms in 1967 failed to stimulate the sector to achieve the desired output levels and supply of milk to meet national demand (FAO, 1969). As a result of that policy, farmers lost the 15 to 40 percent of the shareholding in the milk processing plants, and the plants lost their partnerships with farmers. The weakened vertical integration was later to be restored after year 2000 when cooperatives entered into working relationship with private-owned dairy processing companies such as Tanga Dairy Ltd in Tanga region. The fate of those privately-owned commercial dairy farms is not well documented, but it is informally known that some of them were handed over to cooperative societies/village governments, others to government institutions or state-owned enterprises (SOEs), while a few of them were left to be operated by private sector companies.

The reversal of post-1967 Arusha Declaration to hand over nationalized dairy farms to private companies and cooperatives in the mid-1980s ushered a new era whereby government started to play the role of a

[5] Cited to include increased retail price of milk caused by high operating costs of dairy processing factories, mostly due to increase transport costs for milk collection, which affected the final unit costs of production. This resulted in some consumers shifting to relatively cheaper products made from reconstituted imported powdered milk

[6] Public control of the sector was attempted by the colonial Tanganyika government between 1920s and 1940s and by post-independence Tanzania government between mid-1960s and early 1980s.

facilitator to the private sector. This is evidenced by harmonized pro-private sector policies, legislations, institutions, and programmes as part of efforts to create enabling environment for the private sector to flourish. The government has since adopted policies and regulations that encourage effective public-private partnership as evidenced by its efforts to promote different stakeholder platforms, national policies, legislations and the establishment of institutions such as the Tanzania Dairy Board (TDB), as indicated in Table 1.

Table 1: Timeline Indicating the enacting of laws and establishment of institutions in the dairy sector

TIME	LEGISLATIONS	THEMATIC FOCUS	INTENDED OUTCOME	COMMENT
1967-1970	Decree, as part of Arusha Declaration of February 1967, to nationalize large-scale (European settler) dairy farms and processing plants.	Part of Government's policy of controlling key pillars of the economy	Expected to have a more effective contribution of the dairy sector in the economy	Farmers lost the 15 to 40 percent shares they held in the milk processing plants, and the plants lost their partnerships with farmers.
1974	Livestock Development Authority (LIDA) by Act of Parliament no. 13 of 1974	Improve the development and management of dairy sector	Established the Tanzania Dairies Ltd (TDL) and DAFCO in 1975	LIDA was formed as part of the third five-year development plan (1975–1980) to oversee DAFCO and TDL as its subsidiary companies.
1978	Regulation of Food: Control of Quality Act (1978) that resulted in the establishment of National Food Control Commission (NFCC)	Powers to license and register all food manufacturing, marketing and retailing businesses in the country.	National Food Control Commission (NFCC)	With powers to license and register all food manufacturing, marketing and retailing businesses in the country. The importers of powdered milk were national dairy processing plants and the World Food Programme (WFP)
1985-1995	The Presidential Parastatal Sector Reform Commission (PSRC) under the Public Corporations Act, 1992 as amended in 1993 and 1999	Empowered to co-ordinate implementation of the government's economic reform efforts- mostly to privatize non-performing public assets including dairy farms	Assets for Tanzania Dairy Farming Company (DAFCO) and the National Ranching Company (NARCO) were liquidated	Some of the land was given to village governments, farmers' cooperatives
2002	Food and Drugs Act (2002) that established the Tanzania Food and Drug	Establishment of a dedicated agency: Tanzanian Food and	TFDA replaced the NFCC.	TFDA was later in 2018 replaced by the Tanzania Medicines and

TIME	LEGISLATIONS	THEMATIC FOCUS	INTENDED OUTCOME	COMMENT
	Agency (TFDA)	Drug Agency (TFDA)		Devices Authority (TMDA)
2004	2004 Dairy Industry Act No. 8 that resulted in the creation of Tanzanian Dairy Board (TDB).	Tanzania Dairy Board (TDB).	Better coordinated sector to ensure its sustainable development and the welfare of consumers	The law mandated TDB to have overall responsibilities in ensuring quality and safely of dairy products.
2011	Fair Competition Commission (FCC) in 2011 finds Tanga Dairies guilty of ignoring legal provision that requires mergers above a certain amount threshold to seek its prior approval	Enhance fair competitiveness in the market	Tanga Dairy ordered to pay a fine for violating rules	Tanga Dairy argued it was in the best interest of producers and consumers to have profit making companies that can serve them better. It was argued the bought companies were on the verge of collapse
2018	Tanzania Bureau of Standards (TBS) takes over mandates on dairy quality taken from TFDA after Parliament amends laws stabling the two institutions	Dairy products: safety and standards	Reducing regulatory overlaps and cost of doing business	TFDA renamed Tanzania Medicines and Devices Agency (TMDA). TBS delegation of regulatory functions regarding milk to TDB through a MoU is an ineffective arrangement. That mandate should be transferred to TDB using legal instrument
2019	Review of Dairy industry Act no. 8 (2004)	Reducing members of the Board to 9 Redefined milk to include milk other animals (goats, Camels, water buffaloes) (check with TDB!)	Less cost of running TDB	Reducing the number of Board members representing stakeholders to only three dilutes the development aspect of the TDB and has not been well received by Stakeholders
2020	Review of Dairy regulations	Review of stakeholder registration fees Review of milk vessels registration fees	Less cost of doing business	Well-received by stakeholders but deemed not far reaching enough.

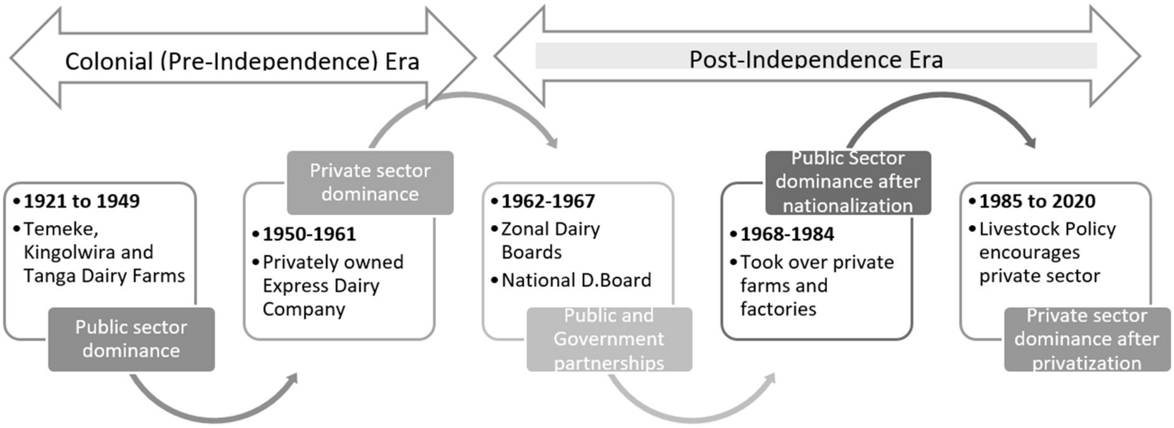
Source: FAO (2011). Dairy Development Institutions in East Africa. Lessons Learned and Options. Prepared by Lusato R. Kurwijila FAO Consultant and Anthony Bennett Livestock Value Chains and Infrastructure Officer Rural

Infrastructure and Agro-Industries Division, FAO.

1.3.3 Evolution of the dairy sector

The evolution of the dairy sector in Tanzania has undergone four phases as diagrammatically depicted as shown in Figure 3 and elaborated in detail in Annex 3. The colonial period involved the establishment of government veterinary laboratories, whereby the government was involved in the establishment of dairy cattle ranches, before switching the approach to encourage the private sector to effectively engage in dairy farming as elaborated in Annex 3. The dominance of the private sector post-independence lasted until 1967 when the farms were nationalized and were mostly in public ownership until 1984 when the government reverted to reliance on private sector include farmer cooperatives as elaborated in Annex 3.

Figure 3: Chart Indicating Evolution of the Sector



Source: ESRF (2019)

The 2004 Dairy Industry Act No. 8 led to the creation of Tanzanian Dairy Board (TDB), which was mandated to coordinate the sector for its sustainable development and the welfare of consumers. The regulatory functions of the TDB and Tanzania Bureau of Standards (TBS)[7] somehow overlap although in practice the law provides that TDB is the lead agency in the overall responsibilities to ensure quality and safely of dairy products. At the regional level, the private sector initiated the Eastern and Southern Africa Dairy Association (ESADA), formed in 2004, coordinate efforts for the development of the dairy sector to enhance production, processing and marketing and in adopting common standards for quality and safety guidelines. However, since it lacks national accreditation, it does not have legal powers to enforce the agreed standards at national levels (Bingi, S and F. Tondel, 2015). On the other hand, the East Africa Dairy Regulatory Authorities Council (EADRAC) established in 2006 to coordinate efforts to enhance and uphold quality and safety standards was established under the ambit of the EAC Customs Union protocol

[7] Previously under the Tanzania Food and Drugs Administration Agency-TFDA- whose name was later changed to Tanzania Medicines and Devices Authority-TMDA

framework[8]. The aforementioned national and regional institutions/initiatives had their core mandates to support smallholder dairy farmers as well as the growth of micro, small and medium enterprises (MSMEs) in dairy processing. Region wide initiatives such as the East Africa Dairy Development (EADD) II Programme (2014-2018) was supported the Bill and Melinda Gates Foundation (BMF) and implemented by Heifer International (HI) and Technoserve also focused to serve 136,000 smallholder families in addition to the 196,000 farm families that essentially supply their milk to dairy processing SMEs.
To encourage the growth of domestic milk market, TDB has coordinated milk drinking programmes in schools[9]; set a yearly calendar in September as a "Milk Drinking Week"; and, encouraged dairy producers and processors to actively participate in national celebrations such as Saba-Saba (International Trade Fair Climax) in July and Nane-Nane (Farmers' Week) in August; and local Sports Bonanza. The latest memorandum for encouraging drinking of milk among school children was signed in March 2021 in Arusha (TADB, 2021)[10]. Some pilot "milk automatic dispensing machines – ATMs" have been started in Kilimanjaro and Arusha regions to simplify the distribution of processed milk at more affordable costs to consumers. Meanwhile, TDB continued with its role of ensuring quality and safety of milk distributed to consumers by conducting regular inspections of milk processing factories, milk kiosks, milk shops and milk distribution vehicles. Owners of small enterprises and groups were specifically targeted for special trainings on milk handling and storage to ensure quality and safety. TDB has plans to encourage the establishment of more milk collection centres and private sector investment in milk processing by linking them with the financial institutions such as the Tanzania Agricultural Development Bank (TADB), which has shown willingness to support the sector.

1.4 Objectives of the Study

The study has three main objectives: First was to explore how do differing institutional environments and value chain relationships shape opportunities for inclusion of agro-processing SMEs in Tanzania. Second, to find out key factors that enable or obstruct the upgrading of technological capabilities among the SMEs in dairy sector. Third, was to recommend some industrial policies that are needed to support the expansion of inclusive agro-processing.

1.5 Motivation for the study

The study was motivated by the observation that there have been some rapid changes in global food system driven by the urbanization and changing consumer habits, which is most likely going to push demand for processed foods. This is regarded as an opportunity for Tanzania to ensure SMEs participate

[8] The EAC Customs Union Protocol imposes a zero tariff for dairy products produced in the region (Bingi, S, *et.al*. 2015: *ibid*.)
[9]School Milk Drinking Program in 49 schools involving 33,115 children in Arusha, Kilimanjaro, Njombe, Mbeya and Tanga regions.
[10] Acting Registrar of the Tanzania Dairy Board Mr. Noel Byamungu, said that the program has now started pilot by involving 13 (9) public and private (4) primary schools with more than 10,000 students where they will implement the program for 12 months.

in the anticipated agro-processing and therefore their effective inclusion in industrial revolution. It is appreciated that the inclusion of SMEs in agro-processing will require some support for them to acquire new technological capabilities and, where possible, re-configuration of value chains and institutions. This implies that the anticipated inclusive industrialization will be a result of combining structural change leading to poverty reduction based on the fact that most of SMEs are also rural-based where more than two thirds of Tanzanians reside and derive their livelihoods.

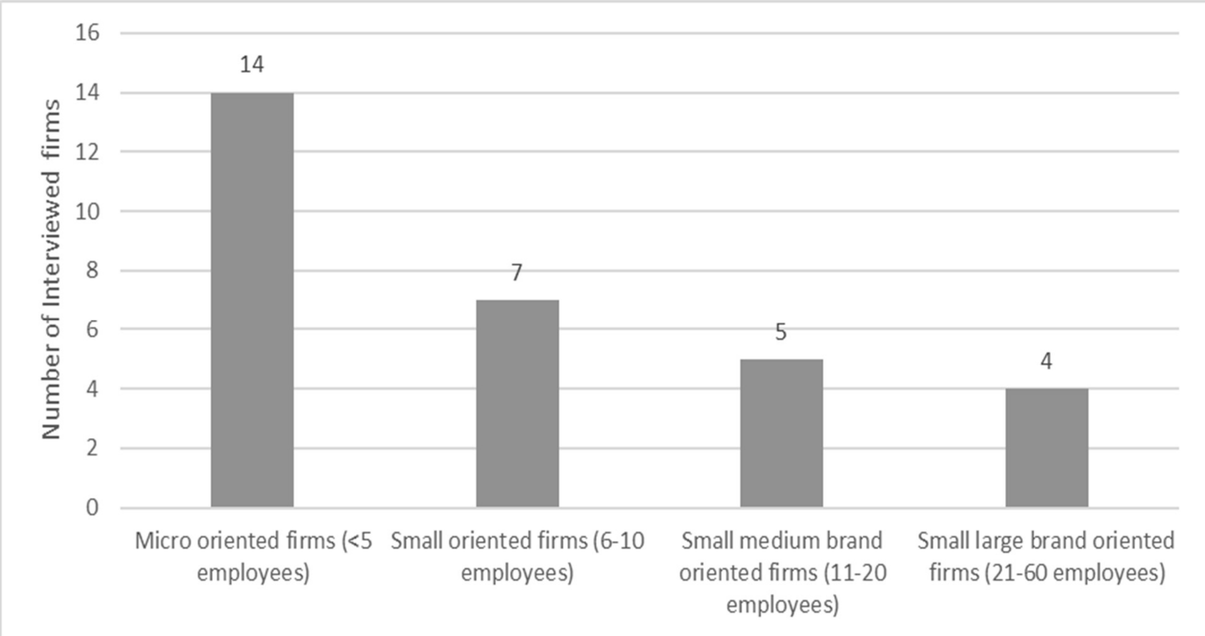
1.6 Methodology and Approach

The paper uses secondary data and primary data sources (survey and key informant interviews) with stakeholders in dairy value chain. The stakeholders include farmers, input suppliers, processors, and traders. The study participants were purposefully identified through recommendations from initial contacts in government and private sector actors who participated during the planning stages of the study. Among the participants who provided some feedback on other key actors in dairy processing are those who attended inception workshops conducted in Dar es Salaam are shown in Annex 1. They included representatives from Ministries, Department and Agencies (MDAs) and private sector actors such as dairy processors. The field interviews included 15 key informants using Key Informant Interview (KIIs) guide; and 30 actors working for firms and organisations using a semi-structured questionnaire. Most of these interviews were conducted in person; but a few were done virtually by phone and/or video links (e.g., Skype and Zoom) after the onset of COVID-19 pandemic.

1.6.1 Firm-level Surveys

The surveys involve small and medium dairy processing firms which are classified into micro oriented firms, small oriented firms, small-medium oriented firms, and small-large brand oriented firms. This classification is modified from the Tanzanian Government's categorization of firms' business size basing on the number of employees (MIT, 2012: Figure 4). The findings demonstrate that most interviewed firms had less than five (5) employees with the rest having between 21 and 60 employees (Figure 4). A full list of dairy processors surveyed can be found in Annex 2.

Figure 4: Interviewed Small and Medium Firms



Source: Survey data

Interviews were conducted in Morogoro, Mara, Tanga, Pwani, Iringa, Dar es Salaam, Mwanza, and Simiyu (Table 2). These regions were selected because of their leading role on contribution in dairy sector in Tanzania and are also more populated with the dairy processing firms with diversity of size, technology, and products.

Table 2: Geographical distribution of surveys conducted

Region								
Dar es Salaam	Pwani	Tanga	Mara	Morogoro	Iringa	Dodoma	Mwanza	Simiyu
2	5	5	5	10	3	0	1	1

Source: ESRF Survey data for this study in 2020

The KIIs involved 15 stakeholders comprising research and training centres, academia, MDAs, dairy cooperative unions, large and successful dairy companies. They also included packaging industry and equipment suppliers (See Annex 2).

1.6.2 Analytical tools

The analysis in the paper uses mixed-methods approach utilizing both quantitative and qualitative methodological approaches which allows significant triangulation of data. The qualitative approach is undertaken from the policy dialogue workshop engaged with potential stakeholders having a significant impact on the dairy industry and semi-structured Key Informant Interviews (KIIs). The KIIs angled to wider related issues within dairy processing sector focusing on the opportunities, challenges, strengths, and weaknesses. The study also involved some case studies of factories such as Tanga Dairy Ltd Factory.

1.7 Structure of the Paper

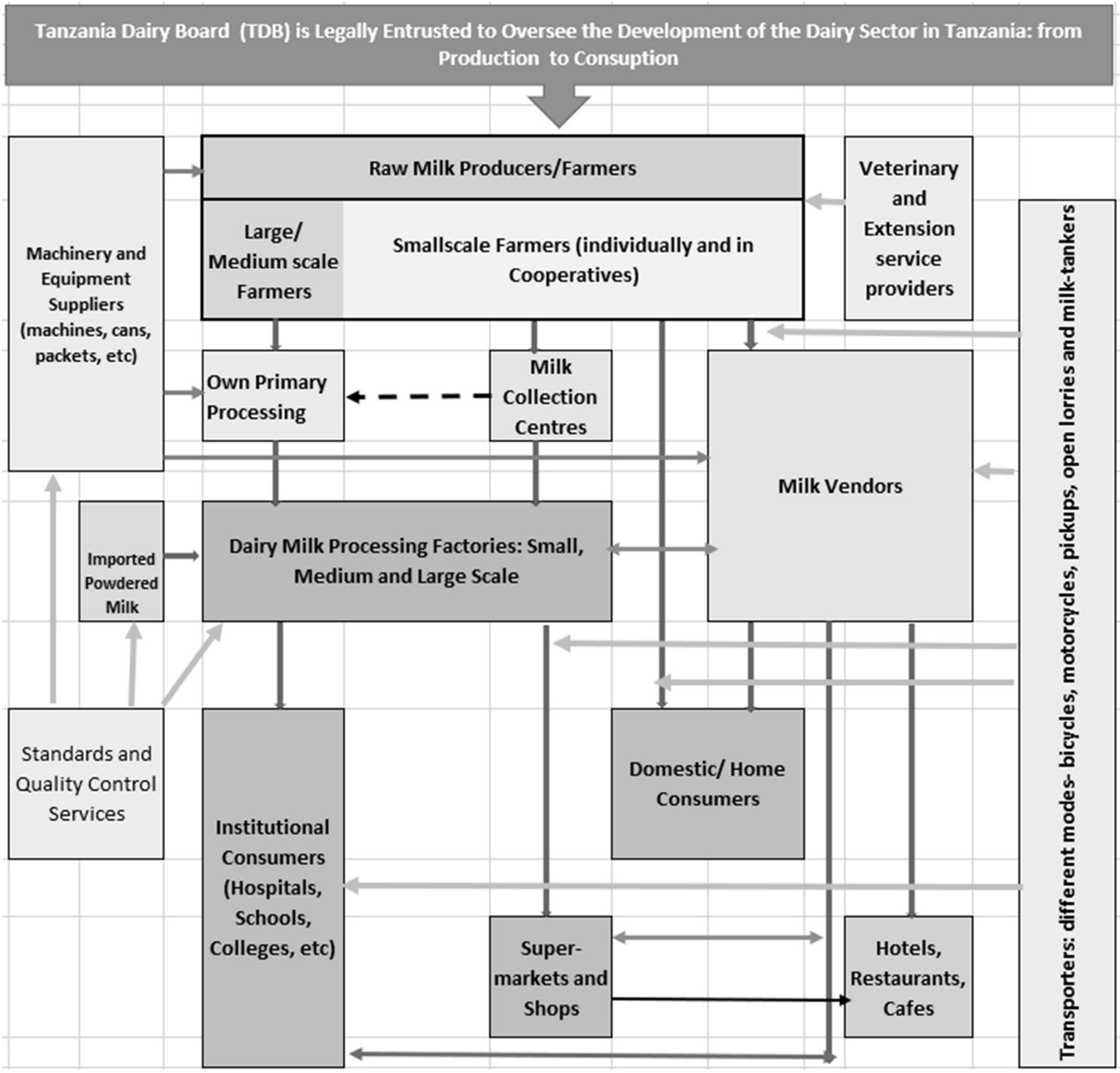
The issues presented in this are arranged as follows: The second section presents a mapping of key actors in the dairy value chain within the wider context of the food system. The third section presents an assessment of the patterns of SMEs inclusion in the dairy VC, while the fourth section examines upgrading capabilities and innovations that have taken place in the sector, before proceeding to the next section six on observed influences of political economy on the growth of the dairy sector. The paper ends with concluding statements and recommendations in section six. .

II- MAPPING OF THE DAIRY VALUE CHAIN: KEY ACTORS, LINKAGES AND GOVERNACE

2.1 The Key Actors in the Dairy Value Chain

The dairy value chain in Tanzania, as shown in Figure 5, is dominated by smallholder farmers at the production level, thousands milk vendors, milk processors of different capacities, consumers and service providers.

Figure 5 Tanzania: Graphical Depiction of the Dairy Value Chain



Source: Author’s comprehension of the dairy value chain

2.1.1 Facilitative and Regulatory Agencies

The 2004 Dairy Industry Act No. 8 resulted in the creation of Tanzanian Dairy Board (TDB) established to ensure a better coordinated sector for its sustainable development and enhanced welfare of consumers. The law mandates TDB to have overall responsibilities in ensuring quality and safely of dairy products. Among the most recent initiatives by TDB has been the redefinition of milk in 2019 to include milk from other animals and reviews in 2020 of regulations on registration fees for dairy sector stakeholders and milk-carrying vessels. TDB is also mandated to provide support for the growth of SMEs in the dairy sector. The Tanzania Bureau of Standards (TBS) is responsible for enforcing regulations regarding standards of equipment and accessories used in the processing of milk as well as safely of packed dairy products. On the other hand, the Tanzania Medicines and Devices Authority (TMDA) is responsible for enforcing gazetted standards of the quality of veterinary medicines and equipment.

2.1.2 Producers of Raw Milk

As already hinted above, about 70 percent of the raw milk production is from small-scale farmers, mostly with indigenous cows, while improved cattle from both smalls-scale farmers with less than five improved dairy breeds, and the few commercial farmers contribute about 30 percent of marketed milk. The large-scale commercial farmers usually have their own facilities for primary processing of milk (e.g., pasteurization), while small-scale farmers take their milk to collection centres established by dairy processors, their own cooperatives or government.

One of the challenges faced by SHF is access to quality breeds of breeds. To encourage the growth of dairy sector, through support to SHFs and dairy processing SMEs, the government made some amendments to the Law on Dairy Sector Chapter 262 through the Written Laws Miscellaneous Amendments, Act 2020, and Act No.1 of 2020. The MLFD has collaborated with the Regional Administration and Local Government (RALG), the Public Private Partnership for Artificial Insemination Delivery (PAID), African Dairy Genetic Gain (ADGG) and the National Artificial Insemination Centre (NAIC) to prepare a Dairy Business Model (DBM). The model has been demonstrated in 18 pilot areas of Dar-es-salaam region[11] (MLFD, 2020). The objective of the DBM is to build the capacity of the Local Government Authorities (LGAs) and dairy farmers to afford the costs of artificial insemination. In the last two years a total of 76,612 cows were artificially inseminated with a conception rate of 62 percent, thus increasing the number of dairy cows. In 2019/2020 some 18,255 dairy heifers were procured, mostly (87%) by private farm owners, who are being encouraged by the government to invest more in providing the service (*ibid.*).

2.1.3 Characteristics of Farmers as Raw Milk Suppliers to Processors and Other Service Providers

There are three categories of farm sizes: smallscale dairy farms with not more than 5 cows, middle sized farms with more than 5 but not exceeding 15 cows; and large sized herds of cattle, with above 15 cows. The situation has been almost the same since the 1990s, with smallholder famers dominating the milk

[11]Kinondoni Municipal Council (MC) (Kawe and Mabwepande wards), Ilala MC (Chanika and Kinyerezi wards)

production sector. It is noted that among the 6,285 registered dairy farmers[12] in Tanga region, medium-scale farmers cannot exceed 50 as most of them are small-scale. Most of the producers sell their milk to TDL through the TDCU, although some of them sell directly outside the cooperative arrangement[13]. The dominance of farmers with small herds of improved dairy cows is common in all the regions in the country, with some of them having obtained supported from Governments' poverty reduction programmes and done funded projects such as Heifer International (already mentioned elsewhere).

Among the challenges faced by milk producers include: (a) foreign exchange fluctuations, which affects prices of imported inputs such as drugs and feed supplements. It was observed that "…whenever the value of our currency drops, the prices of imported drugs and animal feeds go up"; and (b) unstable domestic prices of locally produced farm inputs. For example, when the price of maize grain rise, it subsequently affects the price of maize bran due to competition. The production cost in dairy farm consists of overheads such as electricity, fuel, and wages on one hand, and the costs of wages for farm employees such as herdsmen. The farming costs have been gradually increasing every year. For example, in 2020 the cost of producing one litre of milk was TZS 687, almost equal to the price of one litre paid by Tanga fresh.

2.1.4 Buyers and routes to market

Like the situation in the supply chain linked to the dairy firms, 76.7 percent of the dairy firms (23 firms) did not have contract agreements with wholesale buyers of their products such as supermarkets, while 20 percent (6 firms) had "order by order" agreement with buyers. About 10 percent had formal contracts with some buyers.

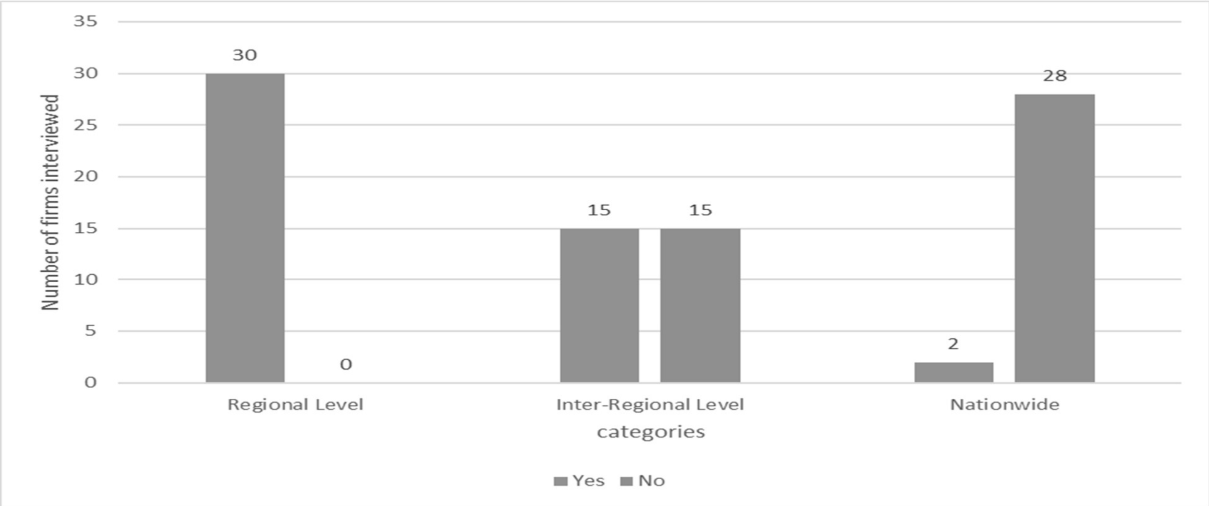
In terms of geographical market coverage, all of them supplied to their immediate customers within their regions of establishment. Therefore, the market route is within their respective regions. About a half of them (50%) went further beyond their regions and undertook inter-regional trading. The rest, about 6.7 percent of the forms were more ambitious marketing campaign by trading nation-wide in all regions (Figure 6). They mentioned that distribution trucks used some pre-defined routes to reach to known customers. In this context, the inter-regional concentration of market routes is done to (i) avoid logistics and transportation costs; (ii) limited advertisement of their products in other regions (iii) limited products' market to other regions (iv) limited manpower to facilitate the inter trading etc. From the economic theory point of view, there is a need to diversify the market routes and not relying on a single route.

---

[12] Defined as those keeping improved breeds of cows for milk production. Otherwise, there are thousands of homes with indigenous herds of cattle, some of which produce milk

[13] <Files\\TZ Dairy KIs\\... _Tanga> - § 2 references coded [10.74% Coverage]-Reference 2 - 5.94% Coverage

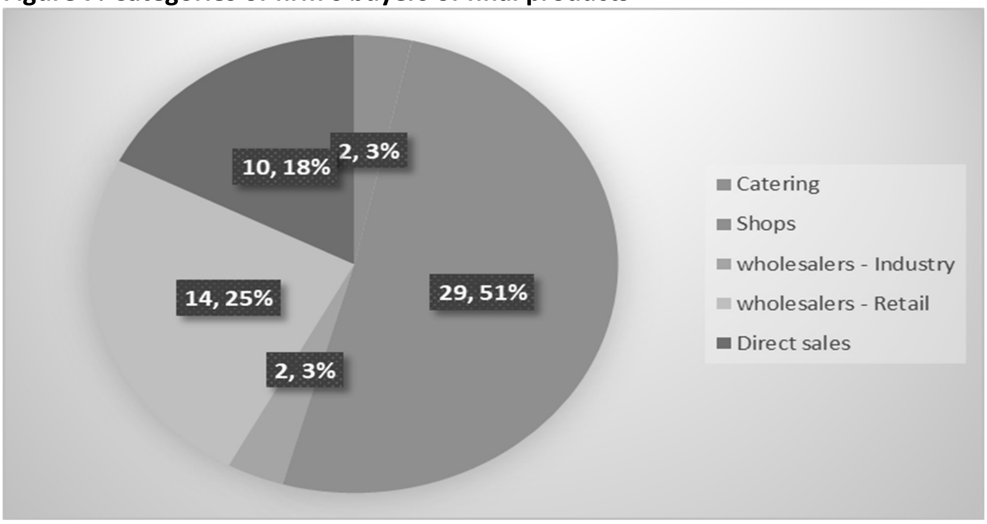
Figure 6: *Firm's product destination to the final consumer*



Source: Survey data

In terms of types of outlets used by dairy firms in reaching final consumers, it was revealed that most firms around 51% sold their final products to mini shops (also known as *Mangi* shops), 14% channeled their products to wholesalers in retail. Also, 18% routed to direct sales while few of them around 3% sold their products to wholesalers-industry and catering respectively (Figure 7).

Figure 7: Categories of firm's buyers of final products



Source: Survey data

Firms have managed to maintain loyal customers given that 63.3 percent had the same list of buyers unchanged in the last five years, while 36.7 percent of the firms had changed buyers for different reasons such as changes of customers included delays on loan repayment, long distance of buyers, changes in buyers' preference of quality of the product and price.

In summary[14] the key informants viewed the main buyers of products from factories were wholesale shops, supermarkets, supply chains, hotels and restaurants, industrial establishments for their workers, independent retailers, and street vendors. There have also been some occasional opportunities to supply milk to school feeding schemes.

2.1.5 Milk Collection Centres

Milk collection centres (MCCs) are critical links in the dairy value chain given the spatially scattered nature of smallholder owners of cattle that produce milk. These) are formed through initiatives of (i) dairy farmers' cooperatives, usually with support from government, who wish to have a central location from which different buyers can come and purchase their produce instead of following them at their individual farmers; and, (ii) dairy processing plant owners who wants to simplify and reduce their operational costs of going to individual farmers. According to Solidaridad[15] setting up new or upgrading existing MCC is an important intervention to improve the quality of milk and reduce wastage before the product reaches factories and consumers.

2.1.6 Service Providers: Input Suppliers, Veterinary and Extension Services, Transporters

These are supported by service providers who include veterinary and extension officers; traders and suppliers of dairy machinery, equipment and accessories; and, transporters, who include those using bicycles, motorcycles, manual and motorized tricycles, pick-ups, and lorries.

2.1.7 Processors

A small promotion of the produced milk is taken to dairy processing plants, the majority of which have daily capacity is less than 5,000 litres per day. In 2020 there were only four operating factories with capacity above 20,000 litres per day, namely, Azam Dairy in Zanzibar (150,000 lt/day), TDL (120,000 lt/day), ASAS Dairies in Iringa (100,000 lt/day) and, Milkcom (100,000 lt/day). There are nine factories with capacity between 7,900 and 20,000 litres, namely, Njombe Milk Factory (20,000 lt/day), International Dairy in Arusha (10,000 lt/day), Bakhresa in Dar (10,000 lt/day), and Shambani Graduates in Morogoro (8,000 lt/day). Four factories with 5,000 lt/day capacity are in Pwani (2), Ruvuma (1) and Kilimanjaro (1). The 8 dysfunctional factories were mostly owned by dairy farmers' cooperatives in different regions that failed to withstand competition from privately owned factories (Table 3). However, we note that some of the factories that are linked to farmers' cooperatives, but had some partnerships with private companies are still surviving. These include TDL (large-scale), Njombe Milk Factory (medium-scale) and several small scale enterprises such as Shambani Graduates in Morogoro, Chakawamku Co-op in Pwani and Ushirika wa Maziwa in Songwe.

[14] <Files\\TZ Dairy KIs\\... Tanga> - § 3 references coded [9.01% Coverage]-Reference 1 - 1.96% Coverage

[15] Solidaridad is an international civil society organization with over 50 years of experience in developing solutions to make communities more resilient, currently work in over 40 countries, on five continents.

Innovation & Inclusion in Agro-processing

Table 3: Summary of Number and Capacity of Milk Processing Firmss in Tanzania in 2020

Region	Range of Capacity (litres/day) of Factories in the Region			
	Above 50,000	25-49,999	10-24,999	5-9,999
Dar-es-salaam	Milkcom (100K);			Dar Zoo (5K), Kondiki (5K)
Iringa	ASAS (100K)			
Tanga	TDL (120K)			
Unguja	Azam (150K)			
Arusha	-	Grand Denam (40K); Galaxy Foods (30K)		
Kilimanjaro			Kilimanjaro Creameries (10K)	Kandilu Smallscale Dai5K)
Mara			Mara Milk (16K)	
Njombe			Njombe Milk (20K)	
Morogoro				Shambani Graduates (8K)
Pwani				Chakawamku Coop (5K); Mother Dairy (5K)
Songwe				Ushirika Maziwa Vwawa (5K)
Tabora				New Tabora Dairies (5K)
Number of Factories with Capacity Below 5,000 litres per day				
Arusha (14); Kilimanjaro (11); Dar (9); Kagera (6); Tanga (2); Iringa (1); Geita (1); Kigoma (1); Katavi (1)				

Source: WMU, 2020: List of Milk Processing Factories in 2019/2020[16].

The investment in large-scale dairy processing plants at Iringa (ASAS) and Tanga (Tanga Dairies) was based on wrong assumptions that there was adequate surplus milk from farmers that could not be adequately handled by existing processing facilities. This assumption led to the decision by TDL, for example, to expand its processing capacity from 50,000 litres of milk per day when it was established for the first time to the current level.

2.1.8 Dairy Market: Consumers and Milk Agents/Vendors

There are thousands of institutional consumers of different categories. Once products are ready from the processors, they are taken to consumer outlets by the firms or by wholesale traders and milk vendors. Milk vendors, most of them using motor-cycles and bicycles, are important players in the milk value chain as they have the flexibility of taking milk from farmers and selling to factories, homes, hotels/restaurants and shops/supermarkets There is a different price setting at each level, which increasing as one moves away from the farm-gate level. The information in Table 4 demonstrates the differences in the price of

[16]This is drawn from the ministry of livestock and fisheries on milk processing industries per year of 2019/2020.

milk that is factory-processed, whose final consumer price is about TZS 3,200 per litre for normally processed and packaged milk, compared to raw milk distributed using motorbikes and bicycles and sold at milk kiosks or directly to homes, whose price is TZS 2,000 per litre (usually in recycled water bottles) by mobile milk vendors and sold door to door or through street food kiosks for home consumption. Ordinary shops and supermarkets sell factory processed and packed milk delivered by factory agents using vans and lorries. It is observed that processed and packaged milk is 60 percent more expensive than the unprocessed milk. This explains the popularity of the informal channel for milk marketing in the country, despite its attendant health risk of taking to final consumers unpasteurized milk that is sold in recycled plastic containers. (Table 4).

Table 4: Price spread between farm gate and final consumer price

Supplier	Payment to Producer (TZS/litre)		Cost to Buyer (TZS/litre)		Share of Farmer to Final Buyer Price		Comments
	2017*	2020**	2017*	2020**	2017*	2020**	
I- Factory Processed Milk							
TDL (processed and packaged)-normal	600	700	2,000[a]	3,000[a]	30.0%	23.3%	Final buyers are supermarkets and shops
TDL (UHT packaged)	600	700	3,500[a]	3,800[a]	17.1%	18.4%	
Small (Mangi) shops[1] (normal processed and packaged)	600[1]	700[1]	3,000[b]	3,200[b]	20.0%	21.8%	Supplied by factory distributors
Small shops UHT milk	600[1]	700[1]	3,500[b]	4,000[b]	17.1%	17.5%	Low fat UHT sells at Sh.4,200
II-Raw Milk (Unprocessed)							
Bike distributors of raw milk (unprocessed) (using motorcycles and bicycles)	1,000	1,200	1,600	1,800	62.5%	66.7%	Buys from farmers around Dar or Ubungo milk market and sells the raw milk to kiosks
Ubungo Wholesale market[#] (unprocessed)	1,000	1,200	1,500	1,700	66.7%	70%	Sold to bikers and hotel owners
Kiosk retailer[#] (unprocessed)	1,000	1,200	1,800	2,000	55.5%	60%	Buys from bike distributors

Note:*Proxied as same paid by the factories to the farmer #Proxied by the price offered to the producer by motor-cycle and bicycle distributors
Source: *Wegerif (2017) and status in 2020 (**this research)

In 2020 TDL was offering TZS 765 per litre for milk received from TDCU. The farmers in turn were offered between TZS 685 and TZS 710 per litre of milk by the cooperatives, depending on deductions for loan repayments (see Table 4). The Union and member societies deduct between TZS 10 and 25 per litre to cover running costs (salaries, electricity, etc) and loan repayments.

Although the leaders of TDCU were not sure how TDL benchmarked their offer price, what they paid was far higher compared to ASAS in Iringa, which in 2020 paid their farmers TZS 600 per litre of milk[17]. It was not clear why it could not afford to pay a better price than that given the climate in Iringa was more conducive to dairy farming compared to that in Tanga. One of the reasons could be farmers serving ASAS are more geographically scattered and spread such that milk trucks must cover 500-800 km to collect products from neighbouring Mbeya and Njombe regions[18]. Among the recent developments, which pleased small scale milk processors was the decision by government to remove taxes on dairy industry. One respondent remarked "I was so happy the decision will encourage the growth of small scales industries. But also, we should undertake marketing promotion to encourage more people to drink milk". Stakeholders were also happy about the government's decision to increase tariffs on the imported milk flour[19]. They believe the move will help to elevate the production and processing of milk in the country for the benefit of farmers and processors.

Most of the surveyed firm (83.3%) sourced their raw milk from suppliers located within their respective regions while, others combined sourcing from within and outside the region. Among those that sourced their inputs from outside their respective regions included Iringa's ASAS and TDL. As already noted elsewhere, it was observed that the main input in dairy processing business is raw milk, which is normally bought on cash from the suppliers as revealed by 16 out of 30 surveyed firms, while 12 firms sourced their main inputs on credit from their main suppliers.

Even though most firms obtained their main inputs on cash, about 77 percent of them said they did not face difficulties in getting the right price from their suppliers, with some exceptions on quality. About 70 percent of the interviewed dairy firms operated without any formal contract agreement with suppliers on purchasing raw inputs. Only one tenth of the firms admitted having signed a framework contract for routine supply with suppliers, while the rest had contracts for ad hoc supplies (order by order contracts) with their suppliers.

[17] <Files\\TZ Dairy KIs\\... Tanga> - § 4 references coded [19.01% Coverage]-Reference 4 - 1.68% Coverage
[18] <Files\\TZ Dairy KIs\\TDKI01 ...> - § 1 reference coded [1.02% Coverage]- Reference 1 - 1.02% Coverage
[19] <Files\\TZ Dairy KIs\\... _Tanga> - § 3 references coded [9.01% Coverage]-Reference 3 - 3.46% Coverage

Innovation & Inclusion
in Agro-processing

III- ASSESSMENT OF PATTERNS OF INCLUSION OF SMALL AND MEDIUM ENTERPRISES IN DAIRY VALUE ADDITION

3.1 Introduction

This section presents some overview of the firms covered in the survey and the influence of institutional framework and dynamics of inclusion of SMEs in agro-processing.

Overview of the SMEs Engaged in Dairy Value Chain

The characteristics or of the surveyed dairy suggests that almost one half of them (46.7%) belong to the category of micro firms, defined as those employing 1-5 people, followed by 7 smallscale, 5 medium scale and 4 largescale (Table 5).

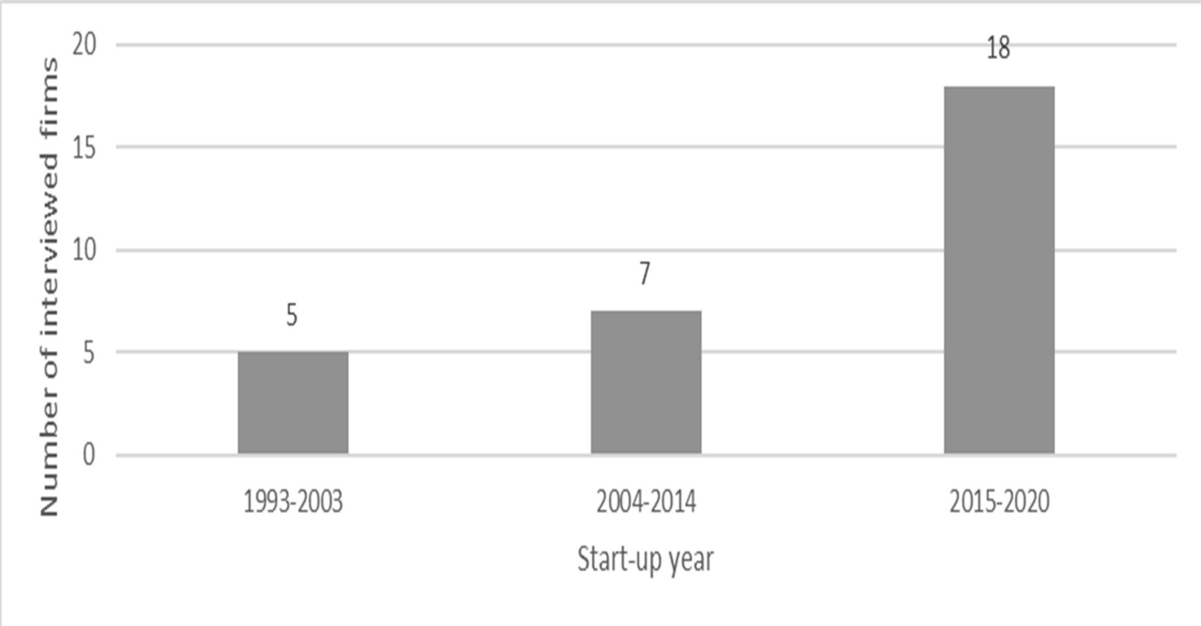
Table 5 Brief overview of the characteristics of surveyed dairy firms by size, age, and main products

S/N	Characteristics/Features of Surveyed Firms (N=30)	Description
1	Firms' size (n=30)	About one half of the forms (14 out of 30) were micro firms; 7 were smallscale firms; 5 were of medium scale firms; and 4 were largescale firms, with some popular brand names
2	Firms' age (n=30)	About two thirds (18 out of 30 firms) started about 5 years or less ago (2015 - 2020); and about one quarter (7 firms) started between 2004 and 2014; while 5 firms are between 17 and 27 years of age, having started between 1993 and 2003
3	Categorization of Firms (Growth in revenue)	Two fifth of firms generated revenue of less than $9,999 per year while three fifth generated annual revenue of more than $10,000
4	Firms' main products produced	More than one half of the firm regarded fermented milk as their core product, while almost one quarter mentioned yogurt as their main product, followed by fresh milk regarded as a main product by one fifth of the interviewed firms.
5	Firms' secondary products produced	Yogurt and fermented milk were regarded as secondary products by one fifth of the interviewed firms, while fresh milk was regarded as secondary product by one tenth of the forms. Some few firms engaged in agrovet business and honey processing as a secondary activity. Two fifth of the firms did not have any secondary product.
6	Firms' competition	Slightly more than one half of the firms mentioned that they faced some stiff competition from large dairy processing firms, while the remaining firms pointed out that their fellow SMEs were their main competitors
7	Firms' raw milk channels	Two thirds of the dairy firms sourced raw milk from individual farmers, while slightly more than one tenth sourced from cooperatives Some of the dairy firms also kept their own milk cows, which supplied one tenth of their requirements.
8	Membership with trade association	Slightly more than one half of firms (17) confirmed to be members of cooperatives or associations, while 12 did not belong to any. One firm didn't respond to the question.

Source: Survey data

In terms of experience in the sector, 18 out of the 30 interviewed firms (about 60 percent) were established about 5 years or less ago (that is, between 2015 and 2020), whereas 7 firms (23%) started between 2004 and 2014, with the remaining 5 firms (17%) are aged between 17 and 27 years of age (Figure 8). This profile suggests that the majority of firms interviewed are fairly new to the dairy processing business; but also, an indication of increasing interest by the private sector to invest in the dairy sector.

Figure 8: Interviewed Firms' age (n=30)

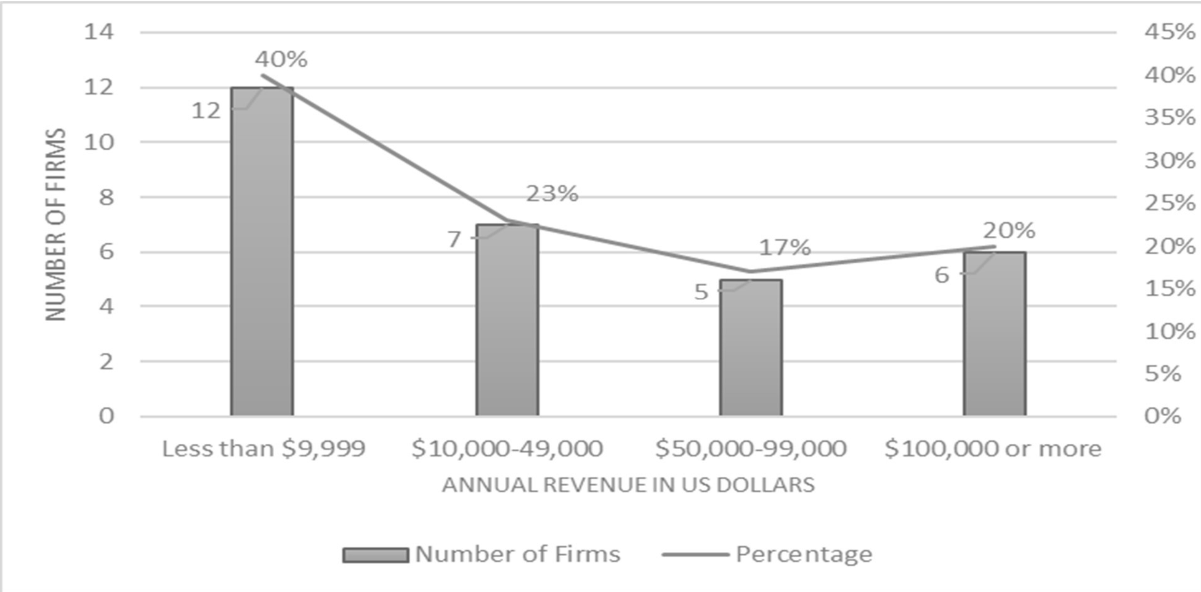


Source: Survey data

The firms generated revenues from selling a range of products that include fermented milk (16 firms), yogurt (7), fresh milk (5) and raw milk (2) (Figure 9). The product specialization suggest that more than fermented milk was the most dominant product, followed by yogurt. About 60 percent of them engaged in secondary line of business, which included selling of honey and agro-veterinary services. Two thirds of the firms sourced their milk directly from smallholder farmers and one half of them believed that larger firms posed some competition to their main line of business. Slightly more than one half of them (16 out of 30 firms) belonged to an industrial-related association (Table 6).

More than three fifth of the firms generated annual revenue streams of USD 10,000 per year or more, while the rest get less than that amount (Figure 9). Input pricing mechanism and price levels have some influence on enterprise profitability. Slightly more than one half (16 out of 30 firms) indicated that they were price takers as they paid in cash what was predetermined by milk suppliers (Table 6).

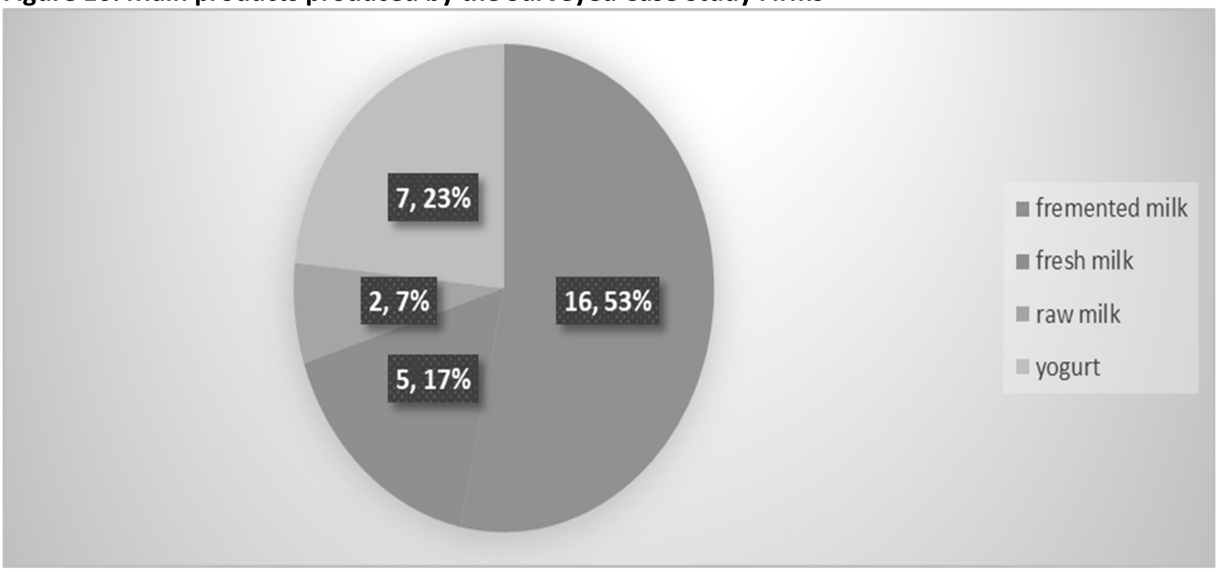
Figure 9: Growth revenue of small and medium case study surveyed firms



Source: Survey data

In addition to fresh milk as the main product, other products included fermented milk and yogurt as shown in Figure 10. The basic nature of main products most probably reflects the preference by the majority of customers in the country.

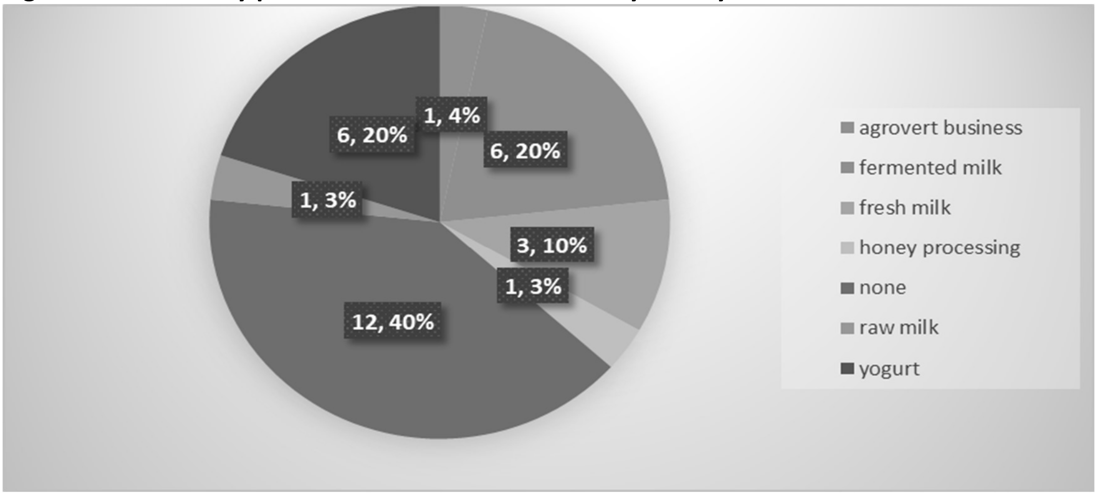
Figure 10: Main products produced by the Surveyed Case Study Firms



Source: Survey data (n=30)

Other products such as cheese and milk butter are usually seen in shops located in high-income residents in cities such as Dar-es-salaam, Arusha and Mwanza. In addition to providing dairy products, some firms also provided services such as agrovet services and honey processing (Figure 11). This is an indication of product diversification by dairy processing firms.

Figure 11: Secondary products and services offered by Surveyed Firms



Source: Survey data

Small scale processors believed there were price takers, unlike medium and largescale processors, slightly more than one half of the interviewed firms (16 out of the 30) did not believe the arrangement was problematic and did not affect the quality of milk they bought. One half of them sold their products directly to mini shops. Firms that sold their products to supermarkets reported to be at the mercy of the owners, who took their products on credit and paid them after one month or so. When it comes to technological upgrades and uptakes, two fifth of the surveyed dairy firms had managed to introduce new technologies over the last few years (Table 6). This seems to have been possible after firms invested to modernize their operations, especially with respect to packaging technologies which would be acceptable for display in supermarkets.

Table 6: Features in Price Setting, Contractual Agreements and Access to Loans by surveyed dairy firms

S/N	Firms' Varieties	Description
1	Firms' Price Mechanism On Raw Dairy Materials Such As Raw Milk, Cultures, etc	Just over half of dairy firms bought their raw milk based on prices already set by suppliers, implying they are price takers, while one third of them negotiated with their suppliers to agree on purchase price for the supplied materials such as raw milk and cultures
2	Firms' mode of purchasing main inputs	Around half the firms interviewed bought on cash from the suppliers , while slightly more than one third sourced their main inputs on credit from their suppliers
3	Difficulties in getting right the price and quality from the suppliers	About three quarters of the interviewed firms revealed that they didn't face difficulties in getting the right price and quality from their suppliers; while slightly more than one tenth of them admitted that they faced some difficulties in that aspect. It should be noted that medium and large scale processors more-or-less dictate the prices that can offer to farmers, while small and micro-

S/N	Firms' Varieties	Description
		processors tended to negotiate and mutually agreed at the producer prices
4.	Contractual agreement with suppliers	Slightly more than two thirds of the interviewed dairy firms had no contractual written agreement with their main suppliers, with only one tenth admitted having signed a framework contract for routine supply with suppliers. The rest had contracts for ad hoc supplies (order by order contracts) with their suppliers
5.	Categories of firm's buyers of final products	Just over half of the firms interviewed said they sold their final products to mini shops (also known as *Mangi* shops), slightly more than one tenth channeled their products to wholesalers in retail. Also, close to one fifth routed to direct sales while few of them sold their products to wholesalers-industry and catering respectively
6.	Access to loan application	Slightly more than one half of the surveyed firms had access on loan application while slightly less than one half were not able to access loan application. A few of then refused to answer

Source: Survey data

Competitiveness of Dairy Processing Firms

Overall Capacity Utilization and Effects on competitiveness: It was reported that medium and large-scale factories utilized between 40 and 60 percent of their installed capacity. This implies any establishment of micro and small Enterprises (MSEs) in their catchment areas without a corresponding increase in raw milk production spells doom to the medium and large establishment as their capacity utilization is likely to further drop. For that reason, when in 2010 Tanga Dairies Ltd (TDL) initiated a merger with (implies as a take-over) two small competitors (namely, Morani Dairy Company Limited, and International Food Processors Limited), the matter was reported to the Fair Competition Commission (FCC) in 2011 arguing that the move would strengthen TDL's monopoly position in the region (Temu, G., 2015). The dissolution of the two companies were interpreted to weaken competition among buyers of milk from farmers. The move was also interpreted to go against the spirit of encouraging more private sector players in the industry. The judgment by FCC in 2011 found TDL guilty of ignoring legal provision that requires mergers above a certain amount threshold to seek prior approval from government (FCC). TDL was therefore ordered to pay a fine for violating rules. It however, appealed and the fine judgment[20] was dropped in 2014. In its appeal Tanga Dairy argued that it was in the best interest of producers and consumers to have profit making companies that can serve them better since the acquired companies were on the verge of collapse.

The challenge of under-utilized capacity for large-scale processors like TDL is partially caused by the prevalence of informal milk marketing system which encouraged producers to sell directly to traders who take the unprocessed milk directly to middle-agents and consumers. Producers are usually motivated to sell their milk to such traders because they offer a relatively higher price compared to that offered by factories such as TDL (Table 4). Producers get a higher share of the final consumer price when dealing with individual traders than dealing with the factory. TDL had tried to invest in extension services and training farmers on good husbandry practices in return for them selling their milk to the factory. However, farmers

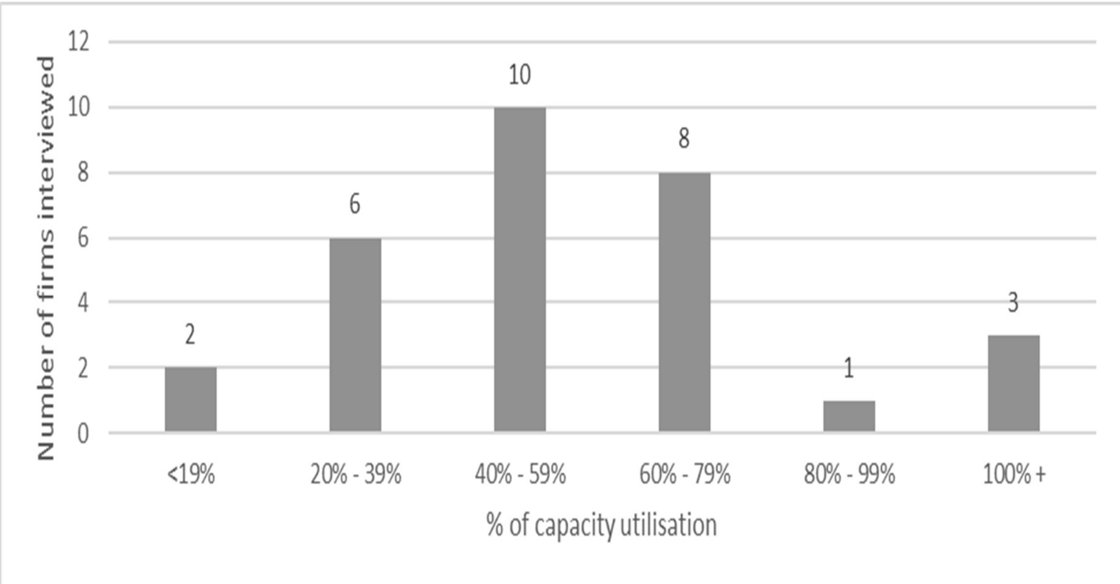
[20] Tribunal Appeal No 5 of 2014, Fair Competition Tribunal, Dar es Salaam.

tend to violate the agreement and engage in "side selling" (Wegerif, 2017)[21].

Capacity Utilisation of sampled firms: The average and median of capacity utilisation of the surveyed case study firms was at 56 percent and 51 percent, respectively. Only 4 out of the 30 interviewed firms had above 80 percent capacity utilization to process raw milk, as one third of them had capacity utilization that ranged from 40% to 59%, followed by slightly more than one quarter of firms whose capacity utilization ranged from 60 percent and 79 percent as shown in Figure 10.

One of the main features of milk supplies is the scattered nature of dairy farmers. It is noted that medium and large-scale dairy processing firms needed a larger catchment from which they can satisfy their daily needs. This adds to their transport costs as they need to send truck over longer distances to collect milk. On the other hand, it can be argued that micro and small-scale processing firms have some cost advantage since they need a smaller catchment area to satisfy their daily processing needs. This implies that any decision by micro and smallscale firms to expand their processing capacity have to involve capital mobilization for both processing facilities/buildings and investment in the transport system.

Figure 12: Capacity Utilization of Case Study Interviewed Firms



Source: Survey data

In conclusion it is observed that dairy processing is dominated by small and medium sized enterprises, most of which are less than 5 years since they started operations. About one half of them generate less than USD 10,000 per year, derived from mainly selling common dairy products such as fermented milk, yoghurt and fresh pasteurized milk. About one half of them cited competition from larger firms as a threat

[21]Feeding Dar-es-salaam: a symbiotic food system perspective.

to their survival, while the rest believed competition from firms of similar size as a threat. About two thirds of SMEs received milk for their factories from individual farmers, while larger firms relied on cooperatives as well as individuals. Under-utilization of processing capacity was a serious challenge among medium and large form, caused mainly miscalculated over-investment in capacities not commensurate with available supply of raw materials. Based on the above-mentioned scenario, one can say Tanzania's dairy sector has favoured the growth of small and medium firms, despite facing stiff competition from well-organized largescale firms.

3.2 Influence of differing institutional environments, structures and dynamics of dairy value chains in shaping opportunities for inclusion of agro-processing SMEs

3.2.1 Governance and Coordination of the Value Chain

We have seen that over the years there have been different attempts to refine policies, strategies and legislations governing the development of Tanzania's dairy sector. At one point it was believed that state owned enterprises (SOEs) would be the solution to ensure adequate supply of dairy products, but the approach couldn't bear the expected results as the country continued to face shortage and low per capita consumption of milk. The main weaknesses of the SOEs included relatively high operating costs relative to generated revenues, caused by, among others, high costs for expatriate staff and imported spare parts for factory machines. The latest approach pursued was that of encouraging partnership between investors in dairy processing and farmer cooperatives as has been the case with TDL, its weaknesses notwithstanding. Meanwhile the government has attempted to strengthen its role of sector facilitation in collaboration with DPs who have supported different smallholder programmes such as Heifer International. However, according to Exum (2019)[22], although there has some impact using this approach, there is still room to improve ability to access productive assets by poor farm families to raise farm productivity considered still at very low levels. One of the lessons from government's efforts to encourage the private sector and monitor their investments in dairy processing is the need to have reliable data on supplies and market dynamics. Two large investors, TDL and ASAS in Iringa, seem to have invested in high-capacity machinery under a misplaced assumption of adequate supplies of milk. They are compelled to buy milk from a catchment with a radius of more 200 kilometers, thus adding to its operational costs that are transferred to farmers by offering lower producer prices than local milk vendors. Government policies seem to take a two-pronged approach: encourage medium and largescale processors on one side and support small scale milk producers to be organized in cooperatives so as to supply the factories. It is from among the farmer cooperatives that we see some of them moving downstream to invest in cooperative-owned small scale dairy processing plants such as those in Songwe, Njombe, Iringa, Morogoro, Mara, Kilimanjaro and Pwani regions.

The 2019 Review of Dairy industry Act no. 8 (2004) has redefined "milk" to include milk other animals

[22] http://theurgetohelp.com/articles/an-investigative-analysis-east-africa-dairy-development/.

(goats, Camels, water buffaloes). The review also reduced the number of members to the Governance Board of TDB to nine (9) in a bid to reduce running costs. Only three of the members are from the private sector, which is regarded as an under-representation given that they are the "engine of the sector" as per the Livestock Policy.

The 2020 Review of Dairy regulations are yet to be tabled in parliament. However, during the 2020/21 financial year, the Minister of Finance accepted proposals to remove four types of fees (mostly import duties and Value Added Tax (VAT) for milk equipment) and reduce some (e.g., registration fees), which cumulatively had led to reduced cost of doing business. The measures were well received by stakeholders but deemed not far reaching enough. More measures to reduce the cost of doing business so that SMEs can operate relatively more competitively in the dairy sector.

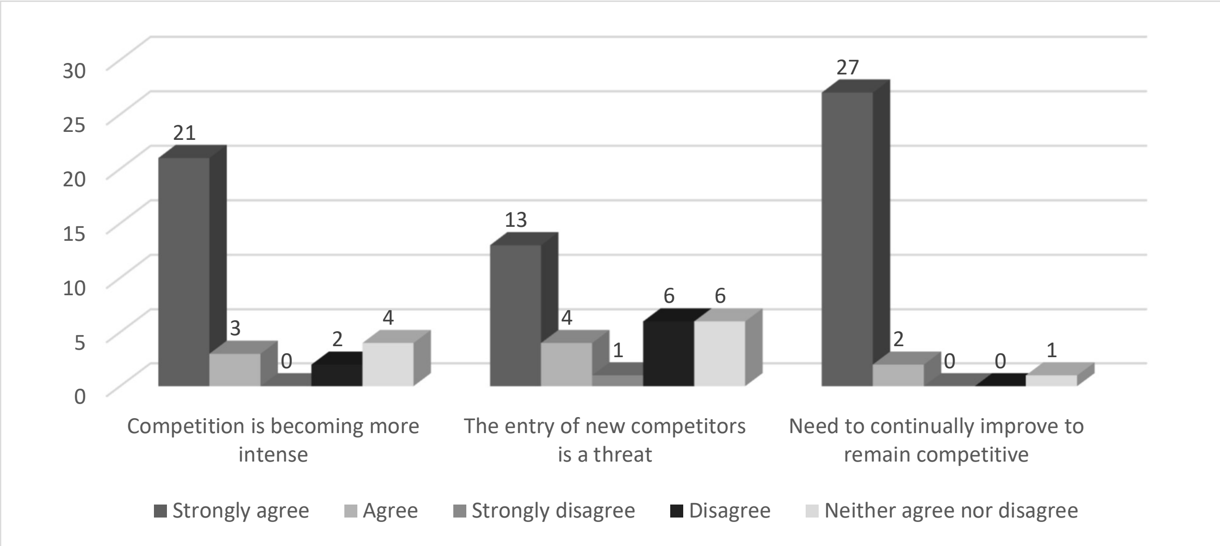
3.2.2 Relationship between Suppliers and Buyers

Among the market developments in recent years is the instantaneous formation of a dawn-milk market that operates informally for 2-3 hours at Ubungo in Dar-es-salaam, starting at around 0330 hours and ending at around 0530 hours daily. Suppliers of milk congregate from 0300 hours from all directions within and outside Dar-es-salaam. Suppliers from within the city come from Ilala, Temeke and Kinondoni districts, while those from outside come from Mkuranga, Kisarawe, Kibaha, Chalinze and Bagamoyo, and as far as Morogoro. According to Wegerif (2017), they used a combination of means of transport: hired vehicles which several of them share to transport their milk containers, buses, motorcycles, and bicycles. Testing of quality of milk is done using some unconventional methods such as mixing with a sample of milk with alcohol (50:50 ratio) to detect presence of impurities including water dilution. According to the Private Sector Desk Officer with MLFD, the TDB has provided some education on safe handling of milk by traders, and they have complied by buying aluminum containers. The Ministry was the process of formalizing the market by securing a more spacious plot of land for that business to be transacted. The operation of this informal market has two implications: (i) it denies supplies of milk to dairy processors, including small and medium processing factories in the originating regions; and, (ii) poses food safety challenges to Dar-es-salaam consumers since they are not checked at the sources.

Competition and market shares

Interviews with key informants revealed that about one half of the firms faced stiff competition from large dairy processing firms while the remaining half pointed that comparable SMEs are their main competitors. Among the interviewed firms close to three quarters of them strongly agreed that "competition was becoming more intense"; while slightly above two fifth thought that that "entry of new competitors was a threat" to their survival. Despite the observed threats 27 out of 30 firms appreciated that "there was a need to continually improve to remain competitive" in the sector (Figure 13). However, two fifth disagreed or strongly disagreed that the entry of new competitors was a threat to the survival, and one fifth did not believe that competition was becoming more intense and therefore negatively affecting their businesses (Figure 13). The revelations are most critical for micro and small firm in their start-up phases because they certainly need to access loans from banks for upgrading their businesses and become competitive.

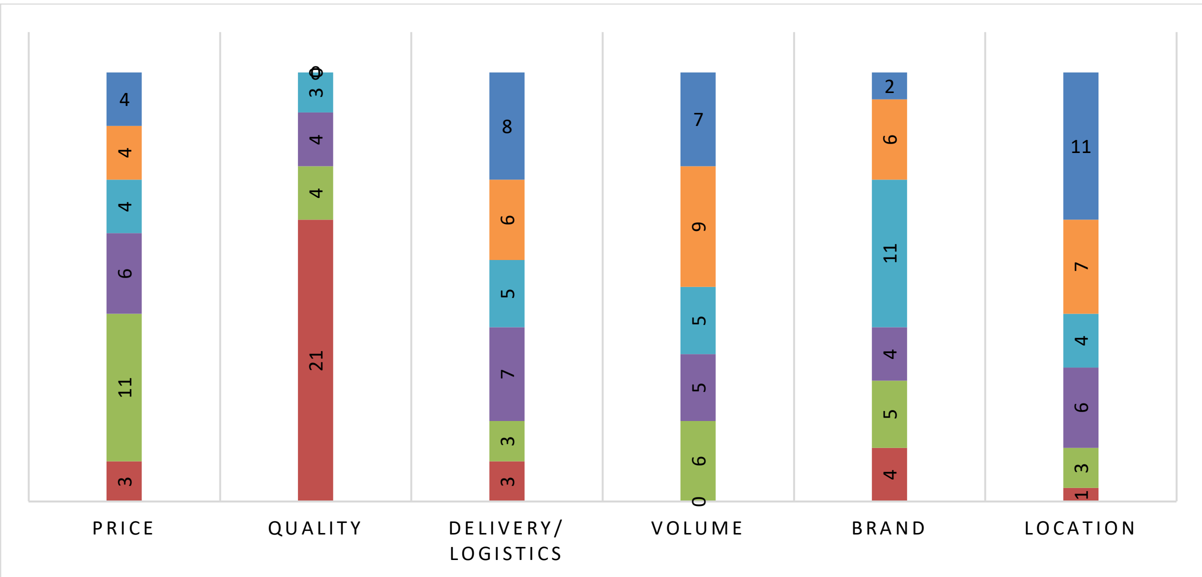
Figure 13: Firms' Perceptions on competition



Source: Survey data

In terms of market factors considered important for firms to capture or increase their share, "quality of the product" was the mentioned as the most important factor in dairy market competitiveness about 21 firms (out of 30), followed by pricing, brand name and location of firm, each factor mentioned by one third of the interviewed firm, respectively. The other factors attributed by one quarter of the firms included adequate volume to supply the market and delivery logistics (Figure 14).

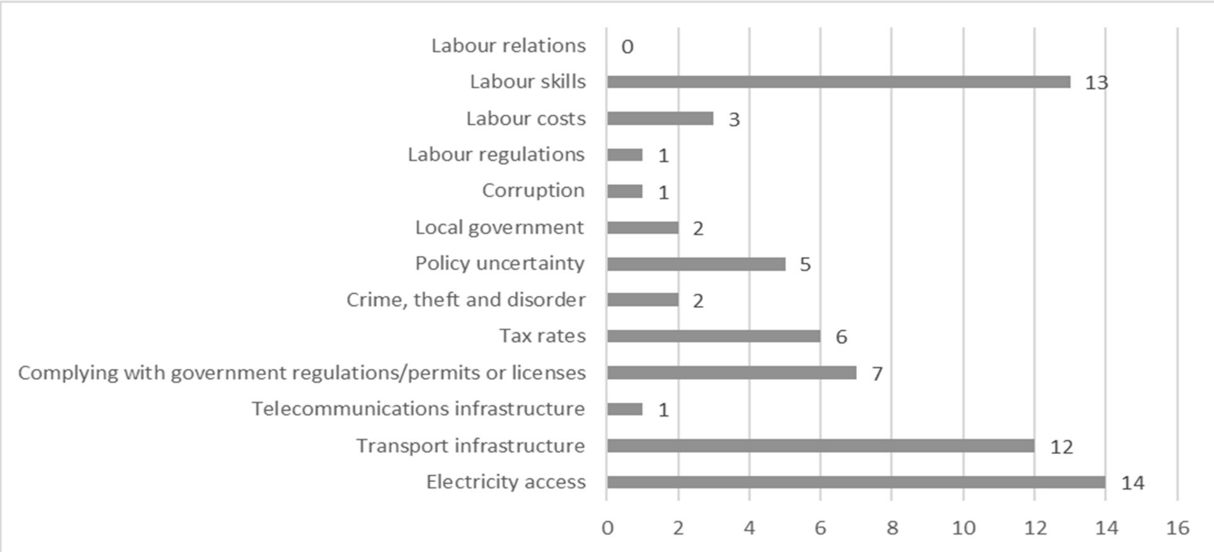
Figure 14: Factors that are most important for competitiveness in the Tanzanian dairy sector.



Source: Survey data

Almost one half of the firms mentioned electricity access and availability of skilled labour among the leading factors hindering market competitiveness. Other critical factors were poor transport infrastructure, tax rates and compliance with government regulations/permits and licenses. Factors that seemed to have no impact on market competitiveness included corruption or labour relations (Figure 15).

Figure 15: Factors hindering competitiveness of the firm



Source: Survey data (n=30)

Stakeholders were also happy about the government increased tariffs on the imported milk flour[23]. They believe that the move will help to elevate the production and processing of milk by farmers and processors, respectively. There will be a need for the government to monitor the behaviour of market prices to protect the interests of both farmers and consumers to prevent locally processed products selling at prices pegged on imported dairy products. Milk processors should also emulate soft drink companies such as Coca-Cola and Pepsi to inform and educate the consumers on product standards and suggested maximum retail prices.

3.2.3 Case Study of Tanga Dairy Cooperative Union (TDCU) and Ammy Fresh Dairy Firms in Tanga

Among the main approached adopted the government has been to encourage farmers to form cooperatives, which in turn can also establish dairy processing plants of different scales. The case of TDL/TDCU is unique due to its tripartite nature of partnership, bringing together farmer cooperatives, government and development partners. It demonstrated that whereas the primary objective of creating a stable market for milk from farmers can be easily realized, the arrangement stifles the emergence of smaller processing plants in the respective catchment area. The seasonal producer prices agreed between the farmers' cooperative and the factory (to which the farmers' coop also belong) creates a monopolistic market environment, compelling some individual farmers to channel their milk through informal market

[23] <Files\\TZ Dairy KIs\\... _Tanga> - § 3 references coded [9.01% Coverage]-Reference 3 - 3.46% Coverage

dealers or to comparable competitor in the region. We also show that Ammy Fresh Dairy, which is solely privately owned, tend to be more flexible in its operations and was posing as a strong competitor to TDL (TDCU), which has historical and statutory ties with dairy farmers.

TDL is among the medium and large diary processing firms that work closely with cooperative societies, an arrangement in which farmers also have 3.5 percent share in the company[24]. It was revealed that members to the cooperative societies in Tanga had tremendously increased since 2007 when the company introduced the system of first and second payments policy and ensured that farmers were paid on time. The company also assisted the cooperatives to offer loans to farmers, mostly in the form of impregnated heifers, which they paid in kind from milks sales.[25].

TDL admitted that their main competitor in Tanga region was Ammy Dairy Processing Company (ADPC) although its capacity is less than 10,000 litres. ADPC is the only surviving competitor after more than five others collapsed and sold their assets to TDL or relocated to Dar-es-salaam. TDL has the advantage of ADPC because members of TDCU are obliged by regulation to sell their milk to it as a customer of first choice. This implies ADPC must rely on non-TDCU milk suppliers. This challenge led to the collapse of Azania Milk Processors (AMP) and the Tanzania Full Processing Company (TFPC), which bought Azania. They realized that there was little milk remaining after most farmers, who belong to TDCU, have sold their milk to TDL.

3.2.4 Experience of State-Owned and Private Sector Owned Dairy Factories

Study participants revealed that, although the country had initially in the early 1990s promoted the establishment of state-owned medium and large-scale dairy processing firms, many of them operated for about 10 years before collapsing and gave way to the establishment of private and cooperative-owned enterprises. As for large private sector-owned enterprises, the country by 2020 remained with only four firms whose capacity is above 50,000 litres (Milkcom, ASAS, TDL and AZAM) as already indicated in the preceding sections[26] (Table 2). Some reasons for the collapse have already been mentioned, which included high operational costs relative to generated income, unstable supply of milk, mismanagement of funds, as well as high wages paid to expatriate engineers and dairy technicians. Farmers were also frustrated by delayed payments after they deliver milk to the factories, which resulted in some of them finding alternative buyers for their milk or abandoning dairy farming altogether. The government came with a solution after 1985 to privatize those factories in the expectation that those who bought them would apply improved management practices and motivate dairy farmers. Unfortunately, that could not happen and so the privatized factories collapsed in the hands of private sector operators. The main lesson from this approach was that (i) state-owned enterprises in sensitive businesses such as dairy processing was not a workable option; and that (ii) when the government decides to promote private sector

[24] The Dutch have 45 percent in TDL business

[25] <Files\\TZ Dairy KIs\\... Tanga> - § 3 references coded [9.01% Coverage]- Reference 2 - 3.58% Coverage

[26] <Files\\TZ Dairy KIs\\TDKI01 ...> - § 1 reference coded [5.29% Coverage]-Reference 1 - 5.29% Coverage

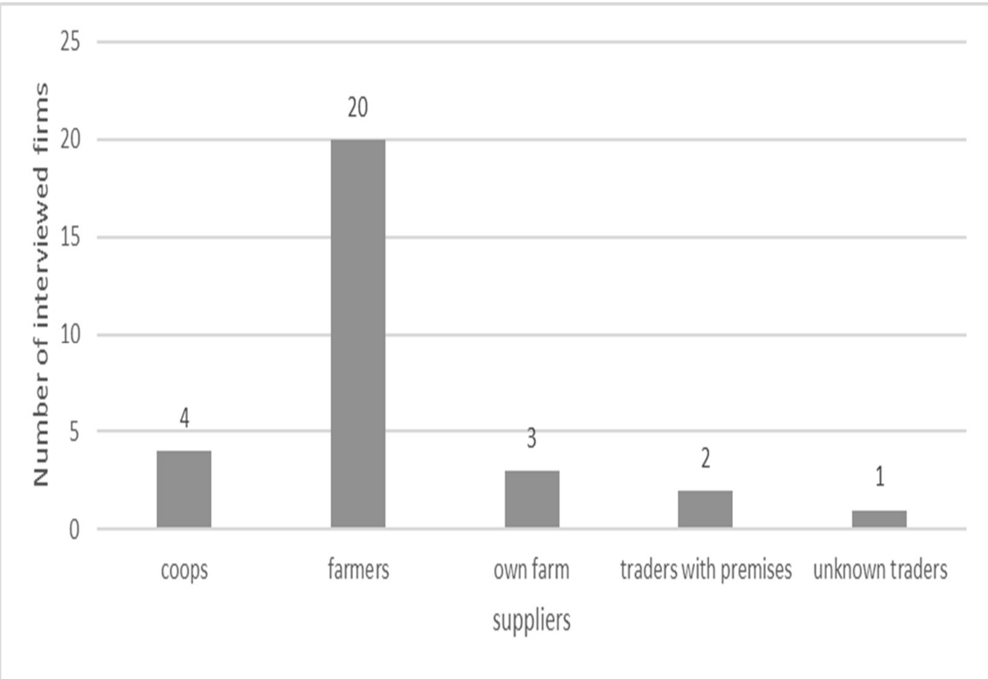
involvement in business, it should as well as ensure it provides the right business environment.

3.2.5 Sources of Milk Supplied to Processors

Individual farmers are the main sources of milk given that there are few commercial large-scale dairy farms, which includes nucleus farms established by dairy processing firms. About 86 percent produced and marketed by smallholder farmers is sold directly to neighbours, with the rest sold through small-scale milk traders or milk collection centres (MCCs). As already mentioned, about 2.4 percent of marketed milk is in the form of processed products and about half of it is imported (MLFD, 2016). There are thousands of institutional consumers of different categories. Once products are ready from the processors, they are taken to consumer outlets by the firms or by wholesale traders and milk vendors. Milk vendors, most of them using motorcycles and bicycles, are important players in the milk value chain as they have the flexibility of taking milk from farmers and selling to factories, homes, hotels/restaurants and shops/supermarkets.

The survey findings show that two thirds (20 out of 30) of the sampled dairy processing firms sourced raw milk from individual farmers, while the rest obtained from cooperatives and traders. Some dairy factories also kept their own milk cows, which supplied one tenth of their requirements (Figure 16). Slightly over one half of dairy firms (16 out of 30) bought their milk requirements based on prices already set by suppliers, implying they are price takers, while one third of them negotiated with their suppliers on the purchase price for the supplied factory inputs (e.g., milk and cultures).

Figure 16: Firm's raw milk sources



Source: Survey data

3.2.6 Price setting of dairy products

There is a different price setting at each level, which increasing as one moves away from the farm-gate level. The information in Table 7 demonstrates the differences in the price of milk that is factory-processed, whose final consumer price is about TZS 3,200 per litre for normally processed and packaged milk, compared to raw milk distributed using motorbikes and bicycles and sold at milk kiosks or directly to homes, whose price is TZS 2,000 per litre (usually in recycled water bottles) by mobile milk vendors and sold door to door or through street food kiosks for home consumption. Ordinary shops and supermarkets sell factory processed and packed milk delivered by factory agents using vans and lorries. It is observed that processed and packaged milk is 60 percent more expensive than the unprocessed milk. This explains the popularity of the informal channel for milk marketing in the country, despite its attendant health risk of taking to final consumers un-pasteurized milk that is sold in recycled plastic containers. (Table 7).

Table 7: Price spread between farm gate and final consumer price

Supplier	Payment to Producer (TZS/litre)		Cost to Buyer (TZS/litre)		Share of Farmer to Final Buyer Price		Comments
	2017*	2020**	2017*	2020**	2017*	2020**	
I- Factory Processed Milk							
TDL (processed and packaged)-normal	600	700	2,000[a]	3,000[a]	30.0%	23.3%	Final buyers are supermarkets and shops
TDL (UHT packaged)	600	700	3,500[a]	3,800[a]	17.1%	18.4%	
Small (Mangi) shops[1] (normal processed and packaged)	600[1]	700[1]	3,000[b]	3,200[b]	20.0%	21.8%	Supplied by factory distributors
Small shops UHT milk	600[1]	700[1]	3,500[b]	4,000[b]	17.1%	17.5%	Low fat UHT sells at Sh.4,200
II-Raw Milk (Unprocessed)							
Bike distributors of raw milk (unprocessed) (using motorcycles and bicycles)	1,000	1,200	1,600	1,800	62.5%	66.7%	Buys from farmers around Dar or Ubungo milk market and sells the raw milk to kiosks
Ubungo Wholesale	1,000	1,200	1,500	1,700	66.7%	70%	Sold to bikers

Supplier	Payment to Producer (TZS/litre)		Cost to Buyer (TZS/litre)		Share of Farmer to Final Buyer Price		Comments
	2017*	2020**	2017*	2020**	2017*	2020**	
market[#] (unprocessed)							and hotel owners
Kiosk retailer[#] (unprocessed)	1,000	1,200	1,800	2,000	55.5%	60%	Buys from bike distributors

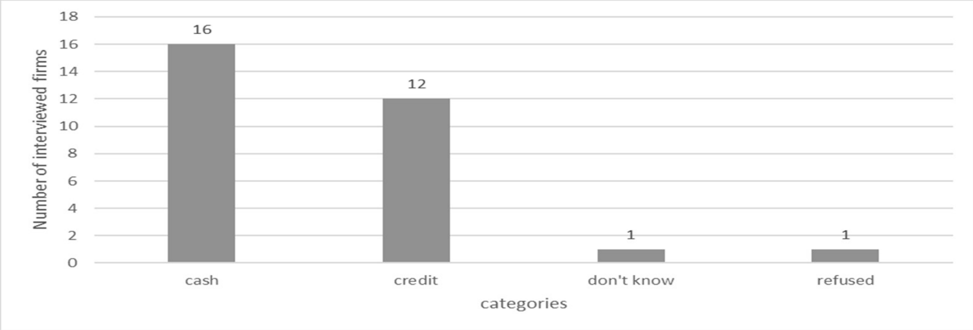
Note: * Proxied as same paid by the factories to the farmer [#]Proxied by the price offered to the producer by motor-cycle and bicycle distributors
Source: *Wegerif (2017) and status in 2020 (**this research)

In 2020 TDL was offering TZS 765 per litre for milk received from TDCU. The farmers were in turn offered between TZS 685 and TZS 710 per litre of milk by the cooperatives, depending on deductions for loan repayments (see Table 7). The Union and member societies deduct between TZS 10 and 25 per litre to cover running costs (salaries, electricity, etc) and loan repayments. Although the leaders of TDCU were not sure how TDL benchmarked their offer price, what they paid was far higher compared to ASAS in Iringa, which in 2020 paid their farmers TZS 600 per litre of milk[27]. It was not clear why it could not afford to pay a better price than that given the climate in Iringa was more conducive to dairy farming compared to that in Tanga. One of the reasons could be farmers serving ASAS are more geographically scattered and spread such that milk trucks must cover 500-800 km to collect products from neighbouring Mbeya and Njombe regions[28]. Among the recent developments which delighted small scale milk processors was the decision by government to taxes on dairy industry. One respondent remarked "I was so happy the decision will encourage the growth of small scales industries. But also, we should undertake marketing promotion to encourage more people to drink milk".

More than four fifth of the surveyed firms sourced their raw milk from suppliers located within their respective regions while, others combined sourcing from within and outside the region. Among those that sourced their inputs from outside their respective regions included ASAS and TDL because milk supplies from their regions cannot suffice their processing capacities. The slightly more than one half of the factories paid cash on delivery when they purchased raw milk from farmers, while two fifth of them sourced their raw milk and other inputs on credit from their suppliers (Figure 17).

[27] <Files\\TZ Dairy KIs\\... Tanga> - § 4 references coded [19.01% Coverage]-Reference 4 - 1.68% Coverage
[28] <Files\\TZ Dairy KIs\\TDKI01 ...> - § 1 reference coded [1.02% Coverage]- Reference 1 - 1.02% Coverage

Figure 17: Firm's mode of purchasing main input



Source: Survey data

Even though most firms obtained their main inputs on cash, close to four fifth of them did not face difficulties in getting the right price and quality from their suppliers. However, over one tenth of them admitted that they faced some difficulties in that aspect. With regards to contractual arrangements, one out ten dairy firms had formal contract for regular supplies of inputs, two out of ten had ad hoc contracts, with the rest, seven out of ten having no experience in contracting suppliers for their needs (Figure 18).

Figure 18: Firm's contract agreement categorization with suppliers on raw inputs

Source: Survey data

IV-INFLUENCE OF POLITICAL ECONOMY FACTORS IN THE UPGRADING OF TECHNOLOGICAL CAPABILITIES

The ability of dairy sector SMEs to acquire and expand their technological capabilities is regarded crucial in allowing them to produce products that can be competitive enough relative to those generated by large firms. It is therefore important to have the right policy landscape that encourages SMEs to modernize their operations at affordable costs. In this section we present findings on the influence of political economy landscape in the ability of firms to adopt and/or upgrade agro-processing technologies.

4.1 Technological change

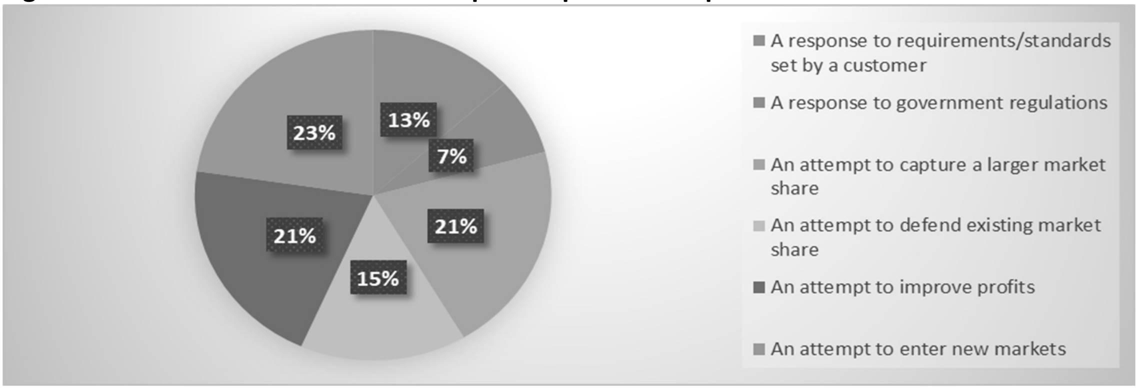
Some 40 percent of the surveyed dairy firms had managed to introduce new technologies in their operational processes over the past five years. However, 12 firms (60%) managed to introduce new products over the same period (Figure 23).

Table 8 Application of Technology by Firms

S/N	Firms' Varieties	Description
1	Technological change on new processes and products	About two fifth of the surveyed dairy firms had managed to introduce new technologies in their operational processes over the past five years while 60% managed to introduce new products over the same period
2	Firms' mode of purchasing main inputs	Slightly more than one half the firms interviewed bought on cash from the suppliers, while two fifth sourced their main inputs on credit from their suppliers
3	Access to loan application	Slightly over one half of the surveyed firms had access on loan application while two fifth were not able to access loan application.

There are several reasons that facilitated these advancements, which include attempts to capture new markets accounting (23%), improving market share profit (21%), attempts to improve profits (21%), defending the existing market share by pleasing customers (15%), response to special customers' requirements on specifications (13%) and fulfilling government regulations (Figure 19).

Figure 19: Reasons to introduce new improved products or processes



Source: Survey data

Slightly more than one half of the firm indicated that they had introduced ICT to digitize their operations after buying computers to replace manual recording and paper files. The rest were still using older system because they do not record on computers their transactions (Figure 20)[29]. About two fifth of the surveyed firms were willing to invest in digitizing in areas that require such a change. About one tenth wished to specifically invest in digitizing their production and sales operations. The application of ICT by firms included use of internet for communicating with customers or suppliers (73.3%), searching to get information on global market trends (70%), effecting payments (65%), purchasing goods (55%), sales and orders (46.7%), and digitizing office records. Other uses of internet were for supply chain management (16.7 percent) and inventory management (23.3%) (Figure 20).

Figure 20: Firm's usage internet on dairy business activities

Source: Survey data

29 <u><Files\\TZ Dairy KIs\\... _Tanga> - § 3 references coded [12.42% Coverage]- Reference 1 - 1.39% Coverage</u>

4.2 Use of New Technologies in the Production Processes

According to key informant interview with TDCU officials, medium and large-scale farmers have been using new technological methods in their production system, including making bales of hay for their cows, application of getting and applying the techniques of artificial inseminations (AI). Generally, it was estimated that around one quarter of the cooperative members were using AI for increasing their stock of improved cattle breeds. The programme to train farmers on the application of AI started way back in 2007 to the success rate by applying AI to breed their animals, which was historically about 25 percent only and so farmers had resorted to using their own natural methods in cattle breeding. The low rate was a result of poor accountability by government extension officers who failed to observe the correct timing for mounting cows using AI. The trainings were introduced to reach at the ideal success rate of between 75 and 75 percent. The success rate achieved by farmers in Iringa under ASAS, for example, was 95-90 percent.

Other adopted technologies relate to dairy processing. Watuta Dairy in Morogoro started making yoghurt using improved technology borrowed from the then Ubungo Maziwa Company in 1979[30]. The initiator of the firm is currently focusing on spreading yoghurt-making knowledge through training and seminars on milk processing to other young people and entrepreneurs. Trainees are from various parts of Tanzania such as Mbeya, Zanzibar, Moshi, Tanga, Sumbawanga, Dar es Salaam, Morogoro, Arusha and other regions. The cost of training is TZS 120,000 for a five-day course accompanied by certificates. Among the beneficiaries of the offered trainings include the founders of Shambani Graduates, YOCA Dairy, and Esther Maziwa Company.

Hygiene and food safety compliance[31]

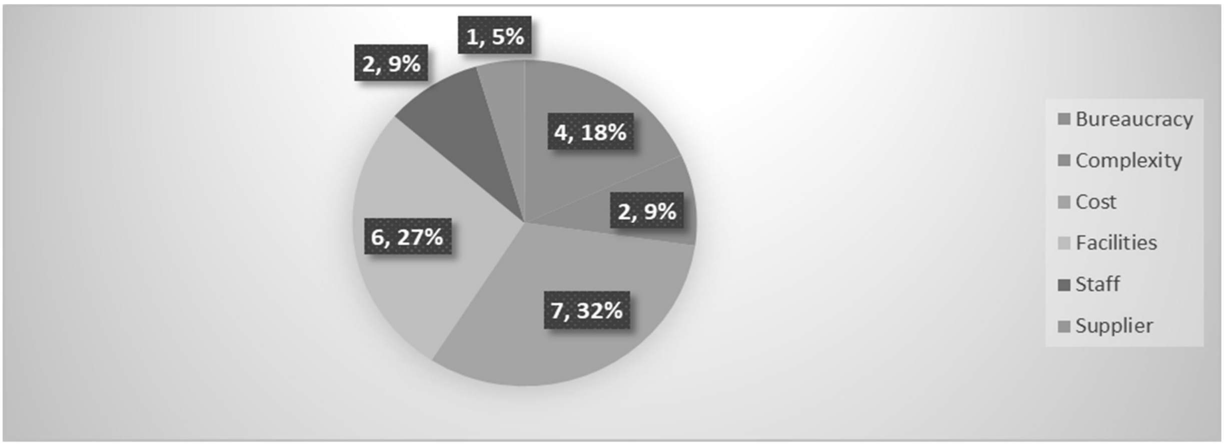
Small and medium dairy processors had to meet involve costs related to legislation, enhanced capabilities, audits, basic legal standards, labeling, meeting ISO 9000 /14000 standards, Hazard Analysis Critical Control Point (HACCP) and Tanzania Bureau of Standards (TBS). As noted earlier, among the reasons for firms to invest in new technologies was to comply with government regulations, which was also mentioned as among the challenges they faced in enhancing their competitiveness (see Figure 21). On observing hygiene rules seven (32 percent) of the interviewed firms were facing cost challenges that hindered them to comply the food and safety standards. Another 18 percent had experienced bureaucracy setbacks on complying the safety standards accounting by 18% (Figure 21). Dairy processing firms are obliged to have apparatus for determining the quality and content of milk for each milk collection centre. The standard measurement for the UHT plant requires the bacteria contents to be below 1 million per ml, which compels factory quality controllers to be very stringent and so must reject milk from many farmers. According to the interviewed TDCU officer, although many farmers unknowingly deliver contaminated

[30] <Files\\TZ Dairy KIs\\TDKI01 ...> - § 4 references coded [12.20% Coverage]-Reference 1 - 2.18% Coverage

[31] <Files\\TZ Dairy KIs\\... _Tanga> - § 1 reference coded [2.73% Coverage]-Reference 1 - 2.73% Coverage

milk, “there are some farmers who are not trustful, as they add sugar or water in the milk”, which is also rejected at the milk collection centres after telling them the deficiency of their milk.

Figure 21: Health and safety compliance issues



Source: Survey data

Challenges faced by small-scale start-ups

Shambani Graduates and YOCA Dairy, included starting without any machines but using simple technologies for milk processing. The interviewed key informant recalled that at one-point Shambani Graduates participated in an international essay writing competition and won an award (a trophy and a cheque) which was given to them in England. They used the award money to import new dairy processing machines. Among the initial challenges faced by Shambani Graduates was receiving milk that could not ferment due to mixing with milk from recently vaccinated or cows treated with antibiotics. Some farmers do not observe the 7 days break before allowing the milk for human consumption. Milk is so sensitive such that 500 litres of fresh milk will get contaminated if mixed with only one litre of milk from a vaccinated cow.

The quality of milk from small scale firms has always been particularly good even though in the earlier years when they started, they had to use concentrated milk and powder milk due to shortage of fresh milk from farmers at a ratio of 75:25, respectively[32]. The milk powder is mixed with oil and then homogenized to get milk as a final product. This system is currently applied by Bakhresa in their milk products.

Different interventions for improving the quality of milk received by processing factories[33]

Companies such as ASAS have their own cows which accounts for one quarter of milk received for processing. So those industries with their own farms did better in quality levels because they cannot

[32] <Files\\TZ Dairy KIs\\...   Tanga> - § 3 references coded [12.42% Coverage]-Reference 4 - 5.29% Coverage

[33] <Files\\TZ Dairy KIs\\TDKI01 ...> - § 1 reference coded [10.95% Coverage]-Reference 1 - 10.95% Coverage

deceive themselves and therefore have some advantage compared to processors who didn't have their own cows. Small scale processors are also taught how to test milk collected from different people without failure. When there is laxity in detecting contamination, including bacteria count, the milk packets start swelling after a few days below the stipulated shelf-life. This problem occurred at one time with products from a factory in Tanga when they received reports from their client in Dar es Salam that 300 out of 1,000 delivered packets of milk were swollen.

Investigations by microbiology experts from Sokoine University revealed that the presence of bacteria, a problem that was traced to deliveries from Pangani where they mixed "ten litters of milk with ten litters of water plus one kilogram of sugar to balance the density" and it passed the lactometer density test. When interrogated farmers confessed that they did that to compensate for the low producer price offered by the dairy processing firm. The milk testers at the collection centres did not conduct the recommended organic test using human sense of taste and smell. If they had used that "human sense approach" they could have discovered that it was sweet due to the 1 kg of sugar added. The field testers had faith and trust in the innocently looking rural farmers and could not imagine they were capable of such deception, which cost the company huge losses for a period of three months. The situation was rectified after retraining of field staff and introducing a more stringent protocol for receiving and handling of milk as a condition for initiating UHT milk production.

In summary, the government has initiated policies taken actions that have reduced the costs of purchasing new production and processing technologies, including ICT meant to promote efficiency in business management by firms. More than one half of the interviewed SMEs reported to have adopted new technologies in production, processing, and packaging of dairy products. This has been done in response to mainly customer needs and government regulations (e.g., compliance with ISO guidelines). They have adopted technologies for microbes count and detecting adulterated milk delivered by suppliers. Firms have also digitized most of their operations and therefore instilling efficiency. SMEs would have done more, however, if it was relatively easier to access competitively priced loans.

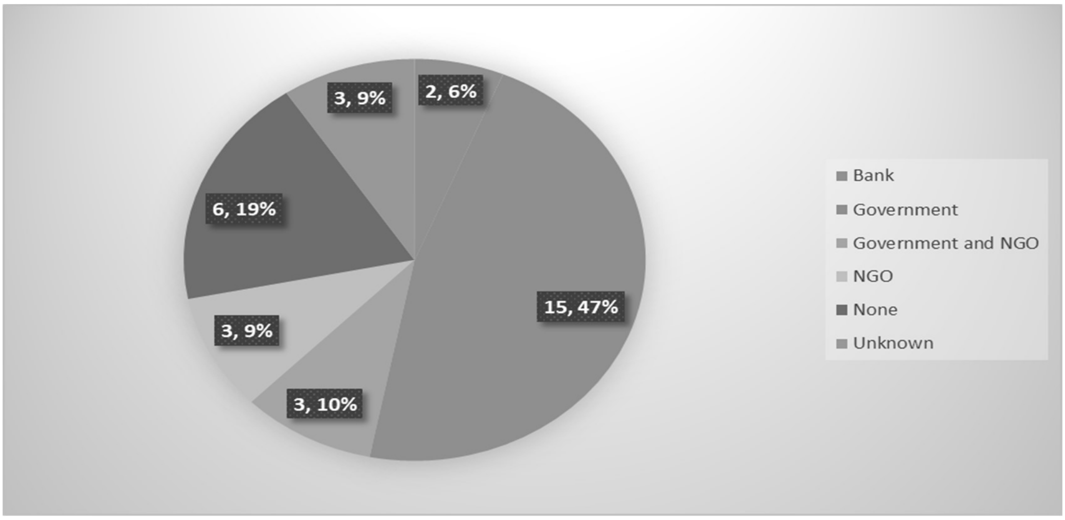
V- THE INFLUENCE OF THE INDUSTRIAL POLICY AND RELATED POLITICAL ECONOMY ASPECTS IN SUPPORT OF INCLUSIVE AGRO-PROCESSING IN FAVOUR OF SMES

The country's political economy is considered critically important in shaping the behaviour of actors in different sectors, and more so in influencing decisions by the private sector to invest in new business or expand the scope of existing ones. In this section we present findings on the influence of industrial policy in supporting inclusive agro-processing by SMEs.

5.1 Government Support and Influence to the Dairy Sector

Close to one half of the interviewed firms (14 out of 30) indicated to have benefited from Government support in different aspects of dairy business, which most probably for SMEs engaged in production was related to accessing animal health services such as vaccination, veterinary services including AI. Those SMEs in processing, irrespective of size, could have benefitted from government support through reduced costs of machinery and equipment after tax/duty waivers. The support received was in the form of either technical and/or financial (Figure 22). About one fifth of them revealed they had received support from banks, which most probably was related to boosting their capital to improve their business through investments in aspects such as new machinery, ICT and digitization of operations, and upgrade transport fleet. A minority of 3 firms indicated to have received support from NGOs, which could include capacity building interventions.

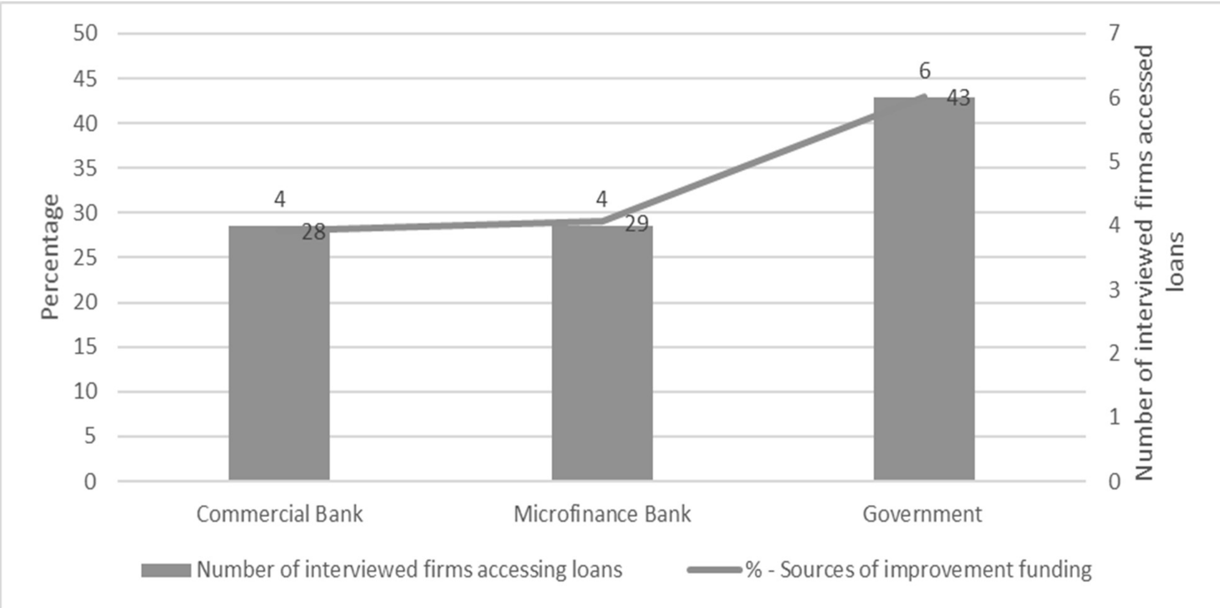
Figure 22: Support gained from different organisations



Source: Survey data

The findings showed that about one half of the firms (16 out of 30 firms) believed that the Government does not favour any firm in the dairy industry, while about one quarter of them thought otherwise. In trying to understand the firms' perceptions on loans application in the past 5 years, it was revealed that one half of them applied for loans and for those who applied two fifth of them accessed loans provided or sponsored by Government while more than one quarter accessed loans provided by microfinance and commercial banks (Figure 23). Despite the admission of some of them obtaining loans, having about one half of them operating without any financial support is something that requires continued policy interventions to establish a more supportive financial system to agribusiness in general.

Figure 23: Sources of financial loans that benefits the dairy small and medium firms



Source: Survey data

From the findings slightly more than one half (16 out of 30 firms) are members of different cooperatives or trade associations, which suggests some commendable level of awareness on the need for collective industrial actions among stakeholders. However, more needs to be done in promoting such platforms as important avenues for stakeholders to advocate for policy changes on one side, and government and other actors to provide facilitative services to dairy sector actors.

5.2 The role of trade associations/cooperatives to dairy processors

The study has identified several membership associations that are linked with the dairy processors such as Tanzania Milk Processors Association (TAMPA) that was established in 2003 with some encouragement from Government, as platform for milk processors (see details in Annex 3); and the Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA), in which TAMPA is also a member, both of which requires members to pay a one-time registration fee and thereafter annual subscription fees. Slightly over one half of the interviewed firms confirmed to be members of trade associations, whereas large processors belonged to both TAMPA and TCCIA as their platforms to voice their challenges to the authorities, while SMEs rely more on TAMPA as their platform specific to the dairy sector. A few of the interviewed firms noted that the associations are bridging the gap on the market information such as market price, demand, and regulations which enabled them to secure new market channels. Also, one dairy processor documented that the associations particularly TAMPA supported the dairy industry on abolishing the Value Added Tax (VAT) on importation of dairy machineries. This has supported many small processors to have accessibility of dairy processing machineries, which also contributed to employment opportunities in dairy processing sector. However, some micro and small firms find it costly to pay annual subscription fees and they gave several reasons for being association members. However, a few interviewed firms noted that being a member of trade associations has some associated risks of being studied by competitors who can take advantage to capturing others' markets through the shared firms' experiences and other information kept by the association's secretariat.

The dairy processing sector is facing some challenges related to the quality of raw milk delivered by farmers. This challenge is mainly caused by the tendency of farmers to contaminate the raw milk with adding water and powder to increase the volume. In this aspect, one of the large, interviewed processors noted that the trade associations play a big role in minimizing this challenge by providing education with technical support to farmers[34]. Also, the associations have much influence on reducing the bureaucracy of accessing dairy business certificates from regulatory bodies, although that problem was mentioned by relatively a few of the interviewed small firms. The firms confirmed the support from the trade associations particularly TCCIA on liaising with the governing bodies on legislation and compliance issues to avoid the bureaucracy challenge. Also, the associations have played some role in linking relatively few dairy small processors with financial institutions. About 6 of the interviewed 17 small processors were able to obtain loans from financial institutions (Figure 29).[35]

5.3 Lessons from past and current policies and institutional arrangements in the dairy sector

As earlier discussed, the country has put in place policies and institutional arrangements for encouraging the participation of private sector in the dairy industry. Study participants commented regarding those government policies and dairy sector regulations, state-business relations, state support, development finance, infrastructure, legislation, public procurement, basic services, government incentives to the sector, state compliance boards, effect of corruption on business, and health inspectors[36]. They made the following observations:

[34] TDL's survey, 2019

[35] Yoca Dairy; Bakhlina Dairy Ltd; Tumaini Jipya; Mufindi Dairy Cooperative Society (MUDCO); Mafinga Milk Group (MAMIGRO); and Iringa Dairy Cooperative Society (IDICOS), survey 2019

[36] <Files\\TZ Dairy KIs\\... _Tanga> - § 2 references coded [18.89% Coverage]-Reference 1 - 12.75% Coverage

a) Although the country had some regulations regarding the dairy sector, they were not strictly adhered to by stakeholders. For example, although food safety regulations don't allow selling of raw milk to consumers, the regulations are flouted in all towns including Tanga and Dar-es-salaam cities where it is common to see street vendors selling raw milk to customers without any restrictions from the authorities. So, we note that despite having regulations there is lack of machinery for their enforcement. The authorities are overwhelmed by the dominance of informal dairy market players: from the thousands of traders to the millions of household-level consumers who are indifferent to the safety risks of using unprocessed milk. Consumers prefer to pay less for the unprocessed milk compared to the processed and well packaged milk. On the other hand, it is not easy to monitor sales from millions of dairy farmers most of whom are not members of cooperative societies and are scattered in different places. But even those who are organized, there are attracted to the higher producer price offered by informal traders.

b) The failure to enforce milk safety regulations favours the informal traders who can afford to buy milk from farmers at higher prices than that offered by factories and then sell to consumers at lower prices than factory-processed milk because they don't incur processing and packaging costs. They also don't pay statutory fees and corporate taxes. This phenomenon of informal competitors has caused the factories to operate below capacity.

c) There is also a need to consider waiving produce cess charged by LGAs to be at par with neighbouring Kenya who have zero rated taxation on all dairy value chain inputs and outputs. When you have zero rated system, farmers can get more money, motivate them to produce more. The reduced transaction costs due to removal of taxes leads lower final consumer prices and stimulate growth of consumers of milk products.

d) There are several things that Tanzania can learn from past experiences regarding the role of SOEs in the development of dairy sector[37]:

   i. Given the landscape of milk producers dominated by scattered small-scale farmers, it has been incredibly challenging to successfully operate large-scale dairy processing plants. This was observed when the government established large-scale state-owned Tanzania Dairy Limited (TDL) and Dairy Farming Companies (DAFCO). Despite the huge investments supported by Development Partners such as Dutch Aid, the plants could not get enough raw milk to operate at full capacity, but also experienced poor management of their resources. These factors led to their collapse.
   ii. The same experience is also facing two large but privately owned dairy processing plants: ASAS in Iringa and TDL in Tanga, which are also operating at sub-optimal levels due to shortage of supplied milk for processing.
   iii. Based on the experiences in dealing with large-scale enterprises that rely on small-scale farmers, the government and the development partners decided to start investing into small-

[37] <Files\\TZ Dairy KIs\\TDKI05 …Tanga > - § 1 reference coded [2.17% Coverage]-Reference 1 - 2.17% Coverage

scale dairy processing and support to enhance productivity among small-scale farmers since 1995[38] when the TSDD Tanzania Small Dairy Development was formed. Under the program small-scale farmers have been trained on good livestock management practices (LMPs) undertaken as a collaborative effort between TDCU and the government[39].

e) There are some lessons to be learned from past experiences on the role of Co-operatives and LGAs in the development of dairy sector by taking Tanga region as a case study:

i. Tanga Dairy Cooperative Union (TDCU), started in 1993, is composed of 26 primary cooperative societies (PCUs) around Tanga region[40], except in Handeni and Kilindi, with a membership of 6,285 individual members in 2020 compared to 550 pioneer members of 6 PCUs some 26 years ago. The PCUs differ in their capacities in milk supply but on average it ranges between 42,000 and 52,000 litres per day collection during the rainy season; but goes down to 28,000 litres per day during dry season.

ii. The TDCU has gone through ups and downs. It initially relied on state-owned Tanga Dairy Limited (TDL)[41] as the main buyer of its milk. However, in the late 1990's, the plant was closed and later sold to a private company after the Cooperative failed to win the tender. The Union therefore resorted to transporting the collected milk to Dar es Salaam. However, due to poor roads in those days it took 10 hours for the lorries to reach buyers in Dar-es-salaam; and so, they transported the milk at night and reached early in the morning with the "fresh milk". That is how the name TDL was coined by customers because they received milk that was "still cool and in good condition".

iii. The strength of TDCU emanated from its constitution that consisted of a Board[42] whose members were drawn from the Boards of individual PCUs. The Boards of PCU is composed of members of the primary society and is responsible for recruiting and workers. The collection centres at the PCU level are opened at 0500 hours every morning seven days a week. The clerks at the collection centres take all quality measurements and fill farmers' cards. After the collection, in the evening the truck comes to pick the milk and repeat the same quality measurements before the milk is taken to the factory. On the 15th of every month the clerks from collection centres sum up delivery records and bring their invoices to TDL for their payments. The payments are made through their phones or through their bank accounts.

iv. To meet operational costs of the PCUs and TDCU: TDL has to deduct the levy for the cooperative societies and deduct what farmers borrowed, whether animal feeds or

[38] <Files\\TZ Dairy KIs\\... Tanga> - § 2 references coded [3.88% Coverage]-Reference 1 - 1.69% Coverage
[39] <Files\\TZ Dairy KIs\\... Tanga> - § 2 references coded [3.88% Coverage]-Reference 2 - 2.19% Coverage
[40] <Files\\TZ Dairy KIs\\... Tanga> - § 3 references coded [17.22% Coverage]-Reference 1 - 4.84% Coverage
[41] <Files\\TZ Dairy KIs\\... Tanga> - § 3 references coded [17.22% Coverage]-Reference 2 - 6.04% Coverage
[42] <Files\\TZ Dairy KIs\\... Tanga> - § 3 references coded [17.22% Coverage]-Reference 3 - 6.34% Coverage-

animal drugs. From there, they submit those deductions to the cooperative societies. The running costs of the cooperative societies are met by members from these deductions as levies. This is because cooperative societies have to pay electricity, diesel and all the other costs. The TDCU model in some sense only encouraged the formation of SMEs in the production side of the value chain.

f) On the matter of stakeholder collaboration and platforms: The former minister for livestock and fisheries, Hon. Luhaga Mpina[43] at one time insisted the Tanzania Dairy Board (TDB) to work closely with Tanzania Milk Processors Association (TAMPA) and Tanzania Milk Producers Association (TMPA) to promote investments in milk production and drinking of milk in the country.

g) In the area of technical capacity building, the government had established specialized professional trainings in dairy processing technology at Sokoine University of Agriculture (SUA) (undergraduate degrees in food processing, with modules on dairy technology) and Tanga Dairy Training Institute (TDTI). Unfortunately, financial support to support TDTI declined, and it stopped working in the mid-1990s. Currently, stakeholders do rely on courses offered by SUA and those offered by individual specialist as tailor-made trainings offered to both private and public sector specialists. Among the courses conducted by a private sector specialist (who was part of the KIIs), take batches of 20 participants[44]. According to the key informant[45] "… we real need people to be trained, we need an institute that can offer diploma or even a certificate two years".

[43] <Files\\TZ Dairy KIs\\TDKI01 ...> - § 1 reference coded [1.82% Coverage]-Reference 1 - 1.82% Coverage
[44] <Files\\TZ Dairy KIs\\TDKI01 ...> - § 2 references coded [2.87% Coverage]-Reference 2 - 1.29% Coverage
[45] <Files\\TZ Dairy KIs\\TDKI01 Watuta Dairy> - § 2 references coded [2.87% Coverage]-Reference 2 - 1.29% Coverage

VI-SUMMARY OF CHALLENGES FACED BY SMEs in THE DAIRY VALUE CHAIN

6.1 Overview

Findings from KII revealed that SMEs faced some barriers to entry or expansion due to challenges of competition from well-established and large-scale firms, inability to meet terms related to trading arrangements, amount, and schedule of payment after supplying dairy products, access to credit and markets, and paucity of skills among enterprise owners. They also complained that the domestic market that did not reward excellence or technology invested in dairy processing. This is because most consumers cared less about how the milk is handled before reaching their tables. Some of the mentioned challenges are elaborated below.

6.2 Limited market incentives for processed and packed milk

The key informants from small-scale dairy processing enterprises[46] feared that the sale of formally processed and packaged milk was frustrated by informal milk suppliers who also targeted the same outlets. Usually, factory sales officers make follow-up phone calls to ask if the shop keepers needed replenishment of the previously delivered stock of milk packets. The most common response from shop keepers would be "we still have some packets remaining"- and promises to replenish their stock after one week or more. Some of the respondents had the perception that the slow movement of packaged fresh milk was also caused by the "low awareness among Tanzanians on the importance of quality milk[47]. This was also a result of shallow understanding that milk constituted a basic dietary requirement for a healthy body. To illustrate how serious the perceived ignorance on milk, one respondent was quoted saying "You see, even the ones that are educated they would rather choose a glass of beer over a glass of milk if given a chance to choose one of them".

One can therefore conclude that there are two issues at hand: one is the low demand for milk in general due to limited appreciation for the health benefits of milk; and second, even where there is demand for milk, it is mostly for raw and unprocessed milk which is sold at cheaper price compared to processed milk and milk products.

6.3 Limited knowledge on dairy technology and high running costs

The earlier start-ups in dairy processing plants[48] installed some technologies whose machines depended on imported spare parts whenever there was a breakdown. This necessitated suspension

[46] <Files\\TZ Dairy KIs\\TDKI01> - § 3 references coded [9.64% Coverage]; Reference 1 - 1.65% Coverage [**there was a standard convention on how interviews would be cited for uniformity across all papers]
[47] <Files\\TZ Dairy KIs\\TDKI01> - § 3 references coded [9.64% Coverage]-Reference 2 - 1.48% Coverage
[48] <Files\\TZ Dairy KIs\\TDKI01 > - § 3 references coded [9.64% Coverage]
Reference 3 - 1.17% Coverage

of operations as they waited for the parts to be delivered. One of the respondents, who had vast experience in the dairy industry in Tanzania Mainland[49] proudly explained that the knowledge gained he gained is not completely lost because he was "currently promoting milk industry in Zanzibar after working in Pemba where I taught them how to produce yogurt". He was confident that "small scale industry can perform well if properly promoted and the problem of marketing is solved".

6.4 Limited Skills and Management Competence

Initially some small enterprises faced some management challenges characterized by high running costs caused by poor expertise and theft of spare parts.

6.5 Marketing and Reliability of Supply Chain Logistics

Unreliability of the dairy plants in accepting milk and delays in payments after delivery discouraged farmers from bringing milk to the factories. One of the key informants recalled that "it was difficult to pay farmers who supplied their milk to the factory. Every time they came for their payments they were told to come after two weeks. When they come again the money was not there. Consequently, they stopped bringing milk and started looking for local markets for their milk". The high running cost resulted in the death of earlier state-owned dairy processing factories that were established such as those in coastal zone, northern zone, southern zone (e.g., Mbeya cream dairy) and central zone (e.g., Utegi dairy)[50] after they failed to purchase powder milk which they mixed with fresh milk". Respondents recalled that "during those days people used to drink a lot of milk compared to nowadays". For example, Coastal Dairies were producing about 50,000 litres per day, mostly for the urban market but failed to pay salaries for workers and experts, could not make payments to farmers, and couldn't afford to buy spare parts." The situation was rescued by other dairy industries such as the privately-owned Tommy dairies whose establishment was accompanied by an aggressive milk marketing campaign "using cars to advise on merits of drinking yogurt" thus filling the vacuum caused by the collapse of SOEs. However, even this private outfit lasted for a few years due to failure to honour payments to farmers. Its running cost was also exaggerated by a high wage bill, including high monthly salaries paid to Indians experts, which didn't correspondent to monthly company revenue. The privately owned companies such as Tommy Dairy and Mjata Dairy in Kibaha, also suffered the same plight of scarcity and high costs of spare parts that faced SOEs.

What is observed from the above historical description of the sector is that the growth of SMEs has been through ups and downs, mostly caused by unstructured dairy marketing system with fluctuating levels of government support to ensure farmers produce enough milk and that private sector operators invest in

[49] <Files\\TZ Dairy KIs\\TDKI01 Watuta Dairy> - § 3 references coded [9.64% Coverage]
Reference 5 - 0.80% Coverage

[50] <Files\\TZ Dairy KIs\\TDKI01 Watuta Dairy> - § 3 references coded [9.64% Coverage]-Reference 3 - 7.07% Coverage

dairy processing. The SMEs on the upstream (production) and mid-stream (processors) have been at the mercy of informal traders and consumers who prefer to deal and consume the relatively low cost unprocessed milk.

6.6 Role of policies and bureaucratic procedures in the certifications of dairy products

What seems to be very clear is government's position to support the role of the private sector in the growth of the dairy sector, mostly demonstrated through the provision of public goods (rural roads, electricity, water and telecommunication services). The government is also guided by the provisions and limitations spelt out under the East African Common External Tariffs framework to protect local producers of dairy products. However, stakeholders feel there is still much to be done to build some confidence within the private sector that the government will predictably continue to streamline repressive taxes and duties, especially at the LGAs level, and reduce red tape in the registration and certification of dairy products from local industries.

6.7 Low bargaining power by farmers

The large dairy processors like TDL[51] reported that farmers have been complaining that the producer price for milk they offered them was too low. The factory admitted that it has about four years since the last increment was made. The failure is attributed to inflation pressure and increased costs of maintaining machineries and servicing bank loans; such that they cannot not generate enough profit to enable them to increase the offered producer price. Despite this defence by processors, farmers were adamant that they have the right to be offered price increments for their milk. Failure to offer them better prices compels farmers to continue sell their milk to informal milk vendors who offered them relatively higher prices. It was reported that some of the farmers have responded by selling their cattle to buyers from Pemba and Unguja, thus reducing number of dairy cattle in Tanga region, hence lowered milk production. One can conclude that although TDCU is special vehicle for dairy farmers, its shareholding to TDL has compromised its objectivity in defending the interest of its members.

[51] <Files\\TZ Dairy KIs\\... Tanga> - § 1 reference coded [4.04% Coverage]. Reference 1 - 4.04% Coverage

VII- CONCLUSION AND POLICY IMPLICATIONS

7.1 Conclusion

Most of the milk in Tanzania is produced by indigenous cows, whose yield is about 1 litre per cow per day during lactation period. Only 3 percent of the country's cattle stock of 32.2 million belong to hybrids. Interestingly, the stock of 1.95 million hybrid cows is responsible for 30 percent of milk produced (almost 1 billion litres out of 3 billion litres) and 70 percent of marketed milk.

A common feature throughout the post-independence period has been the dominance of micro and small-scale enterprises in along the dairy sector value chain, with express support by government. It starts with production by smallholder dairy keepers, followed by milk marketing, which mostly undertaken by informal milk traders/vendors who mostly sell directly to dairy processing SMEs, restaurants, and homes in unprocessed milk form. The fact that these informal traders can by-pass factories to sell unprocessed milk directly to final consumers is regarded as a hinderance to the operational efficiency of SME dairy processors as they cannot access adequate raw milk for processing resulting to losses. This was one of the reasons given for the collapse of 13 firms that collapsed between 1990 and 1995, and the death of 5 firms between 2005 and 2011 that tried to compete with TDL. Currently, although there are 99 registered dairy firms in 2020, about 8 of them were not operating. On the hand, the fact that dairy processing SMEs have increased from 35 in 1995 to reach close to 100 in 2020 is a promising sign that there is willingness by the private sector and cooperative societies to invest in the sector. For example, about 60 percent of interviewed SMEs started operations about 5 years ago and about 80 percent had gross annual revenue of less than USD 5,000, implying they were at infant or start-up phase. The industry is therefore characterized by factories with installed capacity of less than 5,000 litres per day. A few factories have ventured in extra products such as cheese as they are still preoccupied with common products such as fermented milk, pasteurized fresh milk, and yogurt with large-scale firms investing in UHT milk as well.

The challenges mentioned by the interviewed SME dairy processors included (a) low capacity utilization caused by inadequate supply of milk to the processing plants; and entrenched practice where farmers sell their milk through agents who take the raw milk direct to the final consumers (e.g., homes, hotels and restaurants); (b) about one half of SMEs had the perception that large-scale firms outcompeted them in getting adequate supply of milk from producers because of their investment in transport facilities; (c) common habit by the majority of consumers who were indifferent to the way milk is handled before reaching their dining tables. This attitude is attributed to consumers' avoidance to spend their income on the relatively more costly processed and packaged milk; (d) less aggressive technological advancements by SMEs due to uncertainty of raw milk supplies; (e) inability to meet terms related to trading arrangements with supermarkets and established institutions, who normally delay payments and require some consistent supply of stock.

7.2 Policy Recommendations

In order to enhance sustained productivity and adoption of modern technology in dairy processing it is paramount that Tanzania Dairy Board (TDB) collaborates with cooperative unions and private sector umbrella organisations to influence stability and predictability of policies that govern the sector. TDB should also take a more proactive role to promote and protect private sector investments in the sector, by ensuring that factories obtain adequate supplies of quality raw milk and streamline the operations of informal milk market promoting trading of products that adhere to minimum quality and safety standards. It will be important for the government to improve its information system so that private sector operators can make the right decisions on the required processing capacity of machines when establishing new factories or contemplating to scale up existing operations. This will help to minimize the current problem of under-utilized processing capacities of large factories.

Technological upgrading of dairy processing SMEs will depend on continued policies to lower or remove import taxes and duties on dairy-related machinery and equipment. The government should invest in training of specialized professionals for the dairy sector to address the noticed shortage of dairy technicians. Traders and consumers should have access to simple milk quality testing technologies to minimize adulteration of raw milk. Government should also help to intervene in streamlining financial sector regulations to accommodate affordable development loans for the agricultural sector in general, and the dairy sector, in particular.

The establishment of formal channels of milk trading should be given priority to protect the health of consumers. This will require identifying existing popular points where informal milk trading occurs and work with traders to formalize their operations, which will involve providing the necessary infrastructural facilities and equipment to ensure the products are handled per safety standards. While it is recommended that “milk drinking campaigns” should be stepped up, it is also important to enhance efforts for awareness creation and sensitization among milk consumers on the health risks of taking unpasteurized milk; and that it’s better to incur some extra cost to consume safe milk. LGAs are expected to support the establishment of dairy cooperatives and well-functioning milk collection centres and milk trading centres where it can also oversee issues of quality and safety standards.

It may also be necessary for the government to support the establishment of milk traders/vendors so that there is a formal platform and use it reach consensus on the required interventions to transform the way dairy business is undertaken. Meanwhile, government should continue to encourage dialogue with formal stakeholder associations and platforms bringing together milk producers (e.g., Cooperatives and MVIWATA) and milk processors (e.g., TAMPA and TCCIA). It is also expected that government will continue to implement business regulatory reforms that aim at encouraging the role of private sector investors in industrial development including the dairy sector. The availability of high yielding cattle breeds will depend on adequate budgetary allocation to support research and extension as availability of the same to smallholder farmers, including improved cattle feeds and animal health provision by private sector operators.

VIII- ANNEXES

Annex 1: List of Participated Organizations in IIAP Dairy Workshop at Dar es Salaam on 18th June 2019

S/N	Institution	Address
1.	SUA	P.O. Box 3004, Morogoro
2.	Ministry of Livestock and Fisheries	P. O Box 7028
3.	University of Johannesburg, CCRED	Rose bank, Johannesburg
4.	Tanzania Bureau of Standards	P. O Box 9525, Dar es Salaam
5.	Tanzania Dairy Board	P.O Box 38456, Dar es Salaam
6.	ANSAF	P. O Box 33562 Dar es Salaam
7.	TFDA	P. O. Box 31356 Dar es Salaam
8.	TAMPA	P. O Box 712202
9.	Azam Dairy Products Ltd	Zanzibar – Fumba
10.	University of Dar es Salaam, UDBS	P. O Box 35046 UDBS
11.	NBS	P.O Box 796
12.	TANTRADE	P. O Box 5402
13.	Restless Development	Tabata, DSM
14.	Confederation of Tanzania Industries	P. O Box 71783 DSM
15.	Heifer International Tanzania	Mwai Kibaki Road, Regency Hotel – DSM
16.	TRA	P. O Box 11491 Dar es Salaan
17.	Edinburgh University	Edinburgh - Scotland
18.	ESRF	51 Uporoto Street – P. O Box 31226 DSM

Annex 2: List of Surveyed Firms and Key Informant Interviews

S/N	Name Of Surveyed Dairy Firm	Key Informant Interviews
1	Balkina limited	WATUTA Dairy Consultancy Firm
2	YOCA	Regional Agricultural Office – Iringa
3	Mafinga Milk Group (MAMIGRO)	Regional Agricultural Office – Mara
4	Mama kwanza Women Group	SUA Food Processing Unit– Milk Processing
5	Amani Group	SUA Animal Husbandry Department
6	Mother Dairy Ltd	TDL
7	ROMANA	Shambani Milk
8	Meatu Milk Company Limited	Kigamboni Agricultural Office
9	Mema milk Company Limited	Korogwe Agricultural Office
10	Bests and Sweety Dairy Products	Azam Dairy
11	Betayogo Dairies	Tanzania Dairy Board
12	Lucky Dairy	TALIRI
13	Musoma Milk Group Company	Ministry of Livestock
14	CHAWAKIM Cooperative Society	Tanga Dairy Cooperative Union
15	Kihonda Dairy	Regional Agricultural Office – Simiyu
16	One Two Dairy Products Ltd	
17	Tunsime Dairy Ltd	
18	Magengeni Dairy Ltd	
19	Shambani Milk Limited	
20	MUDCO - Mufindi Dairy Cooperative Society	
21	Tumaini Jipya Group	
22	Butiama Milk	
23	Kwetu Milk Company	
24	Nyuki diary	
25	Kwanzaa Ventures Company Ltd	
26	Nuru's milk centre	
27	Ammy Diary	
28	CHAWAMU - Chama cha Wafugaji wa ng'ombe wa maziwa Muheza	
29	Profate Investment Co. Ltd	
30	TAMU Agriculture Ltd	

Annex 3: Dairy Sector Policy Evolution over the Past 20 Years

A.3.1 Policy reforms

The sector has undergone through a series of policy reforms and legislations, starting with those that promoted state monopoly in economic management, during colonial and post-colonial periods, to the current times, especially after 1985, where the private sector was recognized and promoted as the engine of growth for the sector. The main thrust of government policies from 1983 was to reverse historical attempts by the state to engage in production and marketing of milk[52]. It is noted that the nationalization of privately owned dairy farms in 1967 failed to stimulate the sector to achieve the desired output levels and supply of milk to meet national demand (FAO, 1969). As a result of that policy farmers lost the 15 to 40 percent of the shareholding in the milk processing plants, and the plants lost their partnerships with farmers.

The reversal of post-1967 Arusha Declaration to hand over nationalized dairy farms to private companies and cooperatives in the mid-1980s ushered a new era whereby government started to play the role of a facilitator to the private sector. This is evidenced by harmonized pro-private sector policies, legislations, institutions and programmes as part of efforts to create enabling environment for the private sector to flourish. The government has since adopted policies and regulations that encourage effective public-private partnership as evidenced by its efforts to promote platforms such as the Dairy Development Conference (DDC) and the establishment of district-level stakeholder platforms (DSF).

The 1983 National Policy on Livestock Development (NPLD) offers some policy and legal guidance on directions to take in the development of dairy sector. It clarified the expected roles of private sector in the sector's development, with the government assuming some facilitating roles. Consequently, the liberalization policy came into serious play between 1985-1990; a period during which private sector operators were organized by zones, supported by several projects and programmes and some institutional setup, including zonal-based platforms and organizations useful in rallying the interests of sector actors (FAO, 2011)[53].

In 1993 the NLDP was revised with the aim of further sharpening and encouraging private sector operators to take a more active and effective in production, processing and marketing of milk. It included measures to delegate some of the public functions to the private sector companies, associations) and cooperatives (e.g., CODAFA) as indicated in the 1995 stakeholders' proceedings (Mwakatundu, 1995).

A.3.2 Supportive Legislations

The policies enacted in the past 20 years were supported by legislations as shown in Table 1. Between 1967 and 1970 the sector experienced the implementation of Arusha Declaration of February 1967,

[52]Public control of the sector was attempted by the colonial Tanganyika government between 1920s and 1940s and by post-independence Tanzania government between mid-1960s and early 1980s.

[53]Dairy Development Institutions in East Africa. Lessons Learned and Options

which directed to nationalize large-scale dairy farms and processing plants, most of them owned by foreign settler farmers. Legislations enacted to establish specialized institutions and agencies included the (i) Livestock Development Authority (LIDA) by Act of Parliament no. 13 of 1974; (ii) the Control of Quality Act (1978) that resulted in the establishment of National Food Control Commission (NFCC); (iii) the Food and Drugs Act (2002) that established the Tanzania Food and Drug Agency (TFDA), whose mandate on overseeing food quality and safety was transferred to the Tanzania Bureau of Statistics (TBS) in 2018; and, (iv) The 2004 Dairy Industry Act No. 8 that resulted in the creation of Tanzanian Dairy Board (TDB). The Tanzania Food and Nutrition Centre (TFNC) was created by an Act of Parliament No. 24 of 1973 and launched in 1974 with mandates to promote practices that improve human nutrition in the country. Institutions that have been in the forefront in advancing knowledge and technologies that promote the dairy sector include the Small Industries Development Organization (SIDO), which has provided knowledge milk processing and appropriate milk packaging materials and universities such as the Sokoine University of Agriculture (SUA), through its Food Science Department. There has been some reviews of acts and regulations as those undertaken through the review of Dairy industry Act no. 8 (2004) in 2019 and the review of the Dairy regulations in 2020.

A.3.3 Evolution of the dairy sector

The evolution of the dairy sector in Tanzania has undergone four phases as diagrammatically depicted as shown in Figure 1.

Phase 1: Initial Period Before 1950

The establishment of formal milk sector in Tanzania was started by the then Tanganyika government when the Temeke Dairy Farm - Dar-es-salaam (1921) at the current Temeke Veterinary Laboratory, the Kingolwira Dairy Farm - 160 km from Dar in Morogoro region (1949) and Tanga Dairy Farm (at the Current TALIRI Tanga farm) (1930-1940s) were established (Figure 1). The farms were engaged in milk production as well as processing and supplied the products to the armed forces and other consumers in adjacent markets of Dar-es-salaam, Morogoro and Tanga. The farms also supplied heifers to private dairy farmers. Unfortunately, these government facilities lacked efficiency desired to adequately serve the population, which prompted the colonial government to hand over the farms and processing machines to privately owned companies.

Phase 2: Private Sector Dominance during Pre-Independence Period 1950 to 1961

In 1952 the colonial government decided to privatize the functions of dairy distribution, which were undertaken by government agencies (Temeke Dairy Farm) to a privately owned Express Dairy Company, which was contracted for that purpose. It also introduced a formal system of registering all privately owned dairy farms in the country. The move to hand over to the private sector was meant to improve efficiency in the production and distribution of milk after realizing that state owned agencies could not adequately serve stakeholders in the provinces.

Phase 3: Partnership between Private and Public Sector Post-Independence Period to 1967

The experience from private sector participation in the production, processing and distribution of milk necessitated the enacting of the Dairy Industry Ordinance No. 61 Cap. 456 of the Laws of Tanganyika in 1961, which paved the way to the establishment of Zonal Dairy Boards (ZDB). The ZDBs were allowed to charge fees for registration, licensing, and other services, and to appoint inspectors. A notable feature with the establishment of the ZDBs was the devolution of decision-making powers by stakeholders on dairy sector development to zonal levels. ZBDs were designed to serve "areas which produced sufficient amounts of milk to warrant establishment of a dairy plant" (Boki, 1998); and therefore, decisions were vested on members, serving their interests much better than before. The ZDBs' functions included, among others: establishing dairy farms and milk processing plants; collecting, cooling, and marketing milk and milk products from farmers; conducting market research and education relevant to specialized groups within the dairy industry; and providing essential services to dairy farmers and processors (registration, licensing, veterinary services, livestock inputs and testing and grading of milk. Two years later in 1963, the Dairy Industry Regulations were prepared after some consultations with members of the ZDBs. It required, among others, that all commercial diaries to be licensed and observe gazette quality and safety standards of dairy products (Sumberg, 1997).

Farmers (who were mainly settlers) owned between 15 percent and 40 percent of the share capital in the processing plants. The 1961 dairy ordinance lasted until 1965 when it was replaced by the Dairy Industry Act No. 32 Cap. 590 of the Laws of Tanzania, and it resulted in the creation of National Dairy Board (NDB). The NDB was charged with responsibilities that included, but not limited to the following: promoting, organizing, regulating and developing the production, processing, marketing and distribution of milk and milk products; establishing and running dairy farms and milk processing plants; registering and licensing all dairy industry players (including importers, distributors, processors and retailers); fixing milk prices; making by-laws for safeguarding the dairy sector; and promoting market research in relation to milk and milk products. The NDB was managed by 11 Governance Board members who represented industry stakeholders. The changes that came with the 1965 ordinance and the creation of NDB started well but later on failed to deliver the intended results due to different reasons including ineffectively constituted Governance Board members. The Board collapsed in 1973 due to the failure by the Minister responsible to renew its Board members, which was an indication of lack of political will post 1967 to appoint a new Board after the privately owned dairy farms and processing plants were nationalized.

<u>Phase 4: Nationalization of Private Dairy Farms and Processing Factories: Post-Arusha Declaration to 1985</u>

The Arusha Declaration in 1967, required that all major means of production be in state control, and therefore large-scale (European settler) dairy farms and processing plants were nationalized. As already stated above, farmers and processors lost their investments in the sector. The nationalization scheme by government was part of the larger plan for the state to have controlling hand in all the key pillars of the economy. The move was expected to enhance the effective contribution of the dairy sector in the economy. Consequently, the Dairy Industry Ordinance No. 61 Cap. 456 was scrapped and the ZDBs were dissolved in 1968. In response of to a concern of growing gap between domestic milk production and national milk demand, the National Dairy Board [Control of Marketing- Coastal Zone Order of 1969] conferred powers to the state-owned Coastal Dairy Industries Limited (CDIL) as the sole purchaser and distributer of milk in a bid to "streamline the dairy sector". However, CDIL failed to deliver as expected and therefore it was dissolved in 1975 and its assets transferred to a newly established Tanzania Distributors Ltd (TDL), which took the responsibility of distributing milk to Dar es Salaam and the surrounding districts of Kisarawe, Bagamoyo and Mzizima.

In a bid to improve the development and management of dairy sector, and therefore solve milk supply and distribution challenges, the government proceeded to establish the Livestock Development Authority (LIDA) by Act of Parliament no. 13 of 1974 as part the third five-year development plan (1975–1980). LIDA proceeded to create two subsidiaries in 1975, namely, the Tanzania Dairies Ltd (TDL) - mainly for milk processing and marketing; and Dairy Farming Company (DAFCO) - mainly to produce milk and multiply heifers for dairy farmers. Unfortunately, the subsidiaries failed to perform as expected.

The government also established other agencies meant to provide support in the regulation of the sector, which included the Food Control of Quality Act (1978) that resulted in the establishment of National Food Control Commission (NFCC). The latter had powers to license and register all food manufacturing, marketing, and retailing businesses in the country. However, due to its wide mandate covering all types of food, it had weak focus on milk and dairy. Nevertheless, it did relatively better in ensuring quality and safely compliance for imported powdered milk, which was mainly for the national dairy processing plants (blending with locally produced milk) and the World Food Programme (WFP) for refugees.

Despite the good intentions of nationalization, it had its downside as it failed to achieve the desired efficiency in the sector, leading to persistent milk shortages in the country.

Back to Public-Private Partnership with Dominance of Private Sector Operations: 1985 to 2020

As already pointed out above, the second phase of post-independence government 1985-1995 was supported by the revised 1993 NPLD, which gave a firm support to the philosophy of private sector as an engine of growth under a guided free market economy. The policy further sharpened and encouraged the role of private sector operators in the sector, with government delegating of some of the public functions to the private sector. The Government relinquished its role in marketing dairy products and left the business to the private sector to handle (Mwakatundu, GAK (1995). The liberalized dairy sector was accompanied by organized stakeholders in zonal and national platforms. The international community also supported the development of the sector through several projects and the establishment of dairy companies and cooperatives (e.g., Coastal Dairy Farmers Association (CODAFA) established by individual farmers from Dar es Salaam and its neighborhoods in 1995). Initiatives such as the Tanga Dairy Development Programme (TDDP) supported by the Dutch Government[54], was the first regional dairy stakeholder organization to be established as well as the establishment of Tanga Dairy Cooperative Union (TDCU-1993). The government move somehow helped to improve efficiency in the production, processing, and distribution of dairy products. The sector underwent some evolution that saw the emergence of private sector companies running

[54]Other initiatives included the SDSP in Tanga and Kagera, and by the Austro Project Association's Maziwa Business Development Programme in the coastal and lake zones

parallel to dairy cooperatives and other public institutions.

The establishment of the National Dairy Board in 2004, although took longer than the wishes of stakeholders, was a product of deliberations of the Dairy Development Conference (DCC) held in Arusha in 1998. During the DCC in 1998 it was noted with concern that the "the industry was experiencing unprecedented problems in milk production, marketing and processing. Milk collection infrastructure was minimal and, contrary to government policy, marketing of raw milk prevailed in urban centres, even where milk-processing plants existed. Farmers were experiencing problems in disposing of surplus milk during the flush season while processors scrambled for scarce milk during the dry season, when demand for milk is usually higher" ((Boki (1998), quoted in FAO (2011)). A year before NDB was established, private sector stakeholders had already formed the Tanzanian Milk Producers Association (TAMPRODA) and Tanzania Milk Processors Association (TAMPA) in 2003 with the encouragement of government. These platforms have since been useful in coordinating efforts, exchanging experiences, and jointly engaging the government for policy support. TAMPA has been encouraging its members to invest in modern and cost-effective processing and packaging and at the same time lobbying the government to reduce duties for imported equipment that are not manufactured locally. Other regional and district level focus programmes and projects initiated by Development Partners in support of private sector development in the 2000s include the Southern Highlands Dairy Development Programme supported by Swiss Development Cooperation (SDC).

The efforts to establish district/regional-level dairy industry stakeholder organizations at the district level in the early 2000s was not easy due to stigma attached to cooperatives. Instead, they preferred to register under the Societies Law as not-for-profit organizations. Despite many efforts, by 2011 only village or division-level farming organizations and cooperatives have been registered in the milk shed areas of Tanga/Kilimanjaro/Arusha, the southern highland, the coastal region, Dar es Salaam and the lake zone (FAO, 2011: page 32). By 2020, it is observed that out of 99 functioning dairy processing plants, less than 10 belong to cooperatives.

The 2004 Dairy Industry Act No. 8 led to the creation of Tanzanian Dairy Board (TDB), which was mandated to coordinate the sector for its sustainable development and the welfare of consumers. The regulatory functions of the TDB and TBS (previously under the TFDA) somehow overlap although in practice the law provides that TDB is the lead agency in the overall responsibilities to ensure quality and safely of dairy products. At the regional level, the private sector initiated the Eastern and Southern Africa Dairy Association (ESADA), formed in 2004, coordinate efforts for the development of the dairy sector to enhance production, processing and marketing and in adopting common standards for quality and safety guidelines. However, since it lacks national accreditation, it doesn't have legal powers to enforce the agreed standards at national levels (Bingi, S and F. Tondel, 2015). On the other hand, the East Africa Dairy Regulatory Authorities Council (EADRAC) established in 2006 to coordinate efforts to enhance and uphold quality and safety standards was established under the ambit of the EAC Customs Union protocol framework[55]. Region wide initiatives such as the East Africa Dairy Development (EADD) II Programme (2014-2018) was supported the Bill and Melinda Gates Foundation (BMF) and implemented by Heifer International (HI) and Technoserve to serve 136,000 smallholder

[55]The EAC Customs Union Protocol imposes a zero tariff for dairy products produced in the region (Bingi, S, *et.al*. 2015: *ibid*.)

families in addition to the 196,000 farm families that benefited during the first phase of the programme. However, according to Exum (2019)[56], although there was some impact, there is still room to improve ability to access productive assets by poor farm families.

[56]http://theurgetohelp.com/articles/an-investigative-analysis-east-africa-dairy-development/.

IX-REFERENCES

Bingi, Susan and Fabien Tondel (2015). Recent developments in the dairy sector in Eastern Africa. Towards a regional policy framework for value chain development. ECDPM Policy Brief No. 78 – September 2015.

ESRF (2019). Dairy Policy Chronology Paper. Economic and Social Research Foundation Dar es Salaam, Tanzania.

Exum, Cassandra (2019). An Investigative Analysis: East Africa Dairy Development. September 30, 2019). (Source: http://theurgetohelp.com/articles/an-investigative-analysis-east-africa-dairy-development/).

FAO (1969). The state of food and agriculture 1969. Food and Agriculture Organization. Rome, Italy.

FAO (2011). Dairy Development Institutions in East Africa. Lessons Learned and Options. Livestock Value Chains and Infrastructure. Paper prepared by Kurwijila, Kusato R and Anthony Bennett. Rural Infrastructure and Agro-Industries Division, Food and Agriculture Organization (FAO), Rome.

MLFD (2016). Tanzania Livestock Modernization Initiative. Ministry of Livestock and Fisheries Development Dodoma, Tanzania.

MLFD (2020). Minister's Budget Speech for the Ministry of Livestock and Fisheries - 2020/21. Ministry of Livestock and Fisheries Development Dodoma, Tanzania.

MoFP (2016). National Second Five Year Development Plan 2016-2021. "Nurturing Industrialization for Economic Transformation and Human Development". Ministry of Finance and Planning. June 2016.

MoFP (2021). National Third Five Year Development Plan 2021/22 to 2026/27. Ministry of Finance and Planning. Draft Report. April 2021.

Mwakatundu, GAK (1995). Strategies for market orientation of small-scale milk producers and their organizations. Proceedings of a workshop held at Morogoro Hotel, Morogoro, Tanzania, 20-24 March 1995.

Nell, Arend Jan, Hans Schiere, and, Sifra Bol (2014). Quick Scan Dairy Sector Tanzania. January 2014. Written at the request of the Dutch Ministry of Economic Affairs (Dept. of European Agricultural Policy and Food Security; DG Agro) (accessed from https://edepot.wur.nl/334382).

SOLIDARIDAD, 2020. Investing In A Sustainable Dairy Industry In Tanzania. 30 March 2020 (posted on https://www.solidaridadnetwork.org/story/investing-in-a-sustainable-dairy-industry-in-tanzania/)

TADB (2021). Tanzania Dairy Board signs a memorandum of understanding with Galaxy and Beverages Ltd for milk drinking in schools. Posted on: https://www.tdb.go.tz/news/bodi-ya-maziwa-tanzania-yasaini-hati-ya-mkubaliano-na-kiwanda-cha-galaxy-and-beverages-ltd-kwa-ajili-ya-unyweshaji-maziwa-mashuleni

Temu, Goodluck (2015). Jurisprudential Value of TDL v. Fcc1 in the Law of Mergers and Acquisitions in Tanzania In: University of Dar-es-salaam Journal, Vol. 42, No. 2 (2015).

URT (1999). The National Development Vision 2025. Ministry of Finance and Planning. United Republic of Tanzania (URT). Dar-es-salaam.

URT (2016). Agricultural Sector Development Programme (ASDP-II). “Agricultural Sector For Industrial Development”. United Republic of Tanzania (URT). September 2017.

Wegerif, M. (2017). Feeding Dar es Salaam: A symbiotic food system perspective. Ph.D Thesis. Wageningen University, 2017.

WMU (2015). “Taarifa ya Uchambuzi wa Sekta ya Mifugo Tanzania 2016/2017 - 2031/2032)”. Ministry of Livestock and Fisheries Development. Dodoma, Tanzania.

WMU (2020). Hotuba ya Waziri Bajeti ya Mwaka wa Fedha 2019/20. Kiambatanisho Na.2 Viwanda vya Kusindika Maziwa kwa mwaka 2019/2020. Ministry of Livestock and Fisheries Development (MLFD).

Innovation & Inclusion
in Agro-processing

https://iiap.info/

ES/S0001352/1

THE UNIVERSITY of EDINBURGH

CCRED
CENTRE FOR COMPETITION REGULATION AND ECONOMIC DEVELOPMENT

ESRF

E·S·R·C
ECONOMIC
& SOCIAL
RESEARCH
COUNCIL