Milk and the city: Raw milk challenging the value claims of value chains

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Abstract

This article assesses two models of dairy production and dis-tribution to the large city of Dar es Salaam. One is urban and peri-urban raw milk production through territorial markets and the symbiotic food system and the other a dairy value chain intervention. The raw milk system is remarkably resilient and gives lower prices to milk drinkers and better returns to small-scale farmers. The value chain intervention provides opportunities for some dairy farmers but can't compete and favors corporate entities less aligned with most farmers' and city residents' interests. Policy maker's preference for value chain interventions appears to be ideological as it is not justified by the outcomes, but support for alternatives is growing and needs to be built on.

Keywords: Dairy; symbiotic food system; value chains; territorial markets; small-scale farmers; human economy; development; food security; nested markets

Introduction

This article assesses the supply of milk to residents in Dar es Salaam, Tanzania, from two main sources. The first is raw milk from urban and peri-urban dairy farmers in and around the city. The second is pasteurized milk from one of the largest dairy companies in the country, Tanga Fresh. These two very different systems of milk production and distribution provide insights into the relative strengths of 'territorial markets' (Kay 2016) and the 'symbiotic food system' (Wegerif and Hebinck 2016) versus the 'value chain' approach (Dolan and Tewari 2001; Gereffi, Humphrey, and Kaplinsky 2001; Hobbs and Young 2000; Kaplinsky and Morris 2001; Sturgeon 2008). The methodology is an example of a human economy approach that aims: "to reconnect the study of the economy to the real world; to make its findings more accessible to the public; and to place economic analysis within a framework that embraces humanity as a whole" (Hart 2015, 2).

Tanga Fresh is a successful company and value chain intervention that fits the common descriptions of value chains and is used as an example in value chain

training (Gereffi, Humphrey, and Kaplinsky 2001; Match Maker Associates 2014; Seville, Buxton, and Vorley 2011; Sturgeon 2008). As such it is rooted within the modernization logic that assumes a linear process of 'development' based on 'Western' experience and involving a particular package of discourse, technology and institutions (Arce and Long 2000; Long 2001). Value chain interventions don't question the nature of the economy and globalization, but rather address themselves to the question of "how to take advantage of such globalization trends" (Kaplinsky and Morris 2001). Thus, we can draw important lessons, from the analysis of Tanga Fresh, for this approach to 'development' that has become ubiquitous across non-government organizations, philanthropic foundations and the state.

The supply of foods, including milk, to fast growing Dar es Salaam with 4.6 million inhabitants, is an important site of struggle between contesting development paradigms and provides useful lessons as we face the challenge of achieving the right to food for the fast-growing urban populations of the world (De Schutter 2014; National Bureau of Statistics 2013; Wegerif 2014; Wiskerke and Viljeon 2012).

Ensuring an adequate supply of milk for the residents of Dar es Salaam has been an on-going concern for city leaders, health authorities and the various ministries responsible for the dairy industry for almost a century (Kasumuni 2015; Ministry of Livestock Development 2006; Sumberg 1997). This concern continues despite substantial increases in national milk production from 555 million liters in 1995 up to 1.38 billion liters in 2005. National per capita milk consumption is estimated at 43 liters per person per annum against the Food and Agriculture Organization (FAO) recommended 200 liters (Ministry of Livestock and Fisheries Development 2010, 1). This low consumption can be attributed to economic and cultural factors that limit milk consumption (Kusiluka, Badi, and Lunyelele 2015). There is also a challenge of accurately quantifying the widespread consumption through self-provisioning, especially in pastoralist communities with a strong milk-drinking culture, or traded locally and informally (Njombe et al. 2011). At the same time, 15–20 million liters of liquid milk equivalent are imported per annum indicating a large amount of untapped market potential for local producers (Ministry of Livestock and Fisheries Development 2010, 11).

Most of the national production (70%) is in the traditional livestock sector (Ministry of Livestock Development 2006, 3) and most of the consumption is of raw milk direct from the farm (Msalya 2014). Surveys have found that similar patterns are found in Dar es Salaam, with only a slightly higher per person consumption rate of 48 liters per annum (Kusiluka, Badi, and Lunyelele 2015). This is another example confirming the position, of the Civil Society Mechanism (CSM) for relations to the UN Committee on World Food Security (CFS), that "the bulk of food is channeled through markets linked to local, national and regional food systems ('territorial

markets')" and thus these are the most important markets to be supported for the achievement of food and nutrition security (Kay 2016, 6).

The first author carried out the research in Dar es Salaam as part of a larger study on food supplies to the city that used an actor-oriented approach of following the food (Cook 2006, 2004; Latour 2005; Long 2001; Wegerif 2014; Wegerif and Hebinck 2016). This involved finding retail outlets for milk and from there identifying actors (customers and suppliers) with whom to conduct in-depth interviews and to accompany in on-site observation of each part of the milk supply systems. The second author carried out most of the field research in the Tanga Region as part of a research project on Tanga Fresh using qualitative methodologies and a semi-ethnographic approach (Bryman 2008; Mahoeney and Goertz 2006; Martucci 2015). In Dar es Salaam and Tanga Region the researchers used participant observation and extensive interviews with dairy farmers, traders and Tanga Fresh staff and managers. Visits were made to the Tanga Fresh offices, dairy and collection centers in and around Tanga as well as to the offices, distribution center and retail outlets in Dar es Salaam.

This article does not look at other sources of milk in Dar es Salaam, such as the importation of long-life and powder milk, long established dairy producer ASAS, that is "one of the oldest and biggest business groups in Tanzania" (ASAS 2015), or the more recent dairy initiatives from the Bakresha Group of companies and Milkcom (Bakresha Group Ltd 2013; Milkcom 2016). It is useful, however, to note as part of the context that these competitors exist and supply dairy products to the city.

Dairy and dar: an overview from the literature, statistics and policies

There is limited literature available on the dairy industry in Dar es Salaam, but James Sumberg gives a useful historical overview starting from the 1921 establishment by the British colonial regime of the Temeke Dairy farm (Sumberg 1997, 278). What is missing in this account, and is hard to find, is historical information on the traditional dairy sector that must have existed before and alongside the colonial interventions. Today 96% of the cattle population are indigenous breeds, 86% of marketed milk being sold to neighbors in the vicinity of the producing household, and there is a continued preference for unpasteurized milk that makes up more than 95% of milk being marketed (Kurwijila, Omore, and Grace 2012; Martucci 2015; Msalya 2014).

The dominance of direct marketing of milk continues to be seen as a problem standing in the way of progress, as Sumberg explained "it is difficult for a modern dairy processing plant to compete and survive if some producers are allowed to go directly to the consumers with raw milk." (Sumberg 1997, 279). Almost 20 years later one can hear the same views, for example Dr. Msalya of Soikoine University of Agriculture stated that "[m]ilk

production and marketing face chronic problems of low output, compromised quality and dominance of informal market" (Kasumuni 2015). What these critics miss are the advantages of this direct marketing of raw milk, such as lower prices/cost to the buyers, higher prices/income to the farmers and people's preference for non-pasteurized milk (Martucci 2015; Sumberg 1999, 1997).

There are health concerns related to the consumption of raw milk, such as risks associated with pathogens that can exist in raw milk, but are destroyed in the pasteurization process (Centers for Disease Control and Prevention Undated; Oliver et al. 2009). Dar es Salaam residents and Tanzanians in general are, however, not the only people who prefer raw milk. In Kenya, with a more advanced dairy sector, it has been found that "despite campaigns to promote the consumption of packaged, pasteurized milk from the formal sector, raw milk remains more popular" (Kay 2016, 31). Based on 25 case studies from across Africa Roesel and Grace (2014, xv) conclude that "food sold by the formal sector often has no better compliance with food standards than food sold in the informal sector". Further, they make an important distinction between food hazards and actual risk, and give the example that "studies in Kenya found milk was often contaminated with biological hazards (bacteria); but, because nearly everyone boiled milk before consumption, the risk to human health was low" (Roesel and Grace 2014, xxi). Elsewhere there is a growing raw milk movement and some health studies that argue the risks are low and there are actually health advantages, such as reduction in asthma and allergies, to the drinking of raw milk (Benson 2012; Sentenac 2014; Waser et al. 2007). While many states in the USA ban the sale of raw milk completely, the European Union allows it and there are now even raw milk vending machines in a number of countries (Brasch 2014).

Others have identified positive values of this small-scale urban and peri-urban milk production in Tanzania. Kivaria et al. carried out research with dairy-producing farmers in and around Dar es Salaam and concluded that the activity added to incomes and nutrition status for the farmers and the customers (Kivaria, Noordhuizen, and Kapaga 2006). They note the contribution to the local economy from the range of support industries such as veterinary services. Unlike Sumberg, who claims that urban dairy farmers externalize health and environmental costs through activities such as "inappropriate disposal of manure" (Sumberg 1999, 196), Kivaria, Noordhuizen, and Kapaga (2006), found "[t]he use of manure for gardening leads dairy keeping families to have a more assured food security. In addition, these families are producing surplus vegetables for sale, making them economically more independent than families without cattle." (Kivaria, Noordhuizen, and Kapaga 2006, 121).

Interventions of the colonial and post-colonial state focused on developing large-scale commercial dairy production, whether run by parastatal or private companies. The direct state interventions made in the first two decades post-independence in 1961 had limited success and all ultimately collapsed, although their positive impact could be in the dissemination, by default as much as plan, of some improved cattle breeds and other technology (Martucci 2015; Sumberg 1997). Efforts to strictly regulate small-scale dairy production in Dar es Salaam continued until economic liberalization in the mid 1980s and included a prohibition on the sale of fresh milk to anyone other than Tanzania Dairies Limited (formerly Coastal Dairies) and the banning of the importation of dairy equipment. Nevertheless, in this period, "irrespective of any government policy or programs. . .there has been a dramatic increase in the number of grade dairy cattle kept within the city limits" (Sumberg 1997, 285).

From the 1980s, there was a change of approach that included encouraging more private sector involvement and the development of small-scale dairy farmers (Martucci 2015; Sumberg 1997). Although giving more attention to small-scale farmers, the government objectives for the dairy sector continue to focus on the promotion of commercialization, mechanization and packaging which involves pasteurizing (Ministry of Livestock Development 2006). Whether due to the changes or despite them, increases in milk production and improved dairy cattle, still in the hands of small-scale and urban farmers, has continued in Dar es Salaam and nationally (Ministry of Livestock Development 2006; National Bureau of Statistics 2012). From 1995 to 2008, the population of indigenous cattle increased by 25% to over 20 million and the population of improved dairy cattle increased in the same period by 145% to over 500,000 (National Bureau of Statistics 2012).

The primary approach in the Tanzanian Government's National Livestock Policy and Strategy documents is commercialization, processing and packaging. The Policy does have an objective "To promote peri-urban livestock farming to provide employment, improve household income and food security" (Ministry of Livestock Development 2006, 35), but makes no specific mention of direct marketing or urban and peri-urban production in the sections on dairy. The Strategy only has one objective related to peri-urban dairy farming, and that is to build the capacity of Local Government Authorities and, like the Policy, it contains no plan for direct marketing or urban dairy farming (Ministry of Livestock and Fisheries Development 2010).

Findings for raw milk supply

Overview of production and distribution

As has been noted above, most milk consumed in Dar es Salaam is raw milk, obtained by self-provisioning or purchased from local direct marketing

operations (Kivaria, Noordhuizen, and Kapaga 2006; Kurwijila, Omore, and Grace 2012; Ministry of Livestock Development 2006; Sumberg 1999). This milk comes largely from cows in and around Dar es Salaam and the neighboring geographically larger region of Pwani that completely surrounds the city. Recent figures are not available, but in 2008, there were 32,398 cattle in Dar es Salaam, 24,372 of them improved dairy cattle, with an average herd size of five. This is an increase from an estimated 18,000 dairy grade cattle in 1993 (National Bureau of Statistics 2012; Sumberg 1999). In 2008, Pwani region was found to have 255,258 cattle of which improved dairy cattle were 28,507 (National Bureau of Statistics 2012). This gives a total milk yield in Dar es Salaam Region, based on the 2008 figures, of around 78,000 and 51,000 liters per day for the wet and the dry season respectively[1] and in Pwani 350,000 and 260,000 liters per day.

The producers of raw milk sold in Dar es Salaam varied in scale and style. As confirmed by others, we found dairy farmers having from one cow to hundreds (Kivaria, Noordhuizen, and Kapaga 2006; Sumberg 1999). The larger herds are on the periphery of the city and some up to 100 kilometers away, such as around Bagamoyo and Chalinze in Pwani Region. Many are in the peri-urban areas, such as Kitunda, Kigamboni, Kibaha, and Makongo. The number of dairy farmers in the strictly urban areas appears to be declining as the city becomes more densely populated and the composition of the people change. For example, we were told about and witnessed, the decline of dairy farming on the Masaki Peninsula as luxury apartment blocks have been built on land that was used for cattle grazing and collecting fodder. Residents of Masaki are also increasingly expatriates and a few elite Tanzanians who are less interested in dairy farming, or raw milk purchasing.

Important sources of cattle food are: the collection of grass cut from the sides of roads, river valleys and other pieces of unoccupied land; *pumba* (maize bran) from thousands of maize mills scattered around the city; and brewer's grain (left over from the mashing and brewing process) largely from the Tanzania Breweries Limited operations. In densely populated areas, cattle are kept in sheds, but further out of the city it is common to find cattle grazing on any available land.

Whereas most foods have a few distinct types of outlets or distributors, raw milk in Dar es Salaam is found in a variety of very different places. First, there are dairy farmers who sell to neighbors and passersby from their homes where the cattle are kept. There are rarely any signs promoting the sales, perhaps a hold-over from the days when it was illegal to sell raw milk, but when asked, people knew the milk suppliers in their areas. Second, milk is frequently sold to people at their offices by colleagues or a trader who comes

[1]Yield figures calculated by authors based on the 2008 National Sample Census of Agriculture (National Bureau of Statistics 2012) and the survey carried out by Kivaria et al (Kivaria, Noordhuizen, and Kapaga 2006).

to the office selling to regular customers they have built a relationship with. Third, we have found milk being sold from guest houses and at bars. Fourth, there are certain shops that sell raw milk alongside other products, but it is not sold at most regular *dukas*.[2] Fifth, there are small dairy markets that appear at particular unmarked locations – you hear about them through word of mouth – on the side of roads around the city where milk is sold early in the morning by traders or directly by producers. Sixth, there are bicycle and increasingly motorbike distributors who buy milk from peri-urban dairy farmers and sell to customers they know, some who buy for their own use and others who are vendors. Seventh, some street food vendors sell hot milk or milky tea. Eighth, a place where you can always find milk is at people's markets (designated trading areas with many stalls, often referred to as 'wet markets'), normally sold boiled and by the mug by woman food sellers.

The raw milk supply system is based on many actors and their enterprises, almost all owner operated, that produce and distribute the milk through a system that is based on symbiotic relations underpinned by familiarity between actors with common cultural repertoires (Wegerif and Hebinck 2016). These circuits of production and distribution are typical of the "web-like relationships that link actors in territorial Markets" (Kay 2016, 18) and fit with what some refer to as 'short supply chains' with a limited number of stages, all linked by direct personal connections, between the producer and the milk drinker (Renting, Marsden, and Banks 2003; Wegerif 2014). The functions performed by the actors involved can be grouped to fit into four roles: farmer; trader; vendor and milk drinker. In some circuits a different actor performs each of the different functions. In others there are fewer actors, as for example when the farmer sells direct to the milk drinker, or the trader is also a vendor selling direct to the milk drinker. It is common for actors to perform changing roles, for example, there are traders who sell to vendors (such as street food sellers), but also in other instances become vendors selling direct to milk drinkers. These circuits are illustrated below with arrows showing the range of shifting direct relations between different actors and their roles. The maximum and minimum prices found to be received and paid per one liter of milk for farmers and milk drinkers are shown in Figure 1. The minimum differential between the producer price received and final buyer price paid was zero, this in cases where the farmer/producer sold direct to the milk drinker. The maximum differential was TSh1,000 per liter when this amount was the mark-up made by traders and vendors in-between. The traders and vendors paid for and sold milk at a range of prices between these. This diagram is based on information gathered from a range of specific circuits of raw milk supply that were assessed.

[2]A *duka* is a shop; used here to refer to the small general dealer stores that are found throughout Dar es Salaam.

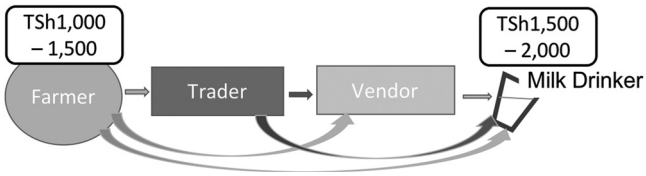

Figure 1. Raw milk supply model.

Examples of raw milk retailing and production

The vignettes below illustrate in more depth the nature of the raw milk production and distribution found in Dar es Salaam and summarized above.

Baba Simon's shop, located in a suburb of mixed retail and residential use about 6 kilometers from the city center, is hard to place in a particular category. It operates under the overhanging roof of a small maize milling 'factory' where the stock is set out and a kiosk of just a few meters squared is used as a store. Baba Simon, his wife and assistant sell maize meal from the mill, chicken eggs, pigeon eggs and milk. They sell fresh milk for between TSh1,300 and 1,500 ($0.79 and $0.91) per liter depending on the customer and *mtindi* (a form of sour milk, like buttermilk, that they make on site) for TSh2,000 ($1.21) per liter. They keep the milk and *mtindi* in 25-liter containers and buckets and sell it in any quantity. Most customers come with their own containers, but they also have a sack full of used water bottles available if needed.

Most of the milk is supplied by a farmer who has about 120 head of cattle kept near Bagamoyo 60 kilometers away in the Pwani Region. The farmer, or one of his workers, brings the milk on the back of a pick-up truck, delivering 250–300 liters a day for TSh1,000 ($0.61) per liter. Baba Simon doesn't pay for the milk until he and his assistant have completed tests on samples using procedures that conform to milk testing guides, such as from the Food and Agriculture Organization (FAO Undated, Kurwijila 2006).

Much of Baba Simon's milk business is selling direct to the final milk drinker, but some is sold to vendors, such as women from the market who get a discounted price from Baba Simon. Thus, in the model shown in Figure 1 he is both a trader and vendor. The vendors he sells to, sell on to others, at prices closer to TSh1,700 ($ 1.03) per liter, depending on variables like the size of mugs used. The shop has a good location on a busy tarred road with pedestrians, *Daladalas*[3] and other vehicles passing all day. Baba Simon puts out a board next to the road advertising the eggs and the milk.

On one morning at the shop we observed a young man on foot buying half a liter of milk, he says it is for a baby at home. A Toyota Land Cruiser stops

[3]A *daladala* is the main form of local transport bus in Dar es Salaam. It is normally a medium sized bus used for urban public transport on set routes.

and the driver buys several liters of milk in a container they brought with them. A woman walks up carrying a young child and buys a liter of milk that she says she will boil and give to the child. We ask why she buys this milk and if she ever buys Tanga Fresh. She says she likes the Tanga Fresh *mtindi*, but she is worried that the Tanga Fresh milk might not be fresh; "There is an expiry date, but sometimes people are not honest, the date might not tell you it has expired, maybe it could give my child a problem. I know the milk here is fresh and I boil it myself". She says nothing about the price, but when asked she confirms that she knows that milk from Baba Simon is cheaper than Tanga Fresh.

Milk, pigs and biogas neighborhood supply

It is a street in a residential suburb, about 14kms from the city center, with high walls behind which sit middle class houses with satellite dishes on the rooves. We knocked at one of the gates where people had said there were dairy cows. Only when the gate opened could we see the chicken sheds, pig sties and cattle sheds.

Mama Christina and her husband Charles had 12 cattle at the time including the calves and the bull that they use for natural insemination of their own cows. The times we visited the bull was out on hire, servicing the cows of other small dairy farmers. They say that the artificial insemination is expensive and unreliable. Charles complained that "you pay vets a lot of money and many times you don't get any calf, so we use our own bull". This is a common problem and natural solution found in other research across Tanzania and reported by dairy farmers in our field research (Kivaria, Noordhuizen, and Kapaga 2006).

Mama Christina and her husband were getting about 50 liters of milk a day at that time. They sell the milk directly from the house to local buyers for their own consumption and to a few traders all of whom come with their own containers. They adjust the price by different amounts for wholesale and regular customers and take milk they do not sell from home to the market. Sometimes she sells to final buyers for up to TSh2,000 ($1.21) per liter, more expensive than quite a few other raw milk suppliers, but still cheaper than Tanga Fresh. TSh1,500 ($0.91) is the minimum that Mama Christina sells for, more often she sells for around TSh1,700, to people she knows.

Mama Christina has been running the livestock operation for decades and now employs three workers and one of their sons also assists. Charles used to work in sales for a company selling drinks, but it did not give enough money and "we like to run our own business, we can do what we want", he said as this freedom was demonstrated by a spur of the moment decision for all of us to have lunch and a beer at a nearby bar. Dairy is just one part of their business and they say the chickens and the pigs bring the biggest profits.

A core part of the feed for the cattle and other animals is the brewer's grain from the Tanzania Breweries Ltd and *pumba* from the maize mills. They have a small concrete silo where they put and mix the animal feed. They have built a biogas digester running on the animal manure and piped the gas to their house for cooking. In June 2015, they were starting to pipe gas to the neighbors' houses. They said that the neighbors do not complain about the animals, because they are happy to have them there, they get fresh milk and meat and soon gas.

Tanga fresh

In Tanga Region, where Tanga Fresh source most of their milk, the average heard size is 10 and the total cattle population is 732,130, of which 41,639 are improved dairy cattle (National Bureau of Statistics 2012).

Tanga fresh: the beginning

Tanga Fresh started operation in 1997, with an initial processing capacity of 15,000 liters a day in the center of the town of Tanga. They moved to their current premises in 2009 and got more equipment which grew the processing capacity to 50,000 liters a day. The company has increased the intake of raw milk and the financial turn-over every year since it started operating and now directly employs around 150 staff.

Important to understanding the development of Tanga Fresh and its success is the history of decades of interventions aimed at developing the dairy industry in the region. The Dutch government was involved in supporting efforts at large-scale parastatal dairy farming in the 1970s. After the lack of success in that, and a change in policies, the Dutch government continued to play a leading role in the Tanzanian Dairy Development Programme in the 1980s with more focus on the private sector and small-scale dairy farmers (Swai, Minja, and Zylstra 1993). A wide range of initiatives have been implemented including research, training, improving cattle breeds, the "take a cow, give a cow" distribution of cattle (ibid) and the establishment of the Tanga Dairy Cooperative Union (TDCU) in 1993 (AECF 2011; Zylstra, Lyimo, and Rutamu 1995). The development of dairy in the region was also enabled to some extent by the collapse of sisal production. There was an economic void, and there was land available. Many of the dairy cows now graze on land that had been sisal plantations (Sabea 2008; Van Voorthuizen 1970). An interesting scheme is one started in the early 1990s near Pongwe village that gave farmers who were under 40 years of age a cow and a piece of land on an old sisal plantation. They could also join Tanga Fresh and deliver milk to the nearby milk collection center.

There have been important long-term involvements of key individuals who have shown a commitment to the initiative that has outlasted organizational involvements and changing government policies. These men carry a vision for the project that sees it being a viable business that also goes out of its way to have wider development and poverty reduction impact. Mr. Zijlstra, from the Netherlands, was involved as the head of the Dutch development interventions in the 1980s and continued beyond that setting up a breeding farm and being closely involved with the establishment of Tanga Fresh. He remains on the Board of Tanga Fresh and owns a small percentage of the shares. Mr. Hossein, a Tanzanian National, was the first Managing Director of Tanga Fresh and ran the company for more than a decade, he is now a member of the Board also with a small shareholding.[4] He continues to live in Tanga and remains very involved with Tanga Fresh and dairy sector development more widely in Tanzania.

The structure

Tanga Fresh has always had a mixed financing model with private investment and financing from development institutions with a social development commitment. The largest shareholder is the Dutch DoB Foundation with 52.5% of the shares since it got involved in 2008 as an equity partner through its program of investing in businesses with a social impact in Africa. DoB equity state that: "We invest in businesses that contribute to a more social and sustainable society" (DoB Equity 2018).

The Tanga Fresh Board meets four times per year and is attended by senior staff and shareholders including representatives from the TDCU Board which holds 42.5% of the shares. The Board meetings of Tanga Fresh are formal occasions where decisions such as on milk pricing and share issues are made. The TDCU representatives and their Board report to and is elected by the Boards of Primary Societies made up of farmers who have the opportunity to attend the two meetings per year convened by the primary society and elective meetings where they select their leaders. Not surprisingly, given the layers of structures (Figure 2), the farmer members feel fairly far removed from the leadership of Tanga Fresh and even from TDCU. One primary society leader complained that "they [TDCU] tell farmers they are the main shareholders, but farmers do not even know whether this year they ran at a loss or profit". Theoretically each farmer member is a shareholder, but this did not seem to mean anything to most of the farmers interviewed. When there is a profit there is the dispersal of a dividend that is split according to the supply from each farmer during the year. Thus, the share of the dividend is linked more to their production and supply than to their ownership in the company, and farmers do not have clear information on how the benefits are

[4]These figures for shareholding were as of 2014.

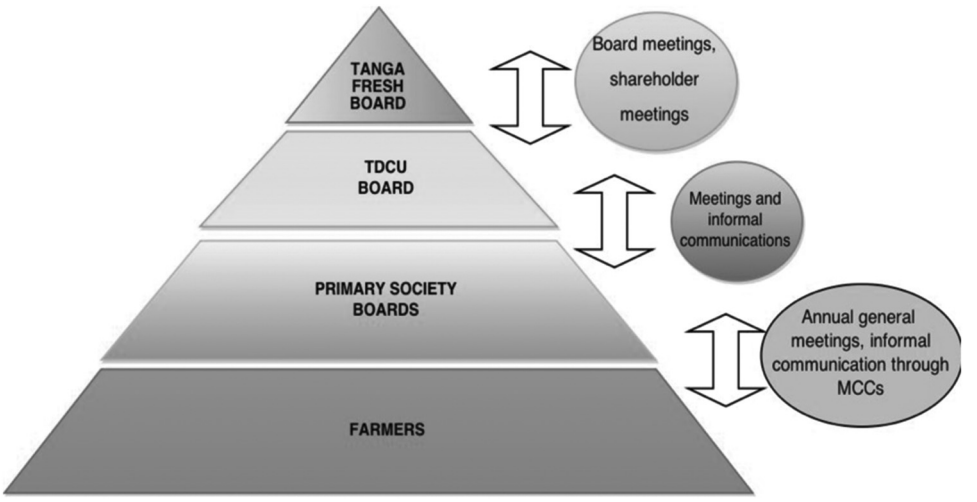

Figure 2. Decision making in Tanga Fresh.

shared. The dividends go to the TDCU and, said one farmer leader, "we've never seen a statement from Tanga Fresh, we get the dividend, so we don't know whether it is fair". Moreover, concerns related to transparency were often raised with regards to a levy that was supposed to support the running costs of TDCU. It was difficult for most of the farmers (especially those not involved in leadership positions) to justify the need for such a levy and explain how TDCU invested it. Inevitably, this weakened the trust relations of ordinary farmers towards the union and its leaders.

Tanga Fresh have various ways of improving direct communication with farmers and other stakeholders, such as convening a Dairy Platform with stakeholders three times per year, running radio programs and providing an SMS information service. Despite these efforts the level of trust between the farmers and the company is limited.

There are beneficial collaborations amongst farmers that go beyond what is directly organized by Tanga Fresh, such as farmers learning from each other when they meet at the milk collection centers. Some also reported supporting fellow farmers who were in trouble, such as when losing cows through disease or theft and there are a number of farmers involved in peer to peer lending and savings groups.

Examples of a Tanga fresh milk supplier and a collection center

The vignettes below are shared to give a greater insight into the Tanga Fresh services and the suppliers, many of whom are small-scale farmers, and the operation of the important collection centers that makes the company accessible to these famers.

We sat on the porch of Mama Anna's house. A few meters away a calf was tethered and lying relaxed in the sun. Mama Anna has eight cows and three calves that graze on communal land and sleep at night in a small cattle *boma* (enclosure) next to her house. She milks the cows every morning and evening and carries the milk on foot to the Tanga Fresh collection center. Her first cow, that she got more than 12 years ago, came from a 'take one, give one' cattle project. She was given a cow and then paid back through passing on a calf to another family. She depends for her income on the milk sales and farming maize, oranges and coconuts on land in a neighboring village where she was born. While she sells most of her milk to Tanga Fresh she also keeps some for home use and sells some to neighbors.

Mama Anna has attended a two-week training on caring for dairy cattle run at a local college. When her cattle are sick she takes blood samples to a veterinary laboratory in Tanga for analysis and to get medicine. There is a vet in Pongwe that assists with artificial insemination for her cows. She gets vitamins from the farmers' cooperative that runs the Tanga Fresh collection center and buys *pumba* (maize bran) as supplementary feed from the maize millers in the same street in the village. When she has financial needs, often for family reasons rather than for dairy production, she borrows money from the milk collection center and her loan repayments are deducted from the money she receives for her milk supplies. When needing advice Mama Anna does not feel she gets it from Tanga Fresh, but she explains how she does benefit from sharing experiences with other dairy farmers when they meet and talk at the collection center.

It was about 8 am in Pongwe Village, we watched as buckets and other containers of milk were lined up in the shade of a zinc roof at the Tanga Fresh milk collection center. Most of the containers were brought by young men on bicycles and motorbikes, women of all ages also came on foot, buckets on their head or in their hands. A few children and some older men were there queuing and chatting as well. The containers varied in size and the quantities delivered per person went from one liter to several hundred liters. Tatu, in her twenties, dressed in a clean white coat, hair net and wellington boots – the classic uniform of hygiene – was taking samples from every container and using an alcohol test kit to check for any impurities. The milk that met the standards (all did that morning) was poured into a shiny stainless-steel container, weighed, and then filtered before being put into one of two large shiny and cooled tanks in the back room of the building. In the same building is a small office used by the milk collection center staff and the primary structure of the Tanga Dairy Cooperative Union. Later in the day a truck would collect the milk and take it to the Tanga Fresh Ltd processing plant.

Collecting and distributing: the benefits and challenges

Tanga Fresh has an impressive network of 47 milk collection centers that receive milk from around 6,000 farmers, giving them access to markets such as Dar es Salaam where it makes an important contribution to the availability of fresh pasteurized milk and *mtindi*.

All the milk collected is taken to the central dairy where it is processed into pasteurized milk, *mtindi*, yoghurt or cheese. There are quality control checks along the way from the checking of each delivery to the collection center, checking the milk at the collection center before transporting to the dairy and checking on arrival at the dairy before it is mixed with other milk. When the milk arrives in Dar es Salaam the depot also checks a sample of sachets for temperature to make sure they remained within the correct temperature range. 80% of the production of *mtindi* and milk, an average of about 31,000 liters per day during 2014, is sold in Dar es Salaam 340 kilometers away.

In Dar es Salaam Tanga Fresh has a marketing and distribution center and five independent agents who market and sell the milk. The distribution center passes on milk to three of the agents (the other two are larger and get direct deliveries) and distribute to shops and other clients. The distribution center also sells direct to the public, but at retail prices, and they run a milk shop in another part of town as well. The largest of the five agents sells more milk than the distribution center, which itself had 17 distribution vehicles (small vans) in operation. Tanga Fresh and the agents distribute to *dukas*, supermarkets, hotels, and some companies and institutions.

Tanga Fresh pays TSh700 ($0.42) per liter of raw milk to the collection centers, from which the collection center and the TDCU take a cut, leaving the farmer with TSh630-680 ($0.38–0.41) per liter. The variation in the amount to the farmer depends on the location of the collection center as some more remote ones have to cover additional transport costs. The prices the milk is bought and sold at are set by the Tanga Fresh Board. In 2014 the wholesale price, whether sold by them or their agents, was set at TSh950 ($0.58) per 0.5 liter of fresh pasteurized milk and TSh1,050 ($0.64) per 0.5 liter of *mtindi*. The agents got the milk from Tanga Fresh at TSh755 ($0.46) and TSh840 ($0.51) for milk and *mtindi* respectively. The set retail prices were TSh1,000 ($0.61) for 0.5 liters of fresh milk and TSh1,100 ($0.67) for the *mtindi*. In practice, all shops sold above the set retail price. Typical prices found in *dukas* and supermarkets in 2014 were TSh1,100–1,200 ($0.67–0.73) for 0.5 liter of fresh milk and TSh1,200–1,300 ($0.73–0.79) for mtindi.

It seems rather odd that Tanga Fresh as a business operating in a market environment tries to set common wholesale and retail prices for all its agents and retail outlets. These set prices remain unchanged through the seasons despite changing supply and therefore shifting supply and demand

relationships. This is done with the idea that they need to be consistent and build a market base by not chasing away customers who may feel the retailers take advantage of them. The set pricing with set profit margins will tend to favor large volume sellers over low volume sellers who might be able to use more flexibility to their advantage and struggle to make ends meet with low margins on small volumes. Another thing it does is to remove any incentive for farmers to invest in maintaining production in the dry season. For example, if the price went up in the dry season it could start to be viable for farmers to invest in improved fodder, such as growing lucerne, to maintain production levels in that season.

Currently, Tanga Fresh relies on small-scale farmers for 90% of its milk supply and it provides an excellent opportunity for even the smallest producer to sell their milk. There is a tension in this, however, as there are high transaction costs when collecting from many small and dispersed producers and the pressure to maximize the production capacity of the dairy and meet market demand makes the larger suppliers attractive.

On the distribution side in Dar es Salaam, Tanga Fresh has an impressive distribution network that gets the milk out to small *dukas* across the city. But, the large buyers in the form of the supermarkets and institutional clients are seen as a priority, due to the volume they purchase. "The supermarkets, they are very important", a Tanga Fresh employee at the depot in Dar es Salaam said. This perspective is a threat for the future and impacting the smaller retailers now. The supermarkets receive preferential treatment in the form of delivery on 30 days credit (the *duka* owners pay cash) and prioritization of their milk supply, at the expense of other retailers, when supplies are low as they are in the dry season. Tanga Fresh encourages their agents to keep supplying all buyers even if with lower quantities, but for the agents and the Tanga Fresh depot this means less sales while delivering to the same number of places. In practice, we found some small outlets were not getting delivery at all during the dry season.

Farmers interviewed appreciate the guaranteed and stable market that Tanga Fresh provides for their milk, but all lamented that the milk price is barely sufficient to cover the basic costs of production. The farmers spoke of the cost of inputs, such as feed and medicine and noted that these costs vary, especially increasing in the dry season, but the price they receive is the same thus affecting the return they get from dairy farming. Some know how to improve feed for their livestock but say the income does not justify the additional costs. As one farmer explained, "we know some of the supplements we can use, but we don't give those things since the milk they produce is not enough to afford the cost of those things".

The seasonal variations in production have left Tanga Fresh with milk unsold in the wet season and short of supplies in the dry season. Tanga Fresh production can drop to around 35,000 liter a day in the low season whereas it

peaks at around 70,000 liters in the high season. This is a challenge to the company and impacts on the income to farmers as well. One response was to make cheese, up to 20,000 kg a day in the high season, which has a much longer shelf life than fresh milk and also a different market, mostly sold to hotels in Zanzibar. This market is small, however, and the cheese production eased but did not overcome the uneven supply problem. The current plan is to produce UHT long-life milk.

The so-called 'side-selling' or direct marketing by dairy farmers is a major issue for Tanga Fresh, just as it has historically been identified as an issue for the development of a commercial dairy sector (Martucci 2015; Sumberg 1999, 1997) and in other value chain initiatives (Minten, Randrianarison, and Swinnen 2009). Tanga Fresh requires farmers who supply them with raw milk to sell their whole supply to Tanga Fresh and if they don't there can be sanctions in the form of refusing to buy from the farmers again or refusing to buy in the wet season. Nevertheless, this agreement is almost universally violated by the farmers. For Tanga Fresh, the direct marketing by farmers reduces the supply of milk they need and also directly competes with them in the market. The Managing Director said "there are many who bring raw milk to town [Tanga], we cannot even sell fresh milk in town because of raw milk". He also relates the direct marketing to both price and preference: "There is competition with raw milk sold in town because it is cheaper and also for lack of knowledge about milk processing. They can see the cream on top, so they think Tanga Fresh has taken away cream, they don't see cream floating, so it's a process of educating".

For farmers, side-selling makes sense for the following reasons: diversification of economic opportunities for more autonomy and security; they receive a higher price, TSh1,000 ($0.61) per liter selling from home in Tanga region (and more sometimes in the dry season) compared to less than TSh700 ($0.42) when delivering to a Tanga Fresh milk collection center; their milk is not subject to strict quality controls as it is by Tanga Fresh, so not as often rejected; and they receive cash payments rather than waiting for the twice per month payment from Tanga Fresh.

The 'problem', or from a farmer's perspective the benefit, of direct marketing increases in the dry season as low availability of milk pushes prices up in the local market, while Tanga Fresh keeps its prices fixed. Thus, two of Tanga Fresh's biggest challenges – reduced dry season supply and "side-selling" – combine to exacerbate each other.

Figure 3 shows the main stages from the dairy farmer to the milk drinker in the Tanga Fresh production and distribution model, and shows the prices per liter for the farmer and the final buyer. Note that this is based on the 500 ml sachets, the smaller 250 ml milk and *mtindi* packets are slightly more expensive per liter to the final buyers, the agents and the shops. At most stages, there is a significant amount of management overhead in the form of

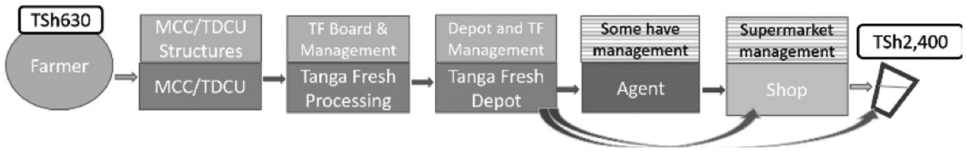

Figure 3. Tanga Fresh milk supply model.

organizational structures and management as indicated by the grey blocks. This includes the high management overhead when the milk is sold through supermarkets and in some of the operations of the larger agents. The Tanga Fresh depot does sell a limited amount direct to the final buyer and consumer and also sells direct to many shops, hence the arrows that make those direct links.

Comparing the two models

Economic competiveness

Despite the positives of the Tanga Fresh model the raw milk production and distribution system delivers consistently and substantially better prices for dairy farmers and lower prices for the milk drinkers as clearly shown in Table 1. Such a finding is not unusual, Seville et al. in assessing a wide range of value chain interventions found that "formal chains tend to provide greater income security but not necessarily higher prices", (Seville, Buxton, and Vorley 2011, 42). The CSM found, after extensive work looking at linking farmers to markets, that territorial markets "are the most remunerative for smallholders since they provide them with more control over conditions of access and prices than mainstream value chains and more autonomy in negotiating them" (Kay 2016, 13). In another example, Minten et al. give a positive assessment of a green pea value chain intervention in Madagascar, but still lament that the company cannot compete with local producers, even when selling to supermarkets in the capital city (Minten, Randrianarison, and Swinnen 2009). Despite contracts and high levels of supervision Minten et al. found that, as with Tanga Fresh, "another enforcement problem is avoiding "side-selling"- a problem which is a general concern in modern supply chains with contracts" (ibid, 1734). Clearly producers are finding higher prices for their products outside the value chain.

The competitiveness of the raw milk supply is due to the following factors:

- Low overhead and almost no management costs. Instead it relies on many interdependent owner operators who are embedded in social relations with common cultural repertoires that replace the need for contracting and management oversight (Wegerif 2017).

- Less stages in the network that brings the milk to the final drinker, when compared to the Tanga Fresh value chain. This despite involving more independent actors running and owning their own enterprises.
- Proximity to the city that reduces transport and storage costs.
- Cost saving due to not processing and packaging the milk that combines with delivery of a preferred product, raw milk. Note, however, that parts of the raw milk system do also include processing in the form of making *mtindi* and the boiling and selling of hot milk by street food vendors. These products remain cheaper than Tanga Fresh and within the parameters as summarized in Table 1.
- No spending on marketing and promotion, instead reputations are built and customers reached through social networks and word-of-mouth.
- Same day delivery and consumption delivers a fresh product and reduces the need for processing and refrigeration.

Autonomy

Another advantage of the raw milk system is the high level of autonomy and equity among actors who have direct ownership and control across the system. Tanga Fresh, on the other hand, is a 'lead firm' in the value chain and shows how "lead firms use their financial and technological advantages to institutionalise dominant relationships with suppliers who are left dependent in terms of technology, information and market access" (Taylor 2007, 10). Despite representative structures and communication mechanisms, most suppliers to Tanga Fresh feel distant from the company and are not involved

Table 1. Prices to producers and drinkers for fresh milk through Tanga Fresh and some examples of raw milk supply circuits.

Supplier	Payment to producer. Fresh milk, TSh per liter	Cost to milk drinker. Fresh milk, TSh per liter[5]	% to producer
Tanga Fresh	630	2,400	26.3%
Motorbike distribution	1,200	2,000	60.0%
Mama Christina[6]	1,500	2,000	75.0%
Via a street market[7]	1,000	1,667	60.0%
Baba Simon	1,000	1,500	66.7%

[5]These are the highest price to eater scenarios in all cases. Unlike in the Tanga Fresh case, many eaters do get the milk for lower prices from the raw milk suppliers than the highest prices reflected here.

[6]As noted in the description of this operation, Mama Christina, as the farmer selling directly frequently gets 100% of the final retail price.

[7]This is one model found via the Ubungo early morning street market. While the prices paid to producers were quite consistent (apart from the direct sellers who are getting a higher proportion) the traders buying and selling on to their customer have a variety of prices that vary around this level and were also difficult to verify.

in any direct decision making. A small leadership group emerges, made up of senior management and the dozen people who sit in the Board of Directors, has a lot of power and is increasingly distant from ordinary members. This seems inevitable with this scale of institution and the social and cultural disconnection between the ordinary farmers and the rigid management systems being used, where even prices are set only quarterly. In stark contrast farmers, traders and vendors in the raw milk system make their own decisions on all aspects of their operations including price, which they can adjust daily, or more often, in response to factors such as the amount of milk a customer buys and the type of relationship they have with that customer.

Suppliers understandably try to spread risk across many and diverse buyers to reduce the risk of "lock-in" and the "higher power asymmetry" involved in dealing only with a lead firm in a value chain (Sturgeon 2008, 24). In the raw milk system, the dairy farmer has a high level of agency and responsibility, able to negotiate on price and to choose between a wide range of different buyers and also different types of market options. The negotiations in the raw milk system are between actors who are relatively equal in their scale and power. Farmers supplying Tanga Fresh find themselves subject to distant decision making and are expected to rely totally on one buyer for their milk sales. Despite the exclusive contract with Tanga Fresh, they still seek autonomy and better prices through selling outside of that. Such a striving for autonomy by 'peasant' farmers has been noted by others and makes sense given the real risk of depending on only one source for your income (Scott 2009; Van der Ploeg 2008). In a direct negation of the aspiration for autonomy, most value chain interventions involve contractually binding small-scale farmers to corporate enterprises in relationships where the power will always be heavily skewed against them. If the benevolent motivations, such as those present in Tanga Fresh shareholders, and the donor funding often used to set up such projects is no longer present, there is a real risk that farmers will find themselves in relationships where the term 'chains' is most appropriate.

Corporate bias at people's expense

Tanga Fresh has a tendency towards collaboration with other larger and more corporate entities that are more like themselves in scale and culture. For Tanga Fresh, strengthening these links is a logical strategy to ensure the viability and sustainability of the business. This fits a tendency of value chains, in particular global and agricultural ones, to "tilt" power away from small producers (Sturgeon 2008). Not only is this a threat for small farmers and retailers in the future, in the Tanga Fresh case it is having an impact now, notably through the preference given to supermarkets over the small retailers. This is being done even though small retailers are as a whole a

larger part of the retailing operation that Tanga Fresh relies on. The risk of this practice goes beyond milk supplies as it threatens the food system that the small-scale producers and retailers are part of. The valuing of single larger entities will, if continued, further reduce the incentive to buy from many small-scale farmers and in the city the more items customers want that small retailers cannot supply, the less viable such retailers will be. Even without the preferences given to supermarkets, the fact that the *dukas* rely on the same suppliers for pasteurized milk as the supermarkets makes it one of the few Tanzanian produced foods where the *dukas* are not more competitive in pricing than supermarkets. This contrasts with other Tanzanian produced foods like eggs, maize and rice, which are supplied through the symbiotic food system that enables the *dukas* to sell them at more competitive prices than the supermarkets can manage (Wegerif and Hebinck 2016).

Social relations versus disconnection

Some of the theoreticians of the value chain approach do acknowledge, with reference to the classic work of Granovetter (1985), the existence and importance of social relations in shaping the economic relations. They, however, apply this very narrowly to the nature of relations between suppliers and buyers, missing how actors are embedded within wider sets of social relations beyond their lives in any particular value chain (cf: Gereffi, Humphrey, and Sturgeon 2005; Sturgeon 2008). When value chain thinking moves from being an approach to analysis to becoming a development intervention the approach and training provided misses even the limited references to the social dimension that is there in some literature (cf: Match Maker Associates 2014).

The value chain approach misses the complexity of how the market relations involved are embedded in social relations among actors with particular cultural repertoires that are shaped by their lives beyond those particular market relations (Beckert 2009; Granovetter 1985; Wegerif 2017). How trust and preference is formed in the raw milk system is often overlooked in a value chain analysis. Tanga Fresh customers are expected to trust packaging and use-by dates, but some experience a 'disconnecting', despite the milk coming mostly from small-scale farmers that tends to undermine trust between consumers and distant producers (Wiskerke 2010). In the raw milk system trust in those one trades with and personal relations play a key role and involve the milk drinker directly interacting with the dairy farmer or a person close to them who shares similar experiences and preferences in relation to milk (Roesel and Grace 2014). People involved with raw milk production and distribution are often brought in and orientated through relations they have with others, but this is not seen in a value chain analysis within which "the specific social relations through which local and

national labor forces are produced, reproduced and deployed to create value within the production process are marginalized" (Taylor 2007, 13). The process of value chain mapping overlooks such relations, firstly due to reifying the narrowly economic nature of transactions as being about utility and secondly, through a deliberate simplification to "tell us at one glance how to get from one dot to the other" (Match Maker Associates 2014). Value chains are argued to be an alternative to "a series of spot-market transactions" involving no long-term relations and instead just "adversarial business relationships" (Hobbs and Young 2000; Match Maker Associates 2014). Such descriptions based on research in North America, bear little resemblance to the relations involved in the raw milk and wider symbiotic food system operating in Tanzania.

The cultural and social disconnection of the Tanga Fresh model can be most starkly seen in the use of technology that is far from the experience of the dairy farmers to produce a form of milk that most of the dairy farmers do not drink. The management discourse focusses on food safety and portrays the preferences of most of their suppliers and the majority of milk drinkers in the country as being based on ignorance; further indicating and reinforcing disconnection. Such disconnection that overlooks people's preferences, cultures and established practices has been found in other modernization driven development interventions, for example attempts to introduce new maize varieties in Kenya, and the results tend not to be successful (Hebinck, Mango, and Kimanthi 2016; Kimanthi and Hebinck 2018). There are a number of potentially negative outcomes from this approach, for example, Tanga Fresh do not supply the large number of mostly women milk vendors selling from home, or through networks in work places and in and around markets. Should the raw milk system be destroyed, so will these small enterprises be jeopardized.

Ecological sustainability

This paper has not explored in-depth the production practices or the farm agroecosystem of milk production of either of the models looked at. What we have focused on is the milk distribution system as whole, the nature of which is both essential for enabling agroecological practices at the farm level and recognized as essential to agroecologly in more recent and holistic definitions (Francis et al. 2003; Gliessman 2018). From this perspective the raw milk supply has agroecological advantages in that it is a highly equitable and accessible relationship-based market system that involves close links between interdependent but autonomous actors from the farm to the table (Gliessman 2018). We can see specific ecological advantages of the raw milk system, such as the utilization of cattle manure for urban horticulture (even biogas generation), the absence of packaging as distribution is in reusable containers,

and energy savings on transport as the majority of sales are direct from dispersed producers to their local community members or to local markets. More importantly this can be seen as a radical part of the movement for agroecology in that it delivers at scale, thus meeting food needs, and it resists the expansion of the unsustainable industrial food regime and incorporation into corporate value chains (Holt-Giménez and Altieri 2013).

Poverty reduction

The competitiveness of the raw milk system suggests that it makes a greater contribution to poverty reduction, but we do not have data to assess if the poorest are involved or compare the wider impacts on poverty with that of Tanga Fresh. It is of concern, however, that a number of assessments of value chain interventions have found that they did not reach the poorest farmers, tending to involve farmers who already had more assets and education (Humphrey and Navas-Alemán 2010; Minten, Randrianarison, and Swinnen 2009; Seville, Buxton, and Vorley 2011).

Why value chains?

While Tanga Fresh does not supply global markets it follows the "inappropriate" organizing principles of value chains that only accommodate linear relations, involve the centralization of decisions over value and it distribution, and "does not accommodate the multiple functions and multiple values (social and cultural as well as economic) that territorial markets include" (Kay 2016, 18).

Almost every major, and many minor, NGO and state interventions dealing with economic or farmer development now includes value chain work. Based on our findings from this research and a review of other literature, there is no valid justification for such a disproportionate amount of support to value chain work.

The concept of the value chain emerged from the corporate approach of supply-chain management and global commodity chain work and has come to prominence with the rise of the current form of neo-liberal corporate led globalization that became dominant from the 1980s and fits within a wider modernization paradigm of progress (Arce and Long 2000; Gereffi, Humphrey, and Kaplinsky 2001; Meixell and Gargeya 2005; Sturgeon 2008). Out of an international meeting, held in the year 2000 at the Rockefeller Foundation's Conference Centre in Bellagio, researchers working on what they agreed to call "value chains", Gereffi, Humphrey, and Kaplinsky (2001, 1) declared "integration into the global economy virtually synonymous with development" for some countries. Many of the researchers present at the meeting in 2000 have continued to be active and

influential in writing and debates on value chains. While wanting to see fairer outcomes of globalization, they make clear that in their view there is little point in challenging globalization or questioning the nature of globalization: "The most fruitful response is not to debate whether global economic integration should take place at all, but rather to examine how this integration can be managed to produce positive effects for a majority of participants" (Gereffi, Humphrey, and Kaplinsky 2001, 2). With the hegemony established 'development' policy makers have either embraced market orientated approaches or decided that as they could not beat corporate globalization, they and the farmers and others they work with should join it.

This hegemonic view has been reinforced by the financing of value chain work and then the financing of research on the same interventions, often by the same funders. Humphrey et al. (2010) assessed 30 value chain interventions funded by donors and found "there is a clear lack of high-quality impact assessments that would substantiate claims that VC interventions are capable of achieving the broader goals"(Humphrey and Navas-Alemán 2010, 61). What one does find are numerous reports, academic and more policy or program orientated, that start and end with looking at a specific value chain intervention with no baseline information or control groups (for examples see: Begovic and Baldini 2016; Minten, Randrianarison, and Swinnen 2009; Quisumbing et al. 2013). For example, CARE International had "generous support of the Bill & Melinda Gate's Foundation" for a dairy value chain project in Bangladesh from 2007 (Care 2015). Then in 2013 the International Food Policy Research Institute and the International Livestock Research Institute put together a team of five senior researchers to produce a report on the same project also with support from the Bill & Melinda Gates Foundation (Quisumbing et al. 2013). This report, although not involving the use of a control group and other impact assessment tools and not being peer reviewed, claims positive impacts and is widely cited, including of course being used in Care project materials to claim success and motivate for continued support to that and similar projects (Care 2015). Further, aside from the individual inadequacies of such reports, because so many get produced it creates an overall impression that value chain interventions are far more significant in our economy and people's lives than they actually are.

Alternatives

The CSM and others have done extensive work over years to study international experience and out of that develop and then advocate for a more holistic territorial markets approach. This builds on the existing practices of farmers, the vast majority of whom are already linked to markets in some way, and gives much more scope for social movement

and state interventions to improve the socio-material infrastructure to enable market relations that are appropriate for small-scale farmers (Kay 2016; McKeon 2014; OECD/FAO/UNCDF 2016). Our research on raw milk supplies to Dar es Salaam, and related work on other foods, fits well with the territorial approach, although emphasizing the symbiotic nature of relations, and has shown how large cities not only can be, but are fed without corporate value chains (Wegerif and Hebinck 2016; Wegerif and Wiskerke 2017). Work on 'nested markets' has assisted to show that small-scale farmers, in collaboration with others, are constructing market circuits outside corporate value chains and in doing so securing greater value for themselves (der Ploeg et al. 2012).

Applying the nested markets concept to the raw milk supply in Dar es Salaam, however, shows its limitations for assisting in analysis of some, especially existing, food systems. Raw milk production and its distribution through territorial markets in Dar es Salaam cannot be described as a nested market as it does not involve new products or services, doesn't follow increasing multifunctionality, nor is it based on "the construction of new markets" (cf: Van der Ploeg 2015; Hebinck, Schneider, and van der Ploeg 2015). Further, it is not consciously purposive in the way that is often emphasized for nested markets that are said to be "constructed with the aim of providing an alternative to the dominant ways of trading, markets and distribution" (der Ploeg et al. 2012, 140). The raw milk production and its distribution rather involves an ancient product and evolves from long established practices and networks. It is also, arguably, the dominant form of milk production and distribution in Dar es Salaam, which raises questions about the value of conceptualizing it as "nested within the wider markets" (der Ploeg and Douwe 2015, 17). It does, however share advantages and important characteristics with nested markets, including the improved return to producers, its interlinking with other sectors, being institutionally embedded and involving the use of common pool resources (Schneider, van der Ploeg, and Hebinck 2015). Perhaps there is potential for the emergence of new nested markets for raw milk that could build on the existing system and add value as part of the territorial market supplying Dar es Salaam.

These alternatives are gaining traction with policy makers, as shown by the CFS recognizing the essential role, in achieving food security, of smallholders and the "local, national, and regional markets and food systems" they primarily operate in (CFS 2016). This followed the 2015 signing of the Milan Pact by 120 cities, committing themselves to supporting local food systems and participatory decision making including the involvement of small-scale food producers (Forster and Mattheisen 2016). There was also high-level support from multi-lateral agencies for the paper "Adopting a Territorial Approach to Food Security and Nutrition Policy" that "proposes a shift from a sectoral, top-down and "one-size-fits-all" approach to one that is multi-sectoral, bottom-up and context-specific" (OECD/FAO/UNCDF 2016, 3).

Conclusion

The value chain approach assumes that incorporation into corporate and global value chains is going to be good for those incorporated, or that they have no other choice. The problem has been compounded by value chain thinking moving uncritically from being a method of analysis of existing global and corporate value chains to becoming a mode of development intervention often applied simplistically and without exploring if there are better options.

We do not deny the value to some farmers of Tanga Fresh and the positive potential for other interventions that follow the beneficial aspects of the Tanga Fresh model, in particular that they work with small-scale producers and retailers and supply national food needs rather than global markets. Overall, however, the level of development sector support to value chain interventions is clearly disproportionate to their actual impact.

What this paper shows, and is increasingly being recognized, is that there are often other options, such as territorial markets, which perform better for the actors involved and the environment. The value chain approach, in fact, has inherent flaws of high management and overhead costs, alienation from many it should serve, increasing unequal power relations and a tendency of linking with corporate entities potentially at the expense of many local actors. The raw milk system, operating within a wider symbiotic food system, is producing and delivering more fresh milk products to Dar es Salaam than any other supplier. Compared to Tanga Fresh, an example of a value chain intervention, it gives lower prices to the milk drinker, greater income to the dairy farmers, and more opportunities for autonomy and ownership. Policy makers interested in dairy production and securing people's right to food, need to take note and find ways to reinforce, rather than continue to undermine, existing practices, such as this raw milk supply system.

The extent of support for the value chain approach, despite growing evidence of its limitations, can only be explained by an unsubstantiated hegemonic view of a particular modernization path bound up in this period of history with a neoliberal and corporate-dominated globalization. We are made to believe that progress depends on linking to large corporations and this belief gets reinforced by value chain projects and uncritical research on these projects that is supported by powerful donors. Academics and civil society groups need to be cautious not to fall into reinforcing this hegemony and should rather increase their research and understanding of the many systems of food production and distribution that people around the world create outside NGO, state and corporate interventions. Let us do more to understand and build on what people do themselves.

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