Making better use of goats in tanzania - improving smallholder livelihoods through local value chains for goat milk yoghurt: a case study

BEDRE UTNYTTELSE AV GEITER I TANZANIA - FORBEDRE SMÅBØNDERS LEVEBRØD GJENNOM LOKALE VERDIKJEDER FOR YOGHURT LAGD AV GEITEMELK: EN CASESTUDIE

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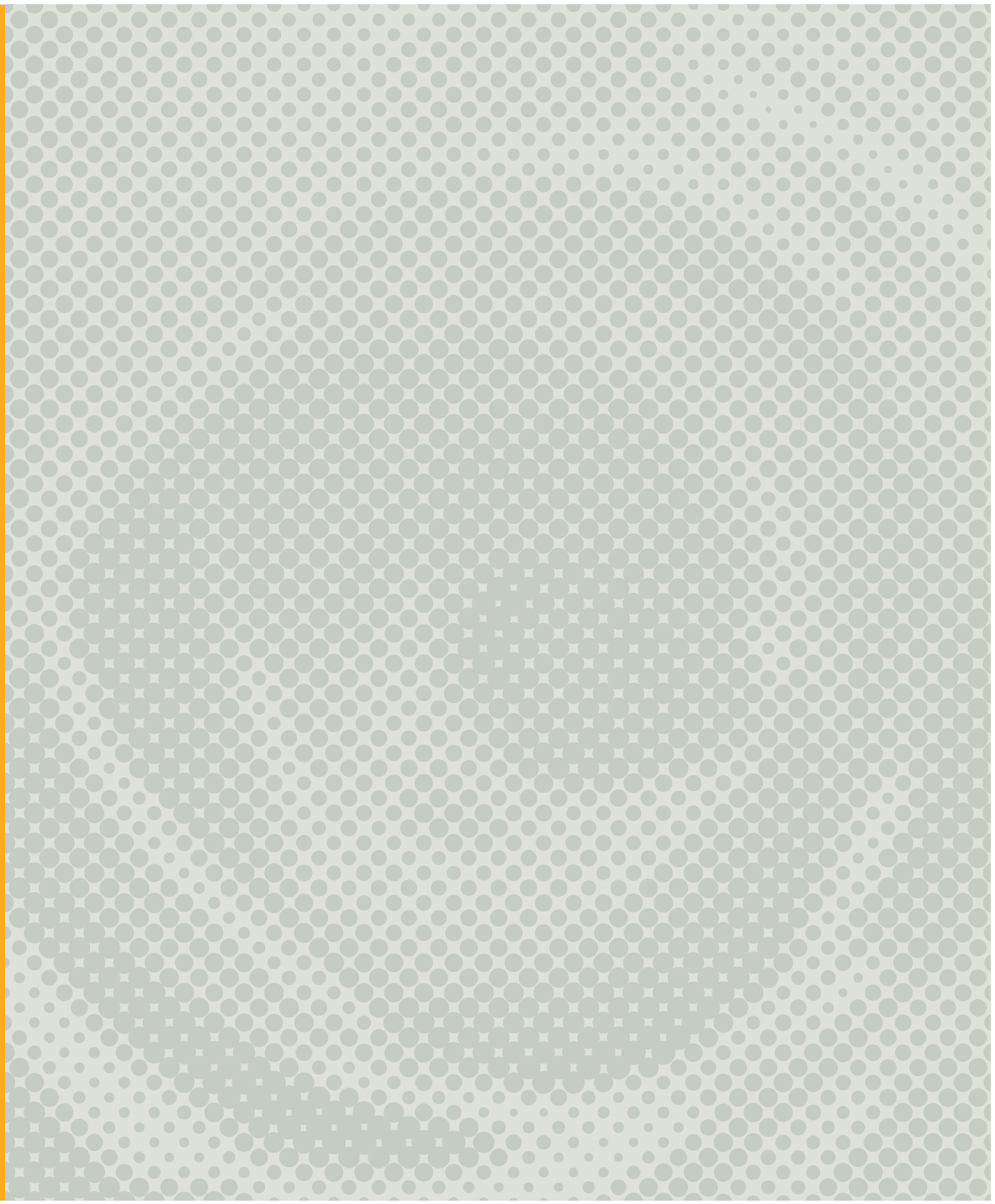

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Abstract

The objective of this research is to assess the potential for local dairy value chains as an approach for smallholder farmers to improve their livelihood. The main research problems are whether local dairy value chains are beneficial for the smallholder farmers and whether smallholder farmers are capable of maintaining and developing a newly established dairy value chain. Another research problem is to identify a set of strategies that could further improve a local dairy value chain. This involves identifying the main challenges when adding value to milk locally and the capacity of smallholder farmers to sustainably manage opportunities and constraints found in the dairy sector. Another aim of the research has been to highlight the characteristics of local value chains (as compared to global value chains), which is valuable when focusing on smallholder farmers in developing countries.

The research has been implemented by giving a broad and in-depth description of the rather unique case of Twawose's local dairy value chain. Twawose is a dairy goat association and farmer-led co-operative that has recently started producing goat milk yoghurt in rural Mgeta, Tanzania. Data was collected during two field visits to Mgeta in May 2010 and January 2011. Multiple methods and sources of data were used to collect the necessary data for a comprehensive case study that could meet the research objective. Qualitative data collected through various types of interviews and observation is the most important material, supplemented with secondary qualitative and quantitative data.

Kaplinsky and Morris' (2001) value chain approach is used as a framework to analyze the nature and strengths and weaknesses of the value chain. The framework was modified to include a review of assets, which resulted in the following research areas: (1) mapping the value chain, (2) review of assets, (3) overview of governance structures, and (4) suggesting upgrading strategies.

Findings confirm that local dairy value chains are beneficial for both the smallholder farmers' directly involved in the chain and to others in the community. The commercialization of goat milk yoghurt has given smallholders in Mgeta a stable and increased income. This is a valuable addition to their seasonal income from vegetable selling. Other positive impacts are an increased asset base for the farmers involved, job creation, and other ancillary effects like improved household nutrition. The chain has potential for further development and positively benefitting more smallholder farmers in Mgeta. However, there are challenges related to lack of critical assets such as electricity, proper packaging, and lack of access to information and finance that complicates the development of becoming an increasingly competitive chain. This can be resolved by a supportive network, which is crucial both for establishing and continuing the development of a value chain. The case confirms that if a supportive network is in place, smallholder farmers have the capability of establishing, maintaining and potentially developing local value chains by identifying an opportunity and utilizing it by pooling their resources through a farmer-led co-operative. The possibilities for replicating the approach of adding value to goat milk to improve the livelihood of smallholder farmers in other locations is discussed.

Sammendrag

Hensikten med denne studien er å vurdere potensialet til lokale verdikjeder for geitemelk for å bedre levebrødet til småbønder. Hovedproblemstillingene er om lokale verdikjeder for geitemelk påvirker småbønder positivt, og om småbønder har evnen til å vedlikeholde og videreutvikle en nylig startet verdikjede for geitemelk. En annen problemstilling er å identifisere et sett med strategier som kan videreutvikle verdikjeder som foredler geitemelk. Dette gjør det nødvendig å identifisere de største utfordringene med å produsere yoghurt av geitemelk lokalt og å se på småbønders evne til å utnytte muligheter og takle utfordringer i meierisektoren på en bærekraftig måte. Et annet mål med forskningen har vært å fremheve fordelene med lokale verdikjeder (i motsetning til globale verdikjeder) når fokuset er på småbønder i utviklingsland.

Forskningen er gjennomført ved å gi en bred og grundig beskrivelse av en ganske unik case, Twawose's lokale verdikjede for geitemelk. Twawose er en forening for bønder med melkegeiter og et kooperativ ledet av de samme bøndene som produserer yoghurt av geitemelk i rurale Mgeta i Tanzania. Data ble samlet inn i løpet av to feltbesøk til Mgeta i mai 2010 og januar 2011. Flere metoder og datakilder ble brukt for å samle inn de nødvendige data for å gjennomføre en omfattende casestudie som kunne svare på problemstillingene. Kvalitative data samlet inn gjennom ulike typer intervjuer og observasjon er det viktigste datamateriale, men også sekundære kvalitative og kvantitative data blir brukt i analysen.

Kaplinsky og Morris '(2001) tilnærming til verdikjedeanalyse er benyttet. Dette gir et rammeverk for å analysere grunnlaget til verdikjeden, samt vise styrker og svakheter. Rammeverket er modifisert ved å inkludere en gjennomgang av ressurser, som resulterte i følgende fokus for forskningen: (1) kartlegging av verdikjeden, (2) gjennomgang av ressurser, (3) oversikt over styringsstrukturer, og (4) forslag til oppgraderingsstrategier.

Forskningen bekrefter at lokale verdikjeder for foredling av geitemelk er fordelaktig både for småbønder som er direkte involvert i verdikjeden, og for andre indirekte involvert. Småbønder i Mgeta, Tanzania, har gjennom kommersialisering av yoghurt laget av geitemelk nå tilgang til en mer stabil og høyere inntekt, som er et verdifullt tillegg til den sesongbaserte inntekten fra grønnsaker. Andre positive virkninger er en økt ressursbase for bøndene som er involvert i verdikjeden, jobbskaping, og andre tilleggseffekter som bedre ernæring i flere lokale husholdninger. Verdikjeden har også potensial for videreutvikling og kan da gi positive fordeler til flere småbønder i Mgeta. Det er imidlertid utfordringer knyttet til mangel på viktige ressurser som strøm, bedre emballasje, og tilgang til informasjon og finansiering, som gjør utviklingen av verdikjeden utfordrende. Til tross for utfordringene, har dette casestudie vist at småbønder, med støtte fra et nettverk, har evnen til å etablere, vedlikeholde og potensielt utvikle lokale verdikjeder ved å identifisere en mulighet. Dette har de evne til gjennom å samle ressursene de har i et kooperativ. Disse positive funnene har åpnet for å diskutere muligheten for å replikere videreforedling av geitemelk som en tilnærming til å forbedre levekårene til småbønder andre steder.

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Acronyms

DASP	Department of Animal Science and Production (SUA)
EPINAV	Enhancing Pro-Poor Innovation and Value Chain Participation by the Poor
FAO	Food and Agriculture Organization of the United Nations
ILRI	International Livestock Research Center
KEBS	Kenya Bureau of Standards
MCPC	Milk Collection and Processing Center
MGBA	Meru Goat Breeder's Association (Kenya)
MT	Million tonns
MVIWATA	Mtandao wa Vikundi vya Wakulima Tanzania (Network of Farmer Groups in Tanzania)
NBS	National Bureau of Statistics (Tanzania)
NGO	Non-Governmental Organization
NORAGRIC	Department of International Environment and Development Studies (UMB)
PANTIL	Programme for Agricultural and Natural Resources Transformation for Improved Livelihoods
RLDC	Rural Livelihood Development Company
SACCOS	Savings and Credit Cooperative Societies'
SDDP	Smallholder Dairy Development Project
SUA	Sokoine University of Agriculture (Tanzania)
TAMPA	Tanzania Milk Processors Association
TAMPRODA	Tanzania Milk Producers Association
TBS	Tanzania Bureau of Standards
TDB	Tanzania Dairy Board
TZS	Tanzanian Shilling (1000 TZS = 3,86 NOK[1], 1000 TZS = 0,567 USD[2])
UMADEP	The Uluguru Mountain Agricultural Project
UMB	University of Life Science (Norway)
WHO	World Health Organization

[1] https://www.dnbnor.no/valutakalkulator (Accessed 12.05.2011)
[2] http://www.xe.com/ucc/convert/?Amount=1000&From=TZS&To=USD (Accessed 12.05.2011)

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1. Introduction

1.1 Agriculture for development

Gwakisa[3] was one of the smallholder farmers that initiated the establishment of Twawose co-operative producing goat milk yoghurt in his mountain village, Mgeta, Tanzania. Before, he was a subsistence farmer with little education and inadequate assets that resulted in few opportunities within his reach, a typical smallholder farmer. After being one of the lead farmers in establishing a dairy co-operative, he is now able to send his increasingly strong and healthy children to a better secondary school in the city, he has bought nice furniture for his house and receives greater respect and admiration from the other residents in his community because of his important role in starting local production and sales of goat milk yoghurt that has given him a stable income.

About 80% of people in African countries depend on smallholder agriculture for their livelihood. The large majority of the world's poor, 75 %, live in rural areas of the developing world. Many farmers have less than one hectare of land, making it difficult to keep livestock and grow sufficient fodder and food to survive. Despite this, agriculture is central in improving the livelihood of millions of people in Africa who lack other options. Diversification, value-adding and efficiency of production are central aspects for smallholder farmers to become economically sustainable. Small-scale production is claimed to be the most efficient agricultural production in terms of cost of production and resource use, if managed properly. Agriculture has the potential to be the lead sector for economic growth, especially in agriculture-based countries by reducing food insecurity and therefore contributing to poverty reduction (World Bank 2007).

The world, including the developing world, is currently experiencing changes in domestic and regional market demands. This is due to population and income growth that are important drivers for increased demand for agricultural products. One such change is the increased demand for processed animal sourced food. This shift is driven by urbanization, women in the labor force, shifting lifestyles and more ownership of household appliances, like refrigerators. The increasing demand for value-added products leads to new opportunities for smallholder. This can result in converting subsistence farmers to market-oriented smallholders with increased income and improved welfare (Larsen et al. 2009; Vorley et al. 2009; World Bank 2007). Small-scale production of goat milk yoghurt that Gwakisa is part of through the Twawose co-operative in Mgeta is a good example of this.

[3] The name has been changed to keep the farmers participating in this research anonymous.

The World Bank, through its *World Development Report 2008,* put a stronger focus on agriculture for development and introduces a vision to redefine the role of producers, with support from the private sector and the state. Agricultural producers need to be better linked to consumers by finding new markets for processed and value- added products. Most smallholder farmers, and particularly poor rural famers, do not participate in formal value chains. Rather, smallholders tend to be limited to informal markets for unprocessed or unrefined commodities such as raw milk, sunflower and grain (Larsen et al. 2009). Enhanced focus on entrepreneurship and developments of innovative agro-food value chains are powerful means to address the challenges and improve the producer's role and redistribute income.

To realize this change, smallholder farming must become more productive, competitive and sustainable, requiring the development of capacities among smallholders, especially in terms of entrepreneurship. Processing cassava into flour, sunflower seeds into oil, fresh fruit into dry fruit and milk into yoghurt or other dairy products, are examples of opportunities that smallholders can increasingly take advantage of (See Goletti et al. 1999; Mpagalile et al. 2009). This requires the establishment of new value chains by linking smallholder production with small-scale industrial production. If implemented, this will not only positively impact farmers themselves, but can also have a domino effect in their communities creating more jobs and opportunities. A new dairy processing plant, for example, creates jobs at the plant, for those producing, collecting and distributing the milk, and for other farm input suppliers (Silva et al. 2009; World Bank 2007).

The critical link, then, is to transform the rural sector in developing countries so that smallholders are integrated into emerging *value chains* for the utilization and value-adding of products from agriculture. The question that then emerges is how best to link smallholders to these opportunities? In order to address this question one needs to have an understanding of what constraints prevent smallholders from taking advantage of the emerging opportunities and achieving the wellbeing Gwakisa has gained. By using Gwakisa's and Twawose co-operative experience as a case study, this paper will discuss the many challenges smallholder farmers face and ways of overcoming them to achieve improved livelihood.

1.2 Smallholder farmers and local value chains

Establishing a new value chain and/or entering a value chain is challenging for smallholder farmers. First, a smallholder farmer must identify an opportunity. If an opportunity is recognized, taking advantage of it can be hampered by limited access to information and credit facilities. While the latter is increasingly being offered in rural areas, the micro-loans provided are often too small an

amount of finance for start-up, or even scaling up, projects in the agro-processing sector. Beyond this it takes entrepreneurship, business skills, education and a range of other assets to start an enterprise. Such skills are usually not provided adequately by schools in the rural sector, if school has been attended at all. More commonly there is a high degree of illiteracy (Vermeulen & Cotula 2010; Vorley et al. 2009; World Bank 2007). This illustrates some of the challenges faced by smallholders in starting up a value-added enterprise.

The focus has for many years been increasing the participation of smallholder farmers in high-value global value chains. A particular emphasis has been exports, often of organic and fair trade products, with support from either the private sector or public sector, through NGO's and other international development agencies. However, in high-value agrifood value chains smallholder farmers have limited control. Furthermore, power is often concentrated among one or a few chain participants that coordinate market activity. As the modern agrifood sector is based on consumer assurance, high standards for food quality and safety, low prices, and reliability of supply, lead actors in retail or export often coordinate the value chain. The ability of smallholder farmers to take the lead is limited, as is their ability to maximize economies of scale. The market is also constantly changing, requiring rural farms and firms to respond by for example switching market channels, change how they are organized, or invest in equipment. Such value chains may thus be less appropriate for many smallholder actors, who may lack the ability to handle dynamic markets and the increasing amount of regulations.

By contrast local value chains that develop to meet growing local demand and enterprises that the farmers themselves have capabilities to operate might be more within the reach of smallholders. Local markets may also be characterized by new consumer demands due to changing lifestyles and increased knowledge on a diversified diet (World Bank 2007). However, to establish and maintain a sustainable value chain in local markets, it must be competitive in terms of costs, price, operational efficiency, and product offering. Improving the livelihood of smallholders by enhancing the competitiveness of smallholders and their entry into new food value chains requires an understanding of ways of organizing value chains to include smallholder farmers. Given that local markets are more easily accessible and a viable market option for smallholder farmers, an understanding of the processes and dynamics of such chains should be of interest. This requires in-depth analysis of successful smallholder entrepreneurs in order to examine the approach used by these individuals. By using an example like Gwakisa's participation in Twawose co-operative, one can delineate how a farmer has been able to enter into his local market and provide a value-added product for his community. It becomes necessary to also examine the structure of the approach

being used by these smallholders, and investigate why one organizational model was chosen over others, as well as the socio-economic performance and outcomes, and what challenges were met and how they were addressed (Vermeulen & Cotula 2010). This paper use an in-depth analysis of one case study, of a newly established local dairy value chain, and investigate how this group of smallholders was able to add value to small-scale production, and through this analysis identify strategies that can improve value chain participation for small producers.

1.3 Problem statement

In large parts of Africa, keeping goats is a part of many rural households. It is estimated that in 2009 there were 294.9 million goats in Africa, 89 million in East-Africa alone (FAO 2009). Improved breeds are becoming more popular, particularly dairy goats, resulting in new opportunities for smallholder farmers to add value to the goat products. The increasing number of dairy goats in developing countries is a relatively untapped resource when it comes to adding value to the products and increasing the returns for smallholder farmers. Peacock (2010), a renowned dairy goat specialist working for Farm-Africa, calls for a greater development and exploration of emerging markets for goats and goat products, which can, at the same time grow to meet the needs of the next generation. Moreover, small-scale dairy production has traditionally been an important source of cash income for subsistence farmers in the East African highlands and most part of sub-Saharan Africa. Dairy goats represent a potential source of additional income and employment, and could thus help to improve the welfare of rural populations (Eik et al. 2008; Holloway et al. 2000; Safari et al. 2005).The objective for this research is therefore to take a closer look at the opportunities smallholders face in the dairy sector.

Objective:

Assess the potential for local dairy value chains as an approach for smallholders to improve their livelihood.

The goal of this research is therefore to understand smallholders' capability to establish and sustainably manage, and continuously develop, a competitive and economically viable dairy value chain. This includes looking at the main challenges faced when value-adding to goat milk production and the capacity of smallholder farmers to manage opportunities and constraints found in the dairy sector. This will be implemented by giving a broad and in-depth description of Twawose, a dairy goat co-operative in Tanzania, which has attempted to improve smallholder livelihoods through the commercialization of goat milk yoghurt. The analysis makes use of a value chain approach that provides a framework to analyze the nature and determinants of competitiveness in value chains in

which smallholder farmers can participate. From this lens, the strategies adopted by Twawose will be analyzed, both to assess the barriers currently faced by Twawose and to provide suggestions for ways forward to sustain and improve market participation.

1.5 Outline of the thesis

The thesis begins with an introduction to dairy goats in Africa, providing an overview of how they are linked to development, an introduction to the dairy sector in Tanzania, and background on Mgeta highlands and Twawose itself. This chapter will provide the necessary contextual background for the rest of the thesis. The analytical framework of value chain analysis will then be introduced, following Kaplinsky and Morris's (2001), as a means to structure the research objective. From this I derive the research questions that are introduced subsequently when introducing the four main analytical sections, which also structure the analysis: mapping Twawose's value chain, reviewing Twawose's asset base and the governance structures in the chain, discussing various upgrading strategies to improve the competitiveness of the chain, and suggesting concrete action points to improve the local value chain. The thesis concludes by assessing whether Twawose's value chain strategy is a good way of improving smallholder (dairy) farmers' livelihoods and other important findings, while further highlighting various issues including the replicability of the approach, strengths and weaknesses of this research, theoretical considerations, and suggestions for future research.

2. Introducing the case of small-scale dairy development

The purpose of this chapter is to introduce the opportunities in the small-scale dairy sector and how these opportunities can improve the livelihoods of smallholder farmers. This will be introduced by arguing for the importance of dairy goats to smallholders, enhanced by adding value to products derived from goats. The challenges in developing the dairy goat sector are also pointed out. I argue this because it sets the foundation for why my case started processing goat milk yoghurt to better utilize their increasing amount of goat milk. A brief overview of the Tanzanian dairy sector, including milk production, dairy processing and milk consumption in Tanzania is given. This demonstrates the opportunities available in the small-scale dairy sector and provides a background for the empirical study. Finally, through my case study I present how opportunities in the sector were used advantageously by the farmers association, Twawose, located in Mgeta highlands, Tanzania. To do this I give a description of the area and of how dairy goats were introduced, leading to the formation of a dairy goat co-operative society, which is the case study of this research.

2.1 Dairy goats in Africa

'Goats are deeply embedded in almost every African culture and true friends to the rural poor in particular' (Peacock 2005: 1).

Goats can play a significant role in supporting smallholder farmers in improving their livelihood in several ways, one of them being production of higher-value products. Goats provide their owners with a number of products and socio-economic services summarized in Table 2.1. Goats are a good asset for food security and in times of crises. When families are unfortunately exposed to crop failure, drought, civil war, illness (especially HIV/AIDS), goats can play an indispensable role in supporting families. Goats are tolerant to infrequent water and limited food options, their herds can recover quickly due to fast reproduction, and, because of their small size, are easy to transport (Peacock 2007).

Table 2.1: Goats products and services (Source: Peacock 2005)

PRODUCTS	SERVICES
Meat (raw, cooked, blood, soup)	Cash income
Milk (fresh, sour, yoghurt, butter, cheese)	Security
Skin (clothes, water/grain containers, tents, thongs)	Loans
Manure (crops, fish)	Religious rituals
Gifts	Judicial role
Hair (cashmere, mohair, coarse hair tents, wigs, fish lures)	Pleasure
Horns	Pack transport
Bones	Draught power
	Medicine
	Control of bush encroachment
	Guiding sheep

Additionally, the presence of goats assures farming families of a continuous flow of income, which is difficult to assure based on seasonal vegetable sales. As a result, the possibilities of higher farm

reinvestment and/or off-farm venturing are increased (Omore et al. 2004). Owning goats is also an investment in capital and can increase the likelihood of getting a micro-loan to implement such, or other, activities.

The primary extra benefit of keeping dairy goats is the additional milk generated from them as compared to the indigenous goats that provide very little milk. Small-scale dairy production is an important source of cash income for subsistence farmers, especially in the East African highlands (Holloway et al. 2000). Markets for goat milk and milk products exist in many African countries and market-oriented small dairy businesses also offer opportunities for non-farm rural employment, due to the need of processing highly perishable milk to reach the market. This provides direct employment for the owners and the employees and indirectly from ancillary services such as transport, bicycle repair, security and maintenance of equipment. Mutabazi et al. (2007) suggest that one cannot overemphasize that unemployment is the most critical dimension of poverty in rural Tanzania, underlining the importance of these effects.

Small quantities of animal products can improve the nutritional status and reduce food-related poverty (malnutrition) for smallholders. Milk is especially important for children and nursing or pregnant women to prevent malnutrition, especially Vitamin A deficiency. Vitamin A deficiency is widespread in the developing world and adequate Vitamin A is crucial to maintaining a good immune system and deficiency can cause night blindness. Goat milk fat and proteins have a higher nutritional value than cow milk and are digested more easily, allowing lactose intolerant people to consume goat milk. There are a high number of lactose intolerant people in East-Africa (Bille et al. 2000; Haenlein 2004; Peacock 2005). Food consumption poverty is particularly widespread among Tanzanians according to Mutabazi et al. (2007). According to the preliminary results from the Tanzania Demographic Health Survey (2010a), malnutrition among children under age five results in 42 % being too short for their age, 5 % too thin for their height and 16 % are underweight. This demonstrates the importance of improving access to affordable and safe milk and milk products to consumers, especially in areas where there is limited milk available, both in Tanzania and elsewhere.

An additional benefit of keeping livestock is the provision of manure that can be used to improve soil fertility and increase the output from produce. For a smallholder farmer it is easier to buy a goat than a cow due to a large difference in investment capacity. Almost anyone can acquire a goat either by buying one or by bartering, and they are not expensive to keep nor do they require much maintenance. Additionally, a farmer needs a smaller plot of land for goats to graze or to provide them with enough fodder. For this reason, on average smallholder livestock keepers maintain up to two dairy cows or comparatively six milking goats if keeping goats instead (Mutabazi et al. 2007). It must be said that goats do not produce nearly as much milk as cows, especially not the indigenous goat. However, the impact of the death of a goat due to disease is not as severe as the death of a cow, because the loss of investment is not as big and a farmer would have more goats left that also reproduce faster than cows (Peacock 2005). The benefits of keeping goats compared to cows are summarized in Table 2.2.

Table 2.2: Relative benefits of keeping goats

GOAT	
Positive	**Negative**
Lower investment cost More nutritious milk Adaptable to challenging climate and terrain Smaller In need of less fodder and smaller plot of land High survival rate Less impact if death occur	Less milk Less meat to sell Not applicable for ploughing etc.

Because of the long list of benefits of keeping goats, especially improved breeds, for smallholders, several development agencies have focused on bringing in new goat species for cross-breeding in several African countries. During the last 40 years, there have been a number of attempts at cross-breeding exotic breeds with local goats to increase the amount of meat, but most importantly milk. The British NGO Farm-Africa[4] has been one of the front-runners for this initiative in East-Africa, followed by a number of smaller organizations, and supported by national governments, universities such as Sokoine University of Agriculture (SUA) in Tanzania and University of Life Sciences (UMB) in Norway, and research institutes such as International Livestock Research Institute[5] (ILRI). After many years of research on goats, project focusing on introducing dairy goats and dissemination of best practices (Peacock 2007; see Peacock 2008; Staal et al. 2008), a new additional strategy for dairy goat development is overdue. Adding value to the increasing amount of milk from goats is seen as a valid addition to the research and projects, which may lead to an increased interest of keeping dairy goats.

Despite the evidence that goats are beneficial for smallholder farmers, dairy goat development does not come without constraints. According to Peacock (2008), there is prejudice and ignorance

[4] See http://www.farmafrica.org.uk/
[5] See http://www.ilri.org/

regarding the importance of goats to smallholders in rural areas. She claims that the contribution of small-scale dairies to the national economy is under-estimated due to the high degree of informal marketing of goats and goat products, which is not shown in national statistics. Some cultures in Africa still associate goats with poverty and cattle with wealth, resulting in goats sometimes being a means to acquire a cow, and a lack of interest in further development based on goats and goat milk.

Implementing and successfully maintaining a dairy business comes with several challenges. Dairy processing depends on a steady supply of quality milk and requires farmers to give more attention to goat husbandry. Transaction costs of dairy products are high due to their perishability and the long distances to markets, the number of traders involved and the many steps of processing. Smallholders face barriers in developing and/or participating in dairy processing, barriers that can be overcome by collective action in farmers organizations and groups (Peacock 2007; Staal et al. 2008).

Dairy co-operatives have played a significant role in dairy development in countries like Kenya. Co-operatives can provide breeding and veterinary services, cheaper supply of inputs like medicines and fodder, technical support, training, access to finance (either micro-loans through savings and credit schemes or external funding), and, finally, improve access to markets by collecting, bulking and processing milk collectively. Another important feature of co-operatives is mutual support and encouragement among the farmers, and collectively increasing the relative amount of power to negotiate terms and conditions for market participation. The benefits of co-operative organization depend on features such as member background, access to resources and the performance of the co-operative. Important aspects are good management based on honesty, effective investment of resources and accountability to the members (Peacock 2007; Simmons & Birchall 2008; Staal et al. 2008).

2.2 The dairy sector in Tanzania

Tanzania is primarily an agro-based economy. The agricultural sector employs more than 80 percent of the population. Out of the 4.9 million agricultural households, about 36% depend on livestock as a source of livelihood. In Tanzania there are 18.5 million cattle (ranking third in Africa after Ethiopia and Sudan), 13.1 million goats (ranking fifth in Africa) and 3.6 million sheep. The livestock sector contributes to 30 % of the agricultural GDP in 2006 and of that the dairy sector contributes 30 %. The main source of milk production is cattle (850.000 tonnes/year), followed by dairy goats (105.000 tonnes/year) and some by water buffaloes and camels (data not available) (FAO 2009; Njombe & Msanga 2009).

The livestock sector in Tanzania makes an important contribution to national food supply, food security and to the livelihood of smallholders by providing a source of cash income, employment and an inflation-free store of capital (MMA 2008; Njombe & Msanga 2009). Milk is one of the products which provide farmers with income throughout the year. To realize market exchange several actors are involved: the farmers that produce the milk, the processors and the consumers (See Appendix 1 for overview of the milk marketing system in Tanzania).

2.2.1 Milk Production

It is estimated that 70 % (1.6 MT) of the total national milk production in Tanzania is produced by smallholder dairy farmers. Of the small ruminants, goats are the most popular in Tanzania and dairy goats are gaining popularity as a source of milk, particularly to the poor. (Njombe & Msanga 2009). There is, however, a large difference between local goats and exotic breeds, when it comes to how much milk they yield. Local goats produce an average of 250 ml of milk daily, while an exotic breed can produce up to 4 liters a day if fed properly. Because of higher feed requirements, the milk production of exotic breeds have seasonal variation between the dry and wet season (Peacock 2007; RLDC 2009).

Milk production from cattle has doubled in Tanzania from 710,000 liters in 2000 to 1,426,000 liters in 2006/07(MMA 2008). This increase is mainly due to an increase in herd size per household and not improved productivity per cow. Challenges to production are inadequate animal nutrition, animal diseases and lack of support services. The milk that is produced is mostly consumed at point of production (90%) and quite often a significant amount is left for the calves. Small quantities of milk reach the commercial market, mostly due to remoteness and poor infrastructure that makes collection and marketing of milk challenging (Njombe & Msanga 2009; RLDC 2010).

In Tanzania there are now 13 million goats, a large increase of the 6.4 million in 1984 (Njombe & Msanga 2009), of which 1.6 % are of an improved breed. Of that percentage 58% are dairy goats, the remaining being improved meat goats (MLD 2003). The number of improved breeds has, however, increased significantly the past decade and the demand for such goats are high.

2.2.2 Dairy Processing

During the last decades the Tanzanian dairy industry has experienced some drastic transformations, led by the privatization of government-run Tanzania Dairy Limited. Several companies (13 of 35) were forced to close down due to inefficient production, poor management of processing, weak

infrastructure and inadequate policy and regulatory framework. This resulted in a sharp decrease of processing capacity. The total milk processing is about 60,000-80,000 liters despite the capacity of milk being 507,000 liters per day in 2006 (MMA 2008; RLDC 2009).

The reasons for the poor performance of national processing are many. There are high costs of milk collection, transportation, and processing, because of high costs of equipment, machinery, packaging materials, followed by poor infrastructure and inadequate access to financial credit. High costs of doing business and very limiting marketing of the processed products also increases the costs (MMA 2008). The low performance in milk processing is also due to the challenge of competing with imported dairy products. The average annual amount of imported dairy products between 2004 and 2009 was 25.9 million liters, the figures growing 9.41 % per year. In 2009, Tanzania had an estimated deficit of 581,000 MT of dairy products. Imports account for 48% of the market for processed dairy products in Tanzania. This amount of imported milk and milk products indicates an unfulfilled demand for milk and milk products, indicating huge opportunities in the dairy industry in Tanzania (RLDC 2010).

Today most of the processors in operation in Tanzania are small- or micro-dairies producing less than 1000 liters a day[6], with a few medium sized commercial actors. In 2007 micro dairies had a processing capacity of about 14 % of the total processing amount that year, only utilizing about 10% of their capacity (Njombe & Msanga 2009).

The product range produced in Tanzania includes a relatively small amount of fresh milk 5%[7], a large amount of mtindi (cultured milk) 54%, UHT (long lasting) milk 23 %, yoghurt 12%, cheese 11% (mostly cheddar and mozzarella), butter and a small amount of ghee (butter oil), sour cream and cottage cheese 2 %. In an attempt to add value, many processors have increased the volume of yoghurt production because of relatively good margins due to high prices and the increasing popularity of yoghurt (RLDC 2010).

[6] In Tanzania a large scale dairy processor produces more than 5000 liters per day, medium dairies between 1000-5000 liters per day, small processor between 500-1000 liters per day, and micro dairies produce less than 500 liters a day (Kurwijila 2011).

[7] The number is low because most of the fresh milk is not processed and also sold through informal market channels, and is therefore not part of the statistics.

2.2.3 Milk consumption

Tanzanians consume a small amount of milk compared to their East African neighbors even though Tanzania has a higher number of cattle and dairy goats. On average, a Tanzanian consumed about 39 liters per year in 2007, an increase from about 20 liters a year in 1995, but still significantly less than their neighbors (Kenya 100 liters p.a. and Uganda 50 liters p. a.) or than the recommended consumption level of 200 liters per year advised by World Health Organization (WHO) (MMA 2008). About 49% of Tanzanians consume milk regularly. Higher levels have been recorded in mainly urban areas. The Tanzanian government aims to raise the per capita consumption of milk to at least 80 liters (Njombe & Msanga 2009; RLDC 2010).

The reason for the low milk consumption is mainly low purchasing power and traditionally low milk consumption in Tanzania, partly due to cultural beliefs and that it is a drink for children. The most popular products when milk is consumed are fresh milk 98 % and secondly fermented milk like mtindi and yoghurt. Part of the reason for this is that most of the milk is consumed locally (90%) and sold through informal markets (90%), and is mostly unprocessed (RLDC 2010).

The informal market is characterized by direct delivery of milk by producers to consumers in the neighborhood, or sale to milk traders or individuals in nearby towns. The informal milk markets remain the dominant channel in Tanzania and consist mostly of unprocessed milk. Thousands of people in Tanzania depend on these informal milk markets as a means of livelihood, and is often the only source of regular income for small-scale dairy producers. The informal markets have no licensing requirements or regulations to operate, have low costs of operation, and have high producer prices compared to formal markets (RLDC 2010).

Formal markets are limited to urban and trading centers in Tanzania, with Dar Es Salaam being the biggest market. However, the formal market has expanded during the last decade after the private sector entered the dairy processing industry. In urban areas the supply of milk and milk products has not been meeting demand. The local capacity in Tanzania was able to meet about 33% of the demand in the 1990s (RLDC 2010).

Data or research outlining the actors processing goat milk is not available. Given the low processing rate of milk and the indications of an unsatisfied demand for milk and milk products, the Tanzanian dairy sub-sector have a great developmental potential. The growing number of dairy goats could assist in meeting this demand.

2.3 Introducing the case study

The chosen case study is the only known processor of goat milk in Tanzania, and hence rather unique. The sub-chapters below will introduce the location of the case, and put it into context of the dairy for development agenda. How dairy goats were introduced in the area, which led to the establishment of a goat co-operative, will also be explained and will lead to more information about Twawose association and co-operative society.

2.3.1 The area in focus; Mgeta

The rural highland of Tanzania is the area for this case study, more specifically the Mgeta division in Mvomero District in Morogoro Region (see map in Figure 2.1[8]). Mgeta division is located on the western slopes of the Uluguru Mountains between 1100 and 1750 meters above sea level. It is about 40 km from the nearest city Morogoro, which takes about 1 to 3 hours to reach, depending on means of transport, on a bumpy, curvy and steep road that is only partly covered with concrete slabs. The population, according to the 2002 census, is 260,525 people in the Mvomero District, with 58,314 households divided into 11 wards and 44 villages (Government of Tanzania 2008). The main villages that are in focus here are Nyandira, Tchenzema, and Mwarazi, which have a total population of 7181 in 2009 (NBS 2010b).

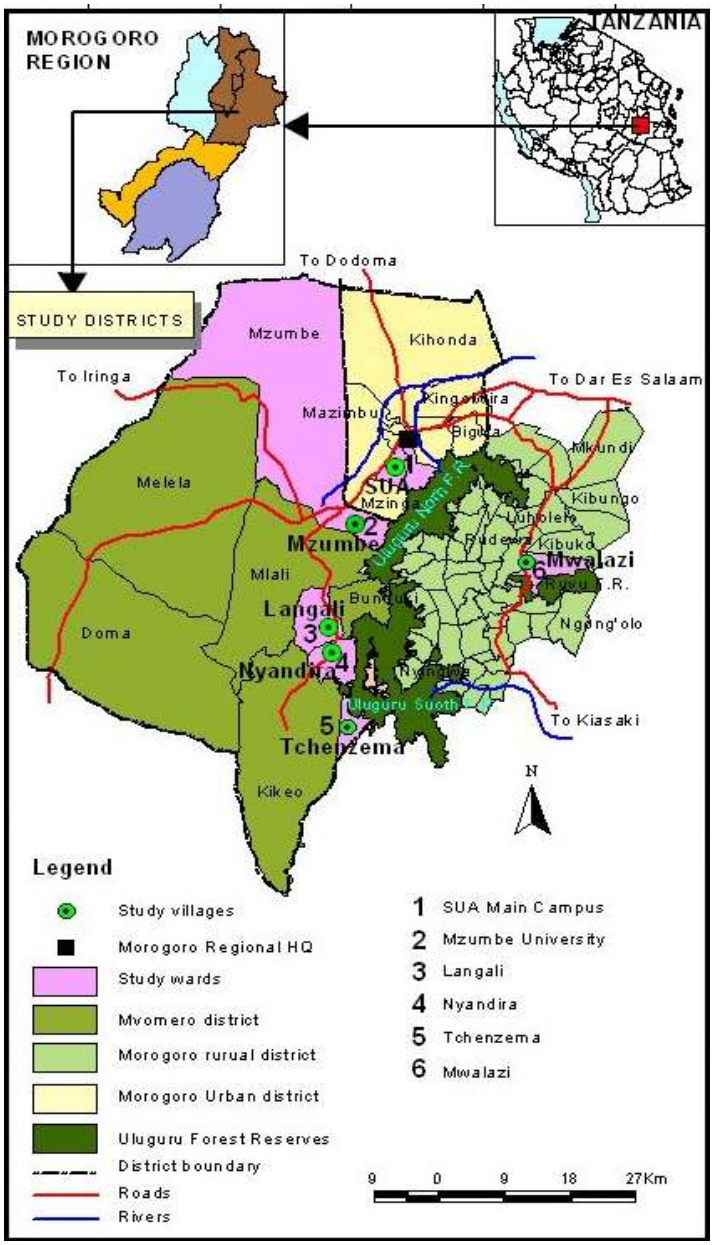

Figure 2 1: Map of the area in focus

[8] Unfortunately the map is not correct. The village of Mwalazi is marked instead of Mwarazi village that is focused on in this study. Mwarazi is located to the left of Nyandira and Tchenzema.

The climate in Mgeta is fairly cool, with temperatures ranging between 11 and 23°C. Dry seasons in Mgeta last for approximately four months, usually from June to September. The population consists mainly of smallholder farmers and agriculture is the backbone of the economy. About 84 % of the residents are engaged in agriculture and animal husbandry. Arable land is intensively used in Mgeta and there is little or no opportunity for expansion, which is a considerable constraint to improving livelihoods in the area. Vegetable production is the most important farming system focusing on cabbage, tomato, green peas, beans, cauliflower and carrots (UMADEP 2001).

The farmers in the district struggle with inconsistent income due to dry seasons, variable yields from farming and lack of alternative income. With the limited access to land and small plots, most farmers sustain a subsistence lifestyle complemented by small amounts of cash crops. Many farmers sell a small amount of surplus crop at the local market twice a week. Traders from outside the community from as far away as Dar Es Salaam comes to purchase produce after a market building managed by a market board was constructed in 2004. Many households struggle from lack of produce or money to provide nutritious food for the family all year round. Household food security is a major concern for many low-income countries such as Tanzania where 22% and 38 % of the people live below the food poverty and basic poverty lines, respectively (Eik et al. 2008). Additionally, many families in Mgeta cannot afford to send their children to school.

Picture 2.1: Typical scenery in Mgeta from Mwarazi village (Photo by H. Lie)

There are also infrastructural challenges in the area with no access to electricity and poor roads that are dangerous and in some places not possible to use during the rainy season. There is good access to water due to the mountainous location and streams and rivers coming down from the mountains, however this is not clean and safe drinking water (UMADEP 2001).

There are numerous farmers' associations and several co-operatives operating in the district. The various groups focus on vegetable farming, irrigation, livestock such as goats and credit and lending groups among others. The welfare of the agricultural groups are, according to the Regional Commissioners office in Morogoro, still not satisfactory (Government of Tanzania 2008). In 1993,

MVIWATA, a national network of smallholder farmers groups in Tanzania, was founded to support farmers in establishing and improving farmer groups. The network's mission is to strengthen farmers' groups and to build a strong national farmer's organization to ensure effective representation of their interests, to facilitate learning and training, and to enhance communication and advocacy strategies to defend and promote their interests. On the initiative of MVIWATA, farmers' groups located in the same area meet and exchange experiences every month. The focus of the meetings range from marketing, saving and credit, environmental protection and livestock production (Mwivata 2009). There are eighteen farmers groups in Mgeta (UMADEP 2001), and one of them is the dairy goat association in this research.

2.3.2 Introducing dairy goats in Mgeta

In 1988, Norwegian dairy goats were introduced in the three villages Nyandira, Tchenzema and Mwarazi in Mgeta Divison, Morogoro. The introduction was lead by Department of Animal Science and Production (DASP) of the Sokoine University of Agriculture (SUA) (UMADEP 2001).

The aim of the project was to improve the livelihoods of smallholder farmers and more specifically to improve the household nutritional standard, especially among children. Previously, there was no access to milk in the area because of the difficulty of keeping cows in a mountainous area. This led to a lack of animal products that add important proteins to a diet. Secondly, the goal was to increase the income level of the smallholder farmers. Income from the multifunctional goats includes revenue from milk that is sold to neighbors and from selling live goats both locally and regionally, and lastly manure that can either be used to improve the output of the farmers' vegetable garden or increase the income further by selling it to neighbors (Krogh 2007).

SUA was in charge of giving the dairy goats to the chosen farmers in Mgeta and the accompanying training in goat management. At the same time, in 1988, a local dairy goat association was established by these dairy goat owners. The name of the group is Twawose, which means, "let us go together" in the local Luguri language. The association's role is to create a network of the farmers owning Norwegian dairy goats, being in charge of the pure bred Norwegian buck for breeding cross bred goats, facilitate training in goat husbandry, as well as organize the selling of live goats and eventually establish an input supply shop with medicines necessary for treating the goats.

Traditionally, Tanzanians are used to keeping indigenous goats which require a minimum amount of work, attention and inputs, letting them graze more or less freely unless tampering with vegetable plots. Norwegian goats however, require more attention to remain healthy and disease-free, and are

kept in goat houses and taken out daily to graze. In return they provide the farmer with more revenue from milk and meat.

A goat owner in Tchenzema states this clearly: *"Keeping dairy goats are a bit like caring for a mzungu [white person], you have to take very good care of them. But I like it because they make it possible for me to send my children to school"* (Dairy goat owner, Tchenzema, Tanzania).

From 1993, the local organization Uluguru Mountain Agricultural Project (UMADEP) took over the promotion of goats and training of the farmers in goat management and formation of farmers groups in Mgeta. UMADEP is based at SUA and operated by the Department of Agricultural Education and Extension. Their aim is to promote all aspects of agricultural development for the communities in Mgeta, which includes the promotion of dairy goats. UMADEP supports an extension officer[9] that live in Nyandira village to support farmers with any difficulties relating to agricultural practices, as well as attending MVIWATA meetings (UMADEP 2001).

Picture 2.2: Proud dairy goat owner in front of her homemade goat house in Nyandira (Photo: H. Lie)

In 2005, SUA and University of Life Sciences (UMB) were again involved in the area through the four yearlong collaborative Programme for Agricultural and Natural Resources Transformation for Improved Livelihoods (PANTIL). The dairy goat project commenced again and was included as one of twelve projects in the program. PANTIL's focus was on scaling out[10] the dairy goat project in the rest of Tanzania and developing the project further by researching the possibility of introducing cashmere goats. The Mgeta farmers and particularly Twawose that focuses on dairy goats was therefore not included in this project any more. Although, some Twawose members are involved in the cashmere pilot project because they keep cashmere goats for trial, the same way dairy goats were introduced. Developing Twawose as an association is therefore not in focus of the project, and the dairy got keepers in Mgeta does not receive any direct support from SUA or UMB.

[9] "Agricultural extension is the function of providing need- and demand-based knowledge in agronomic techniques and skills to rural communities in a systematic, participatory manner, with the objective of improving their production, income and (by implication) quality of life. Extension is essentially education and it aims at bringing about positive behavioral changes among farmers" (Syngenta 2011: 1).

[10] Scaling out is the horizontal expansion of adaptation and best practices by farmers in a given geographical location by a process of diffusion (Pachico & Fujisaka 2004).

2.3.3 Twawose, a yogurt producing co-operative

A natural scaling out of dairy goats in Mgeta started in 1990 and picked up pace from 2000 leading to an increased number of farmers keeping Norwegian goats in the area. By 1999, the initial amount of 10 goat keepers had grown to 50 and by 2009 approximately 380 farmers in the three villages were keeping 1538 dairy goats (see Figure 2.2)(Krogh 2007).

In the 1990s the dairy goat project was already considered a success based on studies that concluded that introduction of dairy goats resulted in meeting the project goals of improved diet, food security and increased income for smallholder farmers in Mgeta. By local farmers and academics at SUA dairy goats were recognized as a path to alleviate poverty among the dairy goat keepers by enabling them to realize daily and instant income. This is important due to the seasonal sale of vegetables. Also, improved household nutritional standards increased, especially among children, through the availability of goat milk (Eik et al. 2008; Safari et al. 2005; UMADEP 2001).

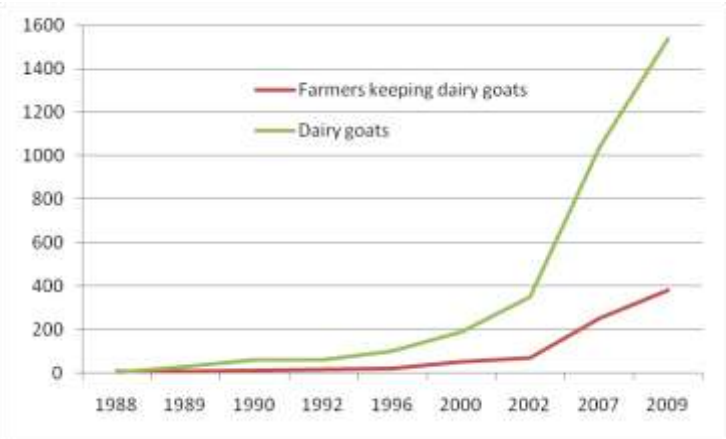

Figure 2.2: Number of dairy goats and farmers in Mgeta from 1988 to 2009

The initial success of introducing dairy goats in Mgeta led to a desire from the dairy goat keepers to further develop the project. The idea of starting a milk collection and production center (MCPC) and adding value to the goat milk by producing goat milk yoghurt materialized in 2007 by the farmers themselves with support from Erling Krogh, a visiting researcher from Norway (Krogh 2010). The idea was based on a lack of motivation to produce more milk because there seems to be a small market for milk. Dairy goat farmers do not see a reason to increase their herd of milking does for increased milk production when it is difficult to sell the milk. The dairy goat farmers believe there was surplus milk that requires collective effort to market. The idea was followed up by a feasibility study conducted by professors from SUA during a PANTIL baseline survey. Findings from the study suggested that both goat milk producers and consumers were in favor of establishing such a center. It was believed that a MCPC would boost milk production and assist in the marketing of milk (Kifaro et al. 2007).

There are several reasons for choosing yoghurt over other dairy products. In hot conditions or in hot environments, milk deteriorates rapidly, which means that for farmers to benefit from the milk beyond home consumption, processing is necessary to prolong the shelf-life so it can reach larger markets. Once processed into fermented milk products like yoghurt or cultured sour milk, its useful life may be extended up to one week depending on quality and temperature. Additionally, it can be said that fermented milk is more nutritious and healthier than fresh milk (Bille et al. 2000). Cheese was not a feasible option because there is no tradition of consuming cheese in Tanzania, especially not in poor rural areas like Mgeta. Cheese production is also more complex and costly. The idea of starting yoghurt production resulted in a small market research implemented in Nyandira with positive feedback and motivated to start production (Krogh 2010).

On request from the dairy goat keepers, training on ensuring the quality of goat milk and producing yoghurt was given by SUA to two selected members of Twawose. By November 2008, a pilot production was started by one of the two farmers at his house on behalf of Twawose. After the pilot processing confirmed the potential of selling goat milk yoghurt locally, the registration of a co-operative as a business unit began in 2009 and finalized in January 2010 due to the time consuming registration process. The establishment and registration of a yoghurt producing co-operative further advanced the already existing dairy goat association, Twawose. Twawose is, however, still functioning as an association. A small grant was given by SUA to support renovation of a room into a processing unit and to buy necessary equipment. In January 2010 Twawose made the transition from being solely a farmer's association to part of the group becoming a co-operative processing and selling goat milk yoghurt. The production started in January 2010 when the MCPC was ready, and by May approximately 20 liters of yoghurt was produced twice a week and sold successfully at the local market days (Thursdays and Mondays). During the market days, farmers from neighboring villages and the nearest town, Morogoro, come to Nyandira, where the processing is located.

Twawose is now both functioning as a dairy goat farmers association and a yoghurt producing co-operative among their other activities of running an input supply shop, offering artificial insemination and offering advice on dairy goat husbandry. Twawose is in an exciting phase where they have taken advantage of one of the many opportunities in the Tanzanian dairy sector with the aim of increasing their income from milk, hence improving livelihood. Taking advantage of opportunities like adding value to goat milk in a rural area does not come without challenges. These challenges and potential additional opportunities in the area, will direct the development of this local dairy value chain, which is part of the focus for this research. To analyze the value chain an introduction of value chain analysis and the analytical framework applied in this study is in its place.

3. Analytical framework

Value chain analysis has been chosen as the analytical framework for this research - the purpose of this chapter is to introduce the rationale behind this choice. This chapter argues that local value chains are more relevant than global value chains for smallholders in developing country settings. I will do this by explaining the basics behind value chain analysis and the value of such analysis. The second part of the chapter presents the analytical framework based on Kaplinsky and Morris' (2001). The framework is developed further to cover the situation of local value chains in asset poor communities. Research questions will be stated along with introducing the modified framework, which will serve as the structural foundation for the analysis. Important concepts like assets, governance and upgrading are explained throughout the chapter, ending with a visualization of my research model.

3.1 Value chain analysis

3.1.1 What is a value chain?

A value chain is the full range of activities that are required to create a finished product or service. This refers to the different phases of production from raw material, processing, distribution, marketing until the product or service reaches the consumer and is disposed of after use. In addition to the flow of the product, a value chain analysis includes all the actors involved in the chain, the linkages between them and the activities within each link. It also takes into account market demand, buyer requirements, quality standards and local, regional, national and global influences on the chain (Kaplinsky & Morris 2001: 14). A value chain approach allows for analysis on a sectoral and microeconomic level.

The value chain approach goes beyond firm- or activity-specific analysis as it looks at all the actors that play a part of a product or service's life cycle, rather than single enterprises. This contrasts with and extends Porters' (1985) approach, where the focus is the value-adding process within a firm. See Table 3.1 for differences between more traditional business relationships and value chain relationships. A single firm may be only one link in the chain, or the value chain may be extensively vertically integrated, meaning that one actor controls several links in the chain. Regardless, all the backward and forward linkages (and ancillary services provided) are included in a value chain analysis. Important components that a

Table 3.1: Comparison of traditional and value chain business relationships

	Traditional	Value Chain
Information sharing	Littel or none	Extensive
Primary focus	Cost/price	Value/quality
Orientation	Commodity	Differentiated Product
Power relationship	Supply push	Demand pull
Organizational structure	Independent	Interdependent
Philosophy	Self optimizing	Chain optimizing

Source: **(Hobbs et al.**

value chain addresses include co-operation, power relations and trust, all of which are important governance. This regards the different actors in the chain and within each link in the chain (Gereffi et al. 2005; Kaplinsky & Morris 2001; M4P 2008).

3.1.2 Value chain analysis

The value chain approach is a mainly descriptive tool to look at interactions between different actors in a value chain. It forces the analyst to consider both the micro and macro aspects of production and exchange activities. The analysis of a value chain therefore helps to identify strengths, weaknesses, opportunities and constraints in the value chain, both from an economic standpoint as well as an institutional one. This can form the basis for improving the co-operation between the different actors involved and can result in lower costs, improved quality, improved timeliness of supply and/or other key components of competitiveness. In today's markets, competitiveness has become increasingly important, and knowing the constraints and core competencies of one's firm and the value chain one participates in is crucial. By mapping the value chain we get an understanding of how the behavior of other actors plays an important role in a single chain participant's success (Kaplinsky & Morris 2001).

The global value chain approach has built on several frameworks such as the world systems approach, which inspired globalization thinking in the 1970s and 1980s (Bair 2005). In the mid-1990s, Gereffi (1994) introduced the global commodity chain approach. Gereffi's contribution enabled the value chain framework to be used as an analytical tool for normative usage. In the late 1990s, Kaplinsky and Morris (2001) built upon this framework to examine the way firms and countries are interlinked, in order to investigate and explain how globalization has contributed to the increasing income disparities both within and between countries. Gereffi (2005) also made an important contribution by introducing the focus on governance in the value chain and its importance for optimal coordination of the complex transactions in a value chain.

Value chain analyses have been utilized by development practitioners and researchers to capture the interactions of increasingly dynamic and complex markets in developing countries (Rich et al. 2010). The aim of such research can be to design programs and projects that provide support to a value chain, or set of value chains, in order to achieve a desired development outcome. Desired outcomes may include: increased income for a particular group, both in absolute and relative terms in relation to other actors in the chain, increased exports, enhanced use of locally produced raw material, generating employment, making the value chain more efficient or in order to benefit a chosen group (M4P 2008). In the last decade, a number of toolboxes or manuals have been developed, with the aim of analyzing value chains to improve a specific group's position in the chain. This group may be

women, the poor, the environment or small producers (see Bolwig et al. 2010; M4P 2008; McCormick & Schmitz 2001; Riisgaard et al. 2008). Value chain analysis has proven to be a flexible tool that can be used to analyze various aspects, such as economic benefit and chain power, from the point of view of any of the actors in the chain.

Value chain analysis is well suited to understanding how smallholders in rural areas of developing countries can participate, or improve their conditions for engagement, in value chains. This is done through identifying barriers to entry into value chains and other challenges such as power asymmetry and resource disparity. Value chain analysis can make an important contribution to improving smallholder farmers' participation in value chains by revealing the determinants for competition in the chain and can improve farmers' relative power. It can also provide an understanding of what the enabling environment[11] of a value chain can do to support smallholders' market participation, keeping in mind that smallholder farmers often engage in a number of different links in the chain as producers, workers and consumers (Kaplinsky & Morris 2001; M4P 2008; Mitchell et al. 2009; Rich et al. 2010).

3.1.2 From global to local value chains

There exists a large body of literature dealing with global value chains and case studies that focuses on smallholder farmer's participation. Examples of this is the trade of cut flowers from Kenya and Uganda, fresh vegetables and coffee from Kenya and several other developing countries and, cocoa from Ghana, all going to the west (see Dolan & Humphrey 2000; Ponte 2008). Contemporary value chain research has generally been biased towards *global* value chains, and *local* value chains have received little attention in the context of developing countries. Development agencies also tend to focus on supporting farmers in developing countries by identifying profitable markets overseas rather than domestically (Shepherd 2007). According to Altenburg (2007), much less work has been focused on local value chains that might provide viable market opportunities, especially for smallholder farmers. This is supported by Shepherd (2007) who states that: "[The] development of export markets is expensive and complex, particularly where small farmers are involved" (Shepherd 2007: 14).

Export market opportunities can be tempting to promote and participate in in many ways, but smallholder farmers' ability to live up to international production standards, timeliness and required volumes are often not considered carefully enough. This can lead to the exclusion and

[11] The enabling environment is policies, institutions and services that foster value chain development (Shepherd 2007).

marginalization of smallholder farmers if they do not meet these expectations (Gibbon & Ponte 2005). This position is supported by Amanor (2009), who critically examines the World Development Report focusing on agriculture for development and points out a number of weaknesses the report has failed to address . One of his points is the tendency towards oligopolization in food chains that are controlled by large agribusiness and a few major supermarkets preferring to deal with large and medium-sized farmers and who exclude smallholders. This point, among other arguments, has, according to Amanor (2009: 261), led to "growing international concerns about global food chains and supermarkets, and their impact on local and regional economies and on the environment".

Thus, a stronger focus on developing and understanding local value chains in developing countries is needed. This can be supported by the growing focus on local food chains in Europe and America, which is led by environmentally conscious consumers demanding quality, local farm products and which has created specialty and local markets. Producers take advantage of this trend by selling their produce at the growing numbers of local farmers' markets and/or directly to customers in food baskets creating local food value chains (see Gilg & Battershill 1998; Verhaegen & Van Huylenbroeck 2002).

Herr (2007) has made an important contribution to increasing the focus on local value chains by developing an operational guide to local value chain development in developing countries. The aim of this research is to emphasize Herr's focus and study a local value chain where smallholders have a greater role in the coordination of and greater relative power within the network that controls cooperation in the chain, hence contributing to the focus on local value chains in developing countries.

3.2 Analytical framework and research questions

The well-developed global value chain approach provides useful insight into value chains also at a local level. This research and analysis aims at developing and adjusting this approach to an analysis of local value chains. My research approach is based on Kaplinsky and Morris' (2001) conceptual and methodological framework for case study analysis. Their methodology has four main components: (1) mapping the activities in the chain and characterizing the actors participating in it, (2) assessing governance structures in the value chain to understand the relationship and coordination mechanisms that exist between actors in the chain which may need to be restructured to improve the chain. The third (3) component focuses on upgrading strategies based on constraints and opportunities in the chain. Lastly, (4) a calculation of who benefits from participation in the chain is

applied, and followed up by examining how the distribution of benefits is influenced by restructuring the chain through the upgrading strategies (Kaplinsky & Morris 2001; Rich et al. 2010).

Kaplinsky and Morris's framework is modified to include a new section - review of assets. This is to take account of the fact that rural smallholders are asset poor, and that assets, or resources, are crucial in entrepreneurial efforts to build new ventures (Boughton et al. 2007; Shepherd & Wiklund 2005). Another modification is that Kaplinsky and Morris's fourth section on benefits is incorporated into the mapping of the value chain and the discussion of upgrading strategies. This results in using the following analytical framework for the study of the Twawose case; (1) mapping the value chain and value addition, (2) review of assets, (3) governance structures, and (4) upgrading strategies, which will be introduced further below. Research questions are introduced and discussed within these four main research tasks.

3.2.1 Mapping the value chain and value addition

The goal of mapping the value chain is to give a visual presentation of the actors in the chains and connections between them. And to make an overview of the flow (and value) of commodities and services from supplier to consumer, and to show the activities performed in each link. Additionally, the move from a simple value chain to a value-added chain will be explained, and more importantly how the value is added and how much will be analyzed. The mapping of the value-chain is guided by the following research questions:

RQ1) How is Twawose's value chain structured, and why was this organizational approach chosen?

RQ2) *How much value is added throughout the chain and how is it distributed?*

3.2.2 Assets overview

How and whether an actor can capture value depends on how assets are generated and maintained and whether the value chain achieves a competitive advantage (Barney & Clark 2007; Shepherd & Wiklund 2005). Assets or resources are key elements when creating and implementing strategies for developing the value chain. Assets are closely related to the resource-based perspective that focuses on firms internal strengths. Resources or the asset base in this case, are important when trying to understand why some smallholders perform better than others and how they can create and sustain a competitive value chain. Review of assets give a sound, contextual background to suggest upgrading strategies and to assess the case's capability to implement such strategies. Capability, in this case, means smallholder farmers' ability to identify and implement strategies to improve the performance of the value chain by making use of their asset base.

Mapping available and lacking resources is important to understand how, or if, actors are able to move into a new value chain, and reveals both constraints and opportunities for further development of the chain. Effort will therefore be put into mapping Twawose assets, which leads to the following research question:

RQ3) What assets are present among actors within Twawose's value chain, including those present in Twawose as an organization itself? Which assets are absent?

Assets can be defined in various ways, and include skills, capacities of individuals, associations and institutions. There are also numerous different types of assets, the most common groups of assets being physical, human, social, financial, environmental, political and cultural. The focus on selected groups of assets is directed by the nature of the case being studied and the aim of the assessment. The location for this analysis is a rural community in Tanzania. Therefore, when identifying and defining the groups of asset inspiration from community-based development has been central. The asset approach is well-used in community-based development (Green & Haines 2008). Five groups of assets have been chosen to give the necessary overview of Twawose's capabilities to take advantage of opportunities and cope with challenges facing their co-operative when developing their value chain. The chosen groups are physical assets, environmental assets, institutional assets, financial assets, and lastly social and human assets in one, all of which will be introduced briefly.

Environmental assets are determined by the location of the place and its characteristics and climate, which influences what natural resources, such as land and water, are available. *Physical assets* are considered to be roads, buildings and other goods such as animals and equipment that require an investment and where a return on investment is expected. *Institutional assets* include the norms, laws, regulations, policies, trade agreements, services and public infrastructure that either makes transactions or movement of a product or a service easier or more difficult along a value chain. This can also be called the business enabling environment and can be grouped into essential enablers (trade policy, infrastructure, property rights), important enablers (financial services, R & D, standards and regulations) and useful enablers (business development services). The institutional or enabling environment comprises of the state, non-governmental agencies or other supporting instances. *Financial assets* are economic resources. These are tangible or intangible assets that can be used to create value. Additionally, it includes access to financial capital from external sources. *Social and human assets* are human capital, which take the form of skills and experiences such as leadership abilities, experience, education, labour skills, agricultural knowledge and mindset. It also comprises network, capability and norms that facilitate collective action and ability to mobilize resources. Social

and human capital can be considered assets that contributes to the development of other forms of capital (Green & Haines 2008).

The presence and/or lack of assets in a value chain will not only influence the chain leader's ability to upgrade the chain, it may also influence the governance structure of the chain and the distribution of benefits.

3.2.3 Governance structure

When conducting a value chain analysis it is important to understand what is going on between the actors in the chain, what keeps them together, how the relationships are evolving, and how market activity is coordinated by and between actors. This is done by examining the governance structures of the chain. Governance is a dynamic feature that characterizes the relationships or linkages among stakeholders in the chain. It examines how different decisions are made and implemented, how activity is coordinated, and how decision-makers are held accountable. The lead stakeholder(s) in the value chain often has the power to control the terms of participation, influencing other actors' involvement. Governance includes, among other factors, power asymmetry, rule-making, sanctions, and degree of trust and dependence between the different parties (Kaplinsky & Morris 2001). In some cases governance is simply referred to as coordination between actors in the same position or different positions in the chain, where the focus is to make different actors within the same value chain act in a way that leads towards a common goal, which includes efforts that prevent anyone from choosing a different direction based on another agenda (Riisgaard et al. 2008).

Gereffi (2005) highlights access to information, complexity of transactions and suppliers' capability as the key determinants of governance patterns in value chains. Lowering transaction costs, the costs of coordinating activities along the chain, are highly relevant when non-standard products, like dairy products, are being produced in unconventional locations (Gereffi et al. 2005). To mitigate these costs and other coordination challenges, a co-operative governance structure is one organization option where producers are the main driver. Others options are buyer-driven models where exporters, processors or retailers rely on contracting with producers, or more intermediary models driven by NGO's or other support agencies, traders or wholesalers (Vorley et al. 2009).

In this research a focus is on a co-operative. Farmer-led organizations like co-operatives are characterized by a democratic association of voluntary members which works collectively to meet a common goal of mutual benefits. In African countries co-operatives have a relatively long and crooked history which contrasts with the co-operative experience for farmers in the US or Europe

that focuses on local markets (Birchall 2003). There are several reasons for the mixed experience of co-operatives in African countries. This relates to poor management, inappropriate cooperative structures, lack of democracy, corruption, lack of working capital and weak supporting institutions. The point is that there exist different models of coordination. The co-operative choice of Twawose has its advantages, but also its constraints, which is based on the reasons for choosing this strategy and the characteristics of the chosen coordination structures.

The following research question has been formulated to guide the analysis of Twawose's value chain governance:

RQ4) How does Twawose's co-operative governance influence the value chain structure and its ability to pursue different upgrading strategies?

The governance structures of value chains are essential for understanding how participants in the chain can improve their involvement, or increase their power (if desired), in the chain and to understand if this ultimately will benefit the entire chain, or simply one specific group. When analyzing a case and drawing conclusions on findings this has to be kept in mind alongside the fact that governance patterns in a value chain are not static, but are constantly changing (Gereffi et al. 2005). Changing governance patterns are one of the possible lines of attack when formulating upgrading strategies with the intention of improving the value chain.

3.2.4 Upgrading strategies

The purpose of a value chain analysis is to understand the activities in the value chain well enough to be able to suggest how to improve the chain either at a general level, or improve a target group's participation in the chain. There are many different definitions of upgrading a value chain. Pietrobelli & Saliola (2008) state that, "upgrading is defined as innovating to increase value added." Kaplinsky & Morris' (2001) on the other hand, emphasize the importance of seeing upgrading in a wider perspective and as being distinctive from innovation. A third definition is offered by Mitchell et al. (2009: 8) "upgrading means acquiring the technological, institutional and market capabilities that allow our target group (resource-poor rural communities) to improve their competitiveness and move into higher-value activities," which is a specific definition focusing on the human aspect of value chain upgrading. In this paper the definition that will be used is offered by Riisgaard et al. (2008: 7): "Upgrading can be defined broadly as a positive or desirable change in chain participation that enhances rewards and/or reduces the exposure to risks".

There are numerous ways of upgrading a value chain, with four types being referred to in the value chain literature: process-, product-, functional, and chain upgrading. Process upgrading focuses on increasing the efficiency of the production both within links and/or between links in the value chain. One of the most common kinds of process upgrading is improvements resulting in higher yields, higher production and increased sales or increased home consumption, or both. Product upgrading is another option and refers to the quality and specification of the product, being entirely new products or by improving old products. Product upgrading is closely linked to process upgrading, because every change in products is linked to improved processes. Increasing the value added to the product by changing the activities carried out within the firm or moving it to another link is functional upgrading. Other alternatives is to upgrade the whole chain by extending the value chain or moving into a new value chain by using the skills gained in participating in the current value chain (chain upgrading). In value chain literature, case studies indicate that product- and process upgrading are most common, while functional upgrading is difficult to achieve (Kaplinsky & Morris 2001; Mitchell et al. 2009).

The following research questions have been formulated to guide the research and the analysis, with the anticipation that it results in concrete suggestions for change:

RQ5) What opportunities and constraints are present in Twawose's value chain, and how do these influence competitiveness and upgrading?

RQ6) Which upgrading strategies can improve Twawose's value chain, and how are they linked to asset and governance structures present in the Twawose chain?

RQ7) What action points can be identified to implement suggested upgrading strategies, and is Twawose capable of implementing them?

3.2.5 Research model

In this chapter the need of strengthening the focus on local value chains in developing countries has been argued. This research aims at contributing to this through an in-depth case study of Twawose's local dairy value chain. To guide the analysis the analytical framework has been summarized in a research model in Figure 3.2. The research model shows how the focus on assets is included in the value chain analysis. The asset base of smallholders sets the base for establishing, maintaining and developing a value-added chain. Before reviewing assets, the chain is mapped to explain the actors involved, the chain structures, and value added. This order is chosen to provide a ground for understanding the chain before looking into the aspect of assets. Thereafter, the co-operative governance and upgrading is under scrutiny. The research objective is to assess how the local dairy value chain influences the smallholder farmers' livelihood. The type of changes to farmers' livelihood

is, however, not the main focus for this study. The focus is rather on identifying constraints and opportunities in the value chain and whether the farmers are capable of overcoming challenges and making use of opportunities apparent in the chain to ultimately create or increase positive benefits or reduce negative effects generated by the chain.

Figure 3.1: Research model

To execute the research model, a large amount of information regarding the local dairy value chain and its characteristics is crucial. A comprehensive empirical research approach has been implemented to obtain the necessary information.

4. Methodology

The methodology is a framework for obtaining the material required to answer the research questions and is guided by the theoretical decisions that have been made. I chose a case study design because it allows me to do an in-depth analysis that increases the understanding of smallholders' participation in local dairy value chains. In this chapter I introduce the comprehensive research approach taken to fulfill this aim, including the multiple methods and sources of data that were I have used. I will also discuss the data collection and analysis process. Extra emphasis is put on how my research is influenced by the cross-cultural aspect of the study, because it strongly affect the quality of the data used in the analysis, hence the overall quality of the research.

4.1 Case study design

A case study is used to examine a research question in detail and advance the understanding of the research subject: participation of smallholder farmers in local food value chains in rural Africa to improve farmers' livelihood. A case study is a research strategy that focuses on understanding and giving a "thick" description of a case, thereby collecting much information on the dynamics present within that single setting (Ghauri 2004).

Twawose's local dairy value chain was chosen as the subject of a case study because of its particular nature as a co-operative producing goat milk yoghurt. There are no similar known cases in Tanzania that involve adding value to goat milk. Based on the detailed information given in this paper, a model for value addition to goat's milk can be initiated and provide typological ground-work for possible replications elsewhere.

The research design aims to optimize understanding of the problem statement. This research is designed to be flexible and hence has an exploratory design; allowing the researcher to change direction when new information is obtained. Flexibility is the key characteristics of this inductive approach, in contrast to the more structured descriptive research undertaken by others (Ghauri 2004; Ghauri & Grønhaug 2005).

A qualitative approach facilitates broad or "thick" information about the case, and is good for highlighting nuances (Rubin & Rubin 2005). This provides a good foundation for understanding how a value chain may be organized and controlled by its governance structures. When using qualitative methods, variations in local context and perspective of study participants can be more fully understood and portrayed in relation to the cross-cultural environment. As a result, qualitative

research can answer the why and how of a specific issue and help improve existing practices. In the case of Twawose, suggesting upgrading strategies, rather than simply assessing the quantitative value (Maxwell 2005).

There is, however, no definite line between qualitative and quantitative research, they overlap each other, but quantitative methods, such as statistical analysis of quantifiable data, are methods that are not appropriate here. Statistical analysis is in general not very helpful for analyzing new and emerging phenomena in a real-life context, or for understanding how they develop (Ghauri 2004). Nonetheless, in parts of this research secondary quantitative data is utilized, such as the number of goats and amount of milk in an area, which is the foundation for answering RQ 2 that relates to value addition.

4.1.2 Research phases

The research was planned to be implemented by going through four different phases. The research started out by exploring the area of interest; small-scale innovative enterprises in developing countries, and getting an understanding of the potential case study during a preliminary field visit in Tanzania in May 2010. This was followed up by an extensive search of available literature after returning to Norway, resulting in a decision to choose the value chain approach for the analytical framework. This laid the foundation for the follow up field work in January-February 2011, the third phase, which was more extensively planned and more focused by using the analytical framework as a guideline. The fourth phase of the project consists of developing an analysis and producing a write-up of the earlier phases.

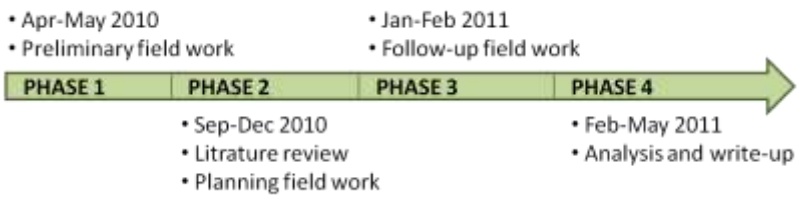

Figure 4.1: Overview of the four stages of the research

4.3 Multiple methods and sources of data

A case-study approach and multiple research questions require the use of a wide range of data sources and multiple methods to access the necessary information. The aim is to produce a more complete and contextual picture of the case in question, as well as the research questions. Underneath the various respondent groups and methods introduced.

4.3.1 Multiple respondent groups

To be able to retrieve all the necessary information during the two periods of field research, a wide variety of respondents were approached. In order to structure the data collection, five groups of respondents were identified and categorized in relation to the main elements of the value chain: (a) dairy goat owners, (b) Twawose leadership group, (c) customers, both current and potential. In addition to the actors participating directly in the value chain, information has also been retrieved from (d) 'experts' that are professors, researchers and extension officers, and (e) similar businesses that enables access to information regarding challenges and possible solutions within the dairy sub-sector.

Respondent selection was done by a process referred to as "snowballing" (Overton & van Diermen 2003). Two key informants were identified during the preliminary research: A professor at SUA and the extension officer in charge in the area. These two individuals provided access to the Twawose leadership group, dairy goat owners (including members of the co-operative and non-members), customers and other experts who provided valuable information. New respondents were approached until the same information regarding the various themes was repeated. After the basic information was collected, new respondents were selected based on the information that was given on upgrading challenges and possible solutions, which were followed up until a sound understanding of the issue was in place. To gather the necessary information from the various respondent groups, a combination of multiple methods has been used.

4.3.1 Interviews

In-depth interviews have been widely used, and can be said to be the oldest and most dominating approach within qualitative research (Ryen 2002). In-depth interviews were used to get a thorough understanding of the case and each respondent's perception of the various themes of the research. It was also used to follow up on observations. The length of the interview was adapted to the type of respondent and what data that was collected. In-depth interviews were used when talking to (a) dairy goat owners, (b) Twawose leadership, (d) 'experts', and (e) similar businesses. Shorter interviews were the focus when talking to customer's buying goat milk yoghurt.

The in-depth interviews were semi-structured, meaning they were supported by interview guides tailored to each respondent group beforehand (see Appendix 2). The interview design is flexible as the interviews were implemented in such a way that they solicit ideas and themes from the interviewees which were followed up in later interviews. Questions were redesigned throughout the period of field work in order to explore new topics and interview new respondents.

Group interviewing is a technique that is used when a discussion needs to be generated among several respondents regarding a specific topic (Askheim & Grenness 2008). In this case, interviews were used to generate a discussion within the Twawose leadership, working in a fashion similar to a reference group, followed up by individual interviews with each individual leader. This was done to gain an insight into the group dynamics of the leadership group, as well as the relationships between individual leaders. Group interviews involved between four and seven participants excluding the researcher and translator.

The second goal of using group interviews was to include members of the leadership in the research as much as possible and to let them have influence over what was being focused on directly by the issues they were facing. In essence, to make this a partly participatory research endeavors. A group interview was therefore used at the very beginning of both main field visits and at the end to wrap up and discuss my findings.

The final group interview with the Twawose leadership group functioned as *respondent validation*: tentative results were presented for the leadership group and findings in light of the respondents' reactions were refined. The goal was to include the main actors of the case study, and others with great knowledge on the topic, in the research to increase the likelihood of the results and suggestions made been as accurate and useful as possible, and in line with cultural aspects. Many researchers are afraid that including the respondents too much will alter the data, but including the respondents can also strengthen the data being analyzed (Silverman 2005).

4.3.2 Observation and written documentation

Information given through interviews was checked against observations. The focus on observation provided an excellent platform for checking if what was described in the interviews corresponded with the behavior of the respondent or community in general. Observation was deliberately used when the goat milk yoghurt was sold at the local market and also when a small and informal period of market research was conducted (see appendix 4 for details). This was in order to see how the group dealt with marketing. Conducting observation of this is a method proven to be more accurate and effective during field work than asking individuals questions about marketing. Observation was also central in the process of developing an overview of assets in the community and what assets Twawose specifically is in charge of, or lack. Observation has also proved to be an excellent way of developing contacts with possible respondents in a complementary manner to using the snowballing method (van Donge 2006).

Finally, the examination of *written documentation* was the final data collection method used. The collection of, and examination, of written documents is another common source of data in case study research (Ghauri 2004). Written documents were collected from Twawose to complement interviews and observations in the field. Documents that were collected are Twawose's *financial reports, records of milk collection, accounts of number of farmers keeping goats in the area, and records of the actual number of goats in the area*. This information was important to understand the background of the case and to be able to answer the research question regarding value addition and the feasibility of different upgrading strategies. When using written documentation, a critical viewpoint has been maintained to consider the quality of the data based on the limited knowledge on record keeping and economics held by the association.

4.3.3 Triangulation

According to Ghauri (2004: 115) "triangulation is one of the defining features of a case study. It refers to the collection of data through different methods or even different kind of data on the same phenomenon". In this case, the goal was to gain a greater insight and a broader understanding of Twawose's value chain and its complexities by checking and validating the information received from various sources; this was of great importance when dealing with upgrading strategies (Ryen 2002). As an example: the performance of the co-operative was discussed in interviews, and was also followed up by an examination of the cooperative's financial records. Additionally, sales and marketing practices were discussed in interviews and followed up with observation of the actual sales process.

Due to the current research being a case study in a developing country, Tanzania, the use of triangulation was important because different methods were needed to gain access to information necessary to the study. In many developing countries like Tanzania there are little or no official statistics or sources of information (Ghauri 2004). During field work in Tanzania an understanding was developed that information is power. This often leads to an ask- and-tell culture where it is not possible to receive any information unless it is specifically asked for, resulting in a time-consuming and necessary use of multiple methods. Triangulation is a useful method for approaching information in different ways, gaining access to it and finally confirming the collected data as being accurate.

Using multiple methods of research, as well as triangulation, is challenging and time consuming. To facilitate research completion in a reasonable period of time, data was structured and analyzed as it was collected, in order to facilitate the navigation of wide-ranging themes and narrow these down as

early as possible. Previous personal experience with research in Zambia and Ghana was helpful and assisted in preparations for doing this type of wide ranging research.

The use of several respondent groups as well as various sources of data makes this research comprehensive. Figure 4.2 has been made to clearly show how the research approach can answer questions in the analytical framework explained in chapter three, and still allow for a thorough analysis in chapter five.

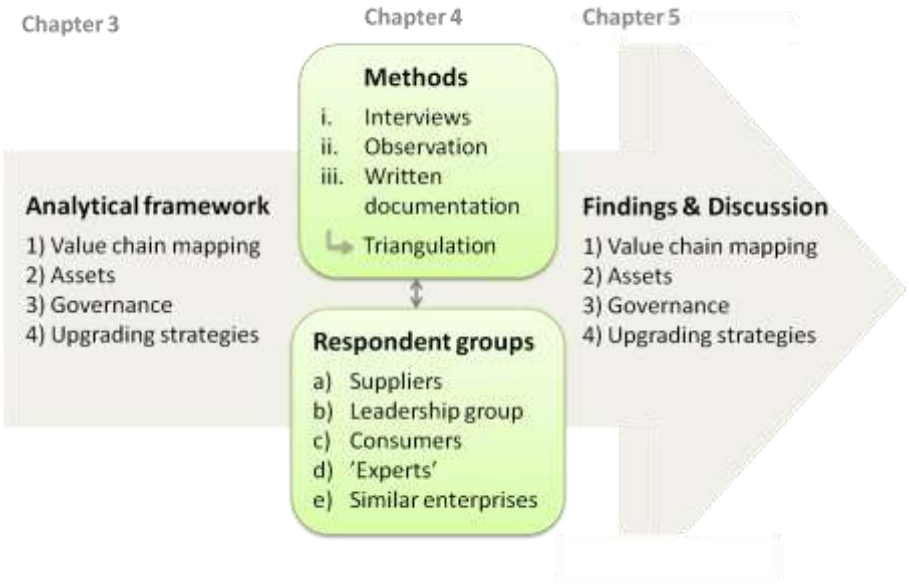

Figure 4.2: Overview of the research approach' link to the analytical framework

4.4 Collecting and analyzing data

The initial field work and collection of data for this study began during an initial visit to Tanzania that began in late April 2010 and ended in May 2010. At that time 37 respondents were interviewed. In January 2011 a total number of 64 people were interviewed. Equipped with a large dose of patience and understanding of the different time perspective, there were no difficulties in getting access to the desired respondents. The majority of respondents were directly integrated in the value chain as suppliers, processors, or customers. Additionally, a cattle milk dairy processor that focused on collecting milk from smallholder farmers was visited in Njombe. A similar operation, located in Morogoro called Shambani Dairies was also visited. Additionally, Meru Goat Breeders' Association MGBA in Kenya, an operation that also produces yoghurt from goat milk, was visited. All three similar businesses to Twawose have provided valuable information on challenges and potential solutions. A more detailed overview of the number of respondents in each category can be found in appendix 3: Research design.

4.4.1 Ethical research

Researchers have a responsibility with regard to how they treat the data they collect. Access to data also means responsibility for how it is presented. Doing ethical research in a foreign setting is according to Scheyvens et al. (2003: 139) "about building mutually beneficial relationships with people you meet in the field and about acting in a sensitive and respectful manner". While in the field all reasonable attempts were made to provide full disclosure about the researcher's interests, context-sensitivity and to think about how this research and relationship can and will affect the members of the community being researched. Scheyvens et al. (2003: 139), goes on to say that "ethical research should not only do 'no harm', but also have potential 'to do good', to involve empowerment," which is the core aim of the present undertaking.

Voluntary participation and informed consent are important ethical aspects of field-work. Only after researchers have explained to the participants of a study what the intended outcomes might be, both for them and the researcher, may the actual research begin. Voluntary oral consent was given by the participants of each interview, before it began.

Research respondents were informed prior to the beginning of interviews that their identity would be protected during the course of the research presented here. Anonymity is important so that the informants feel secure, and understand that participating in the research will not impact them negatively. This has the additional benefit of facilitating an honest and free conversation without influence from other individuals, except potentially the local translator's. This will be discussed below (Desai & Potter 2006). There are a few exceptions made regarding anonymity. Names will be included when using information from interviews of publicly recognized 'experts' such as professors that have agreed to be referenced by name. As they are already participating publicly within the research field through publishing articles and a like, the protection of an anonymized research study is redundant and unnecessary. See list of non-anonymous respondents in Appendix 5.

4.4.2 Use of translator

While visiting the local communities in Tanzania a translator was used. Using a translator posed a number of challenges a researcher would most likely not meet if doing research in this or her own home country. Because an extra link is added to the communication process, the risks of misunderstandings between the interviewee and the researcher are increased. Alternately, a translator who is very familiar with the area may provide insightful knowledge that can support a researcher's understanding of the culture and subject that is being studied (Desai & Potter 2006).

The two translators used in this research, one for each visit to Tanzania, were either current or former extension workers in Mgeta, which gave them extensive local knowledge, but also an important network of contacts with smallholders who were asked to participate in the research. The experience of using a translator can be at times frustrating because the information the respondent gives is delayed and the interviews often take a long time. To reduce this frustration, the research goals, what information was required, and how the circumstances were to be organized was discussed with the translator before the interviews began. Also after the interview the translator was approached to discuss findings, which provided additional insight into the topics that were discussed. As a result, the translators nearly functioned as research assistants and not only as mediators in overcoming a language barrier.

By using a translator considerably more time was freed up to take detailed notes, compared to interviews conducted without the assistance of a translator. This was helpful as a tape recorder was not used while interviewing due to the possibility that such a device might influence the answers of the respondents (Ryen 2002). Community members in the chosen area of study are not used to such technology and its presence could have taken the focus away from the conversation, as well as it might have limited what the respondent want to talk about or what answers they give.

4.4.3 Structuring and analyzing data

Every day, or several times a day, the data collected from interviews as well as any other events of note that were observed were written down in a field diary together with thoughts and plans for the next few days. The written notes were transcribed onto the computer as soon as possible, in order to maintain as much contextual information or other details such as respondents' attitude or reactions as possible. Transcription could not always be accomplished daily due to lack of electricity in the village.

The transcribed notes serves as a collection of all the findings, as well as functioning as part of the analysis. Analyzing data means organizing the data so that themes and structures can be revealed. In qualitative research, analysis begins early on when the first few interviews are examined to make sure the research aim is being met. Data was analyzed alongside the data collection to detect patterns and regularities which made it possible to formulate tentative hypotheses that could be explored further during the research. In this case, various leads were followed up regarding different types of upgrading strategies and also what options each of the strategies had, allowing theories to be developed while they could still be tested on the case at hand (Ghauri 2004).

After returning to Norway, a more structured approached was taken to analyze the data to make sure no important aspects were left out. All the material was read over focusing on one of the four themes from the analytical framework. What the informants expressed as relevant and what was understood by the researcher to be relevant was compared with respondents' statements, looking for coherences or discrepancies between the different respondent groups.

4.5 Quality of the cross-cultural research

When conducting qualitative research the terms reliability and validity are used as quality criteria for the research project. *Reliability* concerns how the data is collected, how the data is used and how it is analyzed reflecting the degree of consistency when different observers, or the same observer on a different occasion, reach the same conclusions (Silverman 2005). *Validity* relates to ensuring that the variables that researchers believe they are measuring are, in fact, what they think they are measuring. Using Silverman's (2005: 380) words validity is 'the extent to which an account accurately represents the social phenomena to which it refers', which is especially important to consider in cross-cultural research.

4.5.1 Reliability and validity of the research

To increase the reliability of the study, great effort has been put into ensuring transparency in regards to how the research has been conducted, as well as into describing the research design in order to ensure that it, along with methods of data collection, are accessible and understandable to the reader. The reliability of this research is further strengthened by placing great emphasis on evaluating the quality of the research that has been done.

Through the application of several types of theories and methods, threats to the validity of a given research problem can be identified and corrected if needed. Triangulation is a way to ensure that valid data is being used. This is accomplished by using several methods that, together, establish credibility and trustworthiness in the data. Additionally, triangulation is used to increase the trustworthiness of data, as multiple sources of evidence essentially provide multiple measures of the same phenomenon. It is not possible to know if the data is correct, but by using triangulation the likelihood of the data being true increases. Triangulation has also been used to reduce the likelihood of misinterpretation (Ghauri 2004). Respondent validation is used as a research technique to improve the quality of the findings and suggestions. The tentative results, in this case upgrading strategies and action points, are tested on the case participants that are meant to implement them. By doing this possible faults or misunderstandings were corrected (Ryen 2002).

In qualitative research *authenticity* is important. According to Ghauri (2004) this is sometimes considered the main issue over reliability. The goal is to present an authentic understanding of people's experience, including their point of view and to interpret it against the background of the context the data is produced (Ghauri 2004). This research is taking place in a different cultural setting than that of the researcher: the Tanzanian culture. As a result, many common cross-cultural challenges must be accounted for in order to be able to portray an authentic representation of the case.

4.5.2 Cross-cultural research

According to Spradley and McCurdy (1972) culture is 'the knowledge people use to generate and interpret social behaviour'(in Ryen 2002: 230) . According to Ryen (2002), the main challenge for those conducting cross-cultural research is learning to interpret the meaning of symbols in the host countries and corresponding cultures, in order to be able to communicate effectively. Additionally, researchers are challenged to analyse the respondents correctly and avoid misunderstandings, interviewer and response biases and not neglect important cues from non-verbal communication. Ryen (2002) emphasizes that by 'sharpening one's awareness' of cultural behaviour related to issues such as age, hierarchical positions, gender, familiarity, ethnicity or religiosity, communicating becomes easier, which often is challenging facing cultural differences.

To overcome the cultural challenges, an emphasis was placed on building trust and focusing on reciprocity. This was accomplished by genuinely being interested in the lives and well-being of informants, by showing that value was given the information they provided. An interests in and appreciation for the local knowledge was expressed by learning about local customs like greeting rituals. Greeting rituals are complex and important in Tanzania, as are social hierarchy rules, when seen from a Norwegian perspective. Tanzania was visited twice for data collection, which gave more time to learn and adopt local customs, such as greeting practices and to learn the basic Swahili phrases. It is, however, not expected of an outsider to know all and adhere to all the local norms. Although, it was important for this research to be accepted into the community to collect the necessary information and some cultural knowledge was therefore essential.

One cultural aspect that had to be considered specifically during this research was the cultural aspect of giving gifts when being welcomed into a person's home or community. Giving gifts are a way of showing reciprocity, which the Tanzanian culture builds strongly on, and questions about gifts in the beginning of an interview were not unusual (Desai & Potter 2006). If gifts are given during field work, it is important to customize the gift to the purpose at hand. Also, it is important to consider social

relations such as formalities, informal friendships and rank, and to do so in a way that it does not influence the reasons for participating in the research or compromise the information given by the respondents (Ryen 2002). During this research, fellow Tanzanian researchers were asked for advice regarding gift giving. As a result of their advice, gifts were not given to individual informants to avoid participation for the wrong reasons, but instead a gift[12] was given to Twawose co-operative at the final group meeting to show my respect and express my gratitude for their open, warmth and supportive manners.

An issue that is difficult to avoid when doing cross-cultural research is the inherent *power imbalances* between researchers and research participants. By recognizing the power dimension it is possible to undertake research in such a manner that the imbalance is weaker. Power imbalances exist on two levels: real differences associated with access to money, education and other resources, and perceived differences which exist in the minds of those participants who feel that they are inferior (Scheyvens et al. 2003).

A researcher from the west traveling all the way to Tanzania, twice, to conduct research, created a superior power relation to the informants. Additionally, being associated with University of Life Sciences (UMB) in Norway and Sokoine University of Agriculture (SUA) in Tanzania, and the projects the institutions run and are carrying out in the location that this research took place might lead respondents to think that researchers come with money. This might potentially influence the information the respondents provided because they want to provide information that helps their chances of receiving external funding. This is a serious concern in data collection, and not an uncommon one when doing field work in developing countries (Desai & Potter 2006). To deal with this properly, it was clearly stated that the researcher did not control any external funds and that it is important to provide the researcher with true information and any information that might be of interest when analyzing the value chain. If important information such as major challenges is kept out it will negatively affect the results of the research. The same questions were also asked to several respondents and some respondents were interviewed several times in order to catch such distortions. Some were also followed up by observation. To reduce the perceived difference, on the part of the respondent, between the respondent and the researcher, all attempts were made to ensure that interviews took place in a location where the informants were comfortable. This served to make the gradient of the power imbalance smaller (Scheyvens et al. 2003).

[12] Two large thermoses and one cooking pot were chosen to be given as gifts, worth a total of 30.000 TZS, based on needs expressed in previous conversations. Additionally, I paid for the yoghurt that was used for samples during the market research, which also can be considered a gift.

From this research and previous experiences, it has become obvious that much can be gained by being respectful, curious, and open and willing to learn, something which helped immensely in conducting research in a culture so different from western culture. This helped at the same time ensure that the authenticity of the people had been addressed, something which positively influenced both the reliability and the validity of the research.

In this chapter, the methods and sources of data used to answer the research questions have been portrayed. Much emphasis has been on being transparent about the research process in order to strengthen the trustworthiness of the analysis. This was especially the reason for focusing on cross-cultural research, because it strongly influences the type and quality of data obtained. The cultural aspect and the various methods and sources of data will be actively used in the following result and analysis section.

5. Findings and Discussion

This chapter utilizes data from both chapter two, which provided the context of the case study, and from chapter three, which outlined the analytical framework used herein. In this chapter, it is argued that Twawose's value chain generates value both for the participants in the chain as well as actors indirectly involved with the dairy value chain. Based on this, it is valuable to examine the chain thoroughly to understand how the value is generated and potentially can be reinforced through upgrading the chain. This will be done by reviewing why Twawose chose the co-operative organization form and how they were capable of doing so by assessing their asset base. The co-operative governance structures of Twawose's value chain, together with their asset base, result in constraints and opportunities in developing the chain. These will be presented and result in a suggested extension to the chain. At this point there is a change of focus from examining the chain to suggesting changes to improve the chain. This is done by focusing on one link in the chain at a time. The growth potential of each link will be discussed, followed by discussing corresponding upgrading strategies to address that potential, which results in action points. It will also be discussed whether Twawose is capable of implementing the strategies suggested and whether the extended value chain is developed to be sustainable, competitive, and generate increased value to the smallholder farmers in Mgeta. Lastly, the chapter will be rounded up by highlighting important findings of the research.

5.1 Mapping Twawose's value chain

5.1.1 Overview of Twawose's value chain

Figure 4.1: Twawose's informal value chain

Before starting goat milk yoghurt production, Twawose's value chain was informal and consisted of farmers selling their surplus goat milk after home consumption to neighbors and small local restaurants (see Figure 5.1). Twawose supplies the dairy goat farmers with medicines through their input supply shop. Other local suppliers provide the farmers with complementary feed. In 2007, when dairy goat farmers started complaining about milk surplus and limited market, the process of starting goat milk yoghurt production was initiated, as portrayed in the case study introduction.

When the concept of processing the milk surfaced it was through the dairy goat association of Twawose and they used their resources, such as their contact with SUA and other foreign researchers to realize this opportunity. There were no actors that already processed goat milk in the region, so there were no obvious private partners to cooperate with to realize the project. It also turned out that the association had the necessary assets to establish a milk collection and processing

center (MCPC) with the support of their network. A small marketing research was implemented in the village with the support from Erling Krogh (2010), a Norwegian researcher from University of Life Sciences (UMB). Monetary support and training on yoghurt production was provided by Sokoine University of Agriculture (SUA). The final stage to realize the idea was a workshop held by SUA professors on various organization forms. Because Twawose already had a relatively strong association and the idea was born internally it was, according to the farmers and professors at SUA, natural to choose a co-operative organization.

Another organizational alternative could have been to contract out and sell the goat milk to an external stakeholder. Starting on one's own requires a substantial amount of resources, both financial and human. It is also related to high risk and requires assurance of quality and supply at all times. When contracting out it is the external stakeholder who mainly deals with these challenges. Alternatively, an independent enterprise could be established in Nyandira by an individual farmer that contracted with Twawose or directly with dairy goat farmers. Through interviews with dairy goat farmers in Mgeta, including Twawose leaders, neither of these organization forms represented a valid option because there was no external actor present to contract with. Additionally, when processing the milk in Nyandira it was important for Twawose, a highly collective association, to share the value-added among the members of the association. The choice of starting a co-operative was also natural because the new enterprise would have great use of the resources Twawose had accumulated over the years, especially regarding governing and developing an association.

Twawose is today both an association of dairy goat owners and a participatory, farmer-led co-operative processing goat milk yoghurt. Twawose comprised of 68 members in January 2011. The number of members is increasing and in 2010, twelve new members signed up. Selling milk to the MCPC is only one of the reasons why people decide to join the group, the others are access to artificial insemination at a lower price, buyer network for live goats and knowledge and training in goat husbandry. *"I became a member of Twawose because it was the easiest way of getting training on goat husbandry" (Male goat owner Mwarazi).* Another reason was given by a different dairy goat farmer: *"I became a member of Twawose because they make it easier to sell live goats since many contact them about buying dairy goats. When I became a member I also did not have to pay the fine for selling goats through them." (Female dairy goat owner, Nyandira).*

The yoghurt production started in January 2010 when the MCPC building was renovated to meet milk processing standards, a process guided by SUA professors. 15 of the 68 Twawose members were trained in yoghurt processing and every three months there is a rotation among these of which two

are producing the yoghurt. This ensures constant production even when illness, or other reasons for not showing, occur. There is one appointed MCPC manager that is appointed for two years and a board of 8 that is elected every three years. The MCPC manager reports to the same board as the association. The organizational map can be seen in Figure 5.2 with the green squares being the association and the orange squares constituting the co-operative.

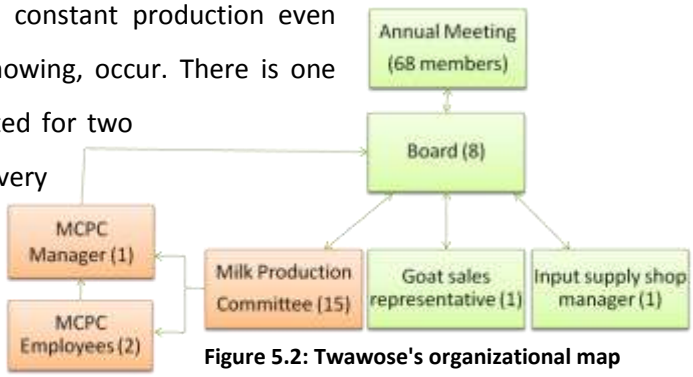

Figure 5.2: Twawose's organizational map

By establishing a co-operative, running a milk collection and processing center (MCPC), two upgrading activities are realized: adding value to the milk (functional upgrading) and enhancing horizontal coordination among the farmers through the formation of Twawose co-operative, although based on the already existing association. Twawose, through their co-operative structure, controls at this point most links and activities within the value chain, hence a vertically integrated value chain (Riisgaard et al. 2008). The heart of the dairy value chain, when value addition is in focus, is milk processing. That means that the MCPC, managed by Twawose, is the chain leader controlling the chain.

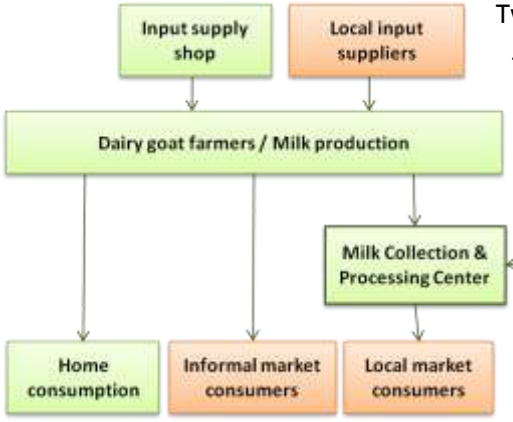

Figure 5.3: Twawose's semi-formal value chain

Twawose's upgraded value chain is mapped in Figure 5.3. The green boxes are the links or links that Twawose controls and the orange boxes are controlled by others. Local retailers supply the MCPC with sugar, fire wood, used water bottles and small equipment like cooking pots. The changes to Twawose's value chain have resulted in a transition from an informal chain to a semi-formal value chain. Before, the milk was traded by the dairy goat farmers themselves at the informal local market. Semi-formal means that the yoghurt production is organized through a formally registered co-operative, but still sold informally at the local market, hence semi-formal. Twawose's upgraded value chain has resulted in new actors and activities in the chain.

5.1.2 Key actors and activities in Twawose's value chain

In order to obtain yoghurt from raw milk, several actors and processes are involved. The main actors in Twawose's value chain are goat owners that supply milk and the farmers working at the MCPC. See Figure 5.4 for an overview of activities and corresponding costs in Twawose's value chain.

Figure 5.4: Overview of activities and costs in Twawose's value chain

Dairy goat owners that produce goat milk consume milk at home, sell it at the informal market, or sell it to the MCPC, or oftentimes a combination of these activities. Findings from interviews with dairy goat owners reveal that the majority of them keep approximately one liter of milk for home consumption. The rest of the milk is sold to the MCPC if the farmer is one who is allowed to deliver milk two days a week the MCPC accept milk. Because only a limited amount of milk is processed, supply restrictions have been made by the MCPC. The farmers usually milk the goats twice a day, in the morning and in the afternoon, and walk up to one hour and a half to reach the MCPC. When selling to the MCPC, the farmers have to be there before 8 a.m. At that time the milk is controlled and recorded for payments (800 TZS per/liter) through the local branch of the Savings and Credit Cooperative Societies' (SACCOS).

Through observations the role of the two employees at the MCPC was mapped. They receive the milk, control and record the milk, process most of the milk[13] into yoghurt, and distribute and sell the yoghurt at the local market. Processing 15-25 liters of milk takes about 4 hours using fire wood for heating the milk and a cold water bath to cool the yoghurt down and keep it from going bad until the following day. The next day the yoghurt is poured into old cleaned water bottles (see Picture 5.1), 0.5 and 1 liter bottles, to be sold at the local market day

Picture 5.1: Filling yoghurt on old water bottles Photo: H. Lie

[13] Some of the milk is sold fresh to local restaurants, or heated to local customers that ask specifically for that. This is however not focused on in this analysis since it constitutes little (9 %) of the total amount of received milk.

twice a week (Mondays and Thursdays).

The two processors are responsible for selling the 20-25 liters of yoghurt that is produced, using direct marketing and sales strategies. First they make one round selling the milk. The second round they collect bottles (if bottles are not returned the consumer has to pay an extra 100 TZS) and money. At the end of their work day the bottles are cleaned to be reused, and the cycle starts over again two days later.

5.1.2 Value addition and value creation

To successfully value-add any product, it is important that it leads to a viable and sustainable business. In this case, it is also important that the value accrues the smallholder farmers. Considerable steps have been taken to add value to the goat milk and develop a value-added chain which includes activities such as bulking, processing and collectively accessing local consumers. The quality of the data collected related to value addition is limited. This is due to lack of record keeping routines and cost knowledge among the Twawose leadership, which was confirmed when studying the numbers received from the Twawose leaders. The calculations must therefore be taken as an approximation, but they do serve to prove the main points of this analysis.

Goat milk is increasing 50% in value when being processed into yoghurt. The value is distributed along the chain. About 42 %[14] of the value goes to the milk suppliers and 37 % remains in the processing link, when including costs of production. See Table 5.1 for further details on value addition. The calculation is based on estimated costs of keeping dairy goats in Mgeta (see appendix 6) and Twawose's annual financial records from 2010 (Table 5.2), supplemented by interviews to get a complete overview over costs.

Table 5.1: Calculated value added generated in Twawose's value chain

	Suppliers	MCPC
Volumes traded (liter)	21,3	20,9*
Value added per liter (TZS)	800	800
Share of value added	50 %	50%
Daily value added (TZS/day)	17.040	16.720
Yearly value added (TZS)	1.704.000	1.672.000
Share of value added minus costs	42 %	37 %

Suppliers of goat milk in Twawose's value chain are supposed to receive an additional income when profit is distributed at the end of the year. However, during interviews with board members and several suppliers it was clear that this profit distribution was not implemented at the end of 2010.

[14] The calculation has not included workload.

The reason given by the board was that 2010 was a pilot year and only in 2011 would they decide to formally start with yoghurt processing, something they have decided to do. Based on the profit from 2010, 288.000 TZS, and the intention that 50% of the profit will be distributed to the farmers, a calculation has been made to provide an example of how much a farmer could expect to receive. The farmer's profit was going to be divided based on amount of milk they have supplied in the past year. It is assumed that one farmer supplies the MCPC with five liters of milk every other day that the MCPC accepts milk. This results in a 17.280 TZS at the end of the year bonus for that dairy goat owner. This can be a motivational factor for supplying the MCPC instead of the local informal market directly where the price usually is 1000 TZS (seasonal variations occur) compared to 800 TZS at the MCPC. Not including the bonus he would have received 23% more in instant cash if selling at the informal market compared to selling to the MCPC. This is, however, only the case when the purchasing power is high enough among the local farmers. This is not always the case based on seasonal income from vegetables and might result in no income at all from milk some days. On the other hand, if that one farmer decided to sell milk at the MCPC he would have received only 31 TZS less each liter if the profit bonus is included.

Table 5.2: Twawose's 2010 financial records

	Costs	% of costs
Income	3175800	
Raw material	1919200	66,46 %
Gross profit	**1256600**	
Allowance	835000	28,91 %
Equipment	45500	1,58 %
Marketing	1500	0,05 %
Other	86600	3,00 %
Total costs (incl. raw material)	**2887800**	**100,00 %**
Net profit	**288000**	

At the MCPC 29 % of the costs is paid as allowance to MCPC workers and to board members when they have official meetings. Labor cost is also considered value added because, for the recipients, the allowance is a valuable contribution to the highly unstable income from subsistence agriculture. The coordination of the MCPC with the circulation of the processing job among a group of fifteen trained Twawose members results in distributing the access to reliable income from working at the MCPC. When one of these trained members is in the role of the processor, it is for three months at a time and the two MCPC employees are paid a combined monthly allowance of 50.000 TZS. This is a decent pay for working four short days a week (two processing days and two sales days), considering 28.418 TZS is the mean monthly income per capita in rural Tanzania (HBS 2007).

Many farmers in Mgeta are subsistence farmers. To these households a constant petty cash income is very important, especially since the little amount of farming products they are able to sell are

seasonal and sold in batches. The value that falls to the suppliers of milk is a very important income to them, in addition to the value that falls to processors, which are also smallholder farmers.

"Income from goat milk is endless, you are ensured to get money. But with vegetables it is difficult to sell sometimes and the price is not good because of a lot of competition or little demand" (Male dairy goat owner, Nyandira)

Dairy goat owners interviewed during my field visit also stated that they were enabled to pay for their children's school fees through their goat earnings. One dairy goat owner was even able to send his children to a better school in the city. In addition, some were able to improve their houses. In studies conducted by UMADEP (2001), 80 % of dairy goat keepers in Mgeta pay school fees for their children from dairy goat earnings.

The MCPC also benefit other actors in the value chain besides dairy goat farmers. The MCPC are dependent on buying sugar, old water bottles, plastic cups, pots and other small equipment. This represents valuable income for local retailers. Literature suggests that each dollar of additional value added in agriculture in Africa generates $0.3-$0.5 of additional rural non-farm income (Haggblade et al. 2010).

A third way of looking at value creation is in a non-monetary way. Knowing how to process yoghurt and control milk quality provides the smallholders with an increased skill base. Milk contributes to reducing food insecurity and improving the household nutritional value, which is confirmed by studies conducted by Eik et al. (2008). Starting the MCPC can facilitate increased motivation to produce more milk and may result in more farmers to acquire dairy goats in surrounding areas. This can result in more people having access to the nutritional milk in surrounding areas that currently have limited access to milk.

5.1.2 Summary of RQ1 and RQ2

RQ1) How is Twawose's value chain structured, and why was this organizational approach chosen?
RQ2) How much value is added throughout the chain and how is it distributed?

Twawose's value chain has been mapped and explained through a figurative and explanatory introduction. The co-operative organizational approach was chosen because the idea of starting a MCPC was born internally in the dairy goat association Twawose. Because there were no external contractors available and Twawose had the asset base necessary to implement such a value addition,

the decision to start a co-operative was taken based on the desire to distribute the profit when locally adding value to goat milk. The amount of value added in each link of the chain has been shown, demonstrating that the smallholder farmers positively benefit from participating in the chain. All value is distributed locally because of the local vertically integrated chain controlled by Twawose. The non-monetary value and ancillary value created has also been assessed and showed that Twawose's value chain also contributes value to persons beyond the smallholders directly participating in the chain. This examination of value created and distributed by Twawose's value chain emphasizes the point of examining Twawose's dairy value chain to suggest how it can be improved and upgraded to potentially increase the value created. This sets the ground for examining the asset base that was crucial for Twawose's initial value chain upgrading; going from an informal to semi-formal value chain. Lacking or available assets are equally important when considering strategies for continued upgrading of the chain.

5.2 Twawose's assets

Figure 5.5: Overview of Twawose's assets

"Asset mapping is a process of learning about the resources that are available in a community" (Haines & Green 2011: 12), or in this case, within a local value chain. The focus here is on which assets are present or missing in Twawose's value chain, revealing both weaknesses and strengths in the chain and related to Twawose as the chain leader. The assets that will be reviewed are environmental, physical, institutional, financial, and social and human assets, respectively. This review is summarized in Figure 5.5 where the available resources are shown above the line and the missing assets below the line. All information, except where stated otherwise, is gathered by interviewing all the respondent groups, except for similar businesses, included in the study and supplemented by observations and secondary data.

5.2.1 Environmental Assets

The location of the three villages in the Uluguru Mountains, the location for Twawose's value chain, provides a cooler climate than the average in Tanzania. For the co-operative, this means a great deal because the Norwegian goats thrive better here than in other warmer locations. It also gives room for temporarily storing the yoghurt over night using only cold water. There is good water access most of the year, but during dry seasons it can be unstable. The area has a challenging terrain and long distances between villages, which impacts both the delivery of milk to the collection center and the distribution of the yoghurt.

There is pressure on the land available for farming and grazing, forcing the smallholders to walk with their goats, in leashes and mouth guards, to find adequate land where they are allowed to graze. A no-grazing policy can be implemented, but results in higher feeding costs. This influences the decisions of keeping a larger herd of dairy goats. It might influence positively if the return of investment in complementary feed is big enough, and given that there are not many alternatives to increase income, because the lack of available land is a bigger challenge if solely pursuing farming. Keeping dairy goats is a relatively new and positive resource in the area, considering the natural environment.

5.2.2 Physical assets

The following aspects are all considered to be physical assets. Twawose's members all own goats, as this is a prerequisite for joining the group. The introduction of dairy goats is thanks to their network and combined effort by SUA, UMB and UMADEP. The MCPC has access to an increasing amount of milk from Twawose members, as well as non-members that are at times allowed to sell to the MCPC. Twawose owns a building, which is the building constructed to serve as an input supply shop. One room in the building is renovated to meet the standards of processing, a crucial physical asset to establish the MCPC. Currently Twawose own enough equipment to process a maximum of 60 liters of milk a day, which means that if they want to scale up to process more they will need additional equipment. In the building there is no sales outlet or shop to sell the yoghurt from.

There is lack of some important physical assets to further develop the chain. There is a need for a packaging machine, including proper packaging material, if a larger production is going to be produced and sold in new and possibly more distant markets. Currently, the yoghurt is sold in old water bottles, which is not an adequate way of packaging if selling to markets outside the local market. Even local market customers raised concerned with the use of old cleaned water bottles during interviews. A better cooling system than today's use of cold water is also necessary. A

refrigerator or a freezer, and possibly a way of cooling the yoghurt during transportation, is crucial to reach larger markets.

5.2.3 Institutional Assets

The infrastructure in the area is rather poor, and infrastructure is an essential element of forming and developing value chains. There is no electricity available in the village, except that from a few generators. This is within the norm, as only 40% of communities in Tanzania are electrified (Kinda & Loening 2008). There is a major drawback for yoghurt production because it is fairly dependent on the ability to store the yoghurt in a cool place before distribution. This leads to another infrastructural challenge; poor road conditions. Steep and curvy roads that are muddy and slippery during the rainy season are the situation in the area. This impacts the suppliers of milk and the co-operative's ability to deliver yoghurt on time to customers.

There is a relatively good cell-phone connection in the area, which is an important asset to access information and coordinate the chain. Cell-phones are charged at the local market board that owns a solar panel, and offer charging services, or at other small business using a generator. Despite the cell-phone connection Twawose has limited access to information. The co-operative does not know about the vast amount of information available that can benefit their business development. This regards everything from animal health, breeding and clean milk production, to processing equipment, transportation and storage of milk, to potential markets, product price, business strategies and advice services, and other possibilities and solutions.

On the other hand there is an extension officer present in the village, at times even two; one state financed, the other an UMADEP initiative, which the co-operative can approach for advice. However, the extension officer's main focus is agricultural practices and not business development. As a result, the extension officer can give information and advice on goat husbandry and likewise, but not on new market options or the price of a packaging machine for example. This is mostly due to limited time and resources for the extension officer in Mgeta.

The area is, however, popular for researchers in different fields giving the villagers a continuous input of information from the outside, although not necessarily on what Twawose want or need, but this information can lead to unexpected outcomes. As an example, a non-profit project has been established in the area where goats are given to empower orphans. The project was initiated by Erling Krogh (2010), an associate professor at UMB, after spending much time conducting research in the area. In addition to visiting researchers, SUA has provided training on goat husbandry and

breeding practices, but it is not a service that is given regularly or when requested as it is highly dependent on financial support from the university or research projects. At the moment the official SUA-UMB collaboration projects on dairy goats in Mgeta are no longer operating and such training is no longer offered even though it is needed to secure proper complementary feeding of goats to increase milk production and to ensure quality milk.

The membership in Mviwata, the farmers' groups association, also provides an outlet for discussing challenges with the aim of reaching solutions. This and the other information channels, shows that Twawose has a fairly large network and there is access to some information, but not unlimited access. The available information is irregular and not on their terms.

When it comes to laws, regulations and policies, essential elements of the institutional and enabling environment, which influence Twawose's value chain, a complete overview is not in place. Part of the reason for this is that Twawose's value chain is not greatly affected by this due to the micro-scale production of goat milk yoghurt. A few factors can be pointed out however, although they do not specifically focus on Twawose.

Tanzania has gone through a development of the dairy sub-sector and continues to do so through the Dairy Industry Act, 2004, formulated to address the needs of the sector. The Smallholder Dairy Development Program (SDDP) has tried to facilitate a restructuring of the dairy sub-sector to benefit smallholder livestock keepers through the formation of Tanzania Milk Processors Association (TAMPA) in 2001 and Tanzania Milk Producers Association (TAMPRODA) in 2002, among other activities (TDB 2006). The two associations are useful for smallholders, processors and farmers' groups, but at the time of the field visit in January 2011 TAMPRODA was unfortunately not operating due to financial constraints. Other recent developments are the formation of Tanzania Dairy Board (TDB) in 2005 (Mpagalile et al. 2008). An enabling environment for development of the dairy sub-sector is attempted to be improved, but there is still a way to go. As an example, the Tanzanian government seems unwilling to invest sufficiently in infrastructure that is important in the dairy industry (Mpagalile et al. 2009). This is proved by the power shortage gravely influencing dairy processors all over Tanzania (Navuri 09.03.2011). Luckily this does not affect Twawose since they do not have access to electricity and consequently are not dependent on it, although they would benefit from electricity access.

5.2.4 Financial Assets

Twawose's financial assets are relatively good given that the MCPC is already generating a profit, which was nearly a total of 300.000 TZS at the end of 2010. 50% of the profit is dedicated to be reinvested into development of the value chain and the second half is distributed to the milk suppliers. There is access to savings accounts through the local SACCOS (also an institutional asset), where the money is safely stored until it is decided among the members what the money is going to be used for. From the same place micro financial loans are provided. In theory the co-operative has the opportunity to invest in needed physical assets, with collateral in the production building and equipment that they own. Normally, however, the loans provided from SACCOS are meant for farmers to buy seeds and other necessary farm inputs and not for 'larger-scale' business development like the MCPC. The needed investment to deal with the inadequate physical resources is greater than what can be provided by SACCOS.

External investment is currently out of reach. Twawose's network could in theory provide the necessary capital through either research projects, directly from the university or through individual or NGO support. With the vast options Twawose has to receive external capital through their network, accessing finance is not considered the biggest barrier if the opportunities are recognized and utilized correctly. Briefly summarized, Twawose's financial resources are both evident and limited, but they are available if the network is used in the right manner.

5.2.5 Social and Human Assets

Twawose is comprised of a group of entrepreneurially minded members that mainly focuses on opportunities and solutions and not problems. These, and the motivation the organization has to succeed, are important reasons as to why the yoghurt production was realized in the first place. These characteristics are also to overcome constraints and barriers in developing Twawose's value chain. This high motivation to succeed stems from the ownership the Twawose members have of the MCPC, and would probably not be the same if it was introduced and/or run by an external source. The fact that the foundation for the co-operative is the dairy goat farmers' association that was founded in 1988 has built a strong sense of cooperation. It has given them experience, both organizational and developmental, that has resulted in ability to solve disputes and ability to move forward collectively. This reflects a strong base of social capital.

Twawose members do not have higher education. The highest education of any of the members is secondary school, but several members have received training on various relevant practices. Training has been given on goat husbandry, yoghurt production and an introductory seminar on co-operative

structures, providing the organization with members who are knowledgeable in these subjects. Based on observations during the informal marketing research and several interviews with the Twawose leadership revealed that business skills such as marketing, cost and price setting knowledge and other business development skills are not sufficient and training in these subjects is needed. If Twawose has limited knowledge about cost of needed equipment and the impact changes might have on the profit margin. This was confirmed when discussing the increase in price of selling yoghurt in Morogoro, which requires fairly costly transportation if small amounts are sold. This could lead them to making poor unstrategic choices and poor investments. On the other hand, the same network could also play a supportive role providing business advice.

Information rich individuals, such as the older members of the co-operative, who have received much training in goat husbandry and yoghurt production, are good assets and appear to share their insights on a continuing basis with the less knowledgeable. One of the first Twawose members said: *"I sometimes offer advice on goat husbandry even when they [other goat owners] do not ask for it. I comment on a goat if it is not looking well and advise them what to do to make them better" (Male dairy goat owner, Nyandira).* This is an important aspect of a farmers' group and of continuing importance when many of the farmers that have been trained are getting older and new, younger goat owners are the majority of Twawose.

Twawose has, as previously mentioned, a large network consisting of collaboration with SUA, Mviwata, extension officers, local NGOs like SACCOs and UMADEP and so forth. According to an 'expert' working closely with Twawose and other farmers groups, the large network outside the village is somewhat unusual and differentiates the co-operative from others. A large network is highly valuable in making up for and/or enabling access to missing critical assets (Casson & Wadeson 2007). Nevertheless, being dependent on others that have limited time and resources for information can be discouraging. This is apparent in Twawose's case. Currently, they are in need of information about new markets and new equipment, but nobody in their network that has been consulted has gotten back to them. Based on interviews with various groups the reason for this might be that the network was not formally asked for advice, but challenges was rather mentioned briefly when a researcher or professor was visiting because of a different matter. To achieve support from their network Twawose has to make more formal requests for support based on concrete plans of action. They cannot always wait for the network to come to them, or expect that briefly mentioning a challenge they have to a researcher or professor result in any action, although it sometimes does. If Twawose is going to develop the dairy value chain considerably they must use their network more deliberately and actively if desired changes are to be realized.

Culture and norms can also be considered social assets. Complying with norms, or at least being aware of them and knowing how to deal with them is of critical importance for success when establishing and developing a value chain, especially when introducing a new product to the market. From a socio-cultural point of view, it is debatable because drinking goat milk may not be seen as common practice in the Tanzanian culture. The villagers in Mgeta have come to like it despite the stronger and more characteristic smell and in comparison with cow milk. Dairy goats were chosen over dairy cows when the dairy project was initiated in the area. Goat milk is now very popular in the area and there is a high demand for the milk, especially now that the consumers know the benefits of drinking goat milk regularly. Other areas are, on the other hand, not accustomed to drinking goat milk, and this is especially true for towns that have limited access to goat milk. The lack of familiarity with and traditions for consuming goat milk may be a major drawback when introducing goat yoghurt to new markets. Also, much of the strong characteristic flavor and smell disappears when the milk is processed into yoghurt, but the awareness of the difference might still be a barrier for people to even try the yoghurt. Moreover, goat yoghurt will compete with yoghurt from cow milk that is now widely available in urban areas already. This aspect will consequently be important to keep in mind when choosing new markets and corresponding marketing strategies.

5.2.6 Summary of RQ3

RQ3) What assets are present among actors within Twawose' value chain, including those present in Twawose as an organization itself? Which ones are absent?

This section has described Twawose's situation with respect to assets, and its ability to mobilize resources which are both important aspects for establishing Twawose's value chain. It was confirmed that the pooling of resources through establishing a dairy goat association was important for starting production of goat milk yoghurt in Mgeta. Future development of Twawose's value chain also depends on their asset base and ability to mobilize resources, which affects what upgrading strategies Twawose is capable of implementing.

From the examination of the assets above, it is clear that Twawose' value chain possess many assets but at the same time is lacking some. Dairy goat owners hold the critical assets of dairy goats and important training on goat husbandry, although there is a various level on this. On the other hand, they need more information and higher knowledge on complementary feed. They are also negatively influenced by poor infrastructure and long walking distances. The strongest and most critical asset of Twawose, as the chain leader, is their collective organization with a relatively long history and active membership. The network that has been built since the establishment of the association is also a

critical asset. This network has supported them to where they are today without taking control of the development or management of the value chain. Based on the value chain's location in a poor rural area in the mountains it is inevitable that there is a lack of assets, which will influence the continuing development of the chain. Examples of these are infrastructural challenges like poor roads and no electricity, and limited access to information and finance.

However, the interconnected relationship between different assets can solve challenges that otherwise would not have been met, or reinforce challenges. For example, in Twawose's case, a packaging machine and a refrigerator both depend on electricity, which again depends on external funding. Although, if Twawose take the right steps, their network can support them with overcoming challenges. Assets, or ability to mobilize assets, are hence critical for upgrading Twawose's value chain, and how capable Twawose, as the chain leader, is to implement the necessary upgrading strategies. The assets that are present or lacking in Twawose's value chain also influence the governance in the value chain, which will be examined in the next section.

5.3 Governance

The fundamental reason for choosing a co-operative form of organization when starting with yoghurt production in Mgeta was to facilitate participation of all the Twawose members in the value chain. This was implemented by using the combined asset base of all Twawose members with the intention to share the value added among the Twawose members actively involved. According to Holloway et al. (2000) producer marketing co-operatives can effectively reduce transaction costs which may enhance market- and value chain participation for farmers. Transaction costs can be defined as "the pecuniary and non-pecuniary costs associated with arranging and carrying out an exchange of goods or services" (Holloway et al. 2000: 280). Examples of such costs can be searching for someone to exchange goods and services with, taking into consideration their trustworthiness and bargaining to reach an agreement, transferring the product (transportation, processing, packaging), and finally monitoring the agreement. Raw milk is highly perishable, especially in tropical environments, leading to increased risks when there is a long distance to markets, implying high transaction costs. How the milk reaches consumers or is processed into less perishable forms controls how high the transaction costs are (Delgado 1999; Staal et al. 1996).

A dairy co-operative can reduce transaction costs facing individual producers by lowering unit collection costs through pooling, making inputs available, and enhancing bargaining power. Co-operatives are also good from a processor perspective making milk supplies more reliable. Buyers of dairy products can also experience lower transaction costs because co-operatives reduce the need

for information about widely dispersed and small-scale sellers of milk (Staal et al. 1996). To lower transaction costs it is important to develop strong bonds among the actors of the chain through trust, reputation and mutual dependence.

How Twawose has been able to mitigate the transaction costs and facilitate participation of Twawose's members in all links of the chain and where there are challenges, will be discussed by studying the governance structures of the value chain. Three critical success factors have been identified and analyzed respectively. These factors are trust and commitment, ownership and power relations, and management. These factors attempt to capture some of the most important decisions that have to be made when organizing and carrying out a dairy value chain, as well as its importance when considering upgrading strategies. However, the list is by no means exhaustive, but is based on theoretical guidelines (Gereffi et al. 2005; Kaplinsky & Morris 2001) and supported by findings during field visits.

5.3.1 Trust and commitment

In the value chain literature, trust is often operationalized as transaction security. Both parties of a transaction, in this case the buyer and seller of milk and/or yoghurt, must be willing and able to fulfill their part of the transaction. It is vital that they can count on the other party to do the same (Szabó 2009). In a value chain, there are several transaction points where trust has to be in place. Trust among members, as well as between the members and the management, including individual leaders, is important. Trust between officials such as extension officers and others that make up the network is also important. "Trust in co-operatives is usually considered as one of the main advantages which can help co-operative members to realize their economic and non-economic aims" (Szabó 2009: 7).

Throughout this study trust is confirmed as an essential factor to ensure reliable supply of products; milk and yoghurt. From a farmers perspective trust is related to reliable payment, and from a processing stand point it is a dependable and high quality milk supply. From a consumers perspective trust is seen through the consistent quality and supply of yoghurt. An important finding of this research is that the farmers tend to have a more short-term focus regarding the sales of their milk whereas the people in charge of the MCPC are considered to have a more long-term focus with a specific focus on reliability and quality of milk supply. The farmers' short term orientation for profits causes the farmer to sell to the highest bidder, often resulting in direct sales to the informal market instead of selling to the MCPC. Selling to the informal market leads to higher revenues with an average price of 1000 TZS a liter in Mgeta compared to 800TZS at the MCPC. This increases

transaction costs between milk suppliers and the MCPC, and is a constraint to scaling up production. Additionally, some farmers tend to add water to the milk to increase their revenue. At the MCPC relatively strict quality requirements are in place to avoid poor quality milk and non-committed suppliers who may add water to the milk, for example.

However, selling to the informal market also has its limitations. A farmer can never be sure whether he can sell all his milk due to lack of purchasing power among the farmers in Mgeta, and if the customers do not have money at the time they might be forced to sell on credit.
"I try to sell milk to my neighbors for 800TZS. It is popular but they do not always have money and that forces me to sell on credit. I do not like that because I never know when I will get my money. The money from the center I save up for one month and then I buy juice and pay school fees." (Female dairy goat owner, Nyandira).

In this sense the MCPC has an advantage because they are able to offer secure payments and relatively steady markets, although this market is small at the moment. Twawose offers secure payments through the local SACCOS branch where the farmers collect their money when they need it. Finding a steady market is a bigger challenge for the MCPC because they are dependent on a limited local market demand for yoghurt. As a result, the MCPC can only accept a limited amount of milk twice a week, and they are not obligated to buy any, which leads to a low commitment from the farmers delivering milk. In contrast, from a theoretical point of view the co-operative model creates high farmers commitment and ensures a more stable market. This shows that there is room for improvement in Twawose's value chain. Then again, several of the regular suppliers emphasized that they were delivering to the MCPC because they are a part of Twawose and therefore want to support their association by selling to the center. *"Since I am a member of Twawose I want to support the milk collection center [the MCPC] by delivering milk there as often as I can instead of selling milk at the local market." (Regular milk supplier, Nyandira).*

Securing a consistent supply of milk is crucial for Twawose and the MCPC. In other words, it is important to facilitate a sufficient reduction in transaction costs for the goat owners in Mgeta, so that they decide to supply the center instead of the local informal market. According to Staal (1996) transaction costs generally increase with distance, most likely faster than transportation costs alone, due to the increased costs of information and the risk of dairy product spoilage before a buyer is found. There are also costs related to monitoring milk quality and potential losses by either of the chain actors handling the milk. That leaves one with the question whether it is the suppliers or the

processors that should pay for the transportation costs to the MCPC, since it contributes to high transaction costs.

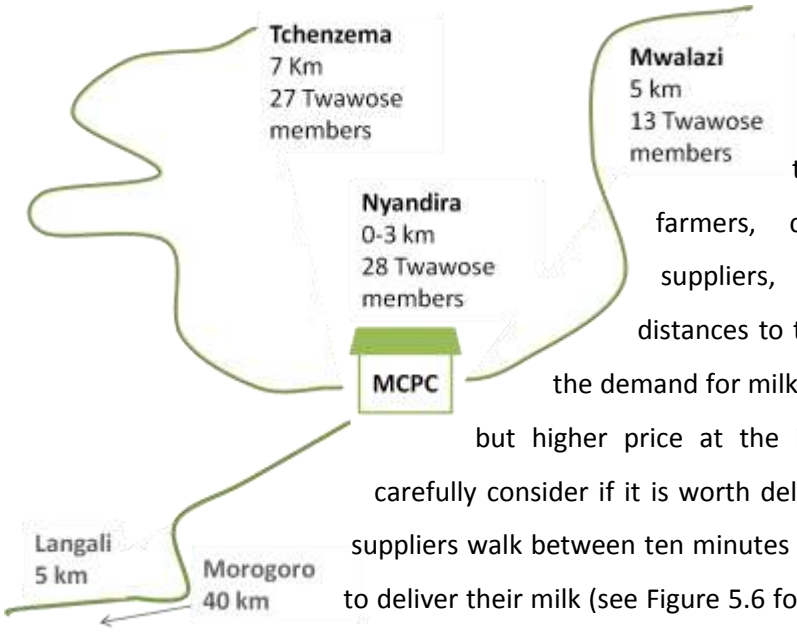

Figure 5.5: Number of Twawose members in each village and distance from the MCPC

In Twawose's value chain the farmers themselves transport the milk individually, hence taking on the cost of transportation. Several farmers, current and potential future suppliers, complained about the long distances to the center and the uncertainty of the demand for milk. This, together with the unstable, but higher price at the informal market, leads them to carefully consider if it is worth delivering to the MCPC. The current suppliers walk between ten minutes up to an hour and a half one way to deliver their milk (see Figure 5.6 for distance from the MCPC located in Nyandira and number of Twawose members in each village). The pooling of milk collection and transport activities has the potential to mitigate costs for the farmers, both reducing the distance and access to market and the information challenge.

Establishing a consistent supply can also be done through improved commitment from both the supply and processing link. A guarantee from the MCPC of buying the same amount of milk all-year round despite the volatile market can facilitate this. In Mgeta there is a significant seasonal variation in the local purchasing power between the high and low season for sales of vegetables, hence a need for more stable income. This can be seen as the difference in the importance of commitment between the two seasons. In the low season (May to August) there are limited sales of vegetables in the area, but still a constant supply of milk, although smaller. During the high season (November to February), there is high purchasing power and a possibility to receive a high price for the milk at the local market. See Figure 5.7 for overview of the variations in supply of milk and yoghurt produced by Twawose in 2010. The

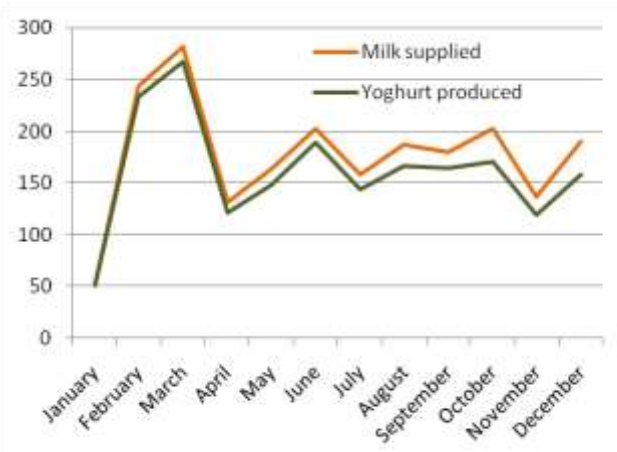

Figure 5.6: Amount of milk supplied and yoghurt produced by Twawose in 2010

challenge is therefore to establish a model for a consistent level of commitment despite the seasonal degree of commitment to sell milk to the MCPC. This goes both ways because farmers want a steady income and the MCPC wants a consistent supply of milk from the farmers, despite the seasonal variations.

Twawose's aim is to only accept milk from members, something they are currently failing to abide by. To date, non-members are allowed to deliver milk if they intend to join Twawose, but the membership intention has not always been followed up. Although, of all the suppliers interviewed only one was not a Twawose member. He had not seriously considered becoming a member because he had not received enough information about why he should join. It seems like this is the case for other dairy goat farmers that are not members of Twawose and who are not supplying milk to Twawose, but who could benefit from a Twawose-membership. This reflects bad information flow between current members and potential new members of Twawose, resulting in low membership recruitment. By allowing non-members to supply milk to the MCPC over existing members, there is a negative impact on the general commitment of the Twawose members to supply milk. Therefore, it is important that the MCPC ensure that only members of Twawose are allowed to supply milk and follow this up with good communication between the MCPC and the suppliers.

The communication in Twawose's value chain is in general not optimal as there are long communication lines due to the remote location of some farmers. Cell phone communication is not actively used because the MCPC does not have its own phone and using a private cell phone for calling suppliers everyday is costly. Regular communication between the MCPC and dairy goat owners therefore goes through suppliers and other smallholders, unless there is a specific issue that needs to be raised. The value chain is characterized by informal and uncertain agreements, but mostly it is affected by the lack of communication. This results in not meeting intended amounts of collected milk based on estimated market demand the following market day. Poor communication is also reflected when a board member was interviewed and it was revealed that a board meeting was taking place later that day without her knowledge.

It is important that the management has well-established communication lines and come forward as good role models so that the members can trust them as a group and individually. All board members were not delivering milk to the MCPC, which negatively influences other members' motivation and commitment. The reason for this was that the Twawose leadership wanted to give the opportunity to supply milk to others that are worse off economically, but this was not communicated. Another example that has not been solved is a dispute with one of the two farmers

that first received training in yoghurt production. This farmer was excluded from all involvement in Twawose, resulting in Twawose loosing valuable experience and knowledge on goat husbandry. Poor communication is something that has to be dealt with in order to attract new members and for existing members to give up their informal market customers and become committed suppliers based on mutual dependence and trust.

To secure a stable demand for products the trust between consumers and processors is crucial. For consumers buying yoghurt it is important that the quality is constantly high and that the availability is reliable. In Nyandira yoghurt can be bought twice a week at the local market, and the MCPC employees sell directly to the consumers. Many of the customers are regulars, meaning committed customers. Customers reported that they are generally happy with the quality, despite slight differences in degree of sweetness and thickness of the yoghurt. The only skepticism relates to the packaging and how clean reused water bottles are. Potential new customers are on the other hand very skeptic to how the yoghurt is made referring to what culture is being used, which controls the amount of bacteria in the yoghurt. A few customers also complained about the sales method because they were busy the one time the sales people passed by their spot at the market, resulting in not being able to buy yoghurt that day. This shows room for improvement in sales strategy.

According to Kaplinsky and Morris (Kaplinsky & Morris 2001), commitment and trust is important, and if it is not high enough to secure a stable supply of quality milk as in Twawose's case, stronger instruments such as rules and sanctions must be established. This will be further investigated by focusing on ownership and power relations.

5.3.2 Ownership and power relations

Ownership relates to who owns and controls the various activities and equipment in each link of the chain, and consequently who receives the potential surplus. This is critical because it influences the bargaining power of the chain actor resulting in either a power balance or power asymmetry (Kaplinsky & Morris 2001). Twawose's co-operative value chain structure provides all farmers with ownership of the MCPC center and rights to the corresponding value addition. All members can influence the decisions being made during the annual meeting or other smaller general meetings. The yearly profit is supposed to be distributed according to participation.

When founding the co-operative the profit from the MCPC was agreed to be split evenly, with 50 % to the members supplying milk and 50 % to reinvestment in the MCPC. This was not implemented at the end of 2010 as discussed earlier. The suppliers seemed to not know about this intention, and

were therefore more concerned about getting a higher price for milk and continuous market to sell the milk. A lack of following up on set co-operative agreements, such as profit sharing, could potentially discourage the suppliers of milk. In this case the situation is rather that the farmers do not know of this agreement, due to poor communication, and will most likely not bring it up. This point's towards a communication failure as opposed to a misuse of power. Also, it is not unrealistic that this was a result of a lack of understanding of how profit sharing can be put into practice given the limited knowledge on business management and only a short introduction on this subject. However, Twawose has a network that could have supported them, if asked to, if they wanted to implement this. This point's towards lack of willingness to execute this among the leadership, a sign of different levels of power within the chain participants. On a daily or weekly basis the MCPC employees and manager have greater power than the suppliers, despite the equal amount of ownership. The amount of milk accepted every week is based on estimated market demand, and is decided by the MCPC manager and employees. The market is, due to limited access, currently small and the power of the market is high because they have the power to control who delivers how much every week.

Rules have been established on how the supply will be organized relating to time of delivery, how many times a week and approximately how many farmers can deliver. Sometimes, one village was delivering one week and another the other week, instead of putting restrictions on how much milk each farmer could deliver. The rules are not followed by sanctions, either positive or negative, because there are no formal contracts. Formal rules have not been agreed upon in the annual general meeting, which is the highest organizational organ, and therefore no sanctions, if desired, can be implemented until that has taken place. Lack of contracts that secure a regular supply to the MCPC and constant income for the farmers is a potential weakness if upgrading the production.

Other methods than using sanctions that secure a constant supply of quality milk includes using price mechanisms and profit distribution among suppliers. Increasing the price for milk was intended to be on the agenda for the 2011 annual general meeting, but this was not confirmed because the visit in the field was over before the meeting was held. This shows that co-operative principles are not always optimal because it leads to a slower decision making process (Szabó 2009).

Customers usually have a high degree of power in a value chain. If they do not buy the product the rest of the chain will fall apart. This emphasizes the importance of constantly paying attention to this link when developing the value chain. In Twawose's case there is a limited demand that controls how much yoghurt is being produced and results in a limited milk supply. Many companies try to give their customers an ownership feeling by branding and marketing the product. This is however

difficult for small co-operatives due to limited marketing resources, but is worth considering if packaging equipment is to be purchased.

5.3.3 Management

The management is in charge of making the MCPC a successful business and their performance is influenced by the motivation of the manager, the MCPC and the Twawose board. In Twawose's case there is one manager that is not paid, but selected for this role based on his relatively high training in dairy processing. His role is to oversee that everything is in order when it comes to quality checks, record keeping, and processing procedures etc. Because the position is not paid but rather based on a collective action in a co-operative, the motivation of doing a good job is thereafter. The manager of Twawose is doing what is expected, but nothing beyond this in order to ensure that the value chain is developing in such ways as securing larger markets.

During the field visits various informants commented that the MCPC employers' payment was too high considering the average payment in the rural areas. Others emphasized that if they were going to increase the processing days the allowance had to increase simultaneously. Others again were arguing that there was no need for two people doing the processing and sales. This was communicated by the board to the current processing employees, but they decided to keep on working together instead of one person getting the total allowance. This is a sign of the collective mindset of Twawose members.

Due to the relatively good allowance the processors, who are the key personnel to secure good sales of a high quality product, have a greater motivation to do a good job than the manager. They are however not incentivized to increase the processing by increasing sales or accessing larger markets, because they are not paid according to performance. They might instead be driven by the wish for the co-operative to perform well and the desire to be selected to be the processing personnel receiving a monthly allowance again soon, as there is no formal rotation of processing employees.

The co-operative has found a good way of securing processing every day by training fifteen farmers in yoghurt processing and rotating the duty every three months between the farmers. This secures that the processing knowledge does not disappear in the case of a sudden death or other unexpected event. Additionally, if one or both of the processing workers are sick one day it is relatively easy to find a substitute, given that the communication is good, which is questionable in Twawose's case.

Neither the manager nor the MCPC employees are in charge of locating and accessing new markets, improving the product or likewise. These strategic tasks therefore fall to the board, which is also in charge of the rest of the activities of the farmers' group. The chances of prioritizing the development of the dairy value chain is uncertain considering that the board also spends time developing a good model for organizing sales of live goats, which provides the smallholders with larger sums of money, although not on a consistent level. Counting on the board for developing the chain might therefore result in the development taking longer than necessary. Overall there is room for improvement on the management side of the co-operative, despite the fairly good organization of the MCPC.

5.3.4 Summary of RQ4

RQ4: How does Twawose's co-operative governance influence the value chain structure and its ability to pursue different upgrading strategies?

In Table 5.3, the levels of power, commitment and perceived ownership of the MCPC among the actors in Twawose's value chain is summarized. The two employees and the manager of the MCPC have the most power in the chain because together with the Twawose board because they have the power to make day to day decisions. Suppliers have little power and as a result feel limited ownership of the MCPC being the heart of the value chain, although they theoretically own the same amount. This has led to a varied degree of commitment among the dairy goat farmers. The suppliers' position in the value chain should be addressed if upgrading the value chain.

Table 5.3: Overview of levels of power and commitment in Twawose's value chain

	Suppliers	MCPC	Twawose board
Degree of power	Low	High	High
Commitment	Medium	Medium	Medium
Perceived ownership	Medium	High	High

The review of the co-operative governance structures in Twawose's value chain and its influence on transaction costs reveals that there is room for improvement in each link. There are considerable transaction costs that influence and control the actions of both individual dairy goat owners and the leadership of Twawose running the MCPC. Based on transaction costs, goat owners decide to either supply to the MCPC or to the local informal market. Various options to reduce these costs have been examined with a focus on the MCPC. The main bottlenecks to implement these changes are limiting production of yoghurt based on limited local demand, which is the foundation for examining potential upgrading strategies.

In the review of the governance structures it was also apparent that the various actors were influenced by their asset base. The lack of access to information, and electricity for cooling directs the activities in each link. For example, Twawose could not accept more than 25 liters of milk because they have limited options of keeping the milk cold so that it can be transported to new markets. This influenced the dairy goat owners' commitment to supplying the MCPC because they cannot supply them every day and not as much as they want.

Co-operative governance structure is a flexible form of organization that can be adapted to solve a variety of challenges such as limited coordination between the links or limited access to information. One of the main challenges in Twawose's value chain is that the decision making process is slow and there are poor communication lines. Someone has to be in charge of identifying challenges and solutions and must also have the power to implement these solutions in cooperation with the members. In Twawose's value chain the MCPC manager, in cooperation with the Twawose board, would be the instance that should be in charge of this. The board has many activities to be in charge of considering they are the leaders of both a yoghurt processing center, an input supply store and other association activities like artificial insemination. With a manager that is unpaid and as a result does not spend much time leading the MCPC, their ability to identify and pursue various upgrading strategies is limited. To deal with this, an idea is to start paying the manager and also consider hiring a more experienced manager.

Altogether, a vertically integrated value chain like Twawose's, based on co-operative principles, stands stronger than other value chains because all actors involved are interested in pulling in the same direction. This increases the chances of achieving the desired governance structures and reduces the transaction costs to the minimum and facilitating for continuing growth. This, and corresponding upgrading strategies, will be reviewed to improve Twawose's value chain and potentially increase the positive impacts generated by Twawose's local dairy value chain.

5.4 Upgrading strategies

5.4.1 Constraints and opportunities in Twawose's value chain

Based on the above findings and discussion about the assets and governance structures in Twawose's value chain, constraints and opportunities have been identified and listed in Table 5.4. The major bottlenecks to further developing Twawose's value chain include the unstable milk supply that is closely related to the limited local market demand, and the lack of proper packaging, cooling systems, no access to electricity, and limited access to information. Overcoming barriers that stand in the way of continued development of Twawose's value chain depends on utilizing opportunities in the chain. Finding innovative solutions to the above stated challenges also plays a critical role in a challenging setting such as this.

Table 5.4: Overview of key constraints and opportunities in Twawose's value chain

	Key Constraints	Opportunities
Production (Collection/ Transporting)	- Milk production low due to poor complementary feed - High demand for dairy goats - Natural high seasonality in production - Unstable supply of milk - Low motivation to supply MCPC - High percentage of milk sale to the informal market	- Annual increase in dairy goats and farmers keeping dairy goats. - Underutilized supply of milk -Pooling of collection and transportation of milk - Increase yoghurt production
Processing	-Variable yoghurt quality - No access to new yoghurt culture - No proper packaging - No electricity - No cooling mechanisms - Investment needed	-Increase processing days - Make active use of network
Market (Distribution and marketing)	- Little local market demand - Limited access to markets - Lack of information - Lack of marketing skills - Inadequate infrastructure and transportation options - Unknown demand for goat milk yoghurt in other markets	-New market outlets - Make active use of network -Information intermediary - Improve marketing skills - Several market opportunities

Based on the list of the key constraints and opportunities in Twawose's value chain, suggestions for extensions to the value chain were made, and a summary is shown in Figure 5.8. There are four new nodes: mini collection center, distribution, market outlets, and new market consumers. These additions are based on the many respondents that expressed that the opportunity to deliver milk every day is the most important factor to substantially improve the smallholders' livelihoods because it generates constant income. To implement this, it has to be followed up with accessing new

markets because the current local market has limited demand and seasonal purchasing power. To reach these markets, new distribution systems need to be put in place and new market outlets must be considered to reach new consumers. In between there are several changes that have to be implemented to realize the development of the value chain. Especially important is to keep the transaction costs low, and to secure high quality milk yoghurt throughout the chain, both without compromising the economic viability of the chain. The next sections will address the potential for implementing the suggested extensions by examining the three current main links of Twawose's semi-formal value chain: production, processing, and market. In each section, various upgrading strategies will be assessed and followed up by pointing out action points that have to be implemented for the extended value chain to be realized.

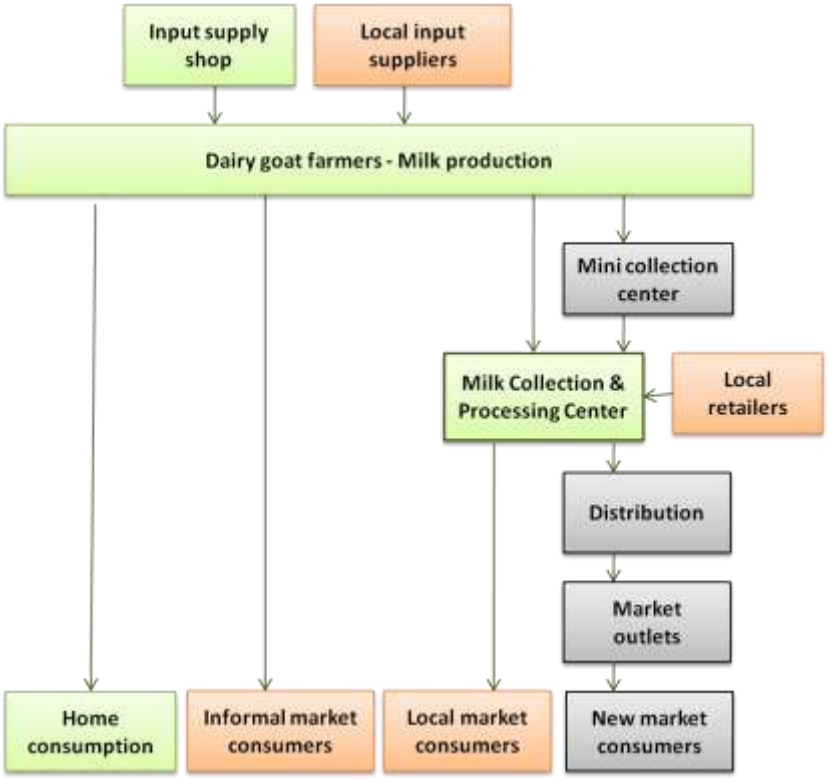

Figure 5.7: Twawose's suggested extended value chain. The blue squares are the new links in the chain

5.4.2 Growth potential and upgrading strategies in the production link

Currently, Twawose members are allowed to supply up to a total of 25 liters to the MCPC combined. The restriction is due to limited local market demand. The goat milk yoghurt is only sold two days a week during market days when people from the surroundings areas come to trade goods. Many Twawose members expressed during interviews that the most important change that could be implemented in Twawose's value chain, was to increase the days goat milk is accepted at the MCPC and preferably followed by an increase in amount of milk accepted too. To address this, the total amount of goat milk in the three villages (Nyandira, Tchenzema and Mwarazi) has been investigated to map the growth potential.

All respondents, from dairy goat owners to Twawose leaders and 'experts', were certain that the supply of milk available is much higher than the 25 liters that is allowed to be sold today. *"More than 100 liters can be collected here at Tchenzema every day. Only four farmers alone can supply 30 liters*

of milk". (Female dairy goat owner and part of Twawose board). This statement was reinforced by a member of the Twawose management who is actively involved in the MCPC who said that: *"there is enough goat milk to collect 100 liters every day. Even more is possible because there are a lot of [Twawose] members that are not delivering now".*

To follow up these statements, an estimation of available milk in the area has been calculated using assumptions given by professor Kurwijila (2011), a renowned dairy technologist working in the department of animal science and production (DASP) at SUA. The calculation is showed in Table 5.5. The calculation is based on the number of dairy goats in the area, number of farmers keeping dairy goats, and average milk yield per goat. The total estimated available goat milk in the three villages is approximately 567 liters every day. Considering that only Twawose members can supply the MCPC, the current available supply is approximately 93 liters. This is a cautious estimation and has not taken into account that today five farmers alone supply the MCPC with 20 liters. This implies, in line with findings from the field visit that Twawose members are keeping more than the average amount of goats and that they tend the goats better due to increased knowledge of goat management, resulting in higher milk yield than the average farmer. Altogether, this confirms that there is greater potential for goat milk supply in the area than what is currently being processed. Advocating for more Twawose members can result in available supply of up to 566 liters. This can be further increased by emphasizing the importance of complementary feeding of dairy goats to achieve the largest amount of milk yield per goat possible. The availability of milk can also be increased by farmers keeping larger herds of goats for milking.

Table 5.5: Estimation of available supply of goat milk in Mgeta

Assumptions	
Number of goats in the 3 villages	1538 goats
Number of female goats in the 3 villages	1186 goats
Farmers keeping goats	382 farmers
Members of twawose	63 farmers
Average amount of goats per farmer	4,0 goats
Average female goats per farmer	3,10 goats
50% are mature females	1,55goats
80% have milk	1,24 goats
2 liter milk average per goat	2,48 liters/day
1 liter for home consumption	1,48 liters/day
Average daily milk surplus per farmer	1,48 liters/day
Supply of milk from Twawose members	**93 liters/day**
Total supply of milk in the 3 villages	**566,8 Liters/day**

The confirmation of the available supply leads to the next challenge of motivating the dairy goat owners to supply milk to the MCPC. According to Riisgard (2008) upgrading a value chain controlled by smallholders often requires stronger forms of coordination between all the links in the chain.

Based on the examination of the governance structures in Twawose value chain, improved coordination is necessary. To increase the coordination between the suppliers and the MCPC, there are several strategies than can be used, and one of the important actions to utilize the excess supply of milk.

Increasing the use of contracts by formulating new informal contracts is one option that can be implemented. Although it is difficult to legally bind farmers in contracts, contracts can be used to improve the communication between milk suppliers and the MCPC. A contract can express the intentions of the MCPC to increase the milk accepted and enhance the trust between the links. Transaction costs will also be lowered because goat owners do not have to spend time looking for buyers. The benefits the farmers receive if they deliver milk to the MCPC compared to the informal market can also be communicated better through informal contracts. This requires the implementation of the 50 % profit distribution among the suppliers at the end of every year.

Another way of increasing suppliers' motivation is through increasing the price of milk. The current price of milk delivered to the MCPC is 800 TZS, which is less than the local informal market price of 1000 TZS. This difference was commented on by several dairy goat owners during the field visit, who repeatedly expressed that this was the main reason for not supplying the MCPC. The Twawose leadership did not concur with the dissatisfaction. They stated that the MCPC price was decided upon together with all members of Twawose at the annual meeting in beginning of 2010. At that time (in 2010) the idea was to implement the profit distribution, which was not realized in 2010. However, the possibility of increasing the price slightly was discussed during a group interview with the Twawose leadership, but no decision was made. In 2010, Twawose had a 135 TZS profit margin per liter of milk received for processing. If the supplier price per liter is increased to match the informal market price, a negative profit margin will ensue if current production levels are maintained. To attract more milk suppliers, the Twawose leadership could count on future economies of scale and could raise the price of milk to for example 900TZS/liter. If not increasing the price, or in addition to doing this, the Twawose leaders can emphasize the benefits of profit distribution and the value of a consistent and reliable market for the dairy goat owners to sell their milk, with hopes that these will be incentives that will motivate the farmers to deliver more milk. This can also be followed up with exclusively allowing Twawose members supply the MCPC to increase the commitment between suppliers and the MCPC.

Increasing the production days of yoghurt would result in a more secure market for goat milk suppliers and would lower the transaction costs. The long distance from farmers to the MCPC is,

however, still keeping the transaction costs high. Pooling of milk collection and transport activities has the potential to mitigate transaction costs for farmers by reducing time spent on sales due to long distances to market and limited access to information regarding demand and prices. During interviews, both suppliers and the Twawose leadership expressed that they wanted to establish small collection centers in Tchenzema and Mwarazi, something that was supported by 'experts', such as Kurwijila (2011). This would lower the delivery time for the farmers since only one dairy goat owner would deliver the bulked milk. In Nyandira, milk can be delivered directly to the MCPC because the distance is shorter. Small collection centers would also lower the risk of farmers selling the milk to customers on the way instead of complying with the agreement of supplying the MCPC and securing a constant supply. To realize a mini collection center, all that is needed is a place to collect the milk, someone in charge of ensuring the quality of the milk and a delivery system for the bulked milk. The farmers from Tchenzema and Mwarazi that want to deliver milk to the MCPC can go together and establish a small collection center in their village. They can learn how to control the quality of the milk and rotate delivery duties on a voluntary basis. This is a model that works well among smallholder farmers delivering milk in Njombe, Tanzania, and in Kenya by the Meru Goat Breeders Association (MGBA).

Table 5.6: Number of villagers, dairy goat owners, Twawose members and distance from MCPC in the three case study villages

	Total population	Number of dairy goat owners	Twawose members	Distance from MCPC
Mwalazi	1780	62	13	5 km
Nyandira	3210	127	28	0-3 km
Tchenzema	2200	193	27	7 km
Total	7190	382	63	

In Mwarazi, the idea of a mini collection center was not well received. A dairy goat owner expressed that the dairy goat owners in Mwarazi do not trust each other when it comes to the quality of the milk. Testing for quality in each village requires that a farmer might have to refuse milk from their neighbors, something they were not prepared to do. The Twawose leadership also expressed that deliveries from Mwarazi to the MCPC had come to an end because water was sometimes added to the milk. This is not accepted at the MCPC, but neighbors might not be able to detect it. There are also not as many farmers that keep dairy goats in Mwarazi, 62 versus 193 in Tchenzema (see Table 5.6 for further details), resulting in a higher local demand for milk in Mwarazi. In contrast, in Tchenzema on the other hand, farmers complain about surplus of milk and lack of market. A mini collection center in Tchenzema therefore seems like a good idea. This is an example of improved horizontal coordination and would not influence the profit margin substantially because the only investment needed is quality control equipment and containers to transport the milk to the MCPC. The actual collection center could be a

dairy goat owners' house or shop. At a later stage if the collection center proves to be successful, buying or building a room for collection could be considered.

To ensure high quality milk, workshops and/or training on goat husbandry is a needed. This is important so that new members of Twawose, who have not received this training before, can learn how to build sturdy goat houses, feed the goats optimally so they produce as much quality milk as possible, treat them appropriately with medicines, and understand the importance of a clean environment when milking the goat. Today, older goat owners do offer advice on goat husbandry, but to secure high milk production and milk quality, good knowledge on goat husbandry should be secured by formalizing the advice and training offered, which can be implemented by Twawose themselves with support. This could also be followed up by the input supply shop offering cheaper complementary feed and corresponding advice.

It has been showed that there is potential to increase supply, but several challenges like poor communication between the suppliers and the MCPC, increase suppliers motivation to supply the MCPC over the informal market, long distances to the MCPC and relatively poor dairy goat management need to be addressed. To address the challenges in the milk production link the following action points are suggested:

- Increase the use of contracts between suppliers and the MCPC
- Increasing the price of milk to 900 TZS/liter, supported by the implementation of the profit distribution at the end of the year and the knowledge of a reliable, year-round market
- Establishing a small milk collection center in Tchenzema
- Formalize the organization of training and advice on goat husbandry

5.4.3 Upgrading the processing link

In 2010, the total amount of milk processed by the MCPC was 2128 liters of goat milk. The goal for 2011, according to the Twawose leadership, is to collect and process 3000 liters of goat milk, an increase of 29% (870 liters). This raise is possible given the calculated supply in the market. This means collecting 30 liters per day as compared to the average of 20 liters now (of the potential 90 liters), with no increase in number of processing days. Despite the large potential, professor Kurwijila (2011) did not recommend a larger increase in processing than 10-15 % of last year's total processing amount. This is a general advice for micro-scale dairy processors like Twawose. The reason is that the coordination of the milk collection must be in place to ensure stable supply, the MCPC must have the capacity to process the milk and there must be a secure market demand to avoid losses. Keeping this in mind, Twawose should increase the processing with 200-300 liters compared to their goal of 800-

900 liters increase in 2011. If following the advice by professor Kurwijila, the increase of 200-300 liters can either be implemented by processing relatively small amounts every day or a larger amount 2-3 times a week, depending on which is more cost effective. Bulking, in order to increase economies of scale as possible would be most cost effective, meaning that they should increase the amount processed and process fewer times a week. This also relates to higher costs of transportation to new markets. According to professor Kurwijila (2011) and the Twawose management, approximately 60 liters of milk can be processed per day before considerable investments in new equipment are needed. This means that farmers could deliver every day to the mini collection center or directly to the MCPC, but the processing would only take place every other day. How much yoghurt production Twawose can and should aim for ultimately depends on how big the market demand is and whether they can reach the market in an economically viable way, which will be reviewed later.

To organize the bulking practices and increase the production of yoghurt, hiring an MCPC manager who can run the co-operative section of Twawose was suggested by an 'expert' that works closely with Twawose. A manager could be in charge of coordinating the milk collection with the dairy goat owners through informal contracts, yoghurt production and developing the value chain by reaching new markets. Today's manager is not paid and therefore cannot afford to spend much time on organizing these activities. To do this job, knowledge of yoghurt production and transportation costs and marketing is crucial. Equally important is that the manager can access information and resources that are necessary for implementing upgrading strategies. A knowledgeable manager that can focus completely on running the MCPC, and not practice farming on the side, can also enable multiple long term plans regarding the MCPC at the same time. This is something that is difficult for the Twawose board because they have the whole association to consider, hence many projects to consider with little time available because everyone is volunteering (only a small allowance is given for board meeting days). Paying a manager will increase the fixed costs of yoghurt production, but these increased costs would be recovered in increased and more efficient production and sales of yoghurt. It can also be backed up by reduced allowance to the MCPC employees since it was reported to be high at the moment, especially if only one assistant is remained.

A strict focus on quality is crucial when increasing production and entering new competitive markets. One important factor is to secure access to new culture that is needed to produce yoghurt from milk. Today the MCPC use yesterdays' yoghurt as the culture, but if one batch go bad they do not have culture for the following day. Access to new culture can be secured through their network, for example through the milk processing plant at SUA.

Improved cooling system is essential to keep a high quality in this case as relying on cold water is not sufficient if processing more and also potentially bulking the milk for processing the following day. When a cooling chain is in place, the shelf life of the yoghurt is extended from about two to between five to seven days. Shelf-life also depends on adequate packaging. If this is met, it will be easier to distribute the yoghurt to new markets. To create a cooling chain the first step is to acquire a freezer or refrigerator for the MCPC, the rest of the chain can use cool boxes since constant cooling is not necessary because the distances are not that long. Acquiring a refrigerator or freezer requires a fairly large investment and is dependent on access to electricity.

Lack of access to electricity is given as the second most common reason for why rural business development is difficult and sometimes results in closure (Kinda & Loening 2008). This emphasizes the importance for Twawose to access electricity. There are two ways of accessing electricity for cooling: generator or solar power. There are already a few smallholders and small businesses that use generators in Mgeta. However, this is expensive and will drive the price of yoghurt up considerably. The generator used by the guest house close to the MCPC for example, uses 2 liters of fuel per hour and one liter fuel cost approximately 1000 TZS. Running a generator all day long to keep a refrigerator cold will be too expensive for the MCPC and the initial investment is also fairly costly.

Solar power on the other hand, does not pose any running costs, but requires higher investment costs and a budget for maintenance. Solar power also does not come without challenges. In developing countries such as Tanzania there have been reported challenges in relation to the ownership of solar panels if an outsider sponsors them. Furthermore, if the panels stop working and require maintenance this can pose great challenges as the owners often cannot afford the maintenance costs and money is rarely set aside for this by the donor (Synnevåg 05.04.2011; Synnevåg & Standal Undated). The possibility of using solar power in Mgeta was discussed with Gry Synnevåg[15] (2011), who has extensive experience with introducing solar technology in developing countries through her work on solar energy project while representing Norway in Afghanistan for the Norwegian Church Aid[16]. Synnevåg confirmed that solar power will be the most sustainable electricity solution for the MCPC and recommended the use of Barefoot College's approach for electrifying rural and remote villages. This is an approach that originated in India and focuses on

[15] Gry Synnevåg is the Head of Department at Department of International Environment and Development Studies (Noragric), UMB.

[16] http://www.kirkensnodhjelp.no/en/

training women from villages that need electricity to build, install, use, repair and maintain solar panels. By doing this one avoids several of the challenges with using solar technology in rural villages in developing countries. The Barefoot approach was introduced in Tanzania in 2008 when eight women from the Meatu district of Shinyanga Region, north of Morogoro, were trained in solar technology for six months (Barefoot college Undated).

The Barefoot College approach could favorably be used by Twawose, where selected members could be retrained by the women in Meatu which is the goal of the Barefoot approach. Professor Anna Temu (2011) of the Department of Economics and Agribusiness at SUA, stated that when considering what solutions to pursue in solving small-business challenges a holistic picture should be kept. By this she meant focusing on the total benefits the solution will give and not only on the specific matter it is supposed to solve. By using the Barefoot approach, Twawose will acquire additional assets that could lead to new ways of earning money. For example, they can start offering charging of cell phones. Additionally, they can offer services in relation to solar panels since some members will be trained solar technicians. The Barefoot approach to electricity access seems to be the best and most viable option, but will require a substantial amount of investment for training and buying solar panels.

Another major bottleneck in developing Twawose's value chain is the poor packaging solution of reusing old water bottles. Today, Twawose uses old water bottles when selling the yoghurt and collects them for reuse the same day unless the customer pays for the bottle (100TZS). The issue of packaging was discussed in several individual and group interviews with the Twawose leadership, customers, 'experts' and similar businesses. Packaging was discussed with the Twawose leadership during both field visits in May 2010 and in January 2011 and despite trying no progress has been made in between the visits. Twawose had decided on using plastic sachets, something that is very common in Morogoro both for yoghurt and mtindi, over other solutions like sealed plastic bottles or small plastic cups. Professor Kurwijila (2011) highlighted in an interview the possibility of using small cups, but throughout several discussions he agreed that best option is to use plastic sachets. MGBA in Kenya and the Njombe milk factory both use small, sealed plastic bottles. Shambani Graduates in Morogoro use plastic sachets when selling mtindi. The reason for choosing plastic sachets in Twawose's case is the cheaper price per unit and that it is a common practice in Morogoro (see Picture 5.1). Plastic sachets will increase the price per liter of yoghurt with

Picture 5.1: Drinking yoghurt from a plastic sachet (Photo: H. Lie)

approximately 100 TZS, to 1700 TZS/liter. Various sizes can be sold, hence a variety of prices and profit margins.

The reason why the MCPC does not use appropriate packaging yet even though this has been focused on since May 2010, is lack of access to information. Interviews in May 2010 revealed that Twawose leaders did not know where to buy plastic sachets, how much it costs or that a packaging machine to seal the sachets requires electricity. Respondents in January 2011 pointed out that the local extension officer was going to help them with buying and making use of sachets. The extension officer, on the other hand, turned out to not have the time or money to meet their request.

Before increasing the production of goat milk yoghurt and accessing new markets, it is important to consider transportation challenges. Transportation is expensive and might drive the price of yoghurt to an uncompetitive level keeping in mind the additional increase by improved packaging. Depending on the mode of transportation it might distort the quality and/or the timeliness of the delivery. One transportation option is to use the public dala dalas (the local public bus the size of a mini bus, which runs when all the seats are filled up, hence there are no time tables). This option would add at least 6000 TZS to the budget and 45 liters would have to be transported at once to break even if the same price as today is applicable. Another option is to transport it self-handed. Because of the distance and mountainous area, a bicycle is not feasible and a motor vehicle, either a motor bike or car, is necessary. This option is too costly at this point in time considering the small amount of yoghurt production. This scale would not bear the cost of fuel, maintenance and repairs of a motorbike. The third transportation or distribution option is inspired by the Danone Grameen joint venture in Bangladesh. They produce yoghurt locally and predominantly use door-to-door distribution by local women that are trained in sales and deliverance of a nutritional message. The women buy the yoghurt using micro-credit and receive a commission for each yoghurt they sell (Yunus et al. 2010). This option would not influence the price substantially because a middle-man, either in form of a retailer, mobile trader or a salary to Twawose members, is expected also if using other modes of transportation and distribution. A 100 TZS commission per liter is reasonable according to respondents talked to during the field visit. Whether it is best to use public transportation or Twawose members to sell the yoghurt on commission depends on what additional market that will be targeted.

Another option is to outsource the distribution of milk and yoghurt to urban markets to someone that has marketing skills, experience and connections in the market. During interviews, the Twawose leadership refrained from this option and emphasized the desire to continue to control the entire

value chain, despite the link from retailer to new urban consumers if accessing the urban Morogoro market. In that case, Twawose has to improve their marketing practices by receiving training and/or practicing. This can be applied by practicing in nearby villages and the local market before possibly entering larger markets.

These are the suggested action points that can overcome key constraints to Twawose's value chain and realize selected upgrading strategies to increase processing:

- Secure access to new culture which is necessary to process milk to yoghurt
- Invest in and install solar panels using the Barefoot College approach
- Invest in a freezer or refrigerator
- Invest in sachets and packaging machine
- Hire MCPC manager
- Business management training of Twawose leadership
- Sales and marketing training of MCPC employees and/or others in charge of sales
- Possibly make use of Twawose members to sell yoghurt on commission in nearby villages

5.4.4 Market potential and corresponding upgrading strategies

Currently Twawose sells yoghurt twice a week during the local market days because according to several respondents that is when there is substantial local enough market demand. The other days there are not enough people in Nyandira village to make it economically viable to produce and sell goat milk yoghurt. Only sporadically, during the high season for vegetable sales from November to February, is there a greater local market demand that allows for selling 3-4 times a week.

Increasing processing is always dependent on a market demand and willingness to pay for the value added to the milk. If there is no market demand for milk and only an increased supply, there is a high risk that lack of sales will lead to failure. Twawose has several options when it comes to new markets, both locally and in the nearest town Morogoro. During the second field visit, small and informal market research was conducted with the aim of clarifying the interest for goat milk yoghurt in new markets keeping in mind the cultural restrictions regarding goat milk in some areas in Tanzania. The goal was also to clarify if the demand for milk and yoghurt is being met in the selected markets and obtains a brief overview of approximately how much selected market outlets would buy if goat milk yoghurt was accessible to a premium price compared to cow yoghurt. See details about the informal market research in Appendix 4.

An overview of the findings from the market research is given in Table 5.7. This table shows the potential markets and some outlet's willingness to test the market. Demand and people's willingness to pay are expected to increase substantially when the market has been tested and consumers have discovered the new product on the market. The data is not of high quality and can therefore not be counted as proper market research, but it does serve as an indicator as to whether there is demand on which to base the continued development of Twawose's value chain. The answer to this question is yes, based on the total demand of 91 liters of goat milk yoghurt every day and 72 liters of goat milk.

The market research revealed that there is a potential to sell more goat milk yoghurt at the local market in Nyandira if the yoghurt is marketed more intensively during the market days. Some yoghurt can also be sold on other days during the week directly from the processing building to people living in Nyandira. Several current customers expressed that they would buy goat milk yoghurt every day if it was available. The local restaurant market is not exploited to date, and introducing yoghurt as a new product in these locations may be a good option because of the limited choices of food and drinks in these places. Brief interviews were conducted with the owners of the 'biggest' restaurants in Nyandira village, and there was positive feedback.

Table 5.7: Overview of potential markets for Twawose

Market option	Nr.	Yoghurt (l/day)	Milk (l/day)	Accessible
LOCAL MARKET				
Improve current market	1	10	10	Yes
Neighboring villages	3	35	40	Yes
Total		**45**	**50**	
MOROGORO MARKET				
Milk bar	-	n.a.	n.a.	Not currently
University cafeterias		33	12	Yes
Hotels	-	n.a.	n.a.	Maybe
Restaurants	-	13	10	Some
Supermarkets	2	n.a.	n.a.	Maybe
Local market	-	n.a.	n.a.	Maybe
Mobile trader	-	n.a.	n.a.	Maybe
Schools	-	n.a.	n.a.	Maybe
Orphanages	-	n.a.	n.a.	Maybe
Total		**46**	**22**	
Grand total		**91**	**72**	

A small amount of yoghurt can be transported back to Tchenzema and sold to, among others, the dairy goat owners that supply the milk. A second option is to introduce the yoghurt in nearby local villages that are not part of the co-operative, such as Langali and Mlali. In these markets, including Nyandira, plastic sachets would be preferable if selling directly to consumers, but not necessary if selling to local restaurants which might be more cost effective considering the time spent selling at local markets. By using cool boxes, it would most likely to appropriate to transport the yoghurt to the nearby villages, but it will have to be sold on the same or the following day to avoid poor quality. In Nyandira, and all neighboring villages, the main source of income is from agriculture, which results in

a highly seasonable purchasing power among the villagers and a threat to stable market demand. However, an interesting finding during the field visits is that people preferred to drink milk and yoghurt when the weather is hot as refreshment, and not so much during the wet (cold) season. To avoid the high level of seasonality in Mgeta altogether one solution is to introduce the yoghurt in the nearest town, Morogoro. This will also bring valuable economic value from outside Nyandira and will allow money to be circulated beyond the local market.

In Morogoro, the goat milk yoghurt can be sold to cafeterias at the two universities that are located there, SUA and Mzumbe, at smaller local restaurants and hotels, and to the two supermarkets. Selling to the supermarkets requires improved packaging, but when selling to cafeterias packaging is not necessarily required because they can sell by the glass. Several restaurants visited during the informal market research followed this practice. Therefore, in addition to plastic sachets, Twawose can sell yoghurt in larger 3-5 liter plastic cans if selling to such markets. However, cooling the yoghurt before transporting it to Morogoro is necessary to ensure quality.

Other market possibilities are schools and orphanages. To realize this opportunity, these institutions must depend on external funding to be able to comply with a contract of regular supply of yoghurt. School feeding programs in Tanzania where milk is included are few and where they exist they are partly funded by the processor and most often partly by an international organization (Njombe & Msanga 2009). No national school feeding program is currently in operation. Tanzania Dairy Board, however, states as part of their mission to establish school milk feeding programs, which might be an opportunity for the future, if a donor does not appear that can take on the costs now.

Another option is to open a milk bar in Morogoro (a shop that sells 'home-made' dairy products) (see Picture 5.2). There has been an upsurge in number of milk bars in urban areas in Tanzania (Ashimogo & Greenhalgh 2007). The market research in this study only revealed two milk bars in Morogoro and none of the sold goat milk. Twawose intended to run a milk bar in Morogoro and started the process in 2010, but aborted when they realized how expensive it would be and when packaging material became harder to obtain. A milk bar usually only sells home-made dairy products, but could also supplement their sales with other products that a customer would find normal to buy at the same time. A milk bar would make the distribution easier because the supplier (Twawose) would not

Picture 5.2: A milk bar producing and selling yoghurt and ice-cream in Morogoro, Tanzania (Photo: H. Lie)

have to deal with different buyers that are dependent on getting the milk and yoghurt at specific times, most likely at more or less the same time, throughout town. Additionally, it does not require packaging because it is common for milk bars to sell yoghurt by the glass. Although, offering packaged yoghurt in addition to selling by the glass would be wise so that people can bring it home to their families. A milk bar might be a good strategy for Twawose in the future when they produce enough yoghurt so that it makes economic sense. A last option is to sell yoghurt through mobile traders that use a cool box either attached to a trolley or a bicycle and sell throughout town. Proper packaging is essential if using this strategy.

According to professor Temu (2011), yoghurt is still considered a new product in Tanzania and doubly so in the case of goat milk, which is not a widespread commodity in Tanzania, especially not in urban areas. This poses a challenge when introducing the product in new markets. Another challenge if Twawose enter the urban Morogoro market is the presence of competing dairy businesses with various products. Micro- and small-scale milk processors located in Morogoro are Shambani dairies, SUA processing plant and Shem dairies. Medium processors located throughout Tanzania that sell their products in Morogoro are Serengeti Ldt., Tanga Fresh, Asas, Tan dairies and Brookside from Kenya. In addition, home production is not uncommon, or restaurants or cafeterias processing their own yoghurt after purchasing milk locally (Watuta 2011).

The price for raw cow milk is on average 400 TZS in Tanzania, which leading to lower prices for yoghurt made from cow milk (ranging from 1200-2000 TZS/l) compared to the goat milk yoghurt produced by Twawose (1600 TZS/l excl. container). When including the price for plastic sachets packaging and transportation costs to Morogoro, the consumer price will most likely increase to 2000-2400 TZS a liter depending on product size and type of market outlet. While conducting the informal market research, 2000 TZS per liter was the starting point and most test customers did not respond that the price would stop them from buying the goat milk yoghurt. On the other hand, according to research conducted by Weliwita et al. (2003), the milk and dairy products group has the smallest budget share among the food groups in Tanzanian households (2.43 % of household expenditure in 2007). The research concluded that products like maize, rice, sugar, fish, fruits, vegetables and meat are price inelastic, whereas the demand for milk and dairy products are price elastic (RLDC 2010). These are challenges that will be difficult for Twawose to overcome.

There are, however, no goat milk or goat milk products, such as yoghurt, available in Morogoro. This is reinforced by the national unmet market demand for dairy products, which can be partly met by implementing a niche marketing strategy for goat milk yoghurt. Niche marketing requires a carefully planned marketing strategy that puts much effort into advertizing the product for the target group.

In this case, the target group has to be selected based on more extensive marketing research. The marketing strategy can be based on educational promotion based on the health benefits of drinking goat milk and the fact that lactose intolerant people can drink goat milk and yoghurt. This can be followed up by establishing a brand name for goat products. Similar businesses to Twawose such as MGBA received funds earmarked for marketing their goat milk yoghurt to enter supermarkets in Nairobi, which might be necessary in Twawose's case as well. However, it must be said that yoghurt is generally not marketed extensively in Tanzania, which may be part of the reason why demand for yoghurt is price dependent among Tanzanians.

After reviewing the market options for extending Twawose's value chain to increase goat milk production and to reach larger markets, it has been explained that there are several market options. Most markets depend on proper packaging such as plastic sachets and preferably cooling before transportation to keep the quality high. Important factors that have to be considered carefully before entering a new market include quality, timeliness of supply, prices that cover running costs, and a strategic marketing strategy. To ensure that these aspects are in place it is advisable to extend the local market first while working on mapping the investment options that can give them access to the necessary capital to implement the previously listed action points. The urban Morogoro market can be entered when these action points are in place, in addition to the ones mentioned in the production and processing nodes:

- Implementing thorough market research
- Formulate a marketing strategy
- Monetary support for implementing marketing strategy
- Training in sales and marketing of Twawose leadership, and others selling the goat milk yoghurt.

5.4.5 Summary of RQ5-7: A feasible upgrading of Twawose's value chain?

RQ5) What opportunities and constraints are present in Twawose's value chain, and how do these influence competitiveness and upgrading?

RQ6) Which upgrading strategies can improve Twawose's value chain, and how are they linked to asset and governance structures present in the Twawose chain?

RQ7) What action points can be identified to implement suggested upgrading strategies, and is Twawose capable of implementing them?

This sub-chapter on upgrading strategies has emphasized some of the key constraints and opportunities in Twawose's value chain. Currently, this local dairy value chain is competitive because there is no direct competition from other similar products in the area. There is limited milk availability and Twawose makes up the biggest supply of both milk and, now, goat milk yoghurt. It has been showed that there is a potential in the amount of goat milk to upgrade the chain. This is followed up by an expressed wish to upgrade the chain from Twawose members because they want to deliver milk every day and not only 1-2 days a week. There are, however, several constraints to developing the value chain due to its location in a rural and mountainous area with poor road quality, no access to electricity and limited access to information. These are all examples of how assets influence upgrading. As previously mentioned, there is both potential supply and demand to extend the local market and also to eventually enter the urban Morogoro market. These opportunities, together with Twawose's motivation to succeed and desire to continue to develop their value chain, and their network, can serve to overcome the challenges they face, like no electricity, need for improved packaging and improved coordination in the chain.

Many upgrading strategies that are necessary to achieve Twawose's goal of substantially increasing the goat milk yoghurt production, have been suggested and followed up by action points. Both process and product upgrading strategies have been suggested. Improved processing strategies are enhanced horizontal coordination among dairy goat owners through establishing a mini collection center in Tchenzema, improved coordination in between the links by strengthening the use of contracts that facilities better communication between processors and suppliers of goat milk. Hiring a MCPC manager has also been suggested. These all relate to the governance of the chain. Product related strategies are for example the use of cooling and improved packaging to enhance quality, which is linked to lack of assets. Packaging can also be considered a functional upgrading strategy since it adds value to the product. These strategies are meant to deal with the assets lacking in Twawose value chain, such as electricity and packaging, by using the asset making up Twawose's, as the chain leader, strengths: their strong sense of community, motivation, entrepreneurial mindset and network. Also chain upgrading has been suggested. The new links represent this upgrading and include establishing a mini collection center, new distribution strategies, new market outlets and new consumers.

The development of Twawose's value chain depends on Twawose's capability to activate and utilize their human and social assets. The expansion of the chain depends on hard work, collective work, smart decisions and, last but not least, a substantial amount of investment. It is crucial that Twawose actively make use of their network to access the amount of money they need. Twawose can

implement some strategies and action points, but others that require access to information, cost knowledge and large investments, a chain integrator[17] would be beneficial.

A chain integrator can be an NGO, a university, researchers, an idealistic person that wants to help out, government agents such as extension workers or a small-scale business development consultant. In Twawose's case, the local extension worker does not have the capacity to facilitate the upgrading process because of many focus areas and limited resources. Twawose has had fairy good cooperation with SUA. A continued extended cooperation with SUA may be a viable alternative. If a chain integrator, such as SUA or others, are further involved, it is vital that they do not take control of the value chain so that Twawose looses ownership, which may result in less motivation to succeed. Loosing ownership, or never having ownership of their value chain or small business, is one of the challenges when chain integrators are involved either from the beginning or when expanding the value chain as in Twawose's case. MGBA experienced this for example. Farm Africa initiated the production of goat milk yoghurt production, but by being too much in charge of decision making, the dairy goat owners do not feel ownership of the value chain and the chain is not economically viable because decisions have been made based more on supporting poor farmers than on business principles. Now, when MGBA is handed over full control of their diary value chain that constitute a big challenge. The goal in Twawose's case should therefore be to work together with external supporters, but not letting anyone other than Twawose members control the chain, except if some nodes are outsourced. And, at all times, decisions should be based on sound economic and business principles to ensure the continuation of an economically sustainable value chain.

An economically viable chain depends on training of the Twawose leadership in business management and economics, and/or hiring a knowledgeable MCPC manager that can be in charge of the chain development. If, or when, Twawose receives investment for realizing upgrading strategies such as setting up solar panels, this cannot be a loan that has to be paid back because it will most likely be difficult to do so. For the large investments, Twawose depends on grants. Grants can be used to enable them to carry out market assessment, and to strengthen skills. Grants spent on packaging (except for trial purposes or equipment), or transport is unlikely to promote economic viability, and in Twawose's case they should use their profit and apply for a loan if necessary to acquire for example packaging materials. The point is that the value chain will probably not survive heavy debt, and therefore depends on grants. Grants on the other hand should not be given for

[17] The term 'chain integrator' is a generic term that in this case should be understood as the role played by different stakeholders that work with the value chain actors with the goal of driving the development of the chain so it becomes more efficient and competitive.

everyday activities. To conclude, Twawose's value chain has potential to be further developed by using opportunities and strengths to overcome constraints. They also have the capability to implement some upgrading strategies, but need support from their current network or others to realize upgrading strategies and action points.

5.5 Important findings in the case study

The research objective of his research was to assess the potential for local dairy value chains as an approach for smallholder farmers to improve their livelihood. From an outsider's perspective, the goal of establishing Twawose's semi-formal dairy value chain by adding value to goat milk is to further improve smallholder farmers' livelihood, based on the successful introduction of Norwegian dairy goats in Mgeta. For the farmers involved in the chain this is also the aim, but first and foremost the goal is to establish a competitive and profitable value chain that results in increased income for the farmers because they would have a reliable market to sell their goat milk. These two focuses are not mutually exclusive, but the point of entry of understanding and analyzing the case is different. In this analysis, the main focus has been the latter: improving smallholder farmers' livelihood through developing an economically viable dairy value chain. The most important finding in the Twawose case study is therefore whether the establishment of Twawose's local dairy value chain contributes to improving the smallholders' livelihood, which is the main research objective. To understand this thoroughly it has been focused on how Twawose's value chain was established, how it is maintained and what challenges complicate the continued development of the chain, but also what opportunities that can be utilized to overcome such constraints.

By producing yoghurt, considerable value is added to the goat milk and the value accrues the farmers since the chain is controlled by the farmers themselves through the co-operative Twawose. The goat milk yoghurt production has increased the market to sell milk for dairy goat owners, but currently the market is not big enough to involve all dairy goat owners in Mgeta or all Twawose members. It has therefore potential to benefit more dairy goat owners, and others through positively benefitting actors indirectly involved in the chain.

If developing Twawose's value chain through increased production of goat milk yoghurt, more dairy goat owners will be able to supply the MCPC with goat milk, resulting in additional income for a number of dairy goat owners. Based on the increased opportunity of supplying goat milk to the MCPC, additional farmers in Mgeta might decide to acquire dairy goats. This is of value in itself, because new households will have easy access to the nutritional goat milk and increased income through sales of goat milk. Other dairy goat farmers might decide to keep a larger herd of dairy goats

for milking and further increase their income potential. Additional supply of goat milk for processing into yoghurt will also result in increased processing time, which raises the income of MCPC employers. A larger yoghurt production might also lead to hiring a MCPC manager, which is another valuable local job created. The ancillary services will also increase substantially, if the value chain is expanded, especially considering that the yoghurt will have to be transported, and there will be an increased need of sugar, packaging material and small equipment. If solar electricity is installed at the MCPC, this may also lead to other people in the villages being able to acquire solar power. This is most probably the case if the Barefoot approach is utilized, because then the goal is to train women in producing, installing and maintaining solar panels not only for themselves, but for anyone in the village that can buy their services. Increased goat milk yoghurt production and subsequent development of the chain will also result in improved assets base in the value chain. This means that more farmers will have increased knowledge in goat husbandry, increased milk processing-, marketing- and business knowledge skills.

The focus of this case study has therefore been to reveal what factors have been crucial in creating and maintaining this value chain. After a through disclosure of the findings of the field visits and discussing the implications, important aspects are the existing asset base that made Twawose capable of establishing the chain. This influenced the participatory farmer-led co-operative mode of organization to be chosen and led to a co-operative governance structure in the value chain, which is crucial for the distribution of value and development of the chain. These structures ensure not only the inclusion of the smallholder farmers, but also their ownership of the chain. All profit that is generated throughout the chain accrues the farmers themselves.

The establishment has, however, not come without challenges. Constraints such as poor infrastructure, limited access to information and services that are common in rural areas, were confirmed in this case study. An interesting finding was that by pooling the resources of individual farmers into a co-operative, it is possible for smallholders themselves to establish and run a semi-formal local dairy value chain with support from a network of universities, organizations and extension officers. An interesting finding was the beneficial role the nearby university, SUA, played in increasing the farmers' assets by introducing dairy goats, which now have been utilized by adding value to the goat milk. An interesting aspect with this research has been to see how the pooling of farmers' resources, and their ability to mobilize resources through their network, can be used to further develop the local dairy value chain and result in increasing the benefits created by the chain.

To map the establishment of the chain and how the development of the chain reinforces the asset base and improved livelihood of the participating smallholder farmers, the research model has been modified. The asset base has been confirmed to play a critical role in establishing Twawose's local dairy value chain. Another important aspect of the value chain is its governance structure and upgrading strategies that further improve the chain and result in improved livelihood. Improved livelihood and going through the process of establishing a value chain also leads to enhanced asset base because of increased experienced and other types of assets, among other things. Consequently, the process can start over again and result in reinforcing the benefits created in the value chain, as explained above. This process is modeled in Figure 5.9. As a final note, the potential of Twawose's local dairy value chain to increase the positive impact on smallholders is there. Realizing it is a matter of executing upgrading strategies, which in Twawose's case is not easy because they are a small co-operative in the rural highlands of Tanzania. But with support from their network it is possible to realize the strategies.

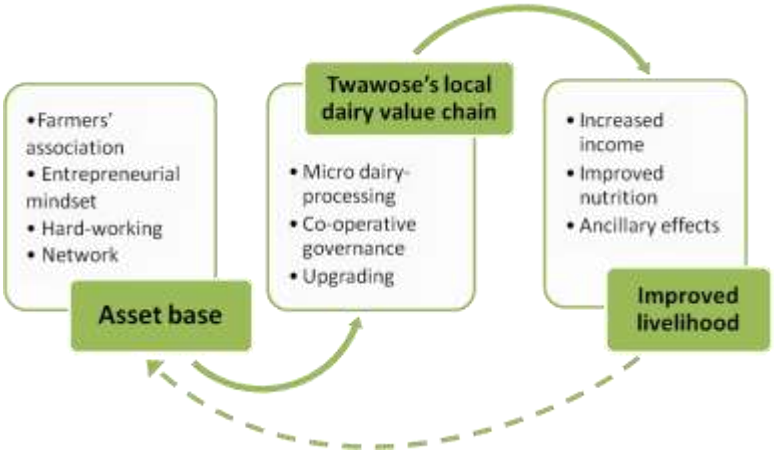

Figure 5.8: Approach to creating and developing an inclusive and beneficial dairy value chain for smallholder farmers

6. Concluding remarks and implications

The objective of this research was to assess the potential for local dairy value chains as an approach for smallholder farmers to improve their livelihood. This in-depth case study has provided a thorough review of Twawose's local dairy value chain and concludes that it has positive implications for the smallholder farmers directly, and indirectly, participating in the value chain. Dairy goats can therefore positively be better utilized in Tanzania. This case study has also shown that smallholder farmers are capable of taking advantage of the increasing opportunities, in this case, in the Tanzanian dairy sector despite many challenges.

Twawose's value chain may not represent a typical situation since it is one of few known cases of value addition to goat milk in Africa. That makes this research valuable in the sense that a potentially new approach to improving smallholder farmers' livelihood has been revealed. This provides an argument for the case that local value chains are a good option for smallholder farmers in developing countries. This will be addressed briefly below and followed up by a discussion that this approach has potential for being replicated in other locations. The thesis will end by giving some considerations regarding the chosen analytical framework that has been modified by including the assessment of assets. And lastly, an evaluation of the research, its strengths and weaknesses, will be addressed and suggestions will be provided for future research that can continue to improve the understanding of local dairy value chains as a means to improve smallholder farmers' livelihoods.

6.1 Local value chains for smallholder farmers in developing countries

In this case study local value chains has proven to be beneficial to smallholder farmers. In the introduction it was emphasized that agricultural producers generally participate in informal markets for unprocessed commodities and that they need to be better linked to consumers. This can be difficult since consumers in distant markets may have different expectations of the product than smallholder farmers can meet. This is often the case when smallholder farmers search for global value chains to participate in. The barriers to entry into a value chain are often high and it is difficult to meet the constantly changing standards that are made without their ability to influence the decisions being made.

Twawose's local dairy value chain turned this premise upside down and instead of being dependent on others, the smallholder farmers have taken advantage of opportunities in their own community; demand for milk and milk products. This is a market they have the capabilities to understand and utilize for mutual benefits. By creating their own semi-formal dairy value chain, the smallholder farmers have complete ownership of the chain resulting in the power to make changes or develop

the chain to their best. This includes that the value added accrues the smallholder farmers compared to large agro-processors who most often capture most of the value in global value chains. This does not mean that quality and other standards can be ignored, rather it means that the barriers to entry are lower and that the development of the product can be achieved. Consequently, it is not always necessary to look to distance markets to create profitable value chains. However, local value chains do have challenges. Some upgrading strategies smallholder farmers can implement through pooling their resources, but other larger changes depend on external support in the form of grants. If this is the case, it is important that the support does not compromise the smallholder farmers' ownership of the chain.

This case study has proven that in the case of the small-scale dairy sector, local dairy value chains are a good option for closing the gap between consumer demands and small agricultural production on the terms of smallholder farmers. This is a good alternative to focusing on entering or participating in a global value chain.

6.2 Potential for replicating Twawose's local dairy value chain

Based on this research and the literature that has been reviewed throughout the study, dairy goats seem to provide a sustainable livelihood improvement for smallholder farmers. Adding value to goat milk provides a strengthening of the benefits provided by dairy goats, predominantly providing increased income. Adding value to goat milk is rare and not many similar case studies have been conducted, but the potential to benefit an increasing number of smallholder farmers is high. Dairy goats are not popular all over the world, but in Africa an increasing number of dairy goats are present due to its many positive qualities that make it a good asset for smallholder farmers. Twawose's approach to establish a value chain based on producing goat milk yoghurt can be adopted by other smallholder farmers in areas as close at other parts of the Morogoro region or in other countries.

The prerequisite is the presence of goat milk. A large amount is not necessary given that Twawose's value chain is based on processing 20-25 liters of milk. Additionally, it does not have to be goat milk, it can also be cow milk, buffalo or camel milk in an area that could benefit from the added shelf life the milk obtain when processing it into yoghurt. If utilizing Twawose's co-operative governance structure to coordinate the chain, it is advisable that it is started by an already existing farmers association that consists of hard-working entrepreneurial minded farmers that has a collective mindset. These characteristics, however, are not absolute, but the pooling of resources has in Twawose's case proven to be crucial for the establishment, the continuation of and the further development of the value chain. Although not included in this case study, other ways of coordinating

the chain are possible, mostly depending on the available assets to base the establishment on. Access to a network that can support smallholders in overcoming barriers is also an important aspect if replicating Twawose's local dairy value chain.

The high transferring value of Twawose's local dairy value chain gives room for sharing their experiences with other smallholder farmers. Visits to Mgeta by potential replicas for knowledge sharing are something that can advantageously be facilitated and supported by stakeholders who intend to support the improvement of smallholder farmers' livelihood.

6.3 Theoretical considerations

The value chain approach inspired by Kaplinsky and Morris (2001) has worked well as an analytical framework, both structuring the gathering of information and structuring the write up of the findings of the case study. This is despite Kaplinsky and Morris' primary focus on global value chains. To adapt the framework to this case study, the aspect of reviewing assets in the value chain was included. This modification is seen as both necessary and a successful addition in the case where the chain actors are assumed to be asset poor. It is interesting to map how they were able to establish and continue to maintain a dairy value chain by utilizing their asset base. In this case study, the review of assets was also important background information when assessing key constraints and opportunities in the value chain and possibilities for overcoming the challenges. The asset review has also made it possible to understand and discuss the smallholder farmers' capability to continue developing the chain by implementing suggested upgrading strategies. Including the review of assets has also made it possible to incorporate cultural obstacles that might otherwise have been overlooked.

The focus on assets, which can also be called capital, is closely related to the resource-base view often used in business management. Utilizing this approach more could have been advantageous in this research. That could have allowed a stronger focus on competencies of Twawose members and Twawose collectively. This could have resulted in a stronger focus on how to facilitate learning and building a culture of continuous improvement and innovation in Twawose's value chain. For example, assess how individuals could be given support and room for testing and implementing innovative ideas. If continuing to develop the incorporation of the asset review in value chain analysis when focusing on local value chains in developing countries, a stronger focus on the resources-base view could be beneficial. Then strengths from two disciplines, community development and business management, can be utilized to improve the analytical framework of local value chains in developing countries. This can further improve the adaptation of the value chain framework to take into account the differences between global value chains and local value chains in developing countries.

6.4 Evaluation of the research and recommendations for future research

This research has been a thorough case analysis of a type of case that has not been researched in detail before. Previously there has been much research on the introduction of dairy goats in various African countries and the benefits dairy goats provide smallholder farmers with. Making better use of the dairy goats has, however, not been in focus. This comprehensive study of Twawose's local dairy value chain is therefore an important contribution to improving smallholders' livelihood through dairy goats.

To implement this case study two field visits, and the use of multiple methods and sources of data were applied. Taking into account the location of the research and the differences in culture between the researcher and the various respondents in Tanzania were crucial for the quality of the data. Quality research is vital for this approach to potentially be replicated elsewhere. The secondary quantitative data that has been used in the analysis is not of good quality and could have been more extensive. The limited quantitative data made it difficult to provide in-depth scenarios of the implications of the various upgrading strategies. The analysis could have focused more strongly on one or a few links, the various aspects of governance or upgrading the value chain. Instead the goal was to provide an introduction to this approach of improving smallholder farmers' livelihood and address this potential, which required a focus on the whole value chain.

Other focus areas that could have been incorporated are the importance and influence of the institutional or enabling environment for the development of small, local value chains. This paper was to take the view of smallholder farmers running a micro-dairy processing plant and not the view of policy makers. Research on how policies can support the establishment and further development of local value chains with smallholder farmers in the driving seat could have positive implications for cases like Twawose's value chain and strengthen the use of approaches similar to this one. The various financial options or chain integrators that could have supported the continuing development of the chain could also have been mapped in this research. This would have had a beneficial contribution since Twawose, like many other newly started businesses, are in need of external financial support that the chain integrator, among other aspects, can provide. However, there are several other research projects that are focusing on access to finance both in Tanzania and other countries.

In Twawose's case it could be interesting to follow up this research with participatory action research focusing on the continuing development of the local dairy value chain. That research could focus on smallholder farmers' capability to be in charge of implementing upgrading strategies and how this

can be supported by external stakeholders without influencing the smallholders' ownership of the chain. This research could strengthen the approach of local dairy value chain as a means to improve smallholder farmers' livelihood and the possibilities of replicating the approach. It could also provide valuable information for policy makers and chain integrators wanting to support the improvement of smallholders' livelihood through local value chains development. A comparative analysis between Twawose's dairy value chain and another local dairy goat value chain would also be an interesting study that would balance the findings from this research. At a later stage it would be interesting to quantitatively measure the impact of the value addition for the smallholder farmers in Mgeta, followed up by qualitative interviews to complement the quantitative information. These suggestions for future studies of Twawose's local dairy value chains are based on the notion that Twawose will continue to run the MCPC, which is likely based on their vision of establishing the first Tanzanian brand for goat milk yoghurt.

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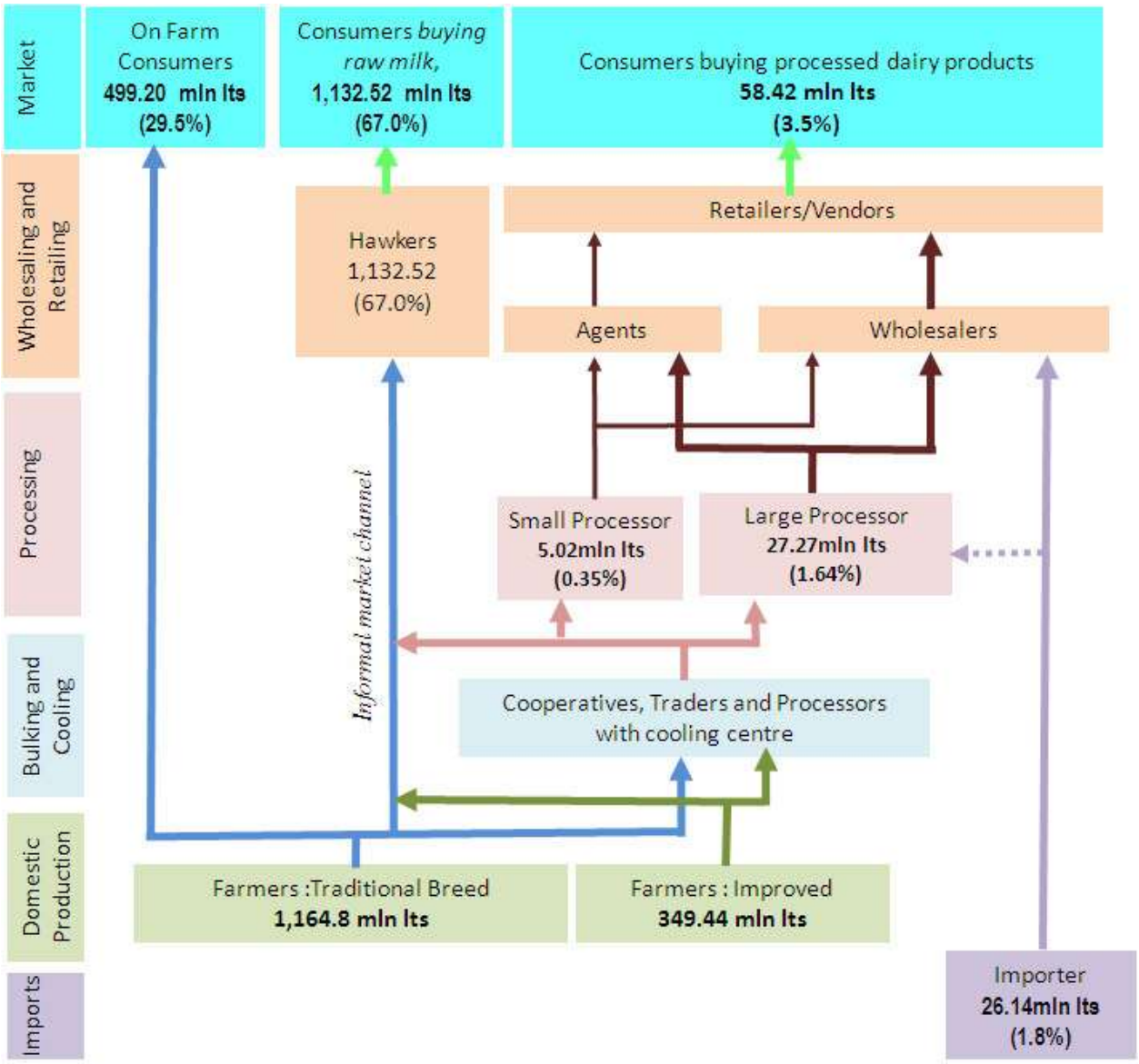
8. Appendices

Appendix 1: Milk marketing system in Tanzania (goat milk is not included)



Source: RLDC 2010

Appendix 2: Interview guides

Interview Guide 1: Twawose (Processors, board members, sales crew)

1. Mapping

- How did the company become established? What were the first steps taken?
- Why this particular activity? What was seen as the potential in this activity versus others?
- How many employees did the company start with (ranges)? How has this changed over time? How many employees are currently employed? At what wage rate?
- What does the enterprise own?
- Are you involved in any sort of association? If so, what type and what benefits do you derive from it? How might the association be improved?
- What role did associations/organizations play in your development, if any? (SUA, UMADEP, others)
- Where do you receive information on markets, prices, services, etc.? Is such information timely? Accurate?
- What are the main reasons to your success?

2. Governance

- How is the enterprise organized (cooperative structure, leadership, organizational)?
- How does the cooperative organization influence the enterprise?
- Who ensures compliance with standards?
- Who ensure sufficient volumes and how?
- Do you ever use formal buying/selling arrangements, such as contracts (written or oral)? If yes, how frequently and what are the terms of contract? Are there penalties for breaking contracts?
- How much trust is there between stake holders in the chain? Where are there risks and from which participants?
- Do you think the functioning of your value chain could be improved by different relationships or structure amongst the participants?
- Who do you perceive has the most power in the value chain? Why? How?

3. Upgrading strategies

- What challenges have the cooperative faced up to now and how did you deal with them?
- Constraints to continuing expansion?
- Sales channels (existing and new ones)?
- What markets have you pursued (What did you sell, how and who bought your products?)
- How did you develop your customer base? How large is it now? Demand? (pull/push)
- How do you develop your reputation (advertising, friends/family, trade fairs?)
- How do you engage in promotion and advertising?
- What are the demand/preferences? Seasonal variations?
- Who are your competitors? What share of the market are they? Locally and in Morogoro?
- How does your company manage risk?
- What were your sales the first year? Were you profitable in your first year? Did you grow your first year in terms of (i) sales, (ii) number of buyers, (iii) growth in employees, (iv) number of new products developed

- Was your growth in the first year in line with your expectations about profits, sales, products, etc.? Why or why not?

- How did you deal with each of these issues? How did you overcome such obstacles? What were the most important factors in dealing with these issues? Why?
  - Expansion (capacity and product growth)
  - Finance (access to credit)
  - Sales (e.g., problems with low sales, markets, certain product lines)
  - Profitability
  - Employment (e.g., problems with labor)
  - Supply channels (e.g., problems with buyers or sellers, seasonal variations)
  - Production
  - Market development
  - Means of purchases (failed contracts, cheating by buyers/sellers)
  - Government interference (domestic, international policies)
  - Calamities (sickness, death, natural disasters)
  - Organizational (problems with partners, cooperative)
  - Other
- How do you plan to scale up the production to meet with the plans of expansion? How much? Over how long time?
- What are your expectations for growth in terms of sales, profit, employment, number of markets/products, capacity, expansion in the next 2 years? The next five years?
- What do you view as the key threats to your business in the future? Why?

4. Benefits

- What are the benefits to the farmers by participating in this value chain?
- How will this change if the enterprise is scaled up?

5. Open ended

- Is there anything else you want to add related to what we have discussed?
- Is there someone else you think I should talk to about my research?

Interview guide 2: Dairy goat owners (suppliers and possible future suppliers)

1. Introduction

- Family status (married/single, number of children)
- Location (Distance to the milk collection center)

2. Goats

- How many
- What type of goat
- Why
- Workload (yourself, husband/wife, children)
- Capacity (amount of goats, feeding, workload)
- challenges
- Do neighbors own or show an interest in owning goats?

3. Twawose membership

- Are you a member of Twawose? If yes, when did you become a member?
- How did you find out about the organization?
- Why did you join the organization? What activities are most important to you?
- Are there any activities you are not happy with or do you have suggestions of improvements?

4. Supply

- What were the reasons for changing into becoming a supplier for milk collection center?
- Length of time being a supplier?
- How often to you supply milk to the center? What do you do with the milk if you do not supply to the collection center?
- How do you deliver the milk to the center? How far is it to walk to the center?
- Is there high demand for the milk at the local market? What price are you able to achieve at the local market?
- How much milk to you keep for home consumption?
- How do you communicate the amount of milk to be delivered to the collection center and how often?
- What standards do you have to comply with?
- Have your milk ever been turned down? If yes, why and how many times?
- If you could choose, how often and how much would you deliver given the goats you have now? And given the capacity of goats you can keep?
- Who do you perceive has the most power in the value chain? Why?
- What are the main challenges related to Twawose and the milk collection center? And what solutions can you see?

5. Livelihood

- What are your main sources of income each month e.g., crops, milk, off-farm labor, own-business, etc? How have these income sources changed in importance the last three years?
- Are there certain months you receive more (less) income than others? If so, why and from what activities?
- What are your main household expenditures each month, such as on food, housing, social fees, schooling, other services, etc.?
- Are there certain months you spend more (less) money than normal? If so, why and from what items?
- What is your daily budget for food?
- Can you afford to buy the yoghurt? If yes, how often and how much do you buy?
- How dependent are you on the income from selling milk? Seasonality?
- How important is selling milk compared to vegetables? Seasonality?
- How do you spend the money generated from milk?

6. Possible suppliers

(number 1-3 and parts of 5)

- Are you aware of a milk collection center. If so, how did you hear about it?
- Why do you not sell to the center?

- What would have to change for you to start selling at the center?

7. Open-ended

- Is there anything else you would like to tell me?
- Is there someone else you think I should talk to about my research?

Interview Guide 3: Customers (Consumers, retailers, businesses, clinics etc.)

- What do you think about the yogurt?
- When was the first time you bought yoghurt in Nyandira?
- Had you tasted yoghurt before that? Where?
- How often do you buy yoghurt each month (week)? How much do you buy each time?
- Has the quality been as good as you expect it to be and want it to be? Has it been constant?
- Do you drink it straight away or bring it home with you?
- Why do you buy yoghurt?
- Is there seasonal variety? If so, why and when?
- Would you buy more yoghurt if it was sold every day?
- Did you buy yoghurt when you had little money?
- Where do you buy your food?
- What is your daily budget for food? How does it change seasonally?
- How well do you know Twawose? Would you consider the sales people as close friends?
- What problems or marketing/coordination exist under the current system?
- Improvement suggestions?
- Is there anything else you would like to tell me?

Interview Guide 4: Similar Businesses (MGBA, Njombe)

1. Mapping

The enterprise

- Established: when, how, why
- Main activities
- Why yoghurt and not other products
- Market pull or push
- Legal structure
- Employment
- Finance and financial records

Value Chain

- Suppliers (Value for farmers)
- Producers
- Distribution
- Marketing & Sales
- Consumers
- Marketing segments; market volatility, price fluctutuations
- Network
- Partners
- Competitors

- Infrastructure

2. Governance
- Organizational structure
- Policy makers
- Goat health (risk of diseases)
- Milk quality
- Yoghurt quality
- Packaging
- Cooling
- Hygiene
- Transportation

3. Upgrading strategies/Business development
- Upgrading processes and growth strategies
- Challenges and solutions; market volatility, price fluctuation, technology, infrastructure, finance
- Product and production development
- Critical success factors
- Competitive advantage
- Benchmarks
- Future plans

4. Benefits to farmers
- Is it beneficial for the farmers to participate in this value chain? Is so, what benefits?

5. Open ended
- Is there anything else you would like to add?
- Is there anyone else you think I should talk to regarding my research?

Appendix 3: Research design

1) Overview over respondent groups and number of respondents per group
2) Overview over methods of data collection used per respondent group

Number of Informants	Methods
1) Dairy goat owners Suppliers (6) and goat owners/future suppliers (17)	Interviews, observation, written documentation
Total nr. of informants: 22	
2) Twawose (7) Leadership (7), processors (3), sales crew (3)	Group interview, in-depth interviews, observation, respondent validation, written documentation
Total nr. of informants: 7	
3) Customers (15) and possible future consumers (9) and sales outlets (17)	Interviews, observation.
Total nr. of informants: 41	
4) 'Experts' Researchers & professors (8), Institutions & organizations (9)	In depth interviews, respondent validation, written documentation
Total nr. of informants: 17	
5) Similar Businesses Shambani (1), MGBA (9), Njombe (3)	In-depth interviews, observation, written documentation
Total nr. of informants: 13	
Total number of informants: 120	**Total number of interviews:107**

Appendix 4: Details of informal market research

Course of action: Myself, my translator and two representatives from the Twawose leadership tested the goat milk yoghurt in Mlali, at Mzumbe University, the two campuses of Sokoine University of Agriculture (SUA) and at selected restaurants in Morogoro town. Both goat milk yoghurt with and without sugar, and yoghurt made the previous day, and the day before that, was blind tested. A set of questions had been prepared and translated into Swahili, but the Twawose leaders were encouraged to lead the testing and follow up with questions and the prepared questionnaire was not utilized.

Beforehand the interest for selling goat milk yoghurt at local restaurants in Nyandira and Langali was investigated.

Aim:

- To test the interest for goat milk yoghurt in existing and new markets
- To observe Twawose leaders' ability to market the yoghurt

Overview of places that was visited:

Date	Location	Type of place
26.01.2011	Nyandira	Small restaurants
26.01.2011	Langali	Small restaurants, potential consumers
27.01.2011	Mlali	Small shops, small restaurants, potential consumers
27.01.2011	Mzumbe University	Hotel, Cafeteria, potential consumers
27.01.2011	SUA	Cafeterias, next to SUA milk processing plant, potential consumers
27.01.2011	Morogoro town	Local restaurants, potential consumers

Questionnaire:

1. What do you think about the yoghurt? Unapenda yogati?
   It tasted / nimeonja:

   a) Very good / nzuri sana, b) Good/nzuri, c) Tolerable/ sawa ni nzuri, d) Bad/ mbaya

2. How can this yoghurt become even better? Kivipi yogati inakuwa hata na ubora?

3. Would you like the yoghurt to be mixed with sugar or not? Ungependa yogati ichanganywe na sukari au isiwekwe sukari? Flavoured? Radha mbalimbali mfano vanilla?

4. How do you think yoghurt from goat milk taste compared to cow yoghurt? Which one do you prefer? Unafikiri je radha ya yogati kutoka kwa mbuzi ukilinganisha na radha ya yogati kutoka kwa ng`ombe? Kipi unapendelea?

5. Do you drink goat milk? unakunywa maziwa ya mbuzi?
   a) Often / mala kwa mala, b) Occasionally / mala chache
   c) Have never tasted goat milk / kamwe sijawhi kuonja maziwa ya mbuzi.

6. Do you think yoghurt from goat milk is healthy? What do you think are the main health advantages by consuming yoghurt from goat milk? Unafikiri yogati kutoka kwa mbuzi ina afya? Unafikiri afya hiyo inaumuhimu gani unapotumia yogati kutoka kwa mbuzi?

7. If this yoghurt is sold here, would you buy it?
   Kama hii yogati itauzwa hapa, utanunua?

8. How often do you think you would buy yoghurt? Which size would you like to buy?
   Kwa mara ngapi unafikiri utakuwa unanunua yogati? nikiasi gani cha lita ungependa kununua?

9. Would you like to buy fresh goat milk or only goat yoghurt? Ungependa kununua maziwa fresh ya mbuzi au yogati ya mbuzi?

10. In what type of container would you like to buy the yoghurt? Sealed bottle? Sachets? By glass? Ni aina gani ya chombo mngependa yogati ihifadhiwe? Katika chupa? Mfuko? Kikombe?

11. In what location would you prefer to buy this yoghurt?
    Ni mahri gani mngependa kununua yogati?

12. Would you like to bring the yoghurt home or would you prefer to consume the yoghurt here? Ungependa kupeleka yogati nyumbani au ungependa yogati uitumie hapa?

13. Are you responsible for cooking and purchasing food in your household?
    Je wewe unawajibika kupika au kununua chakula nyumbani kwako?

14. What is your age? Male or female? Marital status? Occupation?
    Unamiaka mingapi? Mwanaume au mwanamke? Umeoa au kuolewa? kazi?

15. Do you have children? Grandchildren?
    Unawatoto? Wajukuu?

16. Where do you live? Unaishi wapi?

Appendix 5: List of non-anonymous 'experts'

Date	Name	Title
14.12.2010	E. Krogh	Associate professor, Department of Mathematical Science and Technology (IMT), UMB
28.04.2010 05.01.2011 19.01.2011	L. R. Kurwijila	Professor, Department of Animal Science and Production (DASP), SUA.
21.01.2011	A. Temu	Associate professor, Department of Agricultural Economics & Agribusiness (DAEA), SUA.
05.04.2011	G. Synnevåg	Head of Department, Department of International Environment and Development Studies (Noragric), UMB.
28.04.2010 14.05.2010 18.01.2011	G. C. Kifaro	Professor, Department of Animal Science and Production (DASP), SUA.
17.01.2011	E. E. Ndemanisho	Associate professor, Department of Animal Science and Production (DASP), SUA. Head of board, Sunny Day Orphanage, Morogoro.
19.01.2011	R. N. Z. Ryoba	Senior lecturer, Department of Animal Science and Production (DASP), SUA. Manager SUA milk processing plant
19.01.2011	Y. M. Watuta	Senior dairy technician, Department of Animal Science and Production (DASP), (SUA)

Note: the 'experts' that are non-anonymous have been chosen based on the notion that they already are public through published articles. Other 'experts' are not active in the public and therefore remain anonymous.

Appendix 6: Cost of keeping goats in Mgeta (work load is not included)

Supplementary feed	TZS	TZS/Goat/day	TZS/Liter milk
10 kg maize	2500		
2 kg sunflower	500		
15 g mineral	37,5		
12 kg	3038	253	127
1 kg supplementary feed per goat per day			
Medicine	**TZS/per goat**	**TZS/goat/year**	**TZS/liter milk**
Deworming	33,33	100	
External insecticide	20	520	
Penicilling	3000	3000	
Total	3053,33	3620	4,96
Total costs		3873	**131,52**