

Review of successes and failures of dairy value chain development interventions in Tanzania

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Abbreviations

AI	Artificial Insemination
APA	Austroprojekt Association
ASDP	Agricultural Sector Development Program
BDS	Business Development Services
CEFA	A Christian-based Italian NGO processing milk in Njombe
EADD1	East Africa Dairy Development Project - Phase 1
EADD2	East Africa Dairy Development Project - Phase 2
FAO	Food and Agriculture Organisation of the United Nations
GIT	Goat in Trust Scheme
HIT	Heifer in Trust Scheme
HPI	Heifer Project International
HPIT	Heifer Project International in Tanzania
ILO	International Labour Organisation of the United Nations
ISCDD	International Scheme for the Coordination of Dairy Development
KALIDEP	Kagera Livestock Development Programme
MCC	Milk Collection Center
NBS	Natural Bull Selection
NJOLIFA	Njombe Livestock Farmers Association
RLDC	Rural Livelihood Development Company
SCF	SME Competitiveness Facility
SDC	Swiss Development Cooperation
SDSP	Smallholder Dairy Support Programme
SHDDP	Southern Highland Dairy Development Project
SNV	Netherlands Development Organisation
TAMPA	Tanzania Milk Processors Association
TAMPRODA	Tanzania Milk Producers Association
TDCU	Tanga Dairy Cooperative Union
VC	Value Chain
WFP	World Food Programme

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Executive summary

With over 22 million cattle (NBS 2012), Tanzania has the second largest cattle population amongst African countries. Of the total milk production of about 1.74 billion litres a year (Msuya 2012), 70 percent comes from traditional cattle, while the remaining 30 percent is from improved dairy cattle. Most cattle are kept by smallholder farmers scattered all over the country. Kilimanjaro region has the largest number of improved cattle. The annual per capita consumption of milk in Tanzania is estimated to be 44 litres, which is only 20 percent of the FAO recommended 200 litres per capita. The milk shed areas, however, consume almost twice the national average. Most of the milk is sold and consumed with limited or no value addition because of high production and processing costs and poor infrastructure. The most striking feature of milk marketing in Tanzania is its highly fragmented character, with very weak or non-existent links between the various sub-markets and a large volume of transactions that take place outside formal market channels. Currently, there are about 70 milk processing units, the majority of which are small, processing less than 1000 litres a day. Services and inputs to dairy farmers mainly come from the private sector who are demand and profit driven and therefore do not reach the many farmers who are sparsely located as it is not feasible for them to do so.

To examine the successes and failures in dairy development in Tanzania in the context of smallholders, dairy industry experts were interviewed. They included people with experience in managing dairy project interventions, researchers, processors and policy makers, among others. Success was defined to include sustainability, inclusiveness, appropriate timeframe for implementation, innovations of intervention, design, possibility of replication, beneficiary contribution, ability to generate indirect benefits and general contribution to poverty reduction.

In reviewing smallholder dairy development, a systemic approach that embodies the notion of making markets work for the poor (M4P) was used. It uses the value chain as the main entry point. From the review, it could not be ascertained to what extent the specific projects were able to adapt to the daily needs of the smallholder dairy farmers. However, based on the criteria and characteristics set forth by the dairy industry experts, the most successful interventions included breed improvement, training and expansion of animal health services, milk marketing and promotion, collective marketing and the testing and promotion of feed supplements. Perceived failures included targeting of the poor as beneficiaries, introduction of credit, limited intervention logic, the heifer pass on model, focusing on quick wins and the lack of inclusiveness during project and intervention designs.

The review concludes that:

- The dairy sector is highly regulated and this constrains its development, specifically the growth of the formal sector. This partly explains the existence of the informal dairy value chain.
- A suitable model for the delivery of animal health services and other inputs is yet to be found.

- Challenges in animal feeding are hampering the growth of the sector and therefore it is important that any future interventions should undertake research on feeds and feeding.
- Improved access to investment and working capital by all agents in the dairy value chain will go a long way in improving production, processing and marketing of dairy products, thereby improving dairy profitability.
- The large number of local cattle, if exploited in a sustainable way, offers an opportunity to propel dairy development in Tanzania.
- The sparse location of milk producers is a challenge that affects the distribution of animal health services as well as inputs.
- Informal trading of fresh milk is a vibrant business and dominates milk trading in Tanzania.
- There is a general lack of organizational models that can support the development of the sector.

Recommended best-bet interventions

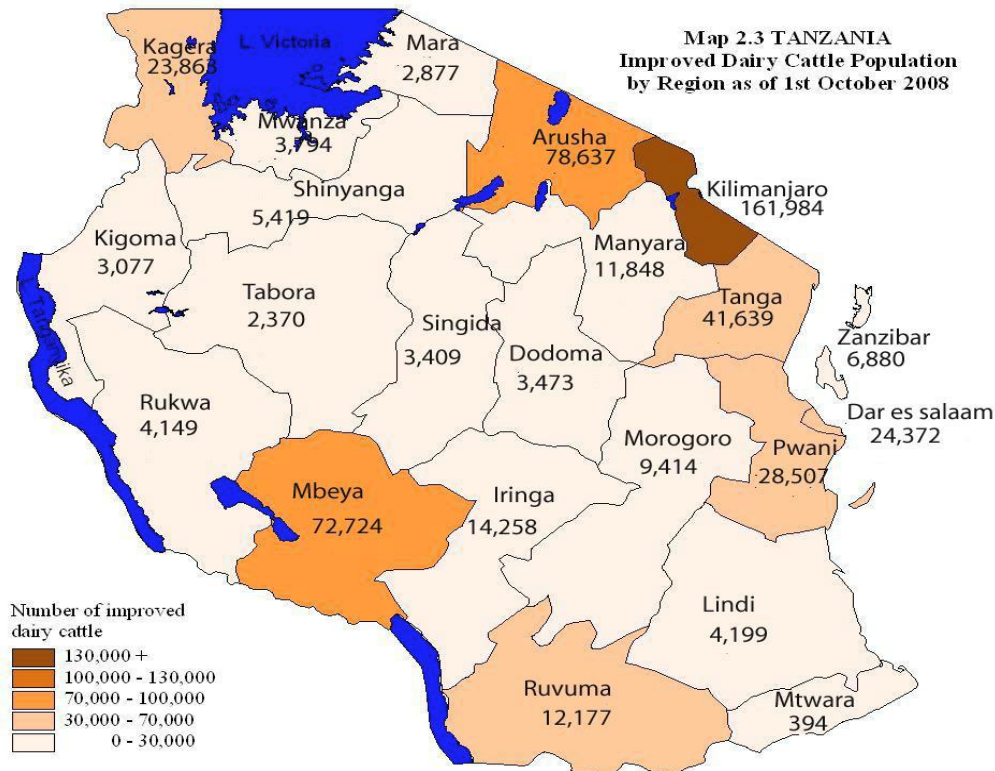
- Formulation of a dairy development master plan that provides a long-term vision towards which dairy development efforts can be directed.
- Improvement of breeds especially through the use of artificial insemination (AI) in areas that already have large animal populations.
- Research on improvement of feeds as there continues to be a serious imbalance between investment in cattle and in pasture. An accelerated research that targets smallholder farmers especially in the areas of improved pasture and supplements and whose findings and recommendations are affordable and accessible is encouraged.
- Development of insurance and financing mechanisms that will enable milk producers and processors adopt appropriate new technologies to reduce inefficiencies in production and marketing.
- Improvement in milk collection systems to enable quick delivery and efficient preservation before and after processing.
- Building stronger dairy farmer groups by encouraging farmers to work together to learn from one another. This would ultimately cut down costs of production and access to necessary services.
- Training of dairy technologists to support small-scale processing units established in all the milk shed areas.
- Organizational models for increasing smallholder profitability can be developed around these areas:
 - i. **Chilling plants** or just accessing them (if under-utilized) through **transport arrangements** that provide both outputs marketing and inputs and services through check-offs
 - ii. Provision of models revolving around check-offs for inputs and services through **milk traders**

The second approach is especially suited to the circumstances of pre-commercial (rural-to-rural) producers.

Introduction: Dairy development in Tanzania

Milk production in Tanzania has shown a marked and consistent growth in recent years. This is largely a result of the development and technical cooperation interventions and activities in the major milk sheds of Arusha and Kilimanjaro, the Southern Highlands, Tanga Coastal Zone and Mwanza and Kagera. Overall, populations of both indigenous and improved cattle have been growing. Between 1995 and 2008, the annual growth rate of indigenous cattle was 2 percent, while the number of improved dairy cattle grew at an average of 7.1 percent per annum over the same period (URT-NBS 2012). The dairy market continues to be dominated by unprocessed liquid milk, which comprises over 95 percent of marketed milk (CGIAR 2011).

Figure 1: Regional distribution of dairy cattle in Tanzania in 2008



Source: National Bureau of statistics

Table 1: Estimated milk production in Tanzania, 1984 - 2012

Year	Estimated Milk Produced ('000 Litres)
1984	292
1994	391
2008	1,650
2012	1,740*

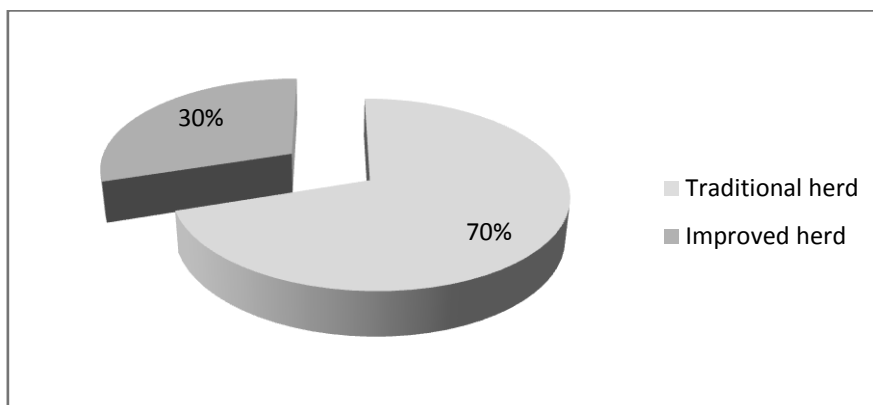
Source: National Bureau of statistics (2012)

**Msuya E.E. (2012)*

Productivity

Traditional breeds continue to play a major role in milk production, contributing about 70 percent of the total milk produced in the country over the last twenty years (Omore et al 1998; MLD 2006; Msuya 2012; TDB 2012). Dairy (improved) breeds contribute the remaining 30 percent. Cattle productivity remains low, standing at an average of 5 -7 litres per cow per day (Scanagri and BCS 2006). In general terms, the productivity co-efficiencies are low, implying that much of the increase in milk production comes from the expansion of the traditional herd and to some extent the improved dairy herd (BACAS/MLDF 2009) whose number still constitutes less than four percent of all cattle in Tanzania.

Figure 2: Milk production by type of cow (2011)



Source: Tanzania Dairy Board

Consumption

Tanzanians are reported to drink only a small quantity of milk, estimated at 44 litres per capita in the course of an average year (TDB 2012)¹. Although consumption has increased by 20 percent over a six-year period, it is still less than the FAO recommended consumption of 200 litres per capita per year. However, consumption data from milk-shed areas and from peri-urban areas reveals much higher consumption levels. For instance milk producers in the central corridor (rural) are estimated to consume an average of 94 litres per capita per year, which is more than twice the national average (Mchau et al 2009; Katia et al 2012). A

¹ According to FAOSTAT, per capita consumption is 24 litres.

descriptive analysis of the national panel survey for livestock and livelihoods in rural Tanzania (2012) also confirmed that rural dwellers outside milk-shed areas drink less than a quarter of the amount consumed by those living in milk-shed areas.

Dairy products consumed in rural areas are characterized by low added value because of the lack of reliable markets and the absence of milk processing facilities. Moreover, rural incomes have been reported to be fairly static, while transport is difficult and storage losses are high. Nyange and Mdoe (1997) confirm that the perishable nature of milk limits its storage and hence hinders farmers from taking advantage of seasonal price differences. Understanding seasonal price differences would enable farmers to plan calving months of their dairy cows so that peak production periods coincide with high milk prices. But they note that the success of such a strategy depends on other factors, such as availability of animal feeds. According to Mchau et al (2009), because of inefficiencies and high transaction costs in the existing formal value chain for fresh milk, the producers' share of the consumer price ranges between 25 and 32 percent in Tanzania, in contrast to 80 percent in Anand, India.

The industry as a whole is extremely energy and transport intensive once it moves from selling liquid milk within the local neighbourhoods to a situation where cooling, pasteurization and marketing outside the local area become important.

The most striking feature of the milk market in Tanzania is its highly fragmented character, with very weak or non-existent links between the various sub-markets. A large volume of transactions takes place outside of any formal market channels. There are significant gaps between demand and supply at specific times and locations. The annual flush of milk from the Zebu herd (indigenous herd) during the wet season poses a challenge as milk prices tend to crash, which affects those without long term contracts or commitments, and formal marketing channels can become saturated. The range of the difference in milk volumes in the wet and dry season is 56 percent on average (Mchau et al 2009; Scanagri et al 2006; Msuya 2012, TAMPA 2012). Where there are contracts for milk supply that keep farm gate prices fairly constant over a long period, the contract is often between the farmer groups/primary cooperative and a processor and not with individual smallholder farmers. Prices are relatively low when a farmer sells directly to neighbours (Nyange and Mdoe, 1997). These observations coincide with testimonies of the cooperatives in Tanga as well as CEFA/Njolifa in Njombe. The critical point of managing the variation in milk prices is within the groups where collective marketing and some kind of price negotiation takes place.

Table 2: Farm gate milk prices in Tanga and Njombe, as per contracts with TDCU and Njolifa

Region	Number of farmers	Milk Price by factory (per litre of fresh milk)	Final Milk price to farmer
TANGA/ TDCU	4600	TSh 573	TSh 555
NJOMBE/NJOLIFA	800	TSh 425	TSh 425

Source: Field survey June-July 2012

Processing

Up to the early 1990s, the milk processing industry in Tanzania was controlled and managed by the state through Tanzania Dairies Limited (TDL). TDL owned and managed major processing plants as well as collection centres constructed by the government with financial and technical support through various bilateral agreements. The processing plants processed both fresh milk from smallholder farmers and state farms and also reconstituted imported powdered milk. From the early 1990s, the private sector started to engage in milk collection and processing. As of 2012, there existed about 70 private sector milk processing units located in various parts of the country, the majority of which are small, processing less than 1000 litres a day.

Service provision and inputs

Provision of livestock inputs is by private sector agents, with most based in urban areas. The Government of Tanzania's National Livestock Policy of 2006 recognizes that livestock extension services are constrained by weak collaboration amongst stakeholders, insufficient expertise, weak research-extension-farmer linkage and inadequate infrastructure and facilities. Likewise, the policy and institutional context upon which livestock services operate has changed significantly. It has been realized that effective delivery of extension services necessitates the involvement of various stakeholders, both public and private. Further, extension services need to be demand-driven and participatory. For this reason, extension services should be nested at the lowest level of the local government authority structure where livestock farmers, mainly pastoralists, can have a direct role in the planning and implementation of extension activities.

Within the Agricultural Sector Development Program (ASDP), guidelines for involving target groups in the planning and implementation of development initiatives are set out using the Opportunities and Obstacles to Development planning approach. The guidelines aim to provide quality extension services that meet the needs of farmers and other stakeholders.

Milk trading

Milk trading is done through various means. The bulk of the milk from both pastoralists and dairy cattle keepers is sold directly to neighbours in raw form (i.e., not processed). The remaining milk is then sold by milk hawkers on bicycles to various clients including processing plants that have milk collection centres. Milk trading regulations prohibit the sale of raw milk. Recently, the Tanzania Dairy Board with support from development partners initiated a pilot training and certification program for milk hawkers to ensure that they comply with existing milk trading regulations, which require that they only deal in processed milk.

Cooperative development

Within the Tanzanian cooperative development policy (1997), a framework to operate on the basis of independent, voluntary and economically viable principles is enshrined. This framework seeks to ensure that cooperatives are member-controlled private organizations. In analysing the collective coping mechanism in Tanzania, Schulz (1995) notes that the cooperatives were used to 'hold together' around common property. For dairy development in Tanzania, farmers have chosen cooperatives for service, marketing, savings and credit and organisation of specific supply of the various inputs and animal health services that benefit farmers depending on whether they are in urban or rural areas.

Background to the review

ILRI is leading a major initiative to consolidate research and development efforts for a pro-poor transformation of the smallholder dairy value chain in Tanzania. Working in close collaboration with Sokoine University of Agriculture (SUA), the initiative will involve a range of other national and international research and development (R&D) partners. ILRI has secured funding from Irish Aid – Tanzania for an initial one-year inception to conduct research that will inform a potential four-year R&D phase to adapt dairy market hubs for pro-poor smallholder value chains in Tanzania (also referred to as the MoreMilkiT Project). The specific research objectives during the one-year inception phase in 2012 are to:

1. Assess the current status of the Tanzanian dairy sector and identify appropriate entry points and partners for promoting a more pro-poor development orientation
2. Develop a strategy for strengthening the policy environment to better support pro-poor dairy development, capitalizing on ongoing engagement with key policy actors and previous successes in Kenya and Uganda
3. Identify sites appropriate for piloting pro-poor dairy development interventions that have been successful elsewhere in East Africa, and assess how those interventions need to be adapted to the Tanzanian context

Multiple studies towards these aims are already underway. An additional key input required towards the objectives is a review of past successes and failures in dairy value chain development in Tanzania, and based on that, to identify best-bet interventions and strategies to pilot that are pro-poor, gender-sensitive and environmentally sustainable.

Approach

The nature of the assignment required different sources of information from available documents. A sample of past and ongoing projects in Tanzania was selected for the review. Information was sourced from documents related to the dairy sector, national development and poverty reduction policies and strategies. Because of limited written information or ‘classified nature’ of private sector information, discussions were held with selected dairy processors and dairy development supporters in the country. Efforts were also made to access more information on dairy development in Tanzania that had been obtained from commissioned studies. To gain deeper insights into dairy development programs, reports on other countries’ dairy sectors were studied. While the selection of the projects² was based to a large extent on the scale, project time frame, focus, and strategic approach to interventions³, private company selection was based on linkage to the beneficiaries, that is, individual milk producers or producer groups.

² The selected projects included ; AustroProjekt, Southern Highland Dairy Development Project, Smallholder Dairy Support Programme and specific Kagera and Tanga interventions; Heifer Project International, FAO Kilimanjaro/ Arusha Smallholder dairy projects of the late 1980s; CEFA/NJOLIFA Njombe dairy project, RLDC ‘s Central Corridor dairy development.

³ Details of the projects mentioned here are found in Annex 1.

In order to achieve a participatory understanding and definition of success and failure of dairy development in Tanzania in the context of smallholders, well-known dairy experts with experience in managing dairy project interventions (researchers, processors, policy makers etc.) were interviewed. From the interviews, we are able to derive criteria for determining success and failure in dairy development.

Noting that a key aspect of the review was the interface of dairy development interventions and the smallholder dairy farmers, the review randomly selected dairy farmers in Njombe and Tanga. Their participation and contribution in the review was to get views from a beneficiary and value chain actor standpoint. The reviewer was aware that dairy milk producers (from both indigenous and improved dairy cattle) are among the key actors and part of a whole chain of development that influences the growth rate and pattern of dairy development in any given locality.

In order to understand broader issues of value chain development in the dairy sector in Tanzania, the importance, role and extent to which the approach has been used was examined, and assessment of various project interventions was undertaken. This was done by comparing value chain and systemic changes using a market development approach, especially through the eyes of making markets work for the poor (M4P).

Limitations

Two key limitations of the assignment were noted:

Stakeholders' definition of success and failure

The assignment necessitated the use a participatory definition of success and failure. Divergent views were obtained from different experts, and an attempt was made to derive criteria for characterizing elements of successes and failure of interventions. The criteria listed are by no means comprehensive.

Timing of the review

Given the size of the industry and the breadth of the objective, the time allocated to the assignment (15 days) was not adequate to thoroughly and critically assess all the appropriate dairy development interventions over the last 25 years in Tanzania and link them to value chain developments to provide a comprehensive national picture. However, every effort was made to access the relevant literature.

Defining success and failure

Successful dairy development interventions

Table 3 provides definitions of successful dairy development interventions in Tanzania.

Table 3: Definition of success as expressed by dairy experts

Criteria	Characteristic(s)
Sustainability	<ul style="list-style-type: none"> • Are the interventions or their modifications sustained after project end? • Have the beneficiaries expanded their activities in the market system? • Are there new entrants participating in the intervention after the interventions come to an end or when a new policy or regulation is introduced? • Are the actors in the value chain adequate and not over-crowded?
Inclusiveness	<ul style="list-style-type: none"> • Is the intervention aware of required actors (private sector, government including LGA, regulators, consumers, transporters/distributors including hawkers?) • To what extent are beneficiaries involved in design, monitoring and scaling up?
Timeframe	<ul style="list-style-type: none"> • Was/is the intervention implemented consistently or with experiential learning over 4 years? • Does the intervention contribute to import substitution over time?
Innovation	<ul style="list-style-type: none"> • Does/did the project introduce any new technologies or other ways of dairying at any level of the value chain? • Does the intervention or policy enable value chain actors to generate increased income leading to improved welfare and business growth? • To what extent does the intervention impact on the availability of value added products to consumers at affordable prices
Design	<ul style="list-style-type: none"> • Do interventions address specific constraints along the value chain? • Is the intervention logic clear and linked to desired changes in the dairy sub-sector? • Are potential and existing dairy farmers and private sector actors involved in design, inception, trials and implementation? • Does the design of the project show a declining trend of direct financial support over the years from facilitators and increased uptake and self-financing of the interventions by the value chain actors? • Is the exit strategy clear with a caretaker in mind?
Replicable	<ul style="list-style-type: none"> • To what extent can interventions be replicated by other actors and are there mechanisms in place to allow and promote replication?
Beneficiaries	<ul style="list-style-type: none"> • Clear selection criteria for beneficiaries including their ability to financially contribute to the interventions • Existing or tested systems in place for business and dairy skills • Proximity of value chain actors minimizing milk losses and maximizing input supply including AI services, milk collection, processing and marketing • Intervention promotes collective marketing and provides higher certainty and assurance of milk market for producers
Indirect benefits	<ul style="list-style-type: none"> • Are indirect benefits from interventions or policies clearly analyzed? Such as direct and indirect employment opportunities • Are costs and benefits of non-core value chain items such as manure estimated?
Poverty reduction	<ul style="list-style-type: none"> • Are the intervention's contribution to growth variables for the industry clearly articulated?

Failing dairy development interventions

It should be noted that failure was not considered by the experts only as failure to meet the criteria for success, but also accounted for the systemic actions, functions, institutions and the relationships within the dairy subsector development programs.

Table 4: Definition of failure as expressed by dairy experts

Criteria	Characteristic(s)
Support services	<ul style="list-style-type: none"> • Lack of animal health services and extension • Costs are prohibitive and irregular • Services are only available as long as a project pays for them, but disappear as soon as the project comes to an end
Business environment services	<ul style="list-style-type: none"> • When policies, laws and regulations are not supportive of the development of a competitive industry • Government as a key ally commits to participate but does not honour its part when it comes to implementation
Revenue generation	<ul style="list-style-type: none"> • Where milk producers are unable to recover the costs of production • Cow productivity either remains stagnant or falls to a much lower level than before

Findings

The reported successes vary from one project intervention and project report to another. In understanding the successes and failures of smallholder dairy development in Tanzania, the reviewer took into consideration the stakeholders' definitions of the two terms and was then able to determine criteria for what constitutes success or failure in Tanzania's smallholder dairy development efforts.

The reviewed projects are listed (with more details in the annex). Note that these are certainly not the only dairy development programmes and interventions that have been implemented in the country over the last 25 years; the choice projects reviewed was based on the availability of project documents including external reviews, commissioned studies, ministerial policies and strategies, which provided valuable insights. The definitions therefore are not based on a given project's performance indicators as outlined in the project's master document but rather on the views of key industry stakeholders.

Dairy development projects and interventions reviewed

Briefs about the following projects with project aims, focus and interventions are in Annex 1 - Heifer Project International (HPI), Heifer Project International in Tanzania (HIT), Southern Highlands Dairy Development Programme (SHDDP), Austroprojekt, Dar es Salaam Maziwa, Mara Maziwa, Smallholder Dairy Support Programme (SDSP), KALIDEP and Tanga Smallholder Dairy Development Programme, International Scheme for the Coordination of Dairy Development (ISCDD), Dairy Development Services (FAO), Rural Livelihood Development Company (RLDC), SME Competitiveness Facility (SCF), IRISH AID PROGRAMME IN MAHENGE – ULANGA,

Dairy value chain development in Tanzania

The value chain describes the full range of activities that firms and workers perform to bring a product from its conception to its end use and beyond. This includes activities such as design, production, processing, marketing, distribution and support to the final consumer⁴. Value chains (VC), in particular, global value chains (GVC), are important for economic actors, firms, workers and policy makers to better understand how VCs function in specific cases and to provide some tools to help predict how they might change over time.

In assessing to what extent VC as a development framework has been used in the dairy sub-sector in Tanzania, the reviewer has used the ILO (2006)⁵ definition, which states that VC analysis is a conceptual framework for mapping and categorizing economic processes and helps to understand how and where enterprises are positioned in economic processes. It also helps to identify new business opportunities and possible leverage points for upgrading solutions. The solutions could imply introduction of new interventions to achieve sustainable development of a sector.

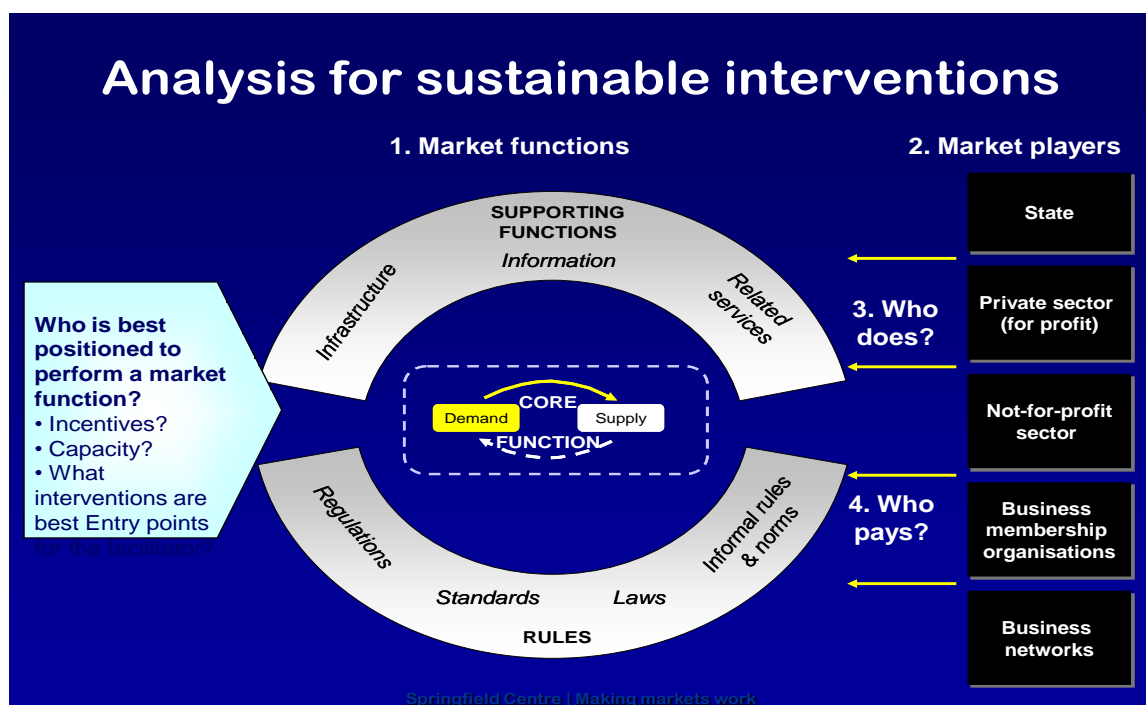
⁴ Accessed on 24 August 2012 from: <http://www.globalvaluechains.org/concepts.html>

⁵ ILO Guide for Value Chain Analysis and Upgrading, 2006

In the context of dairy development, activities may vary and may involve many approaches over time as opposed to having a single approach (more critical when dealing with smallholder dairy farmers and the spatial location of the large indigenous cattle keepers). Activities may target availability of dairy breeds, milk collection, inputs such as AI, breeding, milk processing ingredients, feed, supplements, services such as advisory services, animal health, extension, financing, milking and milk collection and bulking, transportation, processing, packaging, distribution, promotion and marketing, retailing and consumption.

As already pointed out, in order to review dairy development with smallholder producers in mind, it was apparent that the reviewer needed to look at an all-inclusive approach that goes beyond the activities within the VC. This approach, commonly known as making markets work for the poor (M4P), integrates VC as a core entry point for systemic change (Springfield centre 2008)⁶.

Figure 3: A systemic analysis of interventions integrating value chains and key actors



Source: Springfield Centre

The review found that majority of dairy projects and programmes did not address value chains even within their geographical areas of focus. For instance, in one of the projects, it is obvious that there has been more focus on making heifers available to farmers with the aim of increasing milk production. Critical aspects of an inclusive value chain or market development such as the need for access to financing (due to high investment costs required to set up, say, a processing plant)⁷, business development, accessible and affordable animal health services, collection of milk from pastoralists in sparse areas and availability of feeds (especially during the dry season) have not been addressed adequately (Maiseli 2002) to a level that can sustain

⁶Extract from 'The Operational Guide for making markets work for the poor (M4P Approach).

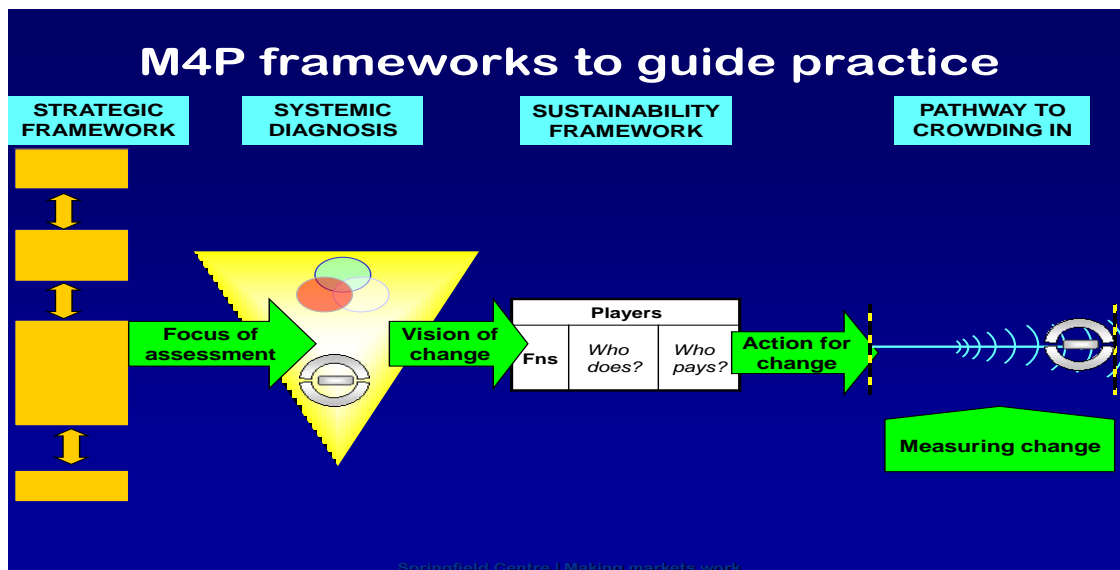
⁷ Mmari, Mnenwa and Mdoe (undated)

the development of the dairy sub-sector. At the same time, from a market development perspective, constraints in the business environment have not been addressed in a way that can attract private sector investment with limited risks (Mmari et al *undated*).

Further, in order to experience sustainable success, it is necessary to have a framework to guide practice right from strategic thinking at design to diagnosis of the systemic constraints. The frameworks shown in figures 4 and 5 enable the assessment of sustainability by looking at key players in any interventions from *who does what and pays for what*, and how to determine whether or not the intervention is on a pathway to either scaling up and out or replication. As emphasized by the dairy experts, such sustainability should be assessed in terms of whether or not the beneficiaries of the interventions have moved into and participate in the market system, whether or not the interventions are foreseen to continue when external support ends, and whether or not other actors are taking up the opportunities created by the interventions.

The mainstay of sustainable success is for the interventions to undergo a thorough assessment, which would then result in a clear vision of change before defining the activities to be done to achieve the change. The vision of change should provide a means for crowding in⁸ other dairy development actors so as to enable more milk to be collected, processed and formally marketed.

Figure 4: An M4P framework to guide practice

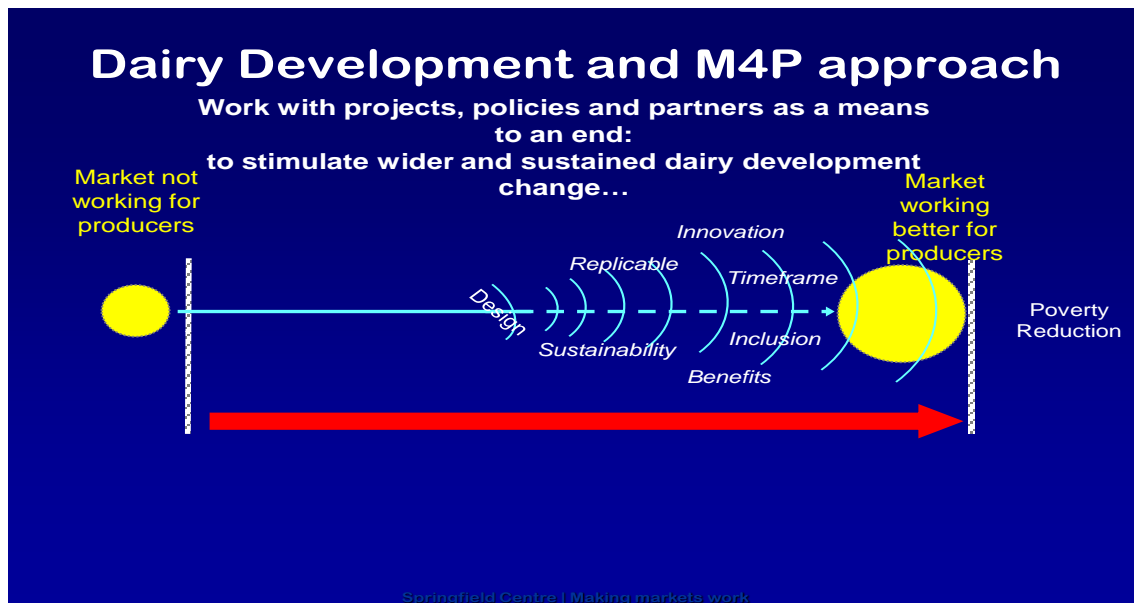


Source: Springfield Centre

⁸ Crowding in refers to deliberate actions by project interventions to create enabling conditions that allow other actors to competitively participate in the development and growth of a sub-sector without necessarily providing financial support. Other non-financial support could include sharing of information, research findings, disseminations etc.

Figure 5 below shows how integrating VC in M4P and defining the right interventions after a thorough and focused assessment of dairy development can benefit smallholder farmers through innovations, inclusion, diversity, volumes, benefits and sustainability. Important in figure 5 is the view that a project should be a means to the desired change in the lives of the smallholder farmers and not an end in itself, with each intervention focusing on the sector-wide changes.

Figure 5: Potential impact of applying M4P approach for dairy development in Tanzania



Source: Springfield Centre

To what extent have dairy development interventions been successful?

Based on secondary data and reports of all the projects listed above, the answer is - success! We find that the criteria used to evaluate the projects either mid-term or at the end of the project often require that evaluators base the successes on the original set of objectives of the specific project. None of the documents showed to what extent the specific projects were able to adapt to the changing needs of the smallholder dairy farmer. Adjustments in the projects seemed to have occurred following recommendations of externally commissioned mid-term reviews. In this review, successful and unsuccessful dairy development interventions have been determined based on the definitions of success and failure put forward by dairy industry experts.

Successful smallholder dairy development interventions

Breed improvement

The purpose of animal breeding and selection is to improve and/or maintain genetically superior animals for higher production. Tanzania has a high number of low milk yielding short horn zebu cows. In order to benefit from the existing numbers, it is necessary to upgrade the existing animals through cross-breeding with high yielding exotic breeds. Experiential learning has proved to be a strong complement to artificial insemination (AI). A review report for the finalisation of SDSP by Kurwijila, Mugittu and Morungu (2005) stated that flexibility and learning by doing played a significant role in the breeding strategy. Further, they state that at first the emphasis was on the use of AI until the monitoring data showed a decline in calving rates and calving intervals of over 600 days. The suggestion was to use more breeding bulls alongside AI. The effect of the use of cross-bred cattle on milk production and sales has been reported by Baker et al (2011) as a straight forward successful intervention.

Use of artificial insemination

In the dairy industry where the aim is to produce more milk efficiently and economically, the application of artificial breeding has contributed immensely in the realization of major achievements. AI has been particularly instrumental in cross breeding for upgrading programmes. Desired herd improvement changes, both phenotypically and genotypically, have been made through artificial means of mating the cow/heifer (Mghwira and Makundi 1998). Taking into consideration the costs of raising and maintaining a bull, AI provides the best alternative for dairy farmers (Msuya 2012). In his review, Msuya (2012) however, notes that in Tanzania, AI has not been used significantly as a way of producing F1 crossbreeds with the farmers' own traditional herds. The main limitation is lack of the necessary infrastructure for the extensive AI scheme. Furthermore, it is noted that AI is expensive per service and therefore requires a substantial amount of dairy cattle to be sired, which can be achieved when farmers act collectively to seek such services in both traditional and improved cattle systems. Valergakis (2006) adds to the importance of AI by stating that cows sired by proven AI semen can produce an average of 896 kg of milk per year more than daughters of Naturally Selected (NS) bulls. Therefore when calving intervals are kept within reasonable limits, AI is more profitable than NS.

Establishment of LMU's to provide F1 heifers

Efforts to increase supply of F1 dairy heifers have included the establishment of heifer breeding units or livestock multiplication units (LMU) (Scanagri and BCS 2006; Msuya 2012; MLDF 2006). The public sector run LMUs however, do not have a good performance record (Msuya 2012), while those owned privately are better managed. Prices of improved dairy breeds vary with the location and ownership. Sellers of improved breeds also include farmers selling calves to their neighbours.

Table 5: Farm Gate Prices for 4 - 5 month pregnant F1 heifer

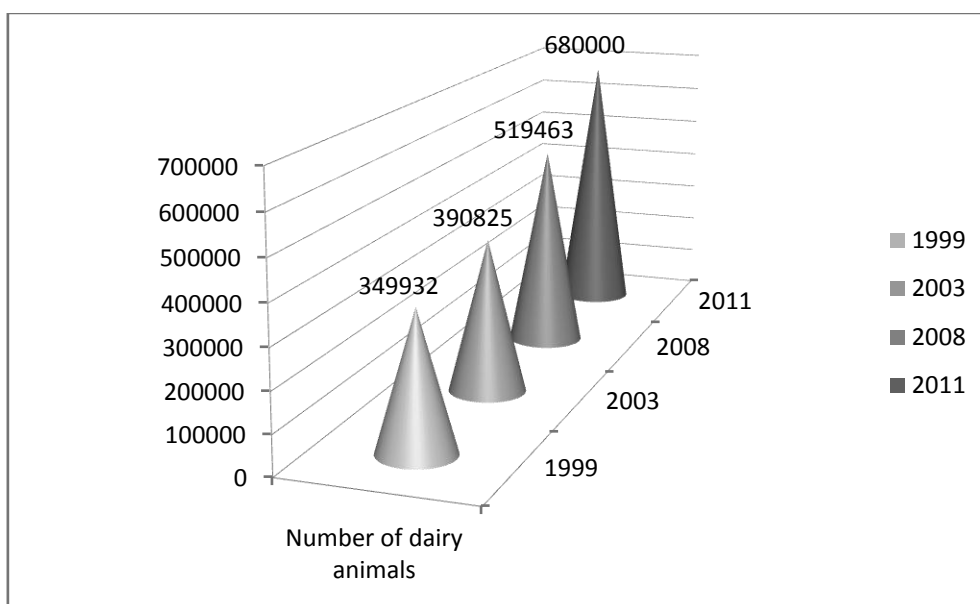
Source	Price (TSh)
Farmers	1,000,000
Public LMU e.g. Kitulo	700,000
Private company e.g. Philips in Iringa	2,000,000
Friends	950,000

Source: June-July field survey

Increase in dairy cattle

The number of improved breed dairy cattle increased from 24,000 in 1967 to 143,000 in 1978 and 680,000 in 2010/2011, a 6 – 8 percent annual growth rate⁹. The majority of these dairy cows have been distributed through HIT schemes by various projects including some LGAs such as Njombe district council (EADD2 2012).

Figure 6: Growth of dairy cattle in Tanzania (1999-2011)



Source: National Bureau of Statistics and EADD2 Tanzania

The increase in the number of dairy cows however, must be taken with caution as it does not reflect the actual *potential increase* (estimated demand). A report by BACAS-SUA (2009) to the ministry responsible for livestock development in Tanzania pointed out that while a total of 4,617 were distributed by various NGOs and dairy development programmes between the 2000 and 2007 implying an average of 660 heifers per annum, the estimated demand stood at about 5,000 heifers per annum.

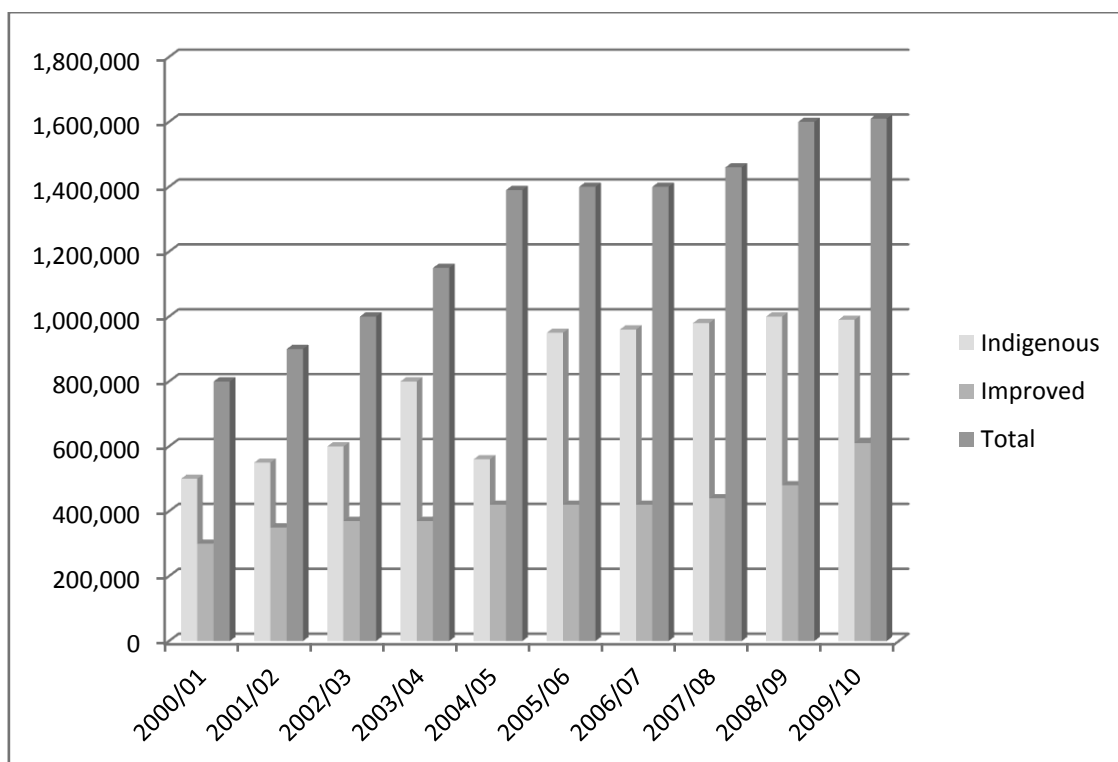
⁹EADD2 Tanzania Stakeholder consultation Workshop report, 11-13th April 2012, Dar es Salaam Tanzania

Increase in milk production

In some locations and time periods, average milk production per cow per year has been estimated at 2,135 litres (KADADET 2002). After about twenty years of dairy promotion through smallholder dairy farmers in Iringa and Mbeya, it has become apparent that there is surplus milk that cannot be absorbed in the two regions even after developing the markets. It must however, be noted that this surplus occurs predominantly during the flush period every year. In Njombe, CEFA has embarked on using 60 percent of the milk to make cheese to help absorb the daily minimum of 2400 litres of milk being delivered at the factory. At the same time, they offload extra milk to ASAS dairies in Iringa town. In Tanga region, Tanga Fresh is reported to be considering other long shelf life products so as to utilize the surplus milk during the flush season. In the northern zone, until quite recently, thousands of litres of milk (less than the 10,000 litres a day required by Brookside to operate a processing plant in Arusha) were being collected and then transported to Kenya for processing by Brookside without causing any noticeable shortage in the market within the northern zone.

Kurwijila et al (1997) observed an increase in milk production from 292 million litres in 1984 to 391 million litres by 1994. Similarly Austroproject Association (2009), RLDC (2009), IRAS (2010), Msuya (2012) and TDB (2012) find a sharp increase in milk production estimated to be up to 1.74 billion litres per year. This increase is also seen in line with the increasing number of improved breeds (and milk market for the indigenous cattle), which has increased from about 350,000 in 1999 to close to 700,000 by 2011, an increase of almost 100 percent in twelve years (NBS 2008; TDB 2012).

Table 6: Estimated milk production between 2000 and 2010 by cattle type



Source: MLFD, 2011

Training and expansion of animal health services

Training of animal health workers

Community animal health workers, government veterinarians and private and traditional herbalists are among providers of veterinary services (Msuya 2012; Maiseli 2002). The existence and provision of traditional herbalists shows the need and demand for services. Trained animal scientists and veterinary officials have also opened up vet shops offering several services that were otherwise provided by the state or NGOs. Many of the animal feed companies and business outlets are privately owned including distribution networks. The DALDO office however, is very important in responding to various diseases and/or conditions facing animals in general (Msuya 2012).

While Baker et al (2011) notes that enhanced availability of inputs and services has been positively associated with sales levels especially the volumes of feed and animal health services, they also point out that some other authors hesitate to attribute causality. Since the mid-1990s, the MLDF policy was to encourage veterinary officers to set up private practice so that they can reach more farmers as the number of dairy cattle increased and hence the demand from the traditional livestock keepers seeking services. This consequently led to the opening up of new business opportunities to some of the hitherto public servants.

Improvement of other agricultural yields

Farm yard manure from dairy cattle is another important by-product (Scanagri and BCS 2006). Manure from cows constitutes an important element in the farming practice of the dairy farmer; it is used by the farmer to grow other crops and the yields are reported to be far much higher than other farmers. In addition to using the manure on their farms, dairy farmers also sell the manure and make additional income that is not directly related to milk sales.

Milk marketing and promotion

Increase in number of processors

Since the collapse of state-owned and managed milk processing plants under TDL, there are currently approximately 70 privately-owned dairy processing units across the country. They are owned by private firms and by farmers through a cooperative mechanism or through the faith-based organisations (TDB and TAMPA 2012). The operating capacity stands at approximately 30 percent (Mbwambo et al 2006; TDB 2012). Processors however, experience several factors that inherently affect their ability to process more milk:

- i. Milk seasonality - milk supply within a year varies greatly with more milk being available during the rainy season, while the amount during the dry season can decline to as low as 40 percent.
- ii. Transport costs are generally high, a result of poor road infrastructure. This affects the ability of processors to collect milk from remote areas where the main milk producing farmers (traditional systems) live.
- iii. Higher energy costs - milk collection especially in remote areas is difficult because of lack of electricity, which would otherwise be used in milk collection centres. The use of generators as an alternative source of energy is beyond the means of many of the small scale and medium processors in the country.

As a result, farmers end up with lower prices for their milk, which leads many of them to engage in informal milk markets where they fetch better prices and this, in turn, leaves only a small percentage of milk (10 percent) to be sold in the formal market and only about 3 percent to be processed. However, this review found that generally there has been an increase in the amount of milk being processed over the last few years. From a critical stand point, one would argue that, even under TDL, the installed capacities of the state-run processing plants were never fully utilised. In addition, even those that operated at a higher capacity (above 60 percent) did so with reconstituted milk and not milk from the state farms or from the farmers in the country.

Increase in consumption per capita

Milk consumption in the country has increased from about 20 litres per capita per year in 1999 to about 44 litres per capita in 2011 (TDB 2012; EADD 2012). The bulk of this consumption is in the rural areas and at the farm level especially in the milk producing communities. In other areas outside the milk producing communities, the increase can be attributed to production, collection of milk, promotion and distribution support services that have been supported by dairy development projects (Mutagwaba Undated).

Collective marketing

SDSP, RLDC, APA, CEFA/Njolifa, Land 'O' lakes (in different locations and time) have all helped to set up milk collection centres. Not only has the collection of milk improved, but also the quality of milk being delivered has tremendously improved over time as noted by the CEFA, Land 'o' Lakes officials and internal reports of RLDC.

Establishment of Milk Collection Centres/Points

Table 7: Volumes of milk (Litres) collected at the Muheza MCC, 2000 - 2010

Year	2002	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Vol in '000 litres	182	248	247	255	255	416	434	673	720	789	944

Source: June – July 2012 field survey

Elsewhere in Njombe, CEFA has also reported an increased amount of milk through its established collection centres and points from 92,194 litres in January 2012 to 112,316 litres in June 2012.

Establishment of milk processing and replication

Milk collection centres established as part of a development intervention triggered the establishment of milk kiosks, mainly in Dar es Salaam. Some of the owners of the milk kiosks, realising that they could get frequent and reliable supplies of milk, established milk processing plants. Such plants include Tan Dairies (still in operation) and Tommy dairies (currently closed). Furthermore, the milk collection centre model has been replicated by various private agents at their own cost and also by development agencies. The obviously challenging aspect of sustaining milk collection centres is the fluctuations in milk supply between the wet and dry season, from 1.6 to 0.9 billion litres (NBS 2012).

Testing and promotion of feed supplements

Introduction of molasses as cattle feed

Most dairy farms are concentrated in areas where farm sizes are very small, usually less than one hectare and implying insufficient land to grow enough fodder to meet the animals' requirements. Consequently, livestock were fed crop residues and grass cut along the roadsides (1991 FAO). Even though much of this feed was of poor nutritional value, the use of feed concentrates was necessary in order to obtain reasonable yields. Conventional sources were in short supply because of a shortage of cereals for human consumption. It was noted that surplus molasses were available from a sugar estate in Kilimanjaro. Trials on the effectiveness and implication of feeding animals on mixed molasses showed an increase in the amount of milk per feed. Also, when fed to the calves, they helped increase body weight by almost 50 percent. This therefore could be classified as innovation in animal feeds. In discussion with industry actors, it was found that a new animal feed company (DEKA Feeds) has been set up in Morogoro and is using molasses as a core ingredient in animal feeds with some success. At the same time, a recent study by Msuya (2012) also indicates that agro input dealers are selling molasses in the Southern highlands dairy zone.

Multi-stakeholder processes

Tanga Dairy Platform

The Tanga Dairy Platform was created in 2008 as an informal forum of the dairy value chain actors Tanga Region with the objective to exchange knowledge and co-create solutions around common problems. Since then, the platform is still running and currently meeting every quarter to address problems related to market access, improving dairy production and the overcoming the strong seasonal fluctuations in milk supply. Among other achievements, the has ensured common understanding among value chain actors on milk prices, lobbied for reduction of value-added tax on dairy inputs and products, and removal of limitations on urban dairy farming in Tanga town.

Perceived failures of dairy development interventions

Targeting of the poor as beneficiaries

Inability to stimulate increased productivity

While the definition of poor is relative and subjective, HPI philosophy has been to target poor farmers with dairy cows through a pass-on scheme so they can raise their income, improve their livelihood and move out of poverty. Similarly, the main target of the Irish-sponsored pilot project in Ulanga was the very poor¹⁰. Selected farmers should be capable of investing in a good cow shed, basic equipment required in a dairy farm and treatments. In fact, looking at the initial investment required of approximately TSh 3 - 4 million for one improved dairy cow and the private-sector driven nature of the subsector, it is not a poor farmer's business. Most of the farmers are unable to provide for the dairy cows they are given, leading to inability to reach the milk production potential of the cows.

On the contrary, the interventions should have been focussed on improvement of the existing traditional cattle that produce not only the largest percentage of milk in the country but are also already owned by the farmers. Harnessing and providing animal health services closer to the pastoralists as well as developing a workable milk collection system for these farming groups would have stimulated the sector to produce more milk for collection, processing and marketing.

Introduction of credit

Supporting the interventions with grants and at the same time providing and managing loans or credit services¹¹ sends a wrong signal to the clients. Most projects are time-bound and it would be good if projects looked at sustainable means of developing market actors who would then take on the activities when the project comes to an end.

“Credit or leasing is a job in itself which requires specific skills and an uncompromising attitude. Furthermore, this function cannot be combined with software services which require real social skills and a level of trust and understanding which does not fit with the characteristics required for proper credit management....” (Luthereau 1998)

Limited intervention logic

In reviewing the available literature, it became clear that majority of the dairy development programs or projects were and continue to be merely focused on specific activities without following any clear intervention logic¹². This poses clear risks not only to the project funders but more so to the smallholder dairy farmers who have to handle a complex and highly

¹⁰ June 1999 Feasibility study of the expansion of the dairy cattle pilot project. Final report; BACAS Bureau for Agricultural Consultancy and Advisory Service Sokoine University of Agriculture

¹¹ Evaluation DAR-Maziwa-Mara, Debriefing Notes by H. Stetter, H. Mulder, N. Mdoe, I Kawa and H. Mafwenga, 28th October 2000, Dar es Salaam.

¹² External Evaluation of Southern Highlands Development project, October 1999

perishable product, milk, and care for the dairy cattle. In fact, this is exemplified by the unclear systems of collection, marketing and distribution of the milk produced within some of the major dairy development programs. It is therefore apparent that dairy development programs should have in their design (as shown on figure 5 above) a whole value chain intervention that takes a broader systems approach to achieve sectoral growth.

Heifer calf pass on

Scattered dairy cow distribution (lack of dairy cattle concentration)

While HPI and its various partners that include faith-based organisations, non-governmental organisations and other programmes have helped to increase the number of dairy cows in the country, countrywide distribution has created setbacks to the detriment of the smallholder dairy farmers. As distances vary between one farming household to another, extension services, milk collection and even organisation of farmers in some areas have become impossible. Farmers in Njombe, especially in new areas such as Lupembe, Ulanga and Mara, all confirm this. The sparse distribution of dairy cattle is also a major factor affecting provision of various services such as AI, animal health and even feeds, thereby making it difficult for the private sector animal health officers to reach out to farmers in a more competitive manner.

Focusing on quick wins

Too little time allocated to interventions

Some of the dairy development projects or interventions are designed and sponsored with too little time allocated, making it impossible to achieve their development objectives for the sub-sector and to develop any meaningful value chain development that would enable the market to work for the farmers. Examples include the RLDC dairy sub-sector development strategy where, even though they designed their interventions using a market development approach, the period of the interventions was not adequate to observe intermediate outcomes. The APA interventions on the Maziwa business development programme was too short to support the development of business services for a sector that is still in its infancy compared to the neighbouring countries such as Kenya, Uganda and even Rwanda. Therefore project life or timeframe is an important consideration that influences some types of value chain interventions. For instance in the dairy sector, breeding as an intervention takes a relatively long period of time.

Design is not inclusive

Where is the private sector during design?

Despite the fact that dairy farming is to a large extent a private and commercial activity that requires substantial financial and time investment even at the farm level, many dairy development projects do not consult the private sector during the project design. In fact, the private sector is only thought of and brought in during exit (Baker et al 2011). In the case of the specific dairy development projects reviewed, less than 20 percent worked and engaged with the private sector right from design or strategy development, assessment of the needs and through to implementation.

Appropriateness of interventions, technologies and strategies

Market conditions

Tanzania continues to offer good market conditions for dairy products as exemplified by the increasing number of imported dairy products, most of which are of high quality and have a long shelf life (mainly UHT, powdered milk and various forms of cheese). By 2009, imported products were estimated to range between 15-20 million litres of liquid milk equivalent per annum (BACAS 2009). At the time of this review, the strategies by most project interventions were focused on increasing cow productivity, ignoring the needs of the growing urban market niche. Despite the increasing number of small scale industries, the technologies used are mainly those that can only satisfy the immediate local market as most of the product is unpasteurized milk.

The strategies of establishing modern milk cooling tanks within a given Milk Collection Centre (MCC) is an appropriate technological intervention and allows the processors to have designated points of collecting milk, while providing an avenue to the farmers to sell their milk. However, with the increasing cost but erratic supply of electricity in Tanzania, it is necessary for the interventions to look into the use of alternative sources of power such as solar energy. It is proposed here that a detailed study of the feasibility of the use of alternative renewable energy sources be undertaken.

Industry conditions

Prior to the 1983 livestock policy, the government had put emphasis on the development of large-scale farms and milk processing plants. In the mid-1970s, Tanzania embarked on an ambitious programme to increase milk production with the introduction of modern technology such as exotic dairy cattle and farm machinery on large farms. Capital input for the programme was supported by the World Bank and WFP. This strategy turned out not to be appropriate as almost all of the technology introduced for processing suffered from poor management, lack of adequate milk supply, high maintenance costs and poor intervention logic that would have linked them to the producers. However, over the last few years, TDB, with support from other actors including ILRI and MLDF, have embarked on working and developing the traditional sector for milk production, collection, and marketing through certification of milk vendors in various parts of the country. This effort is expected to be rolled out to other parts of the country especially where milk vendors collect milk from the smallholder farmers engaged in the traditional sector and do the marketing.

The dairy industry has been reported several times by the processors association as well as the Tanzania Dairy Board as a sub-sector that suffers from over-regulation. Over-regulation is not good for the industry as it tends to stifle its growth. In the long run, this does not support the initiatives of the development projects that aim to make the sub-sector grow and contribute to economic growth of the dairy farmers. Demand, which has been rising sharply, continues to be driven mainly by the fast-growing human population and the high economic growth rate of

about 7 percent per annum. The gap between demand and local supply is expected to continue to widen in the medium term to the year 2020.

Local economic/commercial conditions

The demand for milk and milk products in the country continues to increase. Almost all of the estimated 1.7 billion litres of milk produced are consumed either as raw, semi- processed or as processed dairy products. Extension officers' knowledge on the economics of smallholder dairy farming seems to be inadequate. There is no proper infrastructure for specific interventions that would otherwise ensure that milk moves from the farmers, especially the pastoralist, to the next commercial level such as hawkers and milk collection centres.

On-farm conditions

Farm conditions vary from one ecological zone to another and from farmer to farmer, especially those engaged in modern intensive dairy farming. Most of the projects have laid out strategies that prepare the farmer and develop linkages for animal health services including extension, before the farmers obtain heifers. Despite the large number of traditional cattle in the country, farm conditions for traditional cows remain challenging because of inadequate animal health services, inputs and milk collection systems.

Policy and institutional conditions and governance

Back in 1983, a policy document for the livestock sector prepared by the Ministry of Water and Livestock Development put emphasis on shifting the focus from large scale parastatal farms to smallholder farmers. In addition, the Dairy Development Programme (1995-2005) clearly recommended that production, processing and distribution of livestock products and inputs be left to the private sector, while government services concentrate on the policy, regulatory, research and extension functions. The objective was to focus on dairy development by increasing local production, processing and marketing of milk and milk products to meet the nation's nutritional requirements. But the performance of the dairy industry in Tanzania has been associated with a set of challenges of which a hostile business environment ranks among the highest. Therefore attention has been drawn to multiplicity, complexity and overlapping of regulations governing the industry (TAMPA-BEST AC 2008). This has been echoed by the Tanzania Dairy Board.

Informal trade offers an opportunity for smallholder farmers with either improved breeds or traditional breeds to sell their product through the various vendors who try to avoid the existing regulations in the sector. Institutions that are responsible for ensuring that policies are followed are in place. However, these institutions can only implement these policies if there is a strategic plan towards achieving the policies.

Discussion

There appears to be no authoritative source of information on the dairy sector. Such information would include an estimate of improved dairy cattle in the country; the Ministry of Livestock development estimates 720,000 compared to the 800,000 by the Tanzania Dairy Board. Information would help guide investors in the design and forecasting of their investments as they assess their risks. Despite the increase in number of dairy cows in all the four zones- (Southern highlands, Coastal, Central and Lake zones), it is still worthwhile to bear in mind the role that the traditional zebu cattle play in milk production, noting that the 70:30 ratio has remained almost the same over a period of close to 20 years.

In most cases, large projects have tended to actively promote the formation of farmer groups or cooperatives without any initial assessment of the actual requirement from the farmers. This has led to mixed results; in some projects, farmer group performance is dismal and most of the groups that exist up to the end of the project are unlikely to become economically viable business units or enterprises that can sustain themselves by taking on additional tasks not addressed by the projects. For this reason, it is necessary to try and develop other organisational forms.

As a matter of policy, the Tanzanian government has been in the process of withdrawing from some of the crucial services that are meant to support the growth of the dairy sector. While it is understood and agreed that the performance of government staff is not to the expectation of the industry because of inadequate resources or management, a complete withdrawal from animal health services by the government and takeover by the private sector will worsen the already dismal performance of the sub-sector. Especially affected will be the smallholder dairy farmers who have one to two dairy cows and cannot afford to get the services of an urban-based private service provider. In the interest of the sector, the government and dairy actors should work hand in hand to examine alternative models of service delivery that would propel the growth of the sector and enable the sector to thrive and be fully commercial.

While artificial insemination services can be easily privatized, they are not widely accessible in the country, and not even in the main dairying zones. Limitations arise from the required logistics that include good quality semen (mainly imported) and the constant supply of liquid nitrogen. The recent instruction by President Kikwete to expand AI services is a good step but it is yet to reach the farmers in need and to be sustainably delivered as an affordable service.

Research and the dissemination of the research findings especially those that relate to availing improved feeds to the smallholder farmers and the traditional pastoralist remain important especially during the dry season. The government continues to train several individuals through the ministry responsible for livestock. At the same time, the Sokoine University of Agriculture has been leading several trials and research on food concentrates and other technologies. However, the findings are not widely shared to support the growth of the sub-sector and fall short of the whole value chain approach that has been advocated by dairy stakeholders.

Since the privatization of state-owned processing plants, milk processing has remained a private investment. By accepting to invest, the private sector takes almost all the initial risk. The public sector would therefore be expected to facilitate such investments and to offer a favourable environment so that the investor can forecast the return on investment. Financing remains a great challenge for the dairy sector actors considering the high interest rate that commercial banks charge and the large sums required to set up a modern milk processing plant or purchase packaging equipment. Over-regulation as reported by the dairy actors should be avoided. One way to reduce the financial bottleneck above is to concentrate on interventions that work with the traditional African short horn zebu.

Best-bet interventions

Development of a dairy development master plan

A master plan for dairy development would provide a long-term vision and direction towards whose achievement dairy development supporters and actors could all contribute. In addition, the plan would provide a basis for the development of short-term strategic plans that can be pursued and monitored periodically. A request for funding the development of a dairy master plan was submitted to Austroprojekt GmbH among other activities under the new national dairy sector support project (Anonymous, 1999). However, it appears that this request was never funded and no other development organisation or the government has deemed it important. Kenya is cited as a good example of a fast growing dairy industry in the region; the liberalisation of milk marketing, which started in 1992, followed by a dairy development policy in 1993, was based on a recommendation that was contained in the 1991 Dairy Master Plan (Omore et al 1999). According to Omore et al, "...major impact has been a rapid growth of the formal and informal private sector, which provides input and output services, and a redistribution and increase in the overall social and economic benefits of market-oriented dairying to smallholder producers, market agents and consumers in Kenya" (p. 7). The desire of the TDB to have a master plan sooner rather than later will provide the cornerstone for the future development of the dairy sub-sector.

Improving the breeding component

Under normal circumstances, the provision or access to dairy cows would be the priority in developing the sub-sector much faster as is the case in Kenya and Uganda. If the need is to increase the milk production and make it accessible for processing, then the use of AI in areas already populated by animals, while at the same time continuing with the HIT schemes of pass on would suffice. While AI services have been promoted for several years, success remains elusive except in the regions of Kilimanjaro and parts of Arusha. The main reason is the sparse location of dairy cows in the country, which makes it possible for animal health workers and extension officers to provide the service in a cost effective way as soon as the cow has been detected to be on heat.

Research and improvement on feeds

Various projects and testimonies from dairy farmers have shown that proper animal feeds increase the body weight of heifers and more importantly, the amount of milk produced per cow. In the past, there has been a serious imbalance between investment in cattle and in pasture. It is recommended that any further distribution, AI services and HIT schemes should include pasture needs in the development package and that not all funds be spent on the purchase of cattle. Pasture management and general animal feeds programmes should be instituted for existing farms and should include the renewal of all depleted pastures, introduction of supplements and actual accessibility by smallholder farmers.

While research should be enhanced to target smallholder dairy farmers, emphasis and considerations on affordable and accessible improved pasture and food supplements should be given priority by livestock research institutions including Sokoine University of Agriculture.

There are a number of investments in pastures and fodder production in the country; currently production is estimated at 303,000 bales of hay (2010), while demand exceeds 1,000,000 bales per year. However, most ruminant production in the country depends on natural pastures and crop residues and little supplementation is required in the case of dairy animals. Improved pasture seed production to a greater part is on government farms, in Vikuge and Langwira farm with a production capacity of about 40 tons of seeds annually. Improvement in the areas of pasture production and conservation for dry season feeding will improve livestock productivity. It is therefore necessary to invest in further research on pasture and pasture seed production and conservation.

Compounded feedstuffs production is estimated at 800,000 tons per annum, while potential demand stands at 2.5 million tons. There are about 57 animal feedmills in the country that are not operating at their optimal capacity. Most of them are located in Dar es Salaam, Coast, Arusha and Mwanza regions (MLDF 2011) and to a large extent cater to the poultry and pig farms.

Insurance services and development of financing mechanisms

The technologies used by most milk processors in the country cause inefficiencies in production and marketing thus limiting the ability of the entrepreneurs to process and market more dairy products. Processing equipment and packaging materials are imported, which requires a huge capital outlay. There should be a deliberate intervention in setting up financing mechanisms that especially target the dairy sector. Such a scheme could be used right from the purchase of the dairy cow (as in the case of the Tanga through Farm Friends Tanzania), access to various inputs on credit by farmers, acquiring milk collection equipment including cooling tanks, milk trucks, milk processing equipment and milk promotion. In addition, at the level of the dairy farmer, it is necessary to explore cost-effective insurance schemes to protect farmers. Any mechanism, however, will need to be aligned to a workable organisational model that suits all actors including the smallholder farmers operating within the traditional system.

Improvement in milk collection

Milk, being a highly perishable food product, requires a proper collection system, quick delivery and efficient preservation before and after processing. It is therefore much more important to make an effort to ensure that milk is collected in a consistent and timely manner from milk producing farmers. The possibility of successful milk collection from traditional pastoralists has been proven by the introduction of milk collection centres in pastoralist areas of Coast region. Chilled milk collection increased from 48,182 litres during January - June 1996 to 1,349,032 litres in January - June 1998, which translated to about 7,000 litres per day (Mchau et al 1998). An efficient milk collection mechanism will potentially reduce the cost of milk collection.

Milk collection is crucial to dairy farmers as the amount of milk being produced per cow is higher and is a major source of income for the households. The aspects of milk collection were never addressed at the design stage of the SHDDP and this continues to be so in most HIT scheme projects. The learning from the EADD1 pilot milk hubs can be used to localize and customize milk collection based on production sites.

Build strong dairy farmer groups

Unlike medium and large scale dairy farmers, smallholder dairy farmers need to be encouraged to work, learn from one another and to build stronger relationships. The fact that most smallholder dairy farmers engaged in intensive production acquire the improved dairy cow through the pass on scheme of heifer by default requires the building of such close relationships. For both smallholder farmers who keep either traditional or improved dairy cattle, group action brings down costs of production. Models of group organisation, however, should be tested based on localities and should get a buy in from farmers directly.

However, it should be noted that any model of organization should be left to naturally develop into either a farmer dairy group or cooperative as opposed to being an activity or intervention of a particular project. It is obvious that once dairy farmers have a common problem, they will naturally come together to look for a common solution, which in turn supports sustainable development and management of the farmer groups. Good examples of natural growth of farmer groups are Njolifa and even the various primary dairy cooperatives in Tanga as opposed to the groups and networks that were formed under SHDDP and other projects, as part of the project interventions. These collapsed as soon as the project ended.

Training of dairy technologists

Several small-scale milk processing units have been established by individuals or producer cooperative societies in all the milk sheds including the areas that mainly have the traditional zebu herds. These processing units appear to offer a workable alternative to large-scale milk processing plants. Such initiatives include ghee-making introduced in Bariadi to absorb milk from traditional boran and zebu cattle (FAO 1991). This opportunity however, needs to be explored further to determine its scale and time for scaling out. Scanagri and Business Care Services (2006) confirmed that dairy technology training facilities for operators are not available in Tanzania. Dairy technology training should be established in the country to offer opportunities for the much needed technicians who would then help to increase the amount of milk being processed, increase quality of dairy products as well as the quantity and variety of products.

Conclusions

The existing demand gap in dairy development

Despite having the second largest cattle population in Africa, Tanzania has not been able to adequately develop the sector using the existing stock to meet the demand for milk and milk products. This review has found that almost 20 million litres of liquid milk equivalent is formally imported to fill the gap. As at October 2012, none of the large supermarkets in Tanzania was stocking any long shelf life milk products and consequently this gap is filled by the imported milk and milk products. The demand gap also exists when comparing the current milk consumption per capita and the potential demand of milk especially during the dry season.

Over-regulation of the dairy sector

Different dairy market actors in the country report over-regulation. Each regulation is associated with costs. In the end, over-regulation continues to hamper the growth of the formal sector especially in filling the existing gap in the sector.

Delivery of services

There have been changes in the delivery of animal health services, extension and other inputs. There has been a shift from public service delivery to private sector delivery. There are few private sector actors delivering services at commercial rates and are located in more lucrative business areas. Although attempts have been made to help provide services, there has not been a good organisational model that can sustain the delivery of the services.

Animal feed constraints

Various studies confirm that feed for dairy cattle plays a great role in milk production. However, with majority of animal feed factories producing for the poultry sub-sector, insufficient feeds remain a major constraint for dairy development in the country. It is therefore important that any future interventions should examine appropriate pasture and feed to spur milk production.

Access to working capital

Access to working capital would help dairy farmers to improve their production and eventual participation in the market system. But working capital remains a major constraint. At the processing level, fixed capital remains a major constraint especially for investment in technology improvement. It is important that access to capital is included in the design of any dairy development intervention in Tanzania.

Existence of large number of local cattle

Of the 21.4 million cattle in Tanzania, less than 1 million are improved. While literature indicates that the local cattle produce about 70 percent of the milk, this figure is comparatively small (despite the genetics of the traditional cattle) and shows that the large number of local cattle has not been exploited to its full potential. The large number of local cattle in many

parts of the country provides an opportunity for improvement of the breeds through AI and use of improved bulls to increase productivity.

Sparse location of milk producers

In many parts of Tanzania, milk producers are sparsely located, which makes it challenging to reach them for provision of animal health services and collection of milk. Related to sparse location is the poor infrastructure; transport and energy costs make up to between 35-50 percent of the milk collection, processing and marketing costs.

Informal milk trading

Informal trade in fresh milk is vibrant and cuts across most of the farmers in the country. Most farmers sell fresh milk to either their neighbours or to milk traders who collect milk directly from farmers and sell it to various clients. For most smallholder farmers, informal milk trade offers prices better than those offered by milk processors. Informal milk traders (even though they sell unprocessed milk) create stiff competition for milk processors especially in areas where demand for milk is constant.

Organisational models

This review notes that there is an urgent need to develop appropriate organisational models that can support the development of the dairy sector and systemically solve many of the problems that currently affect the sector and more so the smallholder farmers. Organisational models can be developed that revolve around the following areas:

- **Chilling plants** or just access to them (if under-utilized) through **transport arrangements** that provide both outputs marketing and inputs and services through check-offs
- Check-offs for inputs and services provided through **milk traders**

The latter approach is important because of the strong focus on pre-commercial (rural-to-rural) producers.

References

- Anonymous (1997). Evaluation of DAR MAZIWA Project. Draft report
- Anonymous (1999). Subsector Program “Dairy Development Tanzania” Draft for Austrian Development Cooperation.
- Ashimogo, G. and Greenhalgh, P. (2007). Regoverning markets. Small scale producers in modern agrifood markets. Information sheet. Tanzania trends in growth of modern retail and wholesale chains and related agribusiness- posted at [www. Regoverningmarkets.org](http://www.Regoverningmarkets.org)
- Baker, D., Wanyoike, F., Manyengo, J., Juma, G. and Hasker, S. (2011). Pro-poor livestock marketing: investment options. An investigation of pro-poor livestock development projects. CGIAR. (2011). Dairy value chain in Tanzania: Background proposals for the CGIAR Research Program on Livestock and Fish
- Covarrubias, K., Nsiima, L. and Zezza, A. (2012). Livestock and livelihoods in rural Tanzania. A descriptive analysis of the 2009 National Panel Survey. *Joint paper of the World Bank, FAO, AU-IBAR, ILRI and the Tanzania Ministry of Livestock and Fisheries Development with support from the Gates Foundation*
- EADD2. (2012). Tanzania stakeholder consultation Workshop report.
- FAIDA SEP. (1996). Milk and milk products sub-sector analysis in Arusha
- FAO (1986). Dairy Development Mission to the Arusha/Kilimanjaro Area. International Scheme for the Coordination of Dairy Development.
- FAO (1991). Dairy Development Services Phase II. The United Republic of Tanzania. Project Findings and Recommendations
- FAO (1997). FAO workshop on market-oriented dairying: Role of producers’ organisations and NGOs. Organized by the National Dairy Development Board.
- FAO. (2005). Livestock Sector Brief. United Republic of Tanzania.
- Hall, M., Mugittu, V. F., Kurwijila, L. R., (2003). Report of the Mid-term Review Mission. Smallholder dairy support programme.
- Hela, J. P., (2006). Nafasi ya sekta ya mifugo katika uchumi wa dunia na katika kuinua pato la taifa na kuondoa umaskini nchini.
- ILO (2006). Guide for Value Chain Analysis and Upgrading
- Kagera Dairy Development Trust (KADADET) (2002). Annual report for year 2001.
- Kifaró, D. C. And Mdoe, N.S.Y.(1999). Feasibility study of the expansion of Dairy cattle pilot project. Bureau for Agricultural Consultancy and Advisory Service Sokoine University of Agriculture
- Kurwijila, L.R., Mugittu, V., and Morungu (2005). SDSP Final Review (2001-2005). Draft report for comments.
- Kurwijila, L.R., Rweyemamu, L. and Balakana, J.(2006). Maziwa Business Development Programme in the Lake and Coast. Draft Final Programme Evaluation Report
- Luthereau, F. (1998). Strategies for milk marketing promotion and consumption
- Maiseli, N.G.(2002). Cost-effective and sustainable smallholder dairy production in the milkshed area of Tanga. Technical report. 2001- June 2002 (draft)
- Mbwambo, N.R., Mutagwaba, C.D and Tsoxo, M. (2006). Rapid review of existing and non-performing milk processing plants.
- Mchau, K.W., Busungu, S., Mchaki, C. E., Laffa, J. Y., Simba, M. A. And Auerboeck, R. M. (1998). Milk collection in Dar es Salaam and coast regions: Taking advantage of private initiatives.
- Mdoe, N., Ngasamiakwi, P., Staal, S. and Wolff, J.T.(1997); Evaluation of “DAR MAZIWA” project. Draft report.
- Mghwira, J. E and Makundi, C. N. (1998). National Artificial Insemination Centre and the Role of A.I in Dairy Development.
- Ministry of Agriculture and Food Security. (2002). Agriculture Sector Development Strategy (practical experience in designing policy).

Ministry of Livestock and Fisheries Development. (2011). Livestock extension services implementation guidelines. United Republic of Tanzania.

Ministry of Agriculture and Cooperatives, (1998). Proceedings of the Second Dairy Development Conference held at AICC Arusha. 5th – 7th August 1998.

Ministry of Livestock and Fisheries Development. (2006) National Livestock Policy. United Republic of Tanzania.

Ministry of Livestock and Fisheries Development. (2011). Livestock Sector Development Programme. United Republic of Tanzania.

Ministry of Livestock and Fisheries. (2011). Investment Opportunities in Livestock Industry

Ministry of Livestock Development and Fisheries. (2009). Livestock Sector Development Strategy. Final report. Bureau of Agricultural Consulting and Advisory Service

Mmari, D.K., Mnenwa, R. K. And Mdoe, N.Y.S. (undated). Investment and Processing costs at processor level

Msuya, E. E. (2012). A Dairy Value Chain and market study for southern highlands and eastern milk shed. Contributing to the EADD2 Tanzania proposal development process. Draft final report.

Mutagwaba, C. D. (undated). Development of School Milk in Tanzania. Paper presented at The 3rd International School Milk Conference. Kunming. China. April 11 – 14, 2005.

Mwakilembe, P.A.A (2007). On-farm Phenotypic characterization of UFIPA indigenous cattle in Rukwa region in Southern Highlands of Tanzania.

National Bureau of Statistics (2012): National sample census of Agriculture 2007/2008. Small holder Agriculture Volume III: Livestock Sector - National report

National Bureau of Statistics. (2010). National Sample census of Agriculture 2007/2008. Preliminary Report.

Ngasamiakkwi, P.S. and Lishekya, D.L. (undated). Northern Milkshed and school milk feeding programme. Highlights of the programme.

Njombe, A. P and Msanga, Y.N. (undated). Livestock and dairy industry development in Tanzania.

Njombe, A. P., Msanga, Y. N., Temba, A. E and Tsoxo, M. (2010). Efforts to Increase improved dairy cattle in Tanzania

Omoro, A. (2009). Market mechanisms and efficiency in urban dairy products markets in Ghana and Tanzania. ILRI Research report 19.

Omoro, A., Muriuki, H., Kenyanjui, M., Owango, M. and Staal, S. (1999).The Kenya dairy sub-sector. A Rapid Appraisal

Rugambwa, V.K., Nholope, D. And Stanslaus, D. (1997). Socio-economic impact study of the Kagera Livestock Development Programme (KALIDEP)

Scanagri and Business Care Services. (2006). Value Chain Analysis and the Socio-Economic Assessment of the Dairy Industry in Tanzania. Final report

SCF (2011). Dairy Value Chain.

Schulz, M. (1995). The Informal sector and structural adjustment-Strengthening collective coping mechanisms in Tanzania

SHDDP (1999).Annual report for the period of July 1998- June 1999.

SNV (undated). About dairy value Chain development programme in Tanzania

Tanga Smallholders dairy development programme (1996). Evaluation Phase 1- 1992- 1996.

Tarnutzer, A., Mbise, N. and Ashley, S,(1999).External Evaluation of Southern Highlands dairy Development Project. Ministry of Agriculture and Cooperatives, Government of Tanzania and Swiss Agency for Development and Cooperation.

Valergakis, G.E., Arsenos, G and Banos, G. (2006). Comparison of artificial insemination and natural service cost effectiveness in dairy cattle. Department of Animal Production, School of Veterinary Medicine, Aristotle University of Thessaloniki

Annex 1: Tanzania dairy projects

FAO-WFP dairy intervention in Arusha and Kilimanjaro regions

The largest dairy programme by FAO was in Kilimanjaro and Arusha regions. This project was part of the International Scheme for the Coordination of Dairy Development which started in the early 1980s. In realizing that the two regions had considerable potential for further development of milk production a number of constraints and possible solutions were outlined.

The main focal points of the interventions for the project were as follows:

Cattle feeding: Increase the quantity and quality of roughage produced on the farms and large scale treatment of the roughage, crop waste and coarse grass be developed to improve nutritional value. Intensive production of hay and the utilization of malasses-urea mix as well as other concentrates.

Breeding and AI: Improvement of the heifer breeding units in the area as well as the re-launching of artificial insemination as the main breeding system.

Animal health and veterinary assistance: For purposes of disease control, emphasis should be placed on prophylactic activities. This includes making available sufficient quantities of vaccines and acaricides, strengthening field veterinary services and re-equipping the Arusha Veterinary Investigation Centre and working towards production of new types of bacterial vaccines and antigens.

Integration of dairy activities into rural cooperatives: Through the cooperatives, the following activities should be availed for the dairy farmers: transport services at reasonable cost while supplying inputs, VET aid, AI and extension services, supply of dairy animals, organizing treatment of roughage and provision of concentrates and the collection of milk for further transportation to the plant.

Milk collection, processing and marketing: Advocated for the renovation of the TDL milk collection/cooling centres, introduced payment for milk based on quality-fat content. Exploration of the bulk milk vending machines

Training of farmers and technical personnel: Strengthening extension activities.

Technical assistance to dairy development: Recommended the provision of technical services for the overall development of dairy development framework.

Heifer Project International in Tanzania (HPIT)

Since 1981, Heifer Project International in Tanzania has been giving dairy animals to low-income families, organizing village groups to promote development, and encouraging the adoption of a range of wholesome values. The dairy animals are high yielding exotic breeds, and families are trained in a zero-grazing model of animal care. When a family receives an animal, it is expected to pass-on (usually) the first female offspring to another family in the village; this family in turn should pass-on the offspring's offspring.

By August 2007, (P. Clements and K. Martens 2007) evaluations had indicated that the HPIT is cost-effectively reducing poverty and improving living conditions in about 300 villages across the country.

The HPIT model of offspring pass-on has been widely adopted by many projects and interventions in Tanzania.

Smallholder Dairy Support Programme (SDSP)

SDSP was the exit phase of the long standing Dutch government direct support to the livestock industry development in Tanzania. The programme operated within the period 2001-2005.

Main Focus of SDSP: The programme was geographically focused on supporting the regions of Kagera and Tanga. During its lifespan, the programme provided dairy animals to farmers in the form of credit in kind or Heifer in Trust (HIT) and Goat in Trust (GIT) schemes. The programme also supported the training of the farmers before receiving one or two crossbred dairy cows or goat who were to be bred intensively (stall fed). The credit is repaid by passing on the equivalent animal (cow) to another farmer.

At the goal level, the programme was designed around the “creation of an enabling economic environment in which the smallholder dairy sector can successfully grow and become a viable private sector with income generation opportunities for small-scale farmers and other entrepreneurs in the sector”.

The programme operated as free-standing entity in the two regions outside the government structures and linked other national stakeholder organisations such as TAMPRODA, TAMPA and TDB.

Southern Highland Dairy Development Programme (SHDDP)

With the support of the Swiss Government, the Small Scale Dairy Development Project was started during the financial year 1978/79. This project was later (1996) renamed SHDDP to ‘reflect’ its geographical focus on the regions of Iringa and Mbeya-given that the two regions represent the larger part of the Tanzanian southern highlands. The change of name also underlined a fundamental re-orientation from a dairy production focus to a broader dairy sector orientation approach. The programme was implemented over a period of 25 years under a partnership of Inter-cooperation, SDC and the Ministry responsible for livestock. It primarily focused on small-scale dairy farmers.

AustroProjekt Association (APA)

With the support of the Austrian Government, the APA started to support dairy development in Tanzania in 1994/95.

Focus of the project: The project focused on role players, looking at linking peri-urban dairy farmers and the pastoral communities to the urban milk consumers in and around Dar es Salaam and the Coast regions. The milk chain actors targeted were the small scale (peri-urban) farmers in and around Dar es Salaam and traditional cattle keepers in Bagamoyo, Kilosa and Handeni districts. The project offered support on organisation of the milk marketing system by

targeting milk processors and milk traders operating in the project area. By 1996 and based on the lessons learnt from the Coast area, the Dar Maziwa project was extended to Mara/Lake Zone and named the Maziwa Mara Project. This phase worked on the establishment and funding of the milk collection centres, running of credit schemes for the groups etc.

After the year 2000 project evaluation, the focus was re-aligned to avoid direct involvement in service provision and financial support and instead to adopt a facilitation role, that is, strengthening organisations and technical capacities of milk chain actors by linking them with established Business Development Service (BDS) providers.

In addition, APA also focused on the policy and business environment of the sub-sector including lending support to the setting up of the member associations and the Dairy Industry Act.

Rural Livelihood Development Company (RLDC)

The RLDC had two phases in which it intervened in the small holder dairy development.

Focus: The Company had a limited geographical focus on the central corridor for milk production, but also supported initiatives of value addition and marketing beyond the central corridor. The dairy sub-sector interventions, however, lasted for about four years only ending in 2011 divided into two phases with different approaches.

During the first phase the focus was more on directly supporting individual processors and would-be processors; the latter included supporting the Catholic dioceses of Shinyanga in setting up milk collection centres, trainings etc. However, the partner-the Catholic Dioceses of Shinyanga- never managed to put up a processing plant. In the second phase, the company changed its approach and adopted the broader market development approach where it looked at addressing the constraints within the sub-sector including strengthening TAMPA in its advocacy work as well as working closely with TDB in harmonization and coordination. With this change, the RLDC sub-sector's purpose became 'Improvement of the milk market system by increasing milk channelled through the formal market system from the informal milk market so as to improve the welfare of milk chain actors in the Central Tanzania'.

SME Competitiveness Facility (SCF)

The national SME project funded by the Danish Government, SCF is on-going but with a focus on the improvement of processing and marketing of the milk products through SMEs scattered across the country. In addition the SCF support is also directed towards business management skills and overall organizational growth. In essence, there is little or no deliberate focus on the poor smallholder farmer except the pulling effect that is likely to arise from the 'growing' businesses of the dairy processors. However by April 2012, SCF is planning to adopt the Making Markets Work for the poor approach which would imply inclusiveness for all dairy development actors.

Netherlands Development Organisation (SNV)

Based on several studies and their experience in the red meat sub-sector, SNV has over the last two years been working on three pilot projects focused on improving business links between small scale producers and milk processors of a larger scale.

As of 2012, SNV is in the process of adjusting its approach in the sector towards working with larger scale processing industries through the facilitation of inclusive business models with special focus on organisation and management of Milk Collection Centres.

In addition they intend to adopt a value chain development approach that will include strengthening of groups, multi stakeholder processes, value chain financing, market intelligence, service provider strengthening and public policy dialogue management.

The pilot dairy project in Vigoi division, Ulanga District

The idea for the dairy project was proposed by the Ministry of Agriculture and previously by a planning team from the Institute of Rural Development Planning in Dodoma and was financed by the Irish government. The overall goal of the Project was to raise living standards of people in the district, especially of the poorer rural households.

The immediate objective of the project was to support the establishment of a profitable smallholder dairy industry in Ulanga. The pilot dairy project started in December 1996 with 24 F1 heifers and 32 Boran heifers distributed to selected resource-poor farmers in Vigoi division until end of 1998.

East Africa Dairy Development Phase 2 (EADD2)

EADD2 is part of a 10-year regional dairy industry development programme. The project is divided into two phases. Phase I of four years, also dubbed as pilot phase, already started in 2008 and covered the countries of Kenya, Rwanda and Uganda.

Based on lessons learnt from phase I, EADD2 which is expected to expand to include Tanzania, Burundi and Ethiopia alongside the pilot countries is currently under planning with one objective being scaling-out similar interventions tailored to three East Africa countries - Rwanda, Uganda and Kenya. The tentative approach of EADD2 will be:

- Beneficiaries selected based on need, opportunity and local contribution
- Farmers mobilized into cooperatives/associations/ producer companies
- EADD2 Tanzania stakeholders' consultation: Workshop report 11-13 April 2012
- Producer companies assisted to set up infrastructure to market milk and deliver inputs and services to members through the 'dairy hub'
- EADD staff provide technical assistance to producer companies to achieve farmer goals in a sustainable manner

In order to achieve its vision of increasing the number of beneficiaries and contribution to doubling of the household dairy income by the year 2018, the project will work through integrated interventions in extension-led dairy production, marketing and trade and the application of knowledge. The funding is expected to be through a PPP model. EADD2 is expected to take off during the first half of the year 2013.

Annex 2: Experts consulted to define success and failure

Names	Organisation
Prof. Lusato Kurwijila	SUA
Charles Mutagwaba	TDB
Deo Mlay	TDB (APA)
Dr. Kasim Mchau	DEKA FEEDS (SHDDP, APA)
Emanuel Mariki	TAMPA
Dr. Mpate	Land 'O' lakes, (SHDDP, SDSP)
Rev. Kisanga	ELCT Moshi
Mzee Hamisi	TAMPRODA (TDCU)
Abdul Mtumwa	Heifer In Tanzania
Michael Bulemo	SCF
Nathaniel Mbwambo	MLFD
Rev Canon Marko Mwafute	NJOLIFA
Alfred Method	NJOLIFA
Ben Andreas Mdetele	NJOLIFA
Kidehere	CEFA
Susan Lyaro	RLDC (APA)