IFAD
Investing in rural people

United Republic of Tanzania

Southern Highlands Milkshed Development Project

Detailed design report

Volume 2 - Appendices

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Contents

Abbreviations and acronyms

AI	Artificial insemination
ASDP	Agricultural Sector Development Programme
AWPB	Annual work plan and budget
BMGF	Bill and Melinda Gates Foundation
BRN	Big Results Now!
CAADP	Comprehensive Africa Agriculture Development Programme
CAHW	Community Animal Health Worker
CBPP	Contagious Bovine Pleuropneumonia
CCRO	Certificate of customary right of occupancy
CHW	Community Health Worker
CMCC	Central milk chilling centres
CMT	District-level Council Management Team
COSOP	Country Strategic Opportunities Programme
COWSO	Community-owned Water Supply Organization
CPE	Country Programme Evaluation
CPI	Corruption Perception Index
DAA	Dairy Agribusiness Advisor
DADPs	District Agricultural Development Programmes
DAS	Dairy Agribusiness Specialist
DbyD	Decentralization by Devolution
DDA	District Development Account
DDF	Dairy Development Forum
DLEO	District Livestock Extension Officer
DNO	District Nutrition Officer
DPIU	District Project Implementation Unit
DPO	Dairy Production Officer
DPP	Division of Policy and Planning (in MALF)
DNO	District Nutrition Officer
EADD	East African Dairy Development Programme
ECF	East Coast Fever
EDP	Enterprise development plan
EPOO	Extension & Producers' Organizations Officer
FMD	Foot and Mouth Disease
FOs	Farmer Organizations
GALS	Gender Action Learning System
GDA	Group Development Advisor
GDPP	Good Dairy Production Practice
ILRI	International Livestock Research Institute
INDS	Intended Nationally Determined Contributions
L-FFS	Livestock Farmers Field School
LGA	Local Government Authority
LITA	Livestock Training Agency
LME	Liquid Milk Equivalent
LMU	Livestock Multiplication Unit
L-MIRA	Livestock Micro-Reforms for Agribusiness
LSDS	Livestock Sector Development Strategy
LSMP	Livestock Sector Master Plan
MALF	Ministry of Agriculture, Livestock and Fisheries
MCC	Milk chilling centre

MCP	Milk collection point
MDP	Multi-stakeholder Dairy Platform
MI	Milk Inspector
MIVARF	Market Infrastructure Value Addition and Rural Finance Project
MSMEs	Medium, small and micro-enterprises
MUVI	Rural Micro, Small and Medium Enterprise Support Programme
NAIC	National Artificial Insemination Centre
NGDS	National strategy for Gender Development
NLP	National Livestock Policy
NMT	National Masters' Trainer
PAID	Public-Private Partnership for Artificial Insemination Delivery Programme
PSC	Project Steering Committee
PMK	Planning, Monitoring and Evaluation, and Knowledge Management
RFI	Rural financing institution
RNO	Regional Nutrition Officer
RSP	Rural Sector Performance
SACCOS	Savings and Credit Cooperative Societies
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SHMDP	Southern Highland Milkshed Development Project
SMCC	Satellite milk chilling centre
SOPs	Standard Operating Procedures
SUA	Sokoine University of Agriculture
TAD	Transboundary Animal Disease
TAFSIP	Tanzania Agriculture Food Security Investment Plan
TALIRI	Tanzania Livestock Research Institute
TAMPA	Tanzania Milk Processors Association
TAMPRODA	Tanzania Milk Producers Association
TCCIA	Tanzania Chamber of Commerce and Industry and Agriculture
TDB	Tanzania Dairy Board
TDP	Tanzania Dairy Platform
TFC	Tanzania Federation of Cooperatives
TLMI	Tanzania Livestock Modernisation Initiative
TNBC	Tanzania National Business Council
TPSF	Tanzania Private Sector Foundation
UHT	Ultra-high Temperature
VICOBA	Village community bank
ZPMU	Zonal Project Management Unit

Appendix 1A: Country and rural context background

Country context

1. The United Republic of Tanzania was formed in 1964 by the unification of mainland Tanganyika and the isles of Zanzibar. It has a long coastline and borders with eight countries, of which five are landlocked, so it has the potential of becoming a regional commercial hub. Its land is rich in biodiversity and natural resources, including sizable deposits of natural gas. With a HDI score of 0.52, Tanzania is currently ranked 152nd out of 182 countries; its business environment, 134th out of 185 countries; and government effectiveness 135th out of 212 countries. For the last two indicators, Tanzania's ranking has deteriorated over recent years. Life expectancy at birth is 60 years; the male literacy rate is 75% and female is 60%. Average family size is 4.8 persons. About 13 million people out of a population of 46 million were living in poverty in 2012.

2. **Economic context**. Tanzania has experienced high economic growth, averaging between 6-7% per year over the past decade, driven by macroeconomic policy and economic liberalization. Over the past decade, Tanzania's economy has become significantly more open, and the trade-to-GDP ratio has increased from 13.5% in 2000 to more than 30% in 2011, the highest rate among the East African Community countries. The inflation rate continued to decline in 2013, reaching a rate of 6.3% by October 2013, down from 20% in at the end of 2011. The most significant transformative factor for the economy is the discovery of large natural gas reserves that are expected to begin production in 5-7 years. In the medium term, annual GDP growth is expected to rise to 7.5% or higher due to an expanding mining sector and expanding exports.

3. Tanzania has made good progress in the rehabilitation and extension of the road network, but improvement and expansion of the rural road network is still needed to reduce production and transport costs for agriculture. The country needs to continue to strengthen transparency and accountability across sectors at all levels, especially in the context of future exploitation of natural gas reserves. The most significant constraint on growth, reported by 80% of businesses operating in Tanzania, is the unreliability of the provision of electrical energy and the length of time required for complying with the country's business regulations.

4. **Poverty, human development, and demography**. The recent National Household Budget Survey shows that the percentage of people living in poverty has declined from 33% in 2007 to 28% in 2012. Fertility rates remain high, making it difficult to achieve sufficient per child investments in health and education, and lowering the savings rate of the country. Around 1.6 million people are living with HIV in Tanzania, representing 6% of the population. The severity of the epidemic differs widely from region to region, with some regions reporting an HIV prevalence of less than 2% and others as high as 16%.

5. **Women and youth**. Women of reproductive age (15-49 years old) represent 24.5%[1] of the population, and face challenges in economic empowerment and access to decision-making at all levels. There are many customary practices that discriminate against women. Youth (15 - 24-years) in Tanzania represents roughly 18% of the total population and this share remained stable between 1990 and 2010. In absolute numbers, the size of Tanzania's youth almost doubled from 4.4 million in 1990 to 8.1 million in 2010. It is expected to swell to 11 million by 2020 and 15 million by 2030. Young people accounted for 28% of the labour force in 2010 in Tanzania[2].

6. **Agriculture**. The agricultural sector contributes to about one quarter of GDP and provides employment to three quarters of all Tanzanian workers, while fulfilling 95% of the country's food need. The country has 95.5 million hectares (ha) of land, of which 44 million ha are classified as arable, with only 23% under cultivation. The area suitable for irrigation is estimated to be about 29.4 million ha, with about 1% under irrigation. About 80% of production comes from smallholder farmers still depending on the hand hoe, traditional rain-fed agriculture, and animal husbandry practices. It is characterized by limited access to and participation in input and output markets, extension services; access to knowledge, information and financial services. Women account for more than 70% of the agricultural production especially food crops, and they play an important role in the efforts to transform Tanzanian agriculture. Productivity of agriculture remains low, and frequent droughts and unreliable rainfall patterns aggravate food and livelihood insecurity for the majority of the rural population and the urban poor. There are limited areas under medium and large-scale farming. Despite having abundant land and natural resources, low levels of investment in the agricultural sector has produced a situation under which many agricultural commodities – sugar, maize, vegetable oils and pulses – are imported rather than being produced domestically.

[1] Source: National Bureau of Statistics, Tanzania.
[2] See Appendix 2 for a full discussion on women and youth in Tanzania and the programme area.

7. Over the last 40 years, there seems to be an increase in weather variability, including extreme weather events, notably floods and droughts both within and between seasons. Temperatures seem to be increasing and accompanied by a trend of decreasing annual rainfall, with changes in both the start and end of the cropping seasons. To date, agricultural production gains have been based on expansion of the area cultivated rather than yield increases, and this expansion process has been the driver of deforestation and land degradation.[3] Smallholder agriculture is labour intensive with little application of modern technologies and inputs and high vulnerability to weather shocks. Agriculture is a sector where significant productivity achievements can be made, while making production climate resilient.

8. **Livestock**. Tanzania has the second largest population of cattle in Africa (after Ethiopia), estimated at between 21 and 25 million heads[4], complemented by 17 million goats, 8 million sheep, 2.4 pigs and 36 million chickens. More than 95% of the cattle population is of indigenous breeds, principally shorthorn East African zebu, while crossbred and exotic dairy cattle (mainly Friesian and Ayrshires) make up most of the remainder. The livestock sector contributes 7.4% of the country's GDP, and within it dairy about 2%. However, the growth rate of the sector is low (2.2% p.a.), and that growth reflects in large part increased livestock numbers, rather than increased productivity in the sector; and red meat and dairy imports are substantial. It is widely recognised that the livestock sector is performing well below its potential. As with foodstuffs, red meat and dairy imports remain substantial.

9. However, livestock play an important role in the rural economy: In 2012, about 60% of rural households report earning income from livestock, which provides an average of about 22% of the household income. Livestock accounts for about one quarter of agricultural sales. About one-third of rural households – 2.8 million – keep cattle (7 out of 10 of whom have between 1 and 10 head of cattle), and these households rely on them for an often major part of their income. There is considerable diversity of livestock production systems across the country, which are largely shaped by agro-ecological conditions, climate (mainly rainfall pattern and distribution), and landscape as well as socio-cultural and economic factors. Based on these factors, there are three main production systems, including pastoral/agro-pastoral, crop-livestock and intensive dairy and beef production systems. The pastoralist system that is purely dominated by the Maasai is mostly located in the northern part of Tanzania (Arusha and Manyara) and eastern part (Tanga, Pwani and Morogoro). Extensive pastoralism is recognized, and although village governments often welcome pastoralists, conflicts frequently arise with farmers.[5] The agro-pastoralist system that includes farming and livestock keeping is mostly located around the Lake Zone and central part of Tanzania. The rural smallholder system where farmers keep dairy cattle and mostly practice zero grazing is located in the northern and southern highlands. The possibility of using other areas for livestock production has been limited by tsetse infestation.

10. **Dairy**. The dairy sector currently makes up 2% of GDP. Most cattle are kept by smallholder farmers scattered all over the country, though the northern and southern highlands (Kilimanjaro and Arusha Regions, and Iringa, Mbeya and Ruvuma Region), plus Tanga region in the north-east, are the most important areas for dairy production. Total milk off-take is about 2.1 billion litres a year, 70% of which comes from the traditional herd of shorthorn zebu and the remaining 30% from the 780,000 cattle that make up the improved dairy herd. Productivity is generally low, the result of the intrinsic low productivity of the traditional breed and poor management – reflected in inadequate feeding, long calving intervals and slow genetic gains due to the use of unproven bulls for mating rather than artificial insemination (AI); and support services to dairy producers are extremely limited.

11. Of the total milk offtake of 2.1 billion litres, about one-third is consumed on-farm or sold at the farm gate. Of the remaining two thirds that is marketed (some 1.4 billion litres), most is sold either as raw or sour milk. The milk passes through a variety of channels: it may be sold either individually or through cooperatives, sometimes through a cooling centre, directly or indirectly to traders ('hawkers'), who in turn sell to retailers or direct to consumers. Only about 5% of marketed milk (61 million litres p.a.) is processed.

12. **Key challenges.** Agriculture is given a high priority in the national policies and strategies. However, in both Mainland and Zanzibar, the agricultural sector has generally registered a slower growth rate vis-à-vis its targets (4% vs. about 6%+, respectively). The assessment of the main challenges and potential for equitable

[3] Tanzania Climate Resilience Plan 2014-19, MAFC June 2014.
[4] The former according to the most recent (2007) survey by the National Bureau of Statistics; the latter according to the 2015 Livestock Modernization Initiative.
[5] Aligning and harmonizing the livestock and land policies of Tanzania, Dr Furaha Lugoe, Economic and Social Research Foundation, Dar es Salaam, 2011.

agricultural growth, and supporting strategies are outlined in key Government documents[6]. The main challenges include (with some variation within and between Mainland and Zanzibar):

- Low productivity levels and erratic agricultural growth trends, which reflect dependence on rainfed agriculture and increasing and adverse trends of climate change and variability;
- Low productivity and genetic potential of the indigenous livestock and limited supply of improved breeds;
- Weak institutional capacities and institutional fragmentation;
- Tenure insecurity, inequitable access to land, and increasing land/natural resource conflicts arising from competition between smallholder crop farmers, agro-pastoralists and pastoralists;
- Lack of engagement of indigenous peoples organizations in policymaking and other decision-making processes affecting pastoralism and hunting-gathering;
- Infant stage of private sector role in the sector and its limited level of investments and approaches to transform the rural economy in an inclusive manner;
- High proportion of population below 15 years, creating the need for increased employment preparation and opportunity creation; and
- Constraints to achieving efficient and competitive agricultural marketing and inclusive value-chain development, which are associated with limited access to competitive marketing channels and to sustainable rural finance.

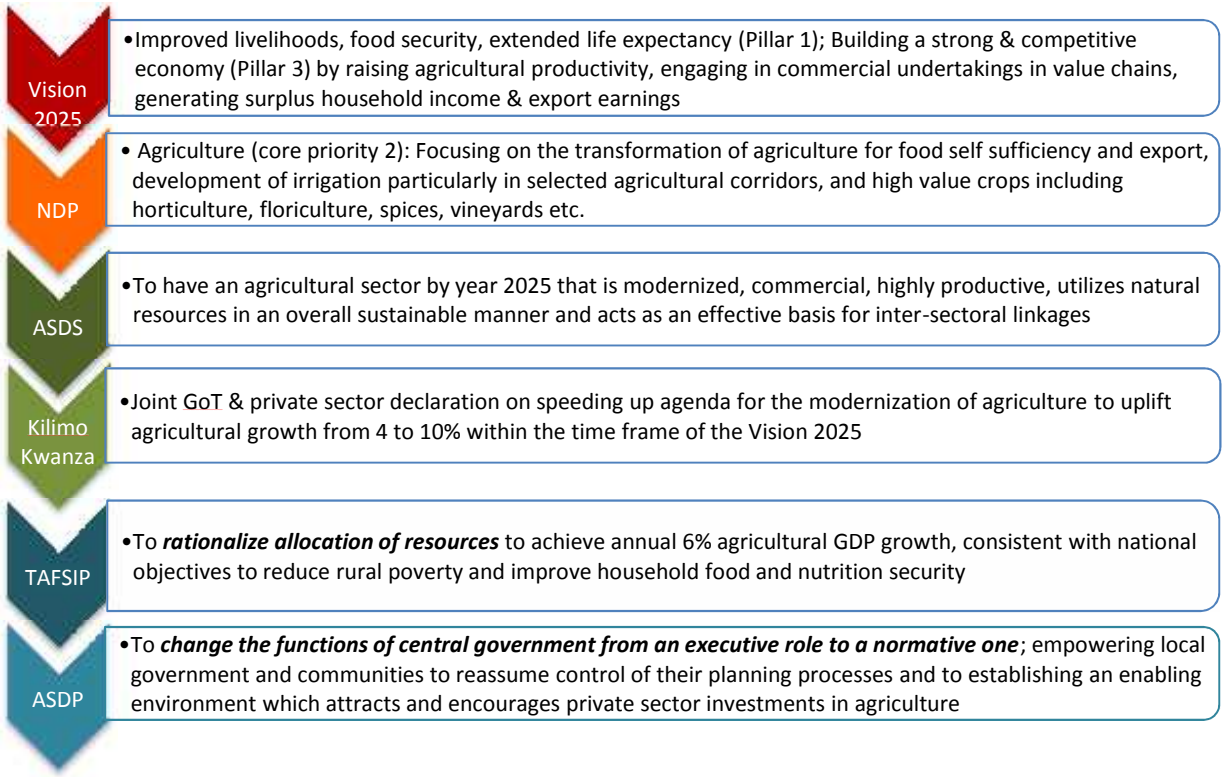
13. These challenges reflect, and are compounded, by the inadequate policy and regulatory environment and uneven policy implementation. In addition, there is an inadequate level, prioritization and quality of public investments, with resulting inadequacies in key infrastructure (especially roads, irrigation) and other important public goods and services. IFAD's Country Strategic Opportunities Programme (COSOP) 2016-2021 focuses on promoting the response of the country to the opportunities created by regional integration and trade, particularly the establishment of the East Africa Common Market, and on scaling up the role and participation of the private sector in priority areas of growth and poverty reduction, such as agriculture. To sustain high growth and make it more inclusive in order to reduce poverty, Tanzania needs to address infrastructure bottlenecks, improve the business environment, increase agricultural productivity and value addition, improve service delivery to build a healthy and skilled workforce, and manage growth in rural and urban areas. Potential climate change impacts could put at risk efforts to sustainably commercialize agriculture and scale up irrigation. Developing responses to promote resilience to climate change is also becoming a key priority to preserve the capacity of natural resources.

National institutional context for poverty reduction

14. The guiding normative framework for articulating policies and strategies is Tanzania Development Vision 2025 (called Vision 2025). It aims to promote the socio-economic transformation required to move the country to medium income status by 2025, with a high level of human development. The Vision has three major objectives: achieving a quality and good life for all; good governance and the rule of law; and building a strong and resilient economy that can effectively withstand global competition. Agriculture is expected to become a key driver of the transformation process, moving from a low productivity system that is mainly dependent on rainfall and rudimentary technology, to a semi-industrialized one in which irrigation and modern technology generate production to support manufacturing activities.

[6] These key strategy documents include: for Mainland: Tanzania Development Vision (TDV) 2025; National Strategy for Growth and Reduction of Poverty phase II (known by its Swahili acronym as "*Mkukuta* II"); Southern Agriculture Growth Corridor of Tanzania (SAGCOT, 2011); Big Results Now Initiative (BRN, 2013); Tanzania Livestock Modernization Initiative (LMI, 2015); Agricultural Sector Development Strategy (ASDS) phase II (draft of October 2015); and Agricultural Sector Development Programme (ASDP) phase II (draft of December 2015). For Zanzibar: Vision 2020; Strategy for Growth and Reduction of Poverty phase II (known as "*Mkuza* II"); and Agricultural Transformation Initiative (ATI) 2010-2020. See Key files 1-4 for further references.

Figure 1. Long & medium-term Policy Framework for the transformation of the agriculture Sector

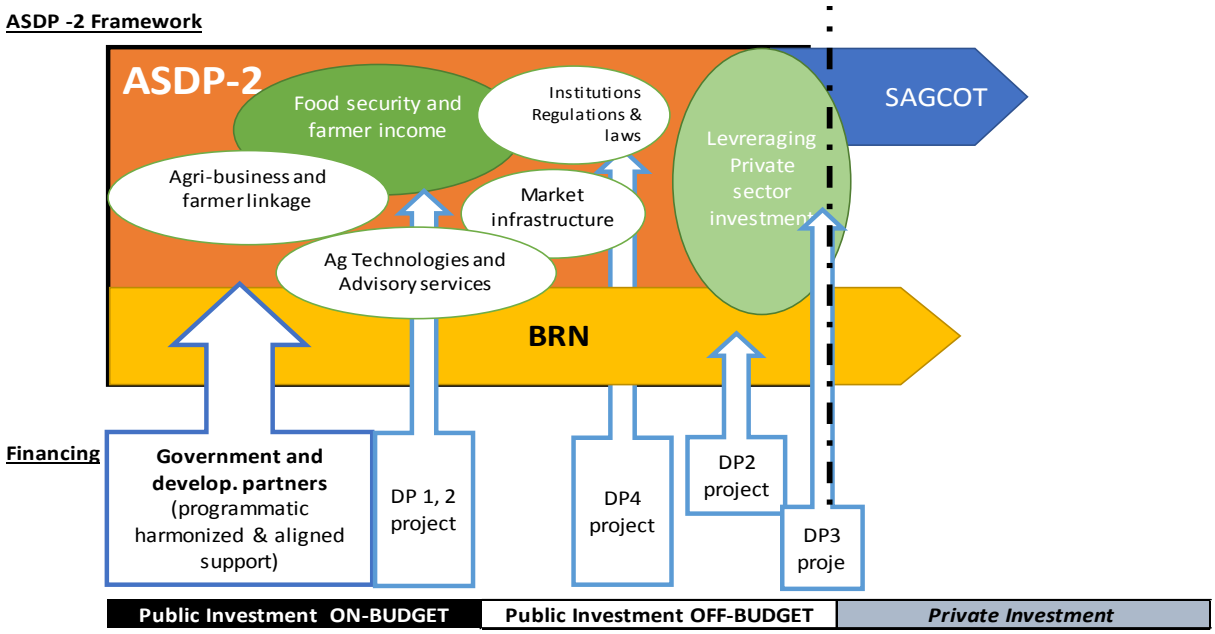


15. The country has signed the Comprehensive Africa Agriculture Development Programme (CAADP) compact and formulated its investment plan, Tanzania Agriculture Food Security Investment Plan (TAFSIP). It has clear pillars for development of agriculture. This is in line with aid harmonization agenda and Kilimo Kwanza ("Agriculture First"), Southern Africa Growth Corridor of Tanzania (SAGCOT) and the more recent "Big Results Now" (BRN) initiatives. The BRN agenda aims at accelerating the country's social and economic development based on six priority sectors, including energy and natural gas, transport, agriculture, water, education and mobilization of resources. Under this initiative, Tanzania envisions that by 2025 it will have commercialized the agricultural sector to ensure nationwide food security and food self-sufficiency, while increasing incomes through viable internal and international trade.

16. Both Mainland and Zanzibar have undertaken various institutional reforms at the central and local levels, as part of the rolling out and implementation of ASDP and the Government's comprehensive decentralization policy. The aim has been to rationalize the role and enhance the efficiency and effectiveness of the state, while expanding and strengthening the roles and capacities of a more inclusive private sector, farmer organizations/cooperatives and civil society, whereby it has formalized various forms of partnership. The new Government elected in October 2015 intends to continue this pathway toward achieving inclusive and broad-based agricultural transformation. Despite this commitment, there remain limited institutional capacities, performance, coordination and governance at central and local levels; and these, along with constraints to effective decentralization and tensions between national and local priorities, result in weak delivery of agricultural-support services to IFAD target groups. To address these institutional challenges, in late 2015 the new Mainland Government consolidated the two line ministries (Ministry of Agriculture, Food Security and Cooperatives; Ministry of Livestock and Fisheries Development) into one integrated Ministry of Agriculture, Livestock and Fisheries (MALF).

17. ASDP II is a results-oriented sector programme for public support delivery and serving as the main vehicle for the implementation of the sector strategy (ASDS II), but also sub-sector policies and development programmes (crops, livestock, marketing, food security and nutrition, private sector, etc.). The formulation framework and its financing modalities (Figure 2) include key elements, such as: (a) orientation towards leveraging and catalysing inclusive private investment; (b) close coordination between public-private-partnership in areas of high potential (SAGCOT) or around commercially viable value chains (BRN), as pilots that can be up-scaled in the framework as a whole; (c) strengthened sector coordination (common planning and budgeting, joint monitoring and evaluation) for increased accountability of all actors, at national and local levels; and (d) integrating different aid modalities and progressively aligning planning and implementation, and M&E procedures to strengthened country systems.

Figure 2. ASDP II framework and financing modalities



18. The new Government elected in October 2015 intends to continue on this pathway towards achieving inclusive agricultural growth. Despite this commitment, constraints remain, such as limited institutional capacities, performance, coordination and weak governance at central and local levels. These, along with tensions between national and local priorities, result in weak delivery of agricultural support services to IFAD target groups. To address these institutional challenges, in late 2015 the new Mainland Government consolidated the two line agriculture and livestock ministries into one integrated Ministry of Agriculture, Livestock and Fisheries (MALF).

19. **Gender**. Vision 2025 aims to attain "gender equality and the empowerment of women in all socio-economic and political relations and cultures." In 2000 Tanzania adopted a Women and Gender Development Policy (WGDP), to ensure gender mainstreaming in all government policies, programs, and strategies. The 2005 National Strategy for Gender Development specifies how gender mainstreaming is to be implemented, including improving women's school attendance and completion of higher levels of education, equal access to engage in economic activities, equal right to land, and specific levels of representation of women in elected bodies and government offices. While progress towards more equitable gender rights has been one of the three MDGs out of seven that Tanzania is expected to reach, there is still scope for improvement, particularly in rural areas. In 2013, the Ministry of Community Development Gender and Children prepared the National Guidelines for Mainstreaming Gender into Climate Change related policies, plans and strategies which outline the need for training of staff in climate change adaption concepts and gender.

Appendix 1B: The dairy value chain

1. The aim of this Appendix is to guide the detailed design of the Southern Highland Milkshed Development Project (SHMDP), by reviewing the dairy value chain and assessing the economics of investment opportunities along it.

Demand for dairy products

2. Current annual per capita milk consumption is estimated at only 45 litres in Tanzania, with the urban population consuming on average 50% more milk than the rural population, and within the rural population higher levels of dairy consumption in dairy production areas. The average figure for Tanzania is low compared to its neighbours: comparable figures are 110 litres in Kenya, 57 litres in Rwanda, and 50 litres in Uganda.

3. Due to population growth, urbanization and income growth, both total domestic demand and per capita consumption of dairy products will most probably grow during the next decades. According to Technoserve (2012)[1], demand growth for dairy products outpaces domestic production by 2% per annum. The Southern Agriculture Growth Corridor of Tanzania (SAGCOT) Centre has projected milk demand in the year 2020, based on a series of assumptions: (i) current consumption levels, (ii) urbanisation levels of 5% per annum, (iii) a population growth of 2.3% per annum, (iv) an overall income elasticity for dairy productions of 0.8, and (v) a modest real GDP growth of 1% per annum. On this basis, the study suggests that by 2020, demand for dairy products could increase to reach a per capita consumption of 100 litres per annum.[2] An important part of this growing demand will take place in the formal sector, and it will be matched by imports from neighbouring countries and the international market if the domestic dairy sector is not able to compete.

Milk production

4. About 1.3 million households are involved in the annual production of 2.1 billion litres of milk (MLFD, 2015). The value of the national annual milk production at farm gate is estimated at US$ 580 million (FAOSTAT).

5. This milk is produced under two very distinctive production systems. On one hand, an estimated 1.15 million households are pastoralists or agro-pastoralists, producing 70% of the milk in an extensive way with indigenous cattle and mainly for home or village consumption. On the other, 125,000 households produce an estimated 30% of the milk from the dairy herd of around 780,000 improved (Friesian, Ayrshire, Jersey) and crossbreed cows. Three types of dairy production system can be distinguished:

- **Rural smallholder dairy:** small mixed farms with crops and livestock in the rural areas away from the cities, farms with 1– 5 dairy cows mainly originating from smallholder dairy development programmes; cattle are kept under semi-zero grazing systems based on cultivated fodder, crop residues and cut grasses from waste or communal land with varying levels of inputs (AI, bull services, veterinary care by CAHWs, supplementary feed, feed conservation). Marketing takes place in a variety of ways: through middlemen/transporters – probably the most common method, direct sales to consumers, and through milk collection centres where supplies are aggregated, though this is probably the least common approach. Farmers use inputs depending on marketing opportunities for milk and on their milk income;
- **Urban / peri-urban smallholder dairy**: this sub-system is similar to the above group but uses a higher level of inputs (depending on milk price), especially for feed and animal health services. The major part of the milk is marketed through the informal market, but there is likely to be more aggregation through milk collection centres than is the case in the more rural context. At present supplying the informal market is often more profitable than selling at the formal market. Marketing problems could occur for the more distant farmers during the wet season when middlemen could buy enough milk close to the cities;

[1] Technoserve (2012). *Dairy Industry in Tanzania: Value Chain Analysis*.
[2] Mordorintelligence.com, in a study dated August 2015, assumes that demand for dairy products will grow at 3.2-3.5% p.a. between 1993 and 2020, and it too arrives at a demand projection of 100 litres per capita p.a. in 2020. It is not clear if this is the same projection cited by SAGCOT.

- **Medium and large scale dairy farming (private)**: Farms keeping crossbred and purebred dairy cattle, having land available for fodder production and conserving roughage (hay or silage) for the dry season. Farmers are responsible for organizing external inputs, (e.g. animal health care, feed premixes). Farmers deliver direct to milk plants or milk is processed on the farm and products sold in the cities. For new dairy farmers it would be hard to develop this model due to poor access to infrastructure, financial services, communications and transport. There are not many of this type of farms.

6. Dairy production takes place principally in the highland milk sheds, in the Northern highlands of Arusha/Kilimanjaro and the Southern Highlands region of Iringa, Mbeya/Rungwe, Njombe and Ruvuma; the Coastal belt around Dar Es Salaam and Tanga; and the Lake Region of Kagera. However, even in the specialized dairy zones the concentration of dairy cattle remains very low: the concentration of dairy cattle in the Central province in Kenya is 106 heads/km^2, compared to 1.5 head/km^2 in Arusha and 1.0 head/km^2 in Tanga.

7. The increase in dairy production over the past decades is mostly explained by growth in the population of dairy animals. Average milk yields at national level are stagnating at around 175 kg per cow, due to a variety of factors, including: (i) low genetic potential of the animals, with less than 2% of the herd crossbreeds and dairy cows – the result of the low success and use of AI services and the poor performance of the public Livestock Multiplication Units; (ii) lack of farmer education in management of dairy cattle – extension access is limited, and extension workers lack specialist dairy skills; (iii) poor quality of feed, with limited use of concentrate feed – resulting in poor animal nutrition, particularly in the dry season; (iv) animal diseases (tick borne diseases, trypanosomiasis, east coast fever, etc.), with 42% of cattle keepers reporting incidence of animal diseases (Covarrubias et al, 2012) – the result of a weak animal health infrastructure; and (v) limited access to finance to cover the high initial investment (dairy cows) and variable costs (feed and water).

8. Seasonality of milk supply, due to fluctuating availability of key inputs such as grass and water, creates a severe fluctuation in production, affecting supply further down the value chain. Supply of milk to processors can drop up to 50% in the dry season due to lack of milk, even though farm gate prices may be higher during this period. The low milk yields contribute to high transaction costs at collection and processing levels and to the low competitiveness of formal milk processing.

Table 1. Performance of traditional versus improved dairy cows

Parameter	Unit	Traditional livestock	Smallholder dairy	Improved dairy
Lactation yield	Litres/lactation	160-250	1,500-2,000	2,800-3,500
Lactation length	Days	200	270-300	300
Milk yield	litres/day	0.5-2	5-7	9-12

Source: Kurwijila (2015)

9. The table below compares the profitability of dairy farming based on local cattle and improved dairy cattle. The models are based on filed research, undertaken by Technoserve in 2012. The model based on local cattle results in a net profit of 50,625 TZS/month (32 US$), compared to TZS 371,320 (232 US$) for improved dairy. Production costs are very low in the traditional system, but the model provides limited opportunities to increase milk production per cow given poor breed quality. With improved feed and management, some results can be obtained.

Table 2. Profitability of dairy farming (without and with project situation)

Item	Unit	Local cattle	Intensive dairy cattle
Litres sold per month	Litre	100	1000
Number of cows	Number	5	5
Sales price per litre	TZS	650	650
Revenue from milk sales	TZS/month	65,000	650,000
Cost of production	TZS/month	14,375	278,680
Labour	TZS/month	2,825	104,245

Feed / fodder	TZS/month	9,750	121,000
Water	TZS/month	250	18,800
Artificial insemination	TZS/month	0	4,000
Other	TZS/month	1,550	30,635
Net profit	TZS/month	50,625	371,320
Profit margin	%	78%	63%
Cost per litre	TZS/litre	140	280

Source: Technoserve (2012).

The value chain for milk and dairy products

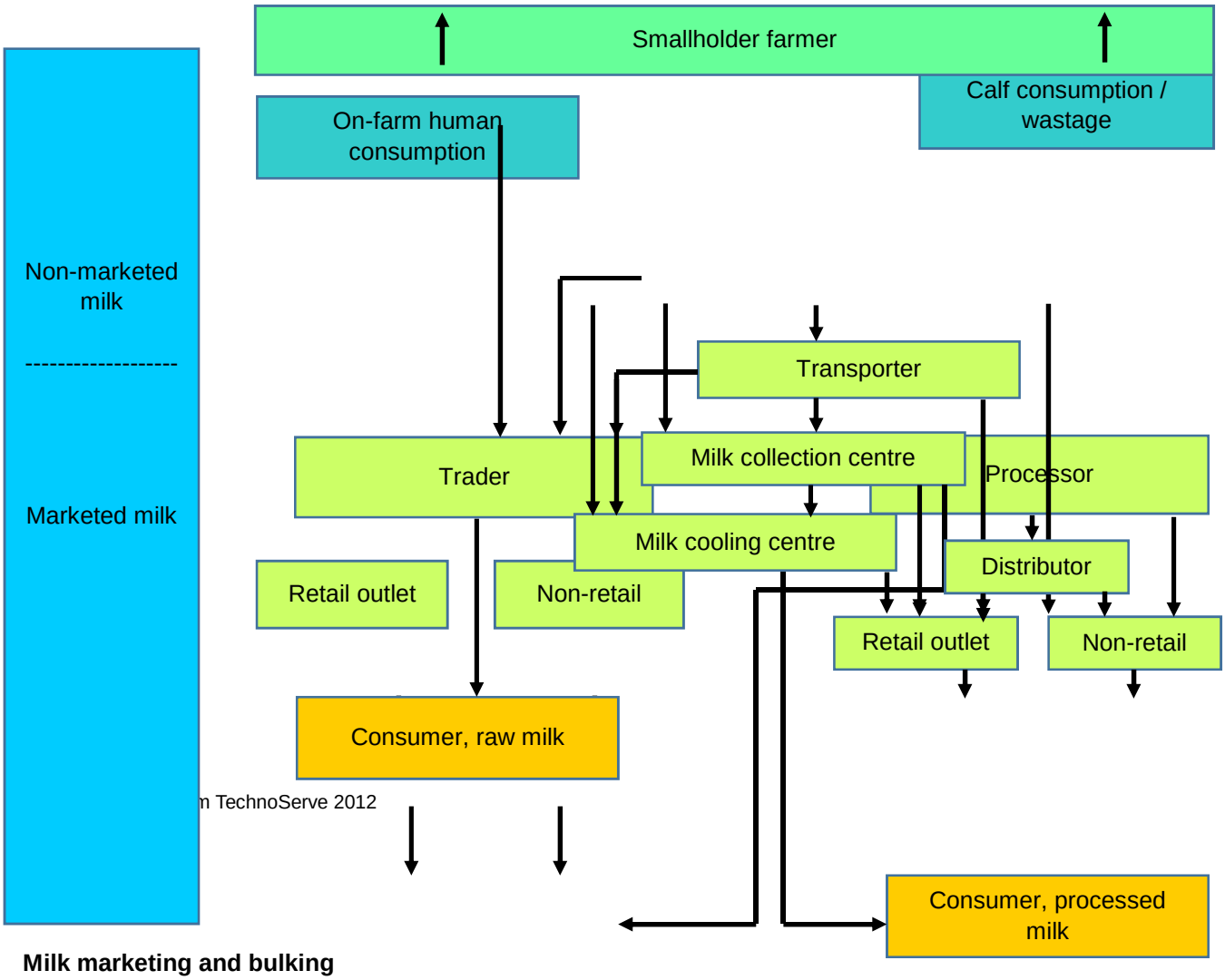
10. Tanzania's dairy value chain from farmer to consumer[3] is composed of different nodes, each with a slightly different degree of coordination and mode of transaction. Key players include traders, transporters, processors – large and small, wholesalers/distributors, retailers and other vendors, such as milk parlours and restaurants.

11. The value chain is typically divided into two separate and parallel elements. The first, which makes up 90% or more of total marketed milk, is the informal value chain, characterised by sales of milk from producer to trader/hawker, and on to consumers – still as raw milk, either directly or via a retail outlet/restaurant. The second, making up only 10% of milk sales, is the formal value chain; and this is characterised by milk passing from the producer either directly to the processor or, more usually, indirectly via a milk collection and/or milk cooling centre; and from the processor to a retailer/restaurant, and eventually to the consumer. These two distinct value chains are reflected in the Figure below, which provides a simplified representation of the domestic milk value chain and the various players.

12. The reality is however less clear-cut. There is much processing, or perhaps more accurately value addition, that goes on in the informal sector – basic bulk pasteurization, manufacture of yoghurt, processing of *mtindi* (fermented milk), direct retail sales of milk from the milk cooling centre, etc. This can be described as 'grey' sector between formal and informal, raw and processed; and much of it is 'invisible', in that it is not reflected in official data on processing.

13. Arguably, the distinction between formal and informal sectors is not a particularly helpful one, other than affirming the legal status of processors as business entities; and it highlights the fact that the SHMDP approach does not need to choose between supporting the formal or the informal processing sectors. It should rather enable *all* players in the value chain to expand the volumes they market and process, and improve the quality and safety of the milk and dairy products they bring to the market. Essentially, the project should promote a gradual formalisation of the sector, with growing efficiency in the value chain.

[3] The dairy value chain includes a range of players upstream of the milk produced by the farmer: input suppliers, , veterinarians, artificial inseminators etc. They are not included in this analysis, which focuses on those actors in the value chain who handle milk and dairy products – from farmer to final consumer.



m TechnoServe 2012

Milk marketing and bulking

14. Milk reaches consumers through many disparate channels, the most significant being the informal market. Informal trade of milk is dominated by so-called 'milk hawkers", who trade 64-67% of all milk produced, while 30 to 32% is consumed on the farm (MLFD, 2014). These hawkers collect small quantities at the farm gate and offer good prices, certainly when milk is scarce, but they are not necessarily a reliable sales outlet, particularly in the case of surplus production. In addition, the local market in rural areas is easily saturated. Once a dairy farm reaches a certain size of surplus production, it requires stable market linkages, even if prices are a bit lower. These informal traders, equipped with bicycles or motorbikes, focus on market imperfections. They often compete with milk collection centres and processors. In addition, sometimes buy from milk collection centres and sell in urban centres; and particularly in remote areas, some buy from pastoralists and sell to milk collection centres. Those that operate in urban centers sell both door-to-door and at fixed retail outlets. The small traders are quite competitive because of their flexibility and low investment costs.

Table 3. Category of market channel

Market channel	% of total milk produced
Consumption on- farm	30%
Informal channels (mainly dominated by milk hawkers, though some limited processing)	67%
Formal channels (processing industry, including collection centres)	3%
Total	100%

15. Most traders operate without quality checks. In Mwanza, health officers make irregular checks using lactometers to try and control adulteration of milk, as well as collecting fees for each load of milk carried; and in fulfilment of its mandate the Tanzania Dairy Board (TDB) is in the process of recruiting a class of Milk Inspector at district level. However, the system risks being an opportunity for rent-seeking, and not being effective as water may be added after the checks. Evidence from Kenya however suggests that regulation or licensing of milk traders does not ensure better milk quality, while incentives such as training in hygiene and safe handling of milk can improve milk quality and safety.

16. Milk collection centres (MCC) are a key part of linking smallholder dairy farmers to processing units. In 2015, there were around 183 MCCs in the country of which about 55 have milk chilling facilities (26 of which are in Tanga Region). The size of a MCC is determined by its bulking and cooling capacity, which is generally between 50 litres and 500 litres. Ownership is mixed. A study commissioned by SNV/TAMPA (2009) identified four models of ownership and operation: (i) the “Processor-smallholder” model; (ii) the “NGO-facilitated” model; (iii) the “smallholder co-operative” model; and (iv) the “processor- large-holder model”. In Tanga, 24 cooling centres out of 45 are owned by dairy co-operative societies operating under a regional umbrella organization, TDCU (Tanga Dairy Cooperative Union). The rest are either privately owned or owned by processors such as Tanga Fresh Ltd. In Arusha and Kilimanjaro, a few milk cooling centres are owned by farmer groups and some are processor owned. The Iringa and Morogoro-Dar es salaam milk shed area has a number of milk cooling centres that are mostly processor-owned (particularly ASAS, based in Iringa) and agent- or manager-operated. The largest processors are vertically integrated with their own network of cooling centres and collection points, which is a requirement to guarantee a good quality and hygiene of milk as well as stable supply. Some MCCs are also involved in basic processing and sell to the local market.

17. Technoserve (2012) concluded that farmer loyalty to MCCs is very limited, as milk hawkers generally offer a higher price, certainly in periods of oversupply. However, the SNV/TAMPA study also identified the five most important success factors for collection centres; these were: (i) the price setting mechanism (i.e who sets the price); (ii) trust and farmer commitment; (iii) ownership and power relations; (iv) management systems (manager *vis à vis* agent); and (v) ability to accommodate middlemen traders.

18. According to Technoserve (2012), MCCs in Tanzania run on 10% profit margins, with their profitability shaped to a large extent by the degree of seasonal fluctuation in supply (which in turn is a function of the extent to which farmers are able to provide fodder to their animals during the dry season). The gross margin between the sales and purchase price of milk is around 15% (approximately TZS 100), which are insufficient to invest back in the MCC through equipment purchases. Labour, machinery and energy are the biggest costs. The East African Dairy Development (EADD) project and ASAS confirmed that the initial investment cost of an MCC is between US$ 15,000 and US$ 25,000.

Table 4. Cost structure of milk collection centres

Item	Percentage
Sales price of milk	100%
Purchase price of milk	85%
Profit margin	10%
Total costs	5%

Source: Technoserve (2012)

Milk processing

19. According to official data, it is estimated that approximately 2-3% of the milk is sold to the formal sector, for processing into consumption milk, fermented milk, yoghurt and cheese (though, as stated above, this is almost certain to be an under-estimate). The Tanzanian dairy industry consists of 80 or so small and medium size plants with capacities that vary from 200 to 50,000 litres per day. The total installed operational processing capacity is about 200 million litres per annum (648,400 litres per day), with a capacity utilization rate of about 26% in 2014 (167,000 litres per day). Most of the plants are operating below capacity. In 2013/2014, the top-3 had a total market share of 60%. Only 13 processors have a capacity that is larger than 1,000 litres per day, 26 between 500 and 1000 litres per day, and 31 less than 500 litres per day. Few cooperatives are currently present in the processing industry in Tanzania.

Table 5. Ranking of processors by processing capacity

Capacity (litres per day)	Number of processors
5000 or more	13
From 1000 to 4999 litres per day	10
From 500 and 999 litres per day	26
Less than 500 litres per day	31
Total	80

20. Most plants are located in the Northern Highlands in areas with high population of improved dairy cattle, namely Arusha and Kilimanjaro (23 units), as well as the Southern Highlands, Kagera, Mara and Dar es Salaam. Tanga currently houses the largest processor (Tanga Fresh) in the country with a daily capacity of 50,000 litres and an average daily production of 30,000 litres. Unguja (Zanzibar) has also become a major processor under Azam Dairies Company (45,000 litres per day) but is not involved in existing dairy supply chain as the company processes imported re-constituted milk – so contributing to the fact that a little under half of processed milk supply is sourced from smallholder farmers.

21. In the proposed SHDMP project area the largest processor is the family-owned ASAS Dairies, which has a capacity of 50,000 litres a day, though it currently handles between 10,000 and 20,000 litres of milk daily. It collects milk from its milk cooling centres in Rungwe and Njombe (which it manages to ensure milk quality), which are in turn linked to networks of collection points radiating out (up to 35km) from the centres. ASAS currently works with 2,500 smallholder farmers – though it is keen to work with more and sees assuring adequate milk supplies as its greatest business challenge. It has a team of field staff – veterinarians, extensionists and milk technicians – who work with them; and it also offers training to the farmers. It buys to contract with the farmers: it pays every 15 days (TSh 600-700/- per litre, according to location), using Mpesa, and it also provides inputs to the farmers on credit, which it deducts from the payments. Its product range includes pasteurised milk, *mtindi*, yoghurt and flavoured long-life milk, which it sells locally, as well as in Dar-es-Salaam and Dodoma.

22. The second largest processor is the Njombe Milk Factory, with a capacity of 6,000 litres a day, though it is currently processing 4,000 litres a day. The factory, which has been heavily supported by the Italian NGO CEFA, is owned by Njombe Livestock Farmers' Association, Njombe Town Council and District Council, the Roman Catholic diocese and Granarolo, an Italian dairy company. It buys its milk from 120 farmers' groups of 10-20 members both at the factory gate (where it pays a fixed, year-round price of TSh 610/- per litre) and at cooling centres that it manages, transporting it in hired trucks. It processes the raw milk into pasteurized milk (10%), yoghurt (20%) and a variety of cheeses (70%) which it targets at the (Italian) tourist market in Tanzania. The factory became a limited company only in 2014, and it is still making the transition from 'project' to 'business'.

23. Beyond these two processors, there are a number of other 'formal' processors (Mbeya Maziwa 1,000 litres/day capacity; Ushirika wa maziwa wa Vwawa 1,500 litres/day; Ruvuma Dairies 500 litres/day; Mufindi Dairy Group), as well as smaller, more artisanal processors and producer-owned cooling centres selling directly to the public.

24. At the national level, at least 41 million litres p.a. of unprocessed fresh milk (and possibly substantially more) is processed annually into different products including *mtindi* (fermented milk), pasteurized milk (fresh), cultured yoghurt (with varied flavors),cheese (mainly Mozzarella and cottage), ghee, butter, and cream. The product range is fresh milk (20%), *mtindi* (70%), ghee (7%), butter and cheese (3%). Most processors pack their milk products in plastic sachets; though as the sector grows and consumer preferences evolve, use of cardboard packs will likely be the priority – as is the case in Kenya and Uganda.

25. The dairy processing subsector is characterized by low operational efficiencies and weak supply chains of milk. They face a series of related problems, including: (i) limited, unreliable and highly seasonal supplies of raw milk; (ii) disorganized milk supply chain, as (apart from Tanga) they many deal with individual farmers rather than groups or cooperatives; (iii) poor road network, increasing collection costs, and limited access to electricity at cooling centres, which affect quality of milk supplies and production costs; (iv) under-utilisation of their processing capacity; (v) high cost of replacement equipment and packaging materials (which are imported); (vi) high costs of processing (including regulatory compliance and taxation); and (vii) low throughput of processed dairy products that, as a result, are uncompetitive relative to imports and insufficiently diversified in terms of product range.

26. For the processors, the challenge is to break this vicious circle, and establish a virtuous circle of increased supplies, increased capacity utilisation, lower costs, and increased production of processed milk and other dairy products, at a more competitive price to consumers.

Table 6. Cost structure of processors for 1 litre of processed milk

Item	%
Sales price of milk	100%
Purchase price of milk	51%
Profit margin	14%
Total costs	35%
Machinery	3%
Packaging / storage	2%
Administration / labour	9%
Power	9%
Other costs	14%

Source: Technoserve (2012)

Milk consumption

27. Depending on the size and sophistication of the processor, they may sell their milk and milk products through agents and wholesalers; they may sell them to vendors, retailers, supermarkets and hotels/ restaurants and tea rooms; and they may even sell them direct to the consumer. Different types of retailers in different parts of the country face different challenges, but lack of cooling equipment, problems of availability and demand (which leads to inadequate turn-over of stock, which further limits demand) and duty-free imports of reconstituted milk, are all important; while traders face quality and hygiene concerns. On the consumption side, there are concerns/issues linked to the affordability of dairy products – particularly for low income consumers, cultural habits and preferences, availability/accessibility, and a limited school feeding campaign. According to survey data, only 40% of retail outlets stock dairy products, an indication of limited access by consumers, while products like cheese, butter, yoghurt and ghee are mostly unavailable in the retail outlets.

28. Tanzania's low per capita consumption of about 45 litres per day – compared to the recommended 200 litres/annum or Kenya's 104 litres – is in part a reflection of the fact that milk production in the country is low (2.0 billion litres/49.1 million people, compared to Kenya's 4.4 billion litres/35 million people). It is also noted that there are marked regional differences in consumption – the average consumption of livestock-holding households is 68 litres/head p.a.; and that per capita consumption is gradually increasing, currently at 1.2 litres p.a.

29. In terms of the range of dairy products consumed, IPSOS (2015) found that raw milk is by far the most regularly consumed dairy product, with *mtindi* a distant second. It broke down consumers of dairy products

into three categories: light, medium and heavy users; and it found that there is a notably higher number of dairy products consumed within the segments comprising heavy and medium users. Usage of unprocessed fresh milk is highest across all user segments (78%), with medium and heavy users recording higher consumption at 85% compared to light users (53%). Consumption of sour milk follows at 31% of the households having consumed in the past one month. 7% of light users, 32% of medium users and 39% of heavy users claimed usage of sour milk. Fresh processed milk is consumed by 9% of consumers. The usage of dairy products over the one month prior to the survey is shown in table 7 below.

Table 7. Consumption of dairy products by consumer segments

One month consumption	Total	Light user	Medium user	Heavy user
	n=475	n=104	n=77	n=294
Unprocessed fresh milk	78%	53%	85%	85%
Sour milk (mtindi)	31%	7%	32%	39%
Fresh processed milk	9%	7%	11%	9%
Ice cream	7%	4%	6%	9%
Powder milk	4%	6%	4%	3%
Cheese	3%	1%	0%	5%
UHT	3%	4%	1%	4%
Butter	3%	2%	3%	4%
Yoghurt	2%	1%	4%	3%
Baby formula milk	2%	2%	1%	2%

Source: Dairy Consumer Market Study for EADDII in Tanzania. Ipsos Ltd. 2015

30. A total of about 70 million litres reaches consumers in the form of processed milk and dairy products[4]. Of that, a sizeable proportion is imported. Figures vary enormously: FAO trade data suggest imports amount to around 10-12 million litres of milk and liquid milk equivalent, plus other dairy products, though other sources propose considerably higher levels of imports. These come from the region (Kenya and South Africa, countries with a dairy sector that is more mature than Tanzania's) and beyond (Ireland, the Netherlands and elsewhere). Imports rose by about 9% annually after 1995 when the industry was liberalized for private sector participation, though FAO data suggest that after 2007 the upward trend slowed, and that imports were no higher in 2015 than they had been in 2008. Trade within the East African Community (EAC) is free of import duties, which means that there is fierce competition from Kenya (where processing is highly competitive) and Uganda (where production costs are extremely low). Milk imports from outside the EAC countries attract 60% common external tariffs, resulting in a market protection is about TSh 400/- (US$ 0.19) per kilo; however Zanzibar has chosen not to apply this, which means that milk products from outside the EAC can effectively be imported into Tanzania duty free. TDB data show that milk powder and liquid (including UHT) milk are the most demanded products, alongside cheese, butter, whey powder, ice cream and evaporated milk. There are over 55 importers of milk and dairy products.

31. The Southern Highlands milk shed is geographically well placed to take advantage of regional export markets for milk, and indeed there are already limited (though unquantified) exports of milk and dairy products going to Malawi, Zambia and the Democratic Republic of Congo (DRC).

Milk prices

32. The price of milk is highly seasonal, with an annual fluctuation that is often up to 50%, in particular in terms of the prices paid to farmers. Urban consumer prices of raw milk vary from 1,000 TZS to 2,000 TZS per litre in the informal market. These price fluctuations are less visible in the formal consumer market. The processing sector is obliged to absorb most of the fluctuations, which is an important challenge.

33. Prices paid to farmers vary by location, season and the nature of the buyer. Prices for raw milk at the factory gate in December 2015 were TSh 850/- per litre in Iringa, TSh 700/- in Tanga and TSh 550/- in Rukwa.

[4] Kurwijila, 2015

Table 8. Price structure for 1 litre of milk

Item	TSh / litre
Supermarket Dar es Salaam	2,400
Sales price processor	1,100 – 1,600
Purchase price processor	550 – 850
Purchase price milk collection centre	550 – 750
Price received by farmer at farm gate	550 – 750

Source: Field survey (December, 2015)

Attachment 1: Dairy policies and institutions

Key Institutions and their roles in the national policy framework

1. Overall, the key public institutions involved in the dairy industry policy framework include: (i) the Ministry of Agriculture, Livestock and Fisheries (MALF), through several regulatory authorities, including Tanzania Dairy Board, Director of Veterinary Services, Veterinary Council, Research institutes (TALIRI), and the Livestock Training Agency (LITA); (ii) the Prime Minister's Office through Ministry of Local Government and Regional Administration; (iii) the Ministry of Health represented by the Tanzania Food and Drug Authority (TFDA); (iv) the Ministry of Industries and Trade represented by the Central Business Licensing Agency (BRELA) and the Tanzania Bureau of Standards (TBS), the Business Registration Centres and the Weights and Measures agency; and (v) the Ministry of Finance represented by the Tanzania Revenue Authority and the Executive Agencies Act. The National Parliament, acting through the relevant Committees, enacts all relevant laws.

2. Business member organizations also play an important role: these include the Tanzania Milk Producers Association (TAMPA), the Tanzania Milk Producers' Association (TAMPRODA), Tanzania Chamber of Commerce and Industry and Agriculture (TCCIA), the Agriculture Council of Tanzania (ACT), Confederation of Tanzania Industries (TCI) and the Tanzania Private Sector foundation (TPSF).

3. **The Ministry of Agriculture, Livestock and Fisheries**. Under the broader national policy of Decentralization by Devolution (DbyD) the MALF retains the core function of policy formulation, coordination, setting standards, supervision, monitoring and evaluation; while the Local Government Authorities at the District level are responsible for implementing most government policies, regulations and development programmes, and for providing key services, including those for agriculture, through the District Agricultural Development programmes (DADPs). The regional secretariats' provides oversight, technical advice, supervision, monitoring and evaluation.

4. Inadequate livestock farmers' knowledge and skills is one of the limiting factors for the development of the industry. Public sector research is the responsibility of the Tanzania Livestock Research Institute (TALIRI) which has several research. Under the DbyD policy responsibility for extension services has been decentralised to the District level, with the central government retaining responsibility for policy formulation, guidelines and technical backstopping. In practice, delivery of livestock extension service is constrained by weak collaboration among stakeholders, insufficient expertise (number and technology), weak research--training- extension-farmer linkage and inadequate infrastructure and facilities.

5. The Ministry has six Livestock Training Institutes under LITA, with a total capacity of about 1,000 students. LITA Buhuri is specially meant to offer short course training for dairy farmers. In order to enhance their autonomy, they are all now operating under one agency- LITA (Livestock Training Agency). None offer specialized certificate or diploma course in dairy science and technology or dairy production.

During the first SAGCOT partnership meeting in May 2015, the following challenges in the dairy sector were highlighted:

- Value chain actors access to finance
- Availability of high value pastures and feeds
- Low milk quantities & quality
- There is no milk drinking culture (contributing to stunted growth in 50% of children under five)

Partners came up with a set of recommendations which would tackle the challenges mentioned :

- Build financial literacy among farmers, including development of business models, record keeping and need for livestock insurance.
- Train farmers on pasture establishment, feed conservation techniques and feeding regimes; support famers' access to pasture, seeds and inputs
- Support access to improved breeds; awareness-building on milk quality and proper feeding; Incentivise farmers with good track record of producing high quality milk.
- Engage TFNC to increase awareness of benefits of proper milk consumption; advocate and incentivise local milk consumption through school milk feeding programmes

6. To summarise, there is no specialized training in dairy production or dairy technology at certificate, diploma or degree level in Tanzania. The result is that the dairy industry is short of qualified dairy extension specialists, as well as dairy technologists with competency to work in the milk production-collection-processing-marketing interfaces. Neither the SUA graduates nor the LITA diploma holders are considered by the industry to be adequately trained to man important positions. They usually require further on the job training. Even small scale processors are forced to employ expatriate staff at considerable cost, or the few Tanzanians trained outside the country.

7. **The Tanzania Dairy Board** (TDB). The TDB was established under the Dairy Industry Act of 2004 with a dual mandate as the main regulatory body for the dairy industry and as the main promoter of the dairy industry and the sector more broadly. The Board and the Annual Council (AC) have the role of advising the Minister responsible for Livestock on matters related to the dairy industry including formulation of regulations on various aspects of the industry. Both bodies are intended to be representative of the major public and private stakeholders in the sector; the chair of both is appointed by the Minister. Due to

its limited capacity in terms of both human and financial resources the TDB has till now been unable to fulfil its mandate.

8. **The Big Results Now** (BRN). The BRN is a planning methodology adopted by Government in 2012 to focus on delivering specific goals within stipulated timelines. The BRN principles are prioritization with clear performance targets, rigorous implementation with detailed monitoring of performance data by dedicated delivery staff and transparent performance management. BRN implementation has six national Key Result Areas (NKRAs), one of them agriculture (crops); livestock – including dairy – has recently been added to the agriculture NKRA. In January 2014 the PDB observed that the business environment situation in Tanzania "is very bad and is the worst in East Africa". Among a host of issues identified, the biggest bottlenecks for businesses were property registration, power connection and business licensing.

9. **The Southern Agricultural Growth Corridor of Tanzania** (SAGCOT) is an agricultural partnership designed to improve agricultural productivity, food security and conservation of natural resources and livelihood diversification along a Growth Corridor that passes through the Southern Highlands. Initiated in 2010, SAGCOT focuses on building efficient, well-functioning and sustainable agricultural value chains, by bringing together government, business, development partners and the farming community to pool resources and work together towards a common goal of sustainable green growth. It has recently built its own capacity in the dairy sector, and is keen to promote investment in this area: indeed, a SAGCOT Dairy Partnership was launched in December 2015, to identify and address challenges that are facing the livestock industry especially the dairy sector through public-private-producer partnerships, and a first dairy partnership meeting was held in Njombe in May 2016.

10. **The Dairy Development Forum** (DDF). This a non-statutory platform, and is more inclusive than the Annual Council of the TDB, as it brings in as many actors in the industry as possible in a bid to explore a coordinated approach to collaborative development of the Tanzanian dairy industry. The DDF has held several meetings, and it has evolved to include Taskforces to address specific issues such feed, dairy genetics, dairy husbandry. It is envisaged that the DDF will eventually represent all farmers' associations at village level, grouped into district- and regional-level platforms. TDB serves as secretariat of the DDF.

11. **Tanzania Milk Producers Association** (TAMPRODA). The association established in 2002 draws its membership from individual members and from its district level chapters; its aim is to lobby for the interest of its members and in the longer term is seeks to offer services to their members. Two members represent farmers on the Board and TAMPRODA is represented at the Annual Council. Its current status is unclear.

12. **Tanzania Milk Processors Association** (TAMPA)**.** The association was established in 2001. Most of the processors are members. The current membership stands at 90. The objectives of TAMPA are to: (i) Build the capacity of the processing industry and that of its members to procure and process milk efficiently; (ii) assist its members acquire skills and knowledge in milk processing and marketing; (iii) promote the consumption of processed milk in the country; and (iv) lobby for the welfare of its members by engaging government, NGOs other private sector organisations.

13. **Other** associations representing the interests of the private sector include the following:

- **Agricultural Council of Tanzania**, with its key functions lobbying and advocacy on key policy issues impacting on the agricultural sector, and capacity building for its 97 members;
- **Tanzania Chamber of Commerce and Industry and Agriculture** (TCCIA) which, with 16,000 members and branches in all regions and in 92 district level centres, is the largest of any business member organisation in the country, providing policy advocacy at national, regional and district levels, as well as services including business information, training, business support and business promotion activities;
- **Tanzania Private Sector Foundation** (TPSF), a private sector platform through which the business community can express its concerns to the Tanzania National Business Council and seek changes in public policy. It also works towards promoting private sector's national, regional and global competitiveness in trade and investment. TAMPA is a member of TPSF which has supported analytical work on the need to rationalize and harmonize policies and the institutional regulatory framework affecting the dairy processing sector; and
- **Tanzania National Business Council** (TNBC) was established under Presidential Circular in 2001 as a forum for public and private sector dialogue. The Council is chaired by the President of the United Republic of Tanzania. Its Secretariat is embedded in the Prime Minister's office, and the Chief Secretary is the chair of the TNBC Executive Committee and the Chairman of TPSF. It conducts investors round table discussions and SMART Partnership Dialogue (SPD). There are also regional business councils that can engage in national and international dialogues. At the last TNBC meeting

the theme was " Enhancing Business Environment for Sustainable Growth", an issue now included in the BRN initiative.

Main features of the policy, regulatory and institutional framework

14. **The National Livestock Policy.** The 2006 National Livestock Policy's broad objective was "to commercialize the industry and stimulate its development while conserving the environment". It sought to accelerate the growth of the livestock industry and its contribution to poverty reduction and the national economy, by making more optimal use of available land, animal and human resources.

15. While dairy policy issues are subsumed within the Livestock Policy, it does recognise that dairy development is constrained by: (i) inadequate livestock farmers' knowledge and skills; (ii) poor nutritional status of the dairy cattle; (iii) livestock disease; (d) poor support services – including poor extension and weak research-training-extension-farmer linkages; (iv) insufficient supply of dairy stocks; (v) inadequate financial and credit facilities; and (vi) poorly organised milk collection and distribution, processing facilities. The specific issues around milk processing, marketing and consumption include high processing and packaging costs; poor storage and marketing infrastructure; inadequate supply of milk especially during the dry season; lack of milk drinking culture; and weak dairy organisations. The policy responses to these are captured in five statements: (i) Promoting collection and processing of locally produced milk; (ii) setting a conducive environment for further developing milk marketing infrastructure; (iii) supporting and strengthening dairy regulatory institutions; (iv) strengthening marketing information and support services (in collaboration with other stakeholders); and (v) sensitising and promoting consumption of locally produced milk and dairy products – in collaboration with other stakeholders.

16. The 2010 **Livestock Sector Development Strategy** (LSDS) spelt out the interventions required to meet the NLP objectives for the livestock sector. The LSDS has a strong focus on poverty alleviation and on improved sustainable and environmentally friendly livestock production and productivity. Implementation envisages a participatory community development approach at District level; extensive private sector participation in livestock production, marketing, value addition, animal health delivery systems and marketing of livestock products; and training to enhance smallholder farmer capabilities, and support to farmers' organizations.

17. The **Livestock Sector Development Programme** (LSDP - 2011/2011–2015/2016) was in turn designed to implement the NLS and LSDS within the context of Decentralization by Devolution (D by D) approach, and contribute to a series of national macro-policy commitments. The LSDP's purpose is to improve the livelihoods of livestock farmers by enhancing the delivery of livestock inputs and services; improving marketing infrastructure and marketing systems for livestock and livestock products; strengthening the capacity of livestock farming communities and the private sector; and strengthening national and local government institutions to provide services to the livestock sector. The total cost of the programme was budgeted at around Tshs. 1,33 trillion (US 1.11 billion) over its five year implementation period.

18. Among the dairy-specific benefits expected from implementation of LSDP were increased numbers of improved dairy cattle through insemination, from 605,000 cattle kept by about 150,000 farm households to about 985,000 cattle kept by 300,000 farmers; and growth in milk production (from 5-6% per annum to 7% per annum reaching 2.25 billion litres). In fact, by 2015 milk production reached 2.1 billion litres; these were produced by 780,000 cattle owned by an estimated 215,000 dairy farmers. Milk production from the improved herd has gradually contributed a higher proportion of the total milk produced, growing from 33% in 2005, to more than 40% currently (2015), contributing to a rise in per capita milk consumption from 38 to 42 litres per capita p.a.

19. **Tanzania Livestock Modernisation Initiative**. Aims to implement the NLP in the context of other key national policies and strategies to support the development of a vibrant livestock sector that is responsive to growing demand, emerging commercial opportunities, and which is economically, socially and environmentally sustainable. The objective of TLMI is to transform the traditional livestock sub-sector into a modern engine for rural development and poverty alleviation, as well as for improved national health and nutritional standards.

20. **Stakeholder perceptions of dairy policy.** The dairy industry stakeholders – especially processors – consider the dairy industry as not being very business friendly. Analysis (Mchau et al/TAMPA-BEST-AC, 2007; TDB 2011; L-MIRA 2016) has pointed to the complexity of regulatory compliance – with around 14 regulators are reported to perform functions specifically for the dairy industry. Kifaro (2010) found that six government institutions (MALF, Ministry of Health and Social Welfare, Tanzania Food and Drug Authority (TFDA),Tanzania Dairy Board (TDB), Local Government Authorities (LGAs) and Tanzania Bureau of Standards (TBS)) are involved in milk regulations related to milk production; five institutions (Ministry of Home Affairs, TFDA, TDB, MALF and TBS) are involved in regulation /inspection of milk transportation; four (TDB, LGAs, TBS and

TFDA) are involved with operations of milk sellers/vendors while five (TBS, TFDA, MALF, LGAs and TDB) regulate the import and export of milk.

21. Processors complain that up to five institutions have overlapping roles enforcing compliance to laws and regulations controlling milk processing. According to L-MIRA, 42 licenses and inspections are required to set up and operate a large-scale dairy plant. Of these, 27 overlap and the total could be reduced to 15 licenses and inspections.

22. **Multiple fees and levies.** Most of the regulatory functions (registration, licensing, inspection and issuing of permits) are accompanied by payment of fees which are often not related to the cost of performing those functions but rather to raise income. Non-compliance often elicits bribes which exacerbate further the cost of doing business. According to L-MIRA, the cost of regulatory compliance imposes a significant cost burden for SMEs, estimated at US$ 22,000 per year.

23. **Misplaced objectives of regulation**. The stated objectives of the policies and regulations is to promote compliance for protection of human health, livestock health and the environment. Evidence from Kenya indicates that regulation *per se* or licensing of milk traders does not ensure better milk quality, while incentives such as training does (www.smallholderdairy.org). Although Government policy is to seek private investment in the processing sector, the heavy fees and levies imposed on it are such that it competes at a disadvantage to both the informal sector – which by definition pays no fees or taxes, and to duty-free imports of processed milk from other countries of the East African Community (essentially Kenya), where the processing sector is less heavily taxed.

Dairy policy in the Region

Neither Kenya nor Uganda has a specific policy on dairy but both have had dairy master plans and specific dairy development programmes. The experience in both countries has shown the value of having a clear plan for development of the entire dairy industry value chain, including milk collection and processing. Rwanda has done the same in 2013 by developing a Five year national dairy strategy with targets to produce surplus milk for export, and it is in the process of developing a national dairy policy. Per capita milk consumption in Kenya stands at 110 litres p.a., while with per capita milk supplies of 50 litres/person p.a. or more in both Uganda and Rwanda these countries have overtaken Tanzania, and Uganda has now become a net exporter of milk. There is a major concern that Tanzania is not maximising its potential in terms of the development of the dairy sector, and that it getting left behind by all of its neighbours: a master plan for the dairy industry would help to guide its rapid and co-ordinated development.

24. **Policy advocacy by business member organizations and civil society.** For reforms of the institutional, regulatory and policy environment to take place, advocacy by business member organizations and civil society, armed with well researched evidence, is critical. The size or perceived importance of the constituency for which policy change is being sought is very important. The last round of the push for rationalization and harmonisation of the regulatory environment was done by TAMPA representing the interest of milk processors: in 2012 it presented a policy brief to the Parliamentary Committee for Livestock, Agriculture and Water in Dodoma, which put forward solid recommendations for policy reforms. Committee members agreed that there are far too many regulations and a lack of inter-ministerial coordination, and gave support to a review of policies. The Ministry of Finance granted the sector VAT exemption, making it more attractive for young farmers to seek a future in the dairy sector, though unfortunately in 2014 the exemption was removed. The Ministry of Livestock, the Tanzania Dairy Board and TAMPA continue working together to resolve the problems of over-regulation and taxation in this sector, but there has been little movement to resolve the policy and institutional mandate overlaps and related costs.

25. Unfortunately, farmers, represented by their weak organization – TAMPRODA – and the traders, without a similar national organization, were never part of the TAMPA-led process. Given the fact that most of the laws and regulations are cross-cutting and affect not just the dairy industry but the livestock subsector and the agriculture sector as whole, broader alliances would address systemic bottlenecks with wider appeal and potential impact, forcing the policy makers to listen to a louder voice.

26. **Current reform impetus**. There is however, growing momentum for change. The Agricultural Council of Tanzania, the Tanzania Chamber of Commerce and Agriculture (TCCIA) and the Tanzania Private Sector Foundation and the Presidential Delivery Bureau under the Big Results Now! have started to address the business environment in general. The President Dr. John Pombe Magufuli has also expressed interest in tackling the business environment issue.

27. Government is currently preparing a Livestock Sector Master Plan and a road map/investment plan for dairy. The foresight and modeling exercise will offer an indication of future investment requirements from both public and private sectors. Both will provide important points of departure for SHMDP.

28. The World Bank is about to start implementing a 3-year the **Livestock Micro-Reforms for Agribusiness (L-MIRA) Project**. Focused on the dairy (and poultry) sector, it will address many of the

concerns listed above, intervening in two broad areas: improving farmers' access to quality inputs and services, and removing regulatory compliance complexity for off-takers and processors.. Public-private dialogue will support the implementation of project activities.

29. SHDMP can make an important contribution to establishing an enabling policy framework that above all: (i) provides an incentive to investment along the dairy value chain; (ii) encourages actors in the dairy value chain to expand and upgrade their businesses and move gradually from the informal to the formal sector; and (iii) offers the sector the opportunity to compete with dairy imports on an even playing field. Experience from Kenya and Uganda shows the critical importance of a strong dairy board or equivalent, in bringing stakeholders together and promoting the sector based on a shared vision and understanding, and agreement as to the appropriate and complementary roles and responsibilities of the public and private sectors.

30. The project will assist in addressing the key policy and regulatory bottlenecks constraining the development of the dairy sector and transformation of the sector to a vibrant investment and commercialised sector that can increase the incomes of rural producers, improve production and milk consumption. This support will take advantage of the new initiatives in the livestock sector, to create a more positive and enabling business environment. In particular, it will take as its point of departure the Livestock Master Plan, and it will work closely with L-MIRA and support its efforts at policy and regulatory reform.

Appendix 2: Poverty, targeting and gender

Demographic context: National and regional level

1. According to the 2012 Population and Housing Census (PHC)[1], the total population of Tanzania Mainland is approximately 45 million people, with a total of 9,276,997 private households. Out of that, 6% households are in rural areas (6.19 million households, comprising approximately 32 million people); 33.2% (3.08 million households, comprising 13 million people) are in urban areas. Even if most of inhabitants currently reside in rural areas, the proportion of the population living in rural areas declined by 7% over the last 10 years[2]. Average household size is 4.8 persons but rural areas have a higher average of 5.3. More than 75% of the households are headed by men, while 25% of the households by women, with no major differences between rural and urban areas[3].

Poverty in Tanzania

2. Despite its GDP growth rate of 7% and its positive poverty reduction trend, according to the 2011/12 Tanzania HBS[4], 28% of the population is poor, with consumption per adult equivalent below the basic needs poverty line; and 9.7% lives in extreme poverty, below the food poverty line. The poverty rate declined by around 6 percentage points between 2007 and 2011, while extreme poverty has declined from 11.8% in 2007 to 9.7% in 2011/12.

3. As per 2014 Human Development Report[5], Tanzania is among the low human development countries ranking 152 out of 182 countries[6] (see Figure 1 in Attachment 1) with a score of 0.521. Under-nutrition remains one of the largest threats to human development in Tanzania.

4. Life expectancy rose from 51 years in 2002 to 61 years in 2012. Infant mortality declined from 68 deaths per 1000 live births in 2005, down to 45 in 2010, partly due to the National AIDS Control Programme (NACP, later TACAIDS) aiming to control and treat HIV/AIDS in the country. HIV/AIDS prevalence in 2012 was estimated at 5.1% of the population aged between 15–49 years, slightly above the SSA average (4.7%) but somewhat below prevalence rates in other East African countries (for example, Uganda 7.2% and Kenya 6.1%)[7].

5. Tanzania's population growth is about 1.2 million people annually, which raises the importance of job creation. The size of the labour force has increased from 15.5 million people in 2001 to 24.1 million people in 2012, growing at an annual rate of 2.3%. In spite of structural change in terms of GDP share, the sectoral distribution of employment has remained largely stationary, with around 80% of Tanzanians working in agriculture. The rapid rising in population reflects a large increase in real terms of those dependent on agriculture for their livelihood. In terms of non-agricultural sectors, industry has the lowest share in employment of less than 5%. Services account for around 15% of total employment. About 79% of employment in the service sector is informal – with an upward tendency.

6. **Rural poverty**. About 33% of the rural population lives below the poverty line, compared to 22% for the urban areas[8]. The percentage of people living in extreme poverty in the rural areas is 11%, and 8.7% for the urban areas. Poor households are larger in size and have more dependents than non-poor households. Consequently, food poverty is highest in rural areas, at 18.4% compared to the national average of 16.6%. The incidence of rural poverty varies across the country but is highest among rural families who live in arid and semi-arid regions and depend exclusively on food crop and livestock production.

[1] The 2012 Population and Housing Census (PHC) for the United Republic of Tanzania was carried out on the 26th August, 2012. The 2012 PHC is unique as the collected information is being used in monitoring and evaluating the Development Vision 2025 for Tanzania Mainland and Zanzibar Development Vision 2020, Five Year Development Plan 2011/12–2015/16, National Strategy for Growth and Reduction of Poverty (NSGRP) commonly known as MKUKUTA and Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP) commonly known as MKUZA. The Census also provided information for the evaluation of the Millennium Development Goals (MDGs) in 2015.

[2] Urban households increased from 26% in 2002 to the current 33%; whilst those in rural areas decreased from 74% in 2002 to 67%.

[3] The average household size reported in the 2011/12 HBS is slightly higher than that of the Tanzania Mainland average reported in the 2012 Population and Housing Census (PHC) which is 4.8.

[4] 2011/12 Tanzania Household Budget Survey; http://www.nbs.go.tz/nbstz/index.php/english/statistics-by-subject/household-budget-survey-hbs/367-household-budget-survey-main-report-2011-12, p. xxi

[5] Human Development Report 2014 - Work for Human Development, UNDP

[6] As per 2015 Human Development Report Tanzania is ranking 151 out of 188 countries.

[7] Tanzania Mainland Poverty Assessment, 2015, www.worldbank.org/tanzania, p.11

[8] 2011/12 HBS

7. Tanzania's low human development ranking is further confirmed by the Multidimensional Poverty Index (MPI)[9] according to which 64% of mainland Tanzanians are poor and 31.3% live in extreme poverty[10]. Overall, rural households have worse living standards than urban households. As reported by UNDP[11], while the use of electricity for lighting has doubled from 10% in 2002 to 21% in 2012, usage in rural areas is still only at 8% (compared to 49% in urban areas). Moreover, 67% of households in Tanzania live in dwellings with floors made of earth, sand, or dung, while 63% of households have no access to piped water as the main source for drinking. Similarly, both the use of wood as cooking fuel and the lack of adequate sanitation are issues for the vast majority of the population.

7. On the education front, Tanzania's education sector has witnessed impressive achievements in school enrolments at all levels since the early 2000s i.e. 80% of primary school-age children (age 7–13) now attend school. Girls' net enrolment decreases sharply in secondary education.

8. **Nutrition and stunting.** Despite the overall improvement in national food security there are persistent problems with food utilization and malnutrition, especially in rural areas. The national rate of stunting decreased from 42% in 2010 to 34.7% in 2014. In addition 43% of the households do not have access to improved water sources[12]. Even though consumption of milk is on the rise with an annual per capita consumption of milk at 45 litres, it translates to only 20% of FAO's recommended amount for a healthy diet. See Attachment 5: Incorporating nutrition issues into project design.

9. **Land, environment and climate linkages to poverty**. Approximately 80% of the total land area in Tanzania is classified as semi-arid with highly variable rainfall and a long dry season. Poor quality and availability of forage is common, characterized by seasonal variation in quantity and quality. Holding a recognised land certificate derived from a land-use plan is preferable for securing grazing lands, access to resources and sustainable water management – all key activities for dairy production . However, farmers claim to have rights on about 12% of the plots they work on, but actually only 4% have officially been recognised through titles called Certificates of customary right of occupancy (CCROs). Only 2% (1.28 million ha) of the 60 million hectares of land deemed suitable for grazing is currently designated within village land-use plans.

10. **Gender**. According to the 2015 UNDP Human Development Report for Tanzania, the 2014 HDI[13] for women is 0.504, lower than 0.538 for men, resulting in a Gender Development Index (GDI)[14] value of 0.938 (see Table 1). Tanzania's Gender Inequality Index (GII)[15] value is 0.54, ranking the country 125th out of 155 countries in the 2014 index. However, differences in cultural patterns, religion and tribal traditions are recognized as having implications on gender roles and equality throughout Tanzania. Women hold 36% of parliamentary seats, and only 5.6% of adult women have reached at least a secondary level of education compared to 9.5% of their male counterparts. For every 100,000 live births, 410 women die from pregnancy related causes; and the adolescent birth rate is 122.7 births per 1,000 women of ages 15-19. Female participation in the labour market is 88% compared to 90.2% for men.

Table 1. Tanzania's GDI and components values

Life expectancy at birth		Expected years of schooling		Mean years of schooling		GNI per capita		HDI values		GDI value
Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
66.4	63.5	9.0	9.3	4.5	5.8	2,320	2,502	0.504	0.538	0.938

[9] Contrary to HDI, which measures average achievements in living standards, health, and education, MPI measures a wide range of deprivations faced by individuals and households.

[10] Although far apart the income-based poverty headcount from the 2012 Household Budget Survey estimating poverty and extreme poverty levels at only 28.2% and 9.7%, respectively, both measures share two common implications: poverty levels are very high and the MDG of reaching a poverty level of 18% by 2015 was unattainable.

[11] Tanzania Human Development Report 2014 - Economic Transformation for Human Development, 2015, UNDP

[12] Tanzania National Nutrition Survey, 2014.

[13] As an aggregate of life expectancy, education, and income indices, HDI measures the level of human development in a country, ranging from 0 for low human development to 1 for high human development.

[14] The GDI measures gender inequalities in achievement in three basic dimensions of human development: health (measured by female and male life expectancy at birth), education (measured by female and male expected years of schooling for children and mean years for adults aged 25 years and older); and command over economic resources (measured by female and male estimated GNI per capita).

[15] The GII reflects gender-based inequalities in three dimensions – reproductive health, empowerment, and economic activity. Reproductive health is measured by maternal mortality and adolescent birth rates; empowerment is measured by the share of parliamentary seats held by women and attainment in secondary and higher education by each gender; and economic activity is measured by the labour market participation rate for women and men. The GII can be interpreted as the loss in human development due to inequality between female and male achievements in the three GII dimensions.

11. The 2008 National strategy for Gender Development (NGDS) was developed to speed up implementation of the Women and gender development policy (2000). NGDS aims to redress gender gaps and inequalities between men and women. It also aims to guide implementers to incorporate gender concerns into their policies, plans, strategies and programmes with a view to implementing commitments at international, regional and national levels.

12. **Youth**. There are over 15 million young people between 15-35 years living in Tanzania, which represents one third of the country's population. At 2.7% per year, Tanzania's population growth is one of the fastest in the world. Adding 1.2 million people per annum, the country's population grows ever younger.[16] Youth age 15-19 have higher education levels than their counterparts age 20-24.[17]

13. About 84.5% (12.5 million) of the total youth aged 15-35 years is economically active.[18] In 2012 Tanzania had more unemployed youth (15 to 24) per capita than in 109 other countries. A survey by the non-governmental organization Restless Development reported that out of more than 1,000 young people across Tanzania, only 14% were working in a formal, wage-earning job (Global Post 2013). The highest proportion of employed youths work as unpaid family helpers in agriculture (45.6%) with the proportion of females being substantially higher (56.1%) than that of males (34.6%). The higher proportion of female youths in this status is highly associated with females' limited ownership of land and other agricultural productive assets. The proportion of female youth in vulnerable employment is higher for lower education levels.

14. **Young women.** Almost 1 in 4 young women age 15-19 are pregnant or already mothers. Only 16% of all young women age 15-24 are using family planning. 95% of pregnant women under age 20 received antenatal care from a skilled provider, but only 57% received delivery assistance from a skilled provider. 3 in 10 young women age 15-24 have experienced physical violence since age 15 and 16% have experienced sexual violence. Almost 2 in 10 young women age 15-19 are too thin and 1 in 10 are overweight or obese. 42% of young women age 15-19 have anaemia.

15. **General gender equality issues**.

- The average age of first marriage is 19 for women, 5 years younger than for men, which limits women's educational and earning potential; age at first marriage is markedly higher among more educated women.
- Women are more likely than men to be poor and illiterate: high dropout rates for girls, and the lack of gender parity in secondary and tertiary education hamper women participation in the economy. About 19% of women have received no formal education, almost twice the proportion of men (10%).
- 40% of married women do not participate in decision-making regarding their own healthcare. Half of married women report that their husbands want to know where they are at all times.
- About 40% of women have experienced physical violence since age 15, and one in five women has experienced sexual violence with 44% of married women reporting that they have experienced physical or sexual violence committed by their husband or partner.[19]
- Overall, women have less access than men to medical care, property ownership, credit, training and employment.

Rural poverty and gender analysis of the Southern Highlands

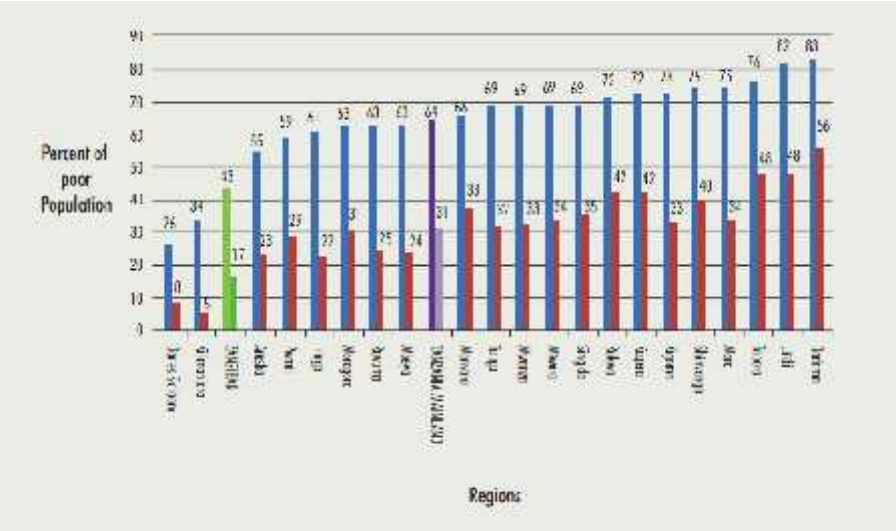
16. **Poverty.** The Multidimensional poverty index (MPI) measures multiple deprivations at the individual level in standard of living, education and health, adjusted by the intensity of deprivation they face. According to MPI, incidence of poverty in the Southern Highlands is in line with the Tanzania's mainland levels: between 61 and 63% of the total population (Figure 1). This, coupled with low levels of HDI observed in the region, reveal harsh conditions in terms of wellbeing which incorporate aspects of human capabilities and deprivation[20]

17. In the Southern Highlands farming and livestock keeping are the main livelihood activities for rural smallholders. Dairy systems with grade cattle generally sell up to 80% of their produce to formal and informal markets. Otherwise cluster farming range from maize, beans, timber tea, bananas, Irish potatoes, and avocado fruits, coffee, pyrethrum, beans, horticultural crops and timber, rice, fruit trees, sunflower, and soya. Farmers also keep other livestock such as pigs and chicken. Besides agriculture activities, other livelihoods include businesses/entrepreneurship activities, such as timber, local brew, handcrafts and charcoal business.

[16] Tanzania Human Development Report 2014 Economic Transformation for Human Development, 2015, UNDP.
[17] According to the 2010 Tanzania Demographic and Health Survey (TDHS).
[18] According to the 2014 Integrated Labour Force Survey (ILFS).
[19] Key Findings on Gender Data from the 2010 Tanzania, Demographic and Health Survey.
[20] http://hdr.undp.org/sites/default/files/thdr2014-main.pdf.

Most of smallholder farmers owning dairy cattle have received livestock through government-led initiatives, which supported pass-on mechanisms in groups and other initiatives.

Figure 2. Multidimentional poverty index by region



19. In the project area, land tenure situation is highly heterogeneous and varies from district to district. While in some districts there is a scarcity of land available and cases of conflict among different land users (crop producers, livestock keepers, pastoralists), in others, the situation is stable and people report an abundance of land. Household grazing patterns (cut and carry or extensive grazing) are also diversified and depend on seasonality, habits, volume of milk produced, type of breed, land availability and on the time and human resources allocated to dairy production. Regardless the grazing pattern, poor rural farmers rarely engage in planned and intensified pasture production but rely on seasonal pasture growing in their areas.

20. **Gender analysis.** The GDI values for the Southern Highlands are among the highest in Tanzania, ranking 1st for Iringa (0,956), 6th Ruvima, 8th Mbeya, and not enough data is available to classify Njombe.[21]. In Mbeya and Iringa 36% of the households are headed by women, in Njombe 38% and in Ruvuma 29% - higher than the national average of 0.938.

21. In the Southern Highlands, the majority of women (95%) are engaged in small business such as selling banana, avocado fruits, tomatoes and Irish potatoes done on the roadside. Other socio-economic activities performed by women include local brewing, local chicken production with few making handcrafts, run small shops and sell food. Men are mainly involved in businesses with higher returns such as trading cash crops (timber, tea and coffee), livestock, cars and bicycles. Women can be involved in the production of these at household level, but men control sales and revenues generated. Furthermore, these commodities involve travelling, which clashes with women's reproductive role in the household.

22. Women that are employed are almost twice as likely as men not to be paid - in cash or in-kind - for their work. Only about 37% of the paid workforce is female, up from 25% in 2007. Women normally own resources with less value such as home utensils, and small ruminants. Even though women perform many economic activities, they often do not own the land they farm and have limited power in the decision-making with regard to this asset and the products deriving from it. Over 50% of widowed women still suffer from being disowned from whatever assets they had shared with their deceased husbands.

23. Women face multiple challenges in accessing formal credit, which can support them to purchase quality dairy animals, hire paid labourers or use modern/improved production technology[22]. However, village community banks (VICOBA) have proved to be quite successful in providing them with access to financial services. Women dominate membership in VICOBA groups practicing/SILC as compared to men, forming mostly women-only groups. However, the design missions did not find any evidence of women-only cooperatives or producer groups engaged in dairy.

24. **Voice and decision-making.** Women in the Southern Highlands, as in the rest of the country, are often discriminated by customary law, in particular with regard to inheritance: they rarely inherit assets such as land and houses and have little to say on the decisions made on dowries. In general, women's participation in

[21] http://hdr.undp.org/sites/default/files/thdr2014-main.pdf
[22] GALVmed 2011a, GALVmed 2011b

decision making at both the household and community level is still minimal[23]. Women at the household level, have limited or no power to control transfers (through sale or inheritance) of valuable assets supporting their livelihood (land, crops, livestock, timber, etc), and they cannot dispose freely from the income they have contributed to produce since household's money is often managed by the men. On the other hand, household decisions related to food and the kitchen such as what and how much to cook; the frequency of cooking etc are made by women.

25. **Workloads.** Women are responsible for most of the reproductive roles and household chores: cooking, fetching water, fetching firewood and charcoal, washing clothes and utensil, caring of children and home cleanliness, and yet by large remain marginalized from major household decisions.

Gender analysis of the dairy value chain in the Southern Highlands

26. The lack of ownership of and control over dairy animals is one of the main constraints that women face in dairy farming. It often precludes women's involvement in the decision-making process, particularly in relation to the use and sale of milk and milk products. This adds to insecure land tenure, which restricts access to grazing for dairy animals where there is no communal grazing land available. Household members participate in dairy activities and their tasks are generally allocated as follows:

- Women tend to contribute more than men to dairy management. Women-headed households have more experience in dairy farming than male-headed ones (16.8 and 13.3 years respectively), which demonstrates women's strong engagement in this activity.
- Women are more involved in shed cleaning, forage, feeding, watering and milking, preparing and cleaning milk containers.
- Men are more engaged in disease control, search of market, selling of milk and disposing of cows – namely buying or selling heads.
- Selling of milk at the farm gate is generally performed by women, whereas it becomes men's task if performed further than the farm's gate or transported to collection points.
- Men are working as casual off-farm labour for collecting, marketing and processing of milk, mainly in the small-scale informal sector.
- As women, children and youth are also involved in the management of dairy cattle, girls tend to be more involved in tending dairy animals, especially when they are kept around the house premises, while young boys tend to be engaged as livestock herders, "graduating" from small ruminants to dairy cattle as they become young men (FAO, 2012b)

27. **Decision-making and voice in the value chain.** Overall, It has been observed that when milk is sold at the farm gate women have a better control over income generated and on how to spend it. However, milk sold at the farm gate represents small volumes so the income generated is not significant to raise the interest of men. As dairy production increases or when collection/selling becomes more formalized and higher revenues are generated, men would tend to step in. Likewise, when formal structures such as cooperatives are created, the family is represented by the man, who then increases his control over incomes.

28. Dairy women smallholder are significantly less likely than men to be part of a group, such as producer's organisation, a self-help group or others: only 8 per cent against 63 per cent. (EADD). This is mostly due to lack of time and overburdening from their productive and reproductive responsibilities. Analysis between women in dairy farming groups and those who are not, revealed that women who were not in groups have limited access and control over dairy farming enterprise. In contrast, women in groups have better access and control over resources on dairy cattle and income generated through it. It was also observed that women in groups were in a better position to overcome traditional practices and could increase their participation in decision-making issues over dairy farming.[24] This proves the relevance of groups for boosting women's involvement in the dairy value chain.

Actors involved on the dairy value chain

- **Better off poor smallholders** already engaged in livestock activities and owing on average 3-7 dairy cows. These farmers are generally the "pioneers" of governmental programmes and started engaging in livestock keeping around 15 years ago, leading to greater experience and confidence in livestock activities. They generally engage in multiplication of improved breeds and in some cases, they can

[23] Gender Inequalities in Rural Employment in Tanzania Mainland. An Overview. FAO 2014
[24] E G Kimaro, J G Lyimo - Macha and J N Jeckoniah, (2013): Gender roles in smallholder dairy farming: pertinent issues on access and control over dairy farming resources in Arumeru district, Tanzania.

rent bulls to other farmers for insemination activities. They can be classified as better off poor, might own plot of land and use employed labour for harvesting. This also enables them to provide better feeding to livestock. They can be members of producers' organizations or cooperatives. Potentially, they can play a key pull role in the dairy value chain, supporting other dairy farmers to access markets, pool production and obtaining more information.

- **Poor smallholders** already engaged in livestock activities as a family business and owing on average one or two dairy cows. Some of them can be members of community groups that benefitted from government livestock programmes; some others can also be members of producers' organizations but the majority tends to sell at the farm gate or through informal systems. In general, they have fewer years of engagement with livestock as compared to the better off. They also have fewer resources for acquiring information and related services. They can own land but of smaller size. Smallholders face limited extension services for control and treatment of diseases, poor quality of cow breed, high cost of feeds and pesticides and low price of milk. Transportation of milk to selling point is also a challenge, particularly for women who do not own bicycles to transport milk to a selling point, resulting into men taking over the income generated.
- **Very poor smallholders** include a diverse set of actors: those without dairy cattle because they have not benefitted from government programmes, they are not part of a group or are waiting to receive a cow through the pass-on scheme. It also includes those engaged with production systems based on small traditional herds, and the most vulnerable segments of the communities such as people affected by HIV/AIDS and orphans. This group generally does not own land and is extremely vulnerable to shocks.
- **Farmers' organizations** are present in the territory and tend to be engaged in milk collection and processing. While many are well established, the extent of formality, quality and processing techniques varies widely. Aggregate data from MALF indicate that approximately 25–30% of all farmers in the Southern Highlands are organized into various forms of farmer organizations, ranging from self-help groups, community-based organizations (CBOs); farmer associations; primary and secondary farmer cooperatives; and a few registered as companies. There are 172 smallholder dairy farmer organizations of different forms in the five regions covered by the project, with Ruvuma leading with 76 farmer organizations, 13 in Iringa, 50 in Njombe, 16 in Mbeya and 17 in Songwe district. Where these exist and are strong, they play a key role in establishment and management of milk collection points for aggregating milk from members (and in many cases, also from non-members) and either process and sell the milk directly to final consumers or enter into business partnerships with processors for contractual supply of milk.
- **Transporters** - when milk is not sold at the farm gate - is generally performed by young males using bicycles or motorbikes to transport milk to collection centres. Milk reaches consumers through many disparate channels, the most significant being the informal market. Informal trade of milk is dominated by so-called 'milk hawkers", who trade 64-67% of all milk produced. These hawkers collect small quantities at the farm gate and offer good prices, certainly when milk is scarce, but they are not necessarily a reliable sales outlet, particularly in the case of surplus production. In addition, the local market in rural areas is easily saturated. These informal traders, equipped with bicycles or motorbikes, focus on market imperfections. They often compete with milk collection centres and processors. In addition, sometimes buy from milk collection centres and sell in urban centres; and particularly in remote areas, some buy from pastoralists and sell to milk collection centres. Those that operate in urban centers sell both door-to-door and at fixed retail outlets. The small traders are quite competitive because of their flexibility and low investment costs.
- **Processors** can be a small, one person/family business, a medium-size private enterprise, or a cooperative. In the majority of the cases they remain informal in many areas visited. However, formal processors such as ASAS Dairy are present in Iringa with a chilling and collection center in Mbeya. Both men and women are working in the processing section. Among the districts visited, Mbinga and Songea are still at an infant stage of dairy processing and sold mostly raw and unprocessed milk through informal means. The formal processor – Mother Dairy, is currently building a processing plant that will cater for both Songea and Mbinga districts. The processor is planning to process at least 2500 litres of milk including fresh milk and yoghurt.
- **Retailers** can vary from cooperatives, small outlet stores, to farmers. Farmers sell at farm gate prices at an average of 500 - 550 Tshs/ltr. Both men and women are part of this group with women engaged in selling, working in the kitchens doing minor processing such as boiling milk or cleaning. Men are

engaged more in oversight and supervisory roles within the cooperatives/retail stores with high powers of decision making.

- **Final market** for dairy products includes retail shops, restaurants, milk bars, hotels and direct consumers – both within the producing community and outside.

Targeting and gender strategy

Overview of project area

29. The project will be implemented in the milkshed areas of the Southern Highlands, within the regions of Mbeya, Iringa, Njombe, Ruvuma and Songwe. The five regions, which are divided into 30 LGAs, border Mozambique, Lake Nyasa, Malawi, Zambia (and are very close to the DRC) to the south and west, and are all connected to Dar-es-Salaam by asphalt road. The SAGCOT passes through the project area.

30. The five regions have a total population of 5.73 million (2012 census), out of which 4.07 million (71%) are rural: these translate to figures of 1.32 million and 940,000 households respectively, and 52% of the rural population is female and 35% is between the ages of 15 and 35. The largest towns in the area are Mbeya, with a population of 385,000; Songea (Ruvuma Region) with 203,000; Iringa with 151,000; and Njombe with 130,000. Population densities are generally low, ranging from 22 persons/km^2 in Ruvuma to 45 persons/km^2 in Mbeya; and in some LGAs they are even lower: 9.3 persons/km^2 in the case of Namtumbo in Ruvuma. Levels of poverty across the regions are in line with the national average (61-63% versus 64% national average)[25], but stunting prevalence stands at between 36 and 51% across the five regions, with Iringa and Mbeya having the highest levels of stunting among the five regions[26].

Table 2. Demographic and cattle data from project target area

	Iringa	Mbeya / Songwe	Njombe	Ruvuma	Total
Population (rural population)	941.238 (684.890)	2.707.410 (1.809.298)	704.097 (538.189)	1.376.891 (1.038.071)	**5,729,636**
Stunting prevalence (% M/F)	51.3 (59/44.8)	36 (41.7/30.3)	51.5 (54.8/48.1)	48.4 (49.9/47.0)	**46.8 (51.3/42.55)**
Indigenous cattle	289.647	234.680	n.a.	192.650	**716,977**
Improved cattle	19.818	46.370	15.412	36.539	**118,139**

31. In the five regions around 624,000 households (just under half of all households) own livestock. On average female-headed households own a third of the cattle compared to male-headed households. The total herd comprises approximately 1.31 million indigenous animals, and 120,000 improved/crossbreeds that constitute the dairy herd. These are kept by about 60,000 smallholder dairy farmers. Total milk production in the area is estimated at about 400 million litres per year; though milk available for collection is much less, at about 90 million litres per year. Much of the milk from the region is collected from improved dairy cattle belonging to smallholders who benefited from Heifer-in-Trust schemes, kept intensively and semi-intensively. Levels of milk production vary according to the season: collection peaks between January and May during the rainy season and reaches minimal points between September and November periods when pastures become scarce.

32. Overall, there is a limited number of milk collection centres in the Southern Highlands, rather MCPs are used and in some cases milk is delivered directly to the outlets (factories, hotels, kiosks, etc.). Currently collection centres are of greatest importance in Mbeya and to a lesser extent Njombe, where there are 58 established milk collection centres (54 in Mbeya and 4 in Njombe region) with a capacity of collecting up to about 35,000 litres/day, though these are utilising only 65% of their capacities. Most of the collection centres in Mbeya are owned by dairy farmers' groups, and in Njombe by Njombe Milk Factory and the Njombe Livestock Farmers Association (Njolifa). In Iringa by contrast there are few collection centres. Milk produced in urban and peri-urban areas, particularly in Mbeya City and Iringa Municipality, is sold directly to consumers without passing through collection centres, as the neighbourhood market is readily available and prices are lucrative.

33. The largest processor in the area is the family-owned ASAS Dairies, which has a capacity of 50,000 litres/day, though it currently handles between 10,000 and 20,000 litres of milk daily. It collects milk from its

[25] Tanzania Human Development Report 2014
[26] http://www.unicef.org/tanzania/nutrition.html

milk chilling centres (MCCs) in Rungwe and Njombe, which are in turn linked to networks of MCPs radiating out from the centres. ASAS currently works with 2,500 smallholder farmers – though it is keen to work with more. The second largest processor is the Njombe Milk Factory, till recently supported by the Italian NGO CEFA, which has a capacity of 6,000 litres/day, though it is currently processing 4,000 litres of milk daily. There are a number of other 'formal' processors (Mbeya Maziwa 1,000 litres/day capacity; Vwawa Dairy Farmers 1,500 litres/day; Ruvuma Dairies 500 litres/day; Mufindi Dairy Group, etc.), as well as smaller, more artisanal processors and producer-owned cooling centres selling directly to the public.

34. **Further definition of the effective project area**. The geographical area covered by the five regions is large, and it is not useful to define the project area in terms of all their 30 LGAs relative to the opportunities that each district offers to catalyze the growth and development of the dairy value chain in the Southern Highlands. In order to establish the basis upon which to further narrow down the final project area, district-level data was collected and analyzed in the following broad areas:

- Productive potential – the number of smallholder dairy producers and groups, and improved dairy animals, as well as the availability of natural resources (e.g. water and land) to support development of the dairy sector.
- Demand for raw and processed milk – the urban population, and the number of processors, to provide market pull for increased production from smallholder dairy farmers;
- Availability of infrastructure for milk collection/cooling; and
- Level of priority accorded to the dairy sector by the LGA in the District Agricultural Development Plan, reflected in the presence of livestock extension staff and willingness to develop or implement village land-use planning, including the identification of suitable grazing land and land for fodder production.

34. Out of the five regions, the SHMDP has selected 15 districts that demonstrate potential for market development in the dairy value chain including: Rungwe, Busokelo, Mbeya Rural and Mbeya City in Mbeya region; Songea TC, Songea DC, Mbinga TC and Madaba in Ruvuma region; Iringa DC, Mufindi, and Mafinga in Iringa region; Njombe TC, Makete and Ludewa in Njombe region and Mbozi district in Songwe region (Table 3)

Table 3. Targeted districts in the Southern Highlands

Targeted districts within project area	# Population (2012)	# Households (2012)	# of improved dairy cattle	# of smallholder farmers	Milk production & marketing		# of farmer org'ns	# of milk collection centres
					Total (MT)	Volume sold (MT)		
A. Ruvuma region	**866,930**	**192,875**	**24,317**	**6,080**	**53,118**	**21,247**	**76**	**3**
1. Songea TC	203,309	47,092	9,678	2,420	25,085	10,034	25	2
2. Mbinga TC	353,683	74,859	6,991	1,748	18,121	7,248	17	1
3. Songea DC	173,821	38,515	4,240	1,060	5,495	2,198	18	0
4. Madaba	136,117	32,409	3,408	852	4,417	1,767	16	0
B. Iringa region	**571,763**	**149,110**	**16,266**	**3,516**	**26,594**	**6,564**	**13**	**8**
5. Iringa DC	254,032	60,484	6,892	2,916	16,777	6,473	9	1
6. Mufindi	265,829	75,650	6,773	600	9,634	0	-	2
7. Mafinga	51,902	12,976	2,601	-	183	91	4	3
C. Njombe region	**227,489**	**87,005**	**12,192**	**12,191**	**5,583**	**3,356**	**50**	**5**
8. Njombe (TC)	130,223	31,279	6,237	6,237	4,510	2,726	23	4
9. Makete (DC)	97,266	25,736	3,247	3,246	825	703	19	1
10. Ludewa (DC)	133,,218	29,990	2,708	2,708	248	107	8	0
D. Mbeya region	**1,126,103**	**271,717**	**61,577**	**25,251**	**102,482**	**729**	**16**	**19**
11. Rungwe	339,157	82,963	27,957	13,143	59,823	14	9	10
12. Busokelo	96,348	23,673	21,512	-	22,247	-	2	1

13. Mbeya Rural	305,319	75,015	7,309	7,309	1,471	336	4	5
14. Mbeya City	385,279	90,066	4,799	4,799	18,941	379	1	3
E. Songwe region	**446,339**	**103,800**	**6,750**	**-**	**3,863**	**2,567**	**17**	**15**
15. Mbozi	446,339	103,800	6,750	-	3,863	2,567	17	15
TOTAL	**3,238,624**	**804,507**	**121,102**	**47,038**	**191,640**	**34,643**	**172**	**48**

Source: MALF, 2016 & NBS, 2012, Population Housing Census

35. To determine the effective area of project intervention, at start-up the project will conduct a rapid assessment that will result in the definition of 'poles of demand'- either a town within each project district or a transport axis – and of the clusters in surrounding areas where producers and other value chain actors are located. Clusters will be characterised by a geographic concentration of interconnected producers, businesses, suppliers, and associated institutions in the dairy value chain. This will provide the basis for defining the effective project area in terms of accessibility and viability from an economic perspective; as well as tailoring the local level project activities to the specific circumstances of the cluster in question. The exercise will be led by the Zonal Project Management Unit (ZPMU), and will involve all key local stakeholders - following a process defined in section III (Project Implementation) and detailed in Attachment 2 (Appendix 5): Using clusters in the implementation approach for Multi-stakeholder Diary Platforms.

Target groups

36. The direct target group comprises of smallholder farmers who are either actively producing milk for the market, looking to access milk marketing opportunities or to start dairy farming. It also includes entrepreneurs, individuals – particularly women and youth - looking to establish or consolidate their micro-enterprises, as well as groups such as traders, processors, milk shops and farmer organisations. The project direct target group comprises around 67,575 smallholders. Overall, women will represent 30% of the target group; and youth – both young women and men – 20%:

- **30,000 poor mixed farming households with small-scale semi-intensive dairy production owning 1-3 dairy cows,** and already engaged in livestock activities. Some of them are already members of producer organizations or farmer groups formed to benefit from governmental livestock support programmes.
- **4,000 poor mixed-farming households with medium-scale intensive dairy production owning 3-7 dairy cows[27],** generally for a longer period of time as compared to the poorer households. This group will play a key role in pulling the value chain, taking a leading role in groups and processing activities. Their participation will be critical to provide the demand-pull for smallholder milk production, as well as to create rural employment opportunities. Some of these are already members of producers' organizations or cooperatives.
- **5,000 non-dairy producer rural women,** who will benefit from new economic opportunities (e.g. cottage dairy processing).
- **5,250 very poor young farm assistants,** aged 15 to 24 and employed on full or part-time basis as paid or unpaid family labourers in both categories of smallholder households mentioned above. They are the "hands-on" male laborers in many dairy farms, especially in female-headed households with no male adults. They are typically from very poor household and have little or no education and a very limited skills base.
- **11,000 very poor** households without dairy cattle, including 10,000 very poor agro-pastoralists with small traditional herds[28], and 1,000 of the most vulnerable segments of the communities with no livestock assets who will be provided with in-calf heifers (the 'pass on the gift' model); both young men and women will be part of this group;
- **A pilot group of 150 very poor youth** with no livestock, no access to financial services but possible access to communal land. They will be directly targeted by the project as part of a pilot scheme with participating districts. Given their poverty level, this group will be provided with in-calf heifers and supported to access communal land and cow-shed facilities.
- Other **rural non-producers beneficiaries** will include**:**

[27] With project support, at least 25% of the 30,000 small-scale semi-intensive dairy farmers are expected to upgrade to this category.
[28] At least 50% of this group are expected to upgrade to the small-scale semi-intensive category.

- 120 livestock farmer field schools (L-FFS) facilitators (50% are to be women)
- 360 MCP and MCC attendants
- 300 public extensionists
- 300 private para veterinarians, input suppliers and AI technicians
- 45 private seed producers
- 200 transporters, who are mainly young men
- 1,200 milk collectors, traders and distributers who will benefit from sensitization, training and capacity building, investments, and certification
- 50 small-scale dairy processors who will benefit from investments in value addition and processing facilities, particularly those which leverage public, private and producer investments
- 9,600 school children.

37. Indirect project beneficiaries include SACCOS and other financial institutions operating in the project area with whom the project will develop partnership agreements and collaboration to support project activities, including Mbinga Community Bank, Njombe Community Bank, MuCoBa Bank PLC, CRDB Microfinance Services Co. Ltd., NMB Bank, Akiba Commercial Bank, Access Bank and EXIM Bank among others.

38. Other project beneficiaries will include: members of non-targeted dairy cooperatives and communities who will benefit from improved governance and infrastructure investments; other milk collectors, processors and traders who will benefit from value chain investments and certification, strengthened local and national institutions, and policy and regulatory improvements; and consumers of milk and dairy products. Other communities will also benefit from access to better roads throughout the year which will facilitate and open up other markets and expand trade. Given the expected project spillover effects, the SHMDP aims to reach at least 40-50% of the entire population within the 15 selected districts.

Targeting strategy

39. The targeting strategy will rely on the following complementary approaches, striking a balance between the need to include poor smallholders and tapping on potential opportunities of ongoing dairy initiatives.

40. ***Geographic targeting***. The target project areas were determined by those districts that demonstrate potential for market-oriented development of the dairy value chain. As indicated in paras. 33-34, SHMDP has selected 15 districts based on criteria such as: (i) milk production potential as demonstrated by the current population of dairy cattle and total milk production in the district; (ii) level of market development as indicated by proportion of produced milk that is marketed, existence of farmer organizations, and milk collection and processing infrastructure; (iii) potential impact as indicated by the number of smallholder farmers involved in dairy farming and the level of vulnerability in the district (incidence of poverty, food insecurity and undernutrition); and (iv) the existence of other development initiatives in the district for synergy/ complementarity (such as in infrastructure development). Another important consideration for district selection has been the level of priority accorded to the dairy sector by the LGA in the District Agricultural Development Plan, reflected in the presence of livestock extension staff and willingness to develop or implement village land-use planning, including the identification of suitable grazing land and land for fodder production. Within each defined project district, as a second step, the ZPMU will conduct a rapid assessment (para. 35) to define the clusters and project activities tailored to their specific circumstances.

41. Application of the above geographic targeting criteria is expected to result in the definition of the project area in terms of those specific areas and locations around the pole where poor rural smallholders are located and that are accessible and viable from an economic perspective. This exercise will be managed by the project during the first year of implementation, and will involve all key local stakeholders through a consultative process. The geographic targeting process will be detailed in the Project Implementation Manual.

42. ***Self-targeting.*** Activities and implementation mechanisms will be designed around the specific needs and livelihoods constraints of the target groups, so as to support their access to dairy activities and avoid elite capture. Training and capacity development will be geared to the needs of smallholder farmers and their organizations that have not fully exploited the productive potential of their dairy production, supporting them in increasing quality and volumes of milk produced, as well as linking them to markets. Overall this approach aims at targeting 50,400 smallholders.

43. ***Direct targeting*** of very poor and/or marginalised households, including youth, without the required financial status to access debt finance to access livestock. A pilot group of 150 very poor youths will benefit from targeted support in building their asset base. This strategy will be initially implemented through one group per district, reaching 10 beneficiaries in each group. The pilot will be assessed at mid-term for potential scaling up. In addition, the project will actively seek to create employment opportunities for young men and women in the services revolving around the dairy value chain, in particular AI, veterinary and para-veterinary services, transportation, trading distribution and labour employed in processing centres. Youth will be trained on selected technical topics such as hygienic collection, handling of milk, AI, etc. This approach is aiming at reaching out around 7,575 beneficiaries, among women, young women and young men. The pilot will be reviewed at mid-term, and if successful, scaled up.

44. ***Empowerment and capacity building measures*** are key to ensuring the target groups' capacity to access supported project activities and complementing the project's self-targeting and direct targeting strategies. Some of the proposed measures for the different target groups are the following:

- Poor smallholder households: capacity development through LFFSs that will be instrumental to increase milk productivity and quality through improved livestock management (12,750 farmers and 5,250 farm assistants).
- Better-off poor: trainings for managers of milk collection and chilling centres on operating practices and enterprise development that will enable them to improve their access to financial services, markets and improved production practices (4,000 beneficiaries).
- Very poor: targeted capacity development and input provision to incorporate them in services throughout the value chain (around 10,000 beneficiaries in cleaning, transportation, etc.).
- Financial literacy and leadership training are specific empowerment and capacity building measures to ensure women and youth can access project supported activities (13,545 beneficiaries).

45. Beneficiaries might be by involved by more than one capacity building measure.

46. ***Enabling environment and policy dimensions.*** **T**he project will promote an enabling environment for all its target groups, so as to ensure conducive conditions for project implementation and sustainability of results. Multi-stakeholder dairy platforms will be promoted, ensuring the participation of women and women-led groups through targeted awareness raising and information sharing. Policy-focused studies would emerge in the course of project from the platform stakeholder discussions based on concrete issues that both men and women producers in the dairy value chain face.

Gender and youth strategy

35. The SHMDP gender and youth strategy will cut across the different target groups and will be entrenched in the project's three components. Its objectives are to:

- Promote the inclusion of both women and men smallholder farmers in the dairy value chain and ensure equitable access to benefits deriving from it. Particularly, it will strive to support women's capacity to remain engaged in the dairy value chain and keep on benefiting from it as it becomes more commercial, supporting women to share control of income generated and decision making.
- Support men and women's joint decision making and promote women's inclusion and voice in relevant organizations and decision making bodies: producers' and processors' groups, cooperatives, as well as stakeholders' platforms and forums for dialogue.
- Promote the involvement of young men and women in the dairy value chain, particularly:
    - In services such as AI, veterinary and para-veterinary services, pasture production, transportation, distribution and labour employed in processing centres.
    - As milk producers, introducing through them a commercial and business-oriented approach to dairy production and marketing.

47. SHMDP will adopt a **climate smart strategy** which includes: (i) supporting and coaching farmers on the zero-grazing model to increase animal productivity through improved breeding, better animal feed (development and selection of diversified forage and fodder varieties with the support of research institutions), on-farm water accessibility and improved cowsheds (protected roof and concrete floor); (ii) enhancing resource use efficiency along the dairy value chain with an emphasis on the substitution of fossil fuel and firewood with green energy sources such as biogas and solar energy sources to power dairy machinery,

chillers/coolers, water heaters and small-scale choppers; and (iii) reducing other outputs concomitant to dairy production and processing (e.g. manure management, recycling of solid waste and wastewater, etc.).

36. **Component 1: Building efficient dairy value chains from producer to consumer.** The gender strategy will support women dairy farmers to take advantage of economic opportunities provided by value chain development and engage in viable business initiatives. Moreover, women will be supported in becoming active and vocal members of relevant organizations such as cooperatives and producer's organizations .

37. In consideration of women's (i) low levels of literacy and numeracy, (ii) lack of business development and management skills, especially records keeping, and (iii) limited voice, leadership and decision making capacity in dairy organizations and business management, the project will support the following initiatives:

- Financial literacy and leadership training for women in the dairy business community. The training will work on a two-path track: women's self-esteem and sense of self-worth, as well as on their capacity to engage in business activities. This activity will support women participation in dairy cooperatives and enterprises, enabling them to engage in income generating activities and benefit from them. Training will target women who are already member of producers' organizations, cooperatives or private enterprises or those who have the potential to be active members of one of those. This is part of the direct targeting strategy, combined with empowerment measures, to support women in dairy business from a leadership perspective. In addition, the project will ensure women's inclusion in key component activities such as (i) trainings for dairy producers, milk processing, transporting and milk preservation, (ii) support processors in the development of business plans for new product development
- Women and youth producers will be assisted in accessing financial services from financial service providers to purchase milking tools, cans and test kits. This will support them in submitting applications to rural financial institutions (FIs - banks, MFI, and larger SACCOs) to apply for financial support for milk kiosks, milk bars and other retail outlets.
- Train women and youth in the business of distribution of products to retail outlets, hotels, restaurants, and institutions.
- The project will pay careful attention to ensure women's inclusion in key component activities, such as (i) trainings for dairy producers in best practices in care of cow, milking process and before transport to chilling centres and cow testing; and (ii) support processors in the development of business plans for new product development.
- The project will provide specific support to the needs – as well as the opportunities- of female-headed households, those affected with HIV/AIDS and youth and orphans.

38. **Component 2: Improving on-farm productivity.** The gender strategy will support (i) women smallholders access to services, inputs and assets; (ii) women and youth inclusion in capacity building activities – both as service providers and farmers; and (iii) the dissemination of labour saving technologies that could reduce women's time burden.

- Financial literacy and leadership training for women farmers to help women widen their capacity to build assets required for dairy production. This training will aim to: (i) manage changes in power dynamics that might occur in the household as a result of the value chain becoming more commercial; (ii) overcome the numeracy and self-confidence gap; and (iii) provide them with the necessary skills to gain access to financial services. This enabling measure will also support the overall project of having at least 30% of women beneficiaries. This activity is part of the direct targeting and empowerment strategy and a stepping stone for women to access training provided under component 1 – in a leadership pathway perspective. The activity will target 13,545 women farmers who are engaged in production activities, living both in female-headed households and in male-headed households. The roll out strategy for training will follow additional information on poverty analysis of the project area and will seek to equally benefit all concerned districts, focusing on those communities with higher gender challenges (selection criteria that could be used are: low number of women actively involved in producers' /community based groups, highest indices of violence, high education gap, etc.). The selection of communities will be conducted by the Zonal Extension & Producers' Organizations Officer (EPOO), with the support of the community development specialist.
- The component will aim to support women's inclusion in the dairy business, both as producers and as Livestock Farmer Field School (L-FFS) facilitators. The project will target a minimum of 50% women LFFS facilitators. Provision for on-site childcare facilities will be facilitated, to enable women to cope with childbearing responsibilities while spending time away from home.

- The household methodology "Gender Action Learning Systems" (GALS), whose success has been proven under a number of IFAD-supported projects in the region, will be used through the L-FFS to promote equal access of men and women to economic opportunities, decision-making processes and share of workload. The ultimate goal is to give women and men more control over their lives as the basis for individual, household, community and organizational development. The results are tangible in terms of: a more equitable work balance in the home, a greater voice for women in household decision-making, a fairer share of economic benefits accruing to women, improved food security and nutrition and a noticeable reduction in domestic violence. The project will also integrate land tenure issues in the GALS implementation with the aim to promote women decision-making in the land use and allocation at household and community level. The project will benefit from already on-going GALS processes in the country, as well as in neighbouring countries.
- In order to support youth inclusion in the dairy services, young graduates who wish to establish themselves as private inseminators will be provided with initial training, or refresher training for existing inseminators.
- A pilot group of 150 very poor youths will be supported to access dairy animals, and to establish themselves as commercially-oriented dairy producers. This strategy will be implemented through groups of 10 beneficiaries per district.
- The project will support the establishment of intensified cut and carry pasture production on communal grazing land. This will contribute to the intensification of dairy production while creating business opportunities along the value chain, especially for women and youth.
- In order to raise general awareness on the topic, gender and empowerment will be included in short-term technical trainings delivered by the MALF.
- Support development and testing of technical innovations that could favour women's workload reduction such as labour-saving technologies for women and small-scale machineries. For instance, biogas materials that are readily available from their dairy farming and reduce unregulated forest harvesting and thus contribute to environmental conservation. These innovations will support women's workload reduction by decreasing the time required in fetching fuel.

39. The project will support GALS through a progressive strategy, starting with a pilot of 12 trainings and then scaling it up the following stages. The GALS process will unfold as follows[29]:

- First SHMDP will train 5 Master trainers (one per region) to fulfil project needs. And a total of 120 facilitators will be trained.
- The L-FFS two Master trainers and 24 L-FFS facilitators (out of the 120) will be trained to become GALS facilitators. Together with project staff, they will also benefit from a one-week exchange visit in a neighbouring country with proven experience of FFS implementing GALS.
- Each GALS trainings led by facilitators, will have a set of 25 participants in each.
- Overall SHMDP will support the establishment and training activities of seven L-FFS per facilitator of the 1st generation, and five L-FFS per facilitator of 2nd generation i.e. a total of 720 L-FFS groups and 12,750 farmers and 5,250 farm assistants, trained in 240 schools, during the project period.
- In order to support the GALS roll out, an experienced service provider/consultant will train the master trainer. Possible international missions will provide in-depth monitoring and follow up.

40. **Component 3**: **Supporting an enabling policy and institutional framework.** Within this component, two key activities will be pursued by the gender strategy. First, it will ensure that policy studies, analysis and follow-up will be gender sensitive, encompassing different needs and implications for men, women and youth. Secondly, it will ensure women's access to financial services. Leadership and financial literacy trainings under components 1 and 2, will contribute to women's access to specialized financial services for the dairy value chain.

41. **Implementation arrangements**

- ZPMU will strive to archive a balanced representation of men and women among its staffing.
- The Project Coordinator has overall responsibility for ensuring that the targeting and gender strategy are interwoven in the project management tools (M&E system, PIM, AWPB) and effectively implemented. This will be included in the ToRs.

[29] Additional details on GALS implementation process, can be found on Attachment 1, Appendix 4.

- Within the ZPMU, the extension/producer organizations' specialist will be responsible for the planning and monitoring of gender mainstreaming in the project, requiring relevant expertise in the field of gender and poverty inclusion.
- Service providers supporting the implementation of activities (particularly those directly dealing with producers and groups) should have a demonstrable commitment to pro-poor and gender inclusive approaches, youth etc. In order to ensure adequate knowledge of relevant gender issues and how to tackle them during implementation of activities, all service providers will benefit from training on gender awareness at year one and a refresher at year two.
- The M&E system gives strong emphasis to monitoring of targeting performance. All service providers are required to provide disaggregated data on women and youth participation, in relation to overall project targets of 30% participation of women and 20% of youth.

Attachment 1: Figure 1. Regions of Tanzania Mainland by adjusted HDI categories

Attachment 2: Targeting checklist

IFAD'S Targeting Checklist	
	Design
1. Does the main target group - those expected to benefit most- correspond to IFAD's target group as defined by the Targeting Policy (poorer households and food insecure)?	The project targets the poor smallholder households already engaged in livestock activities that have no or very limited i) access to the market ii) membership to groups iii) access to credit.
2. Have target sub-groups been identified and described according to their different socio-economic characteristics, assets and livelihoods - with attention to gender and youth differences? (matrix on target group characteristics completed?)	The project group comprises four sub-categories: i) 35,000 poor smallholder households already engaged in livestock activities and owing, on average, one or two dairy cows ii) 5,000 out of the better-off poor, also engaged in livestock activities owing on average, 3-4 dairy cows iii) 10,000 out of the very poor, without a cow, engaged with traditional herds system with non-improved livestock, and the most vulnerable segments of the communities iv) 5,000 rural people, mostly youth and those without livestock assets Matrix on target group characteristics still needs to be completed on the basis of data collection studies
3. Is evidence provided of interest in and likely uptake of the proposed activities by the identified target sub-groups? What is the evidence? (matrix on analysis of project components and activities by principal beneficiary groups completed?)	There is a big demand of smallholders for increasing dairy production and improve access to markets Matrix on of project components and activities by principal beneficiary groups still needs to be completed on the basis of data collection studies
4. Does the design document describe a feasible and operational targeting strategy in line with the Targeting Policy, involving some or all of the following measures and methods:	The targeting strategy has used geographic targeting, self-targeting, direct targeting, enabling, empowering measures and procedural measures to ensure the project is inclusive and reach the poor. A gender strategy has also been incorporated to ensure vulnerable and marginalized groups are included.
4.1 Geographic targeting – based on poverty data or proxy indicators to identify, for area-based projects or programmes, geographic areas (and within these, communities) with high concentrations of poor people	The participating districts will be selected according to an objective and transparent set of criteria, including (i) milk production potential as demonstrated by the current population of dairy cattle and total milk production in the district; (ii) level of market development as indicated by proportion of produced milk that is marketed, existence of farmer organizations, and milk collection and processing infrastructure; (iii) potential impact as indicated by the number of smallholder farmers involved in dairy farming and the level of vulnerability in the district (incidence of poverty, food insecurity and undernutrition); and (iv) the existence of other development initiatives in the district for synergy/complementarity. These criteria will allow the identification of those districts where there are opportunities to be exploited by the project intervention. Within each defined project district, there will be need to conduct a detailed value chain analysis that will result in the definition of 'poles of demand' the effective project area will be defined in terms of those areas around the pole where poor rural smallholders are located and that are accessible and viable from an economic perspective. This exercise will be managed by the project, and involving all key local stakeholders during its first year. The geographic targeting process will be defined in the Project Implementation Manual.
4.2 Direct targeting - when services or resources are to be channelled to specific individuals or households	YES very poor and/or marginalised households, including youth, without the required financial status to access debt finance to access livestock will be supported in building their asset base. The project will actively seek to create employment opportunities for young men and women in the services revolving around the dairy value chain,

4.3 Self targeting – when goods and services respond to the priority needs, resource endowments and livelihood strategies of target groups	Activities and implementation mechanisms will be designed around the specific needs and livelihoods constraints of the target groups, so as to support their access and avoid elite capture. Trainings and capacity development will be geared to the needs of smallholder farmers and their organizations that haven't fully exploited the productive potential of the dairy production, supporting them in increasing quality and volumes of milk produced, as well as better linking them to markets.
4.4 Empowering measures - including information and communication, focused capacity- and confidence-building measures, organisational support, in order to empower and encourage the more active participation and inclusion in planning and decision making of people who traditionally have less voice and power	Empowerment and capacity building measures are put in place for the poor and very poor dairy household, as well as women and youth across all target groups. Some of the proposed measures for the different target groups are the following: i) capacity development through livestock farmer field ii) trainings for managers of milk collection and chilling centres on operating practices and enterprise development would enable them to improve their access to credit, markets and improved production practices. iii)very poor: targeted capacity development and input provision to incorporate them in services revolving the value chain industry iv) Financial literacy and leadership training are specific empowerment and capacity building measures to ensure women and youth access project activities . These are aimed at closing the gap in numeracy and lack of self-confidence that prevent them from encourage active participation in planning and decision making engaging in dairy activities as they become more commercial.
4.5 Enabling measures –to strengthen stakeholders' and partners' attitude and commitment to poverty targeting, gender equality and women's empowerment, including policy dialogue, awareness-raising and capacity-building	
4.6 Attention to procedural measures - that could militate against participation by the intended target groups	Procedural measures are addressed in PIM to prevent political interference in selection of the poorest project areas. Possible procedural obstacles to women and youth and the poor's access to training will be analysed and addressed.
4.7 Operational measures - appropriate project/programme management arrangements, staffing, selection of implementation partners and service providers	Project coordinator will be responsible for seeing that gender and poverty targeting is effective and will be mentioned in the ToRs. All service provider contracts make them accountable for targeting. Service providers will be assessed on their proven track record with poverty, gender and youth targeting.
5. Monitoring targeting performance. Does the design document specify that targeting performance will be monitored using participatory M&E, and also be assessed at mid-term review? Does the M&E framework allow for the collection/analysis of sex-disaggregated data and are there gender-sensitive indicators against which to monitor/evaluate outputs, outcomes and impacts?	The M&E design gives strong emphasis to monitoring of targeting performance. All service providers are required to provide disaggregated data on women and youth participation, in relation to overall project targets of 30% participation of women and 20% of youth

Attachment 3: Gender checklist

IFAD's checklist for gender	
	Design
1. The project design report contains – and project implementation is based on - gender-disaggregated poverty data and an analysis of gender differences in the activities or sectors concerned, as well as an analysis of each project activity from the gender perspective to address any unintentional barriers to women's participation.	Sex-disaggregated data on poverty has been used in the analysis and the challenges specific to women's involvement in dairy value chain activities
2. The project design report articulates – or the project implements – actions with aim to: • Expand women's economic empowerment through access to and control over productive and household assets;	SHMDP will supporting women's inclusion in the dairy business as producers and entrepreneurs through i) support to access to finance ii) leadership and financial literacy training iii) technical trainings through FFS
• Strengthen women's decision-making role in the household and community, and their representation in membership and leadership of local institutions;	The project would enhance women's participation and voice in decision-making of producers 'groups and cooperatives, supporting them through leadership training
• Achieve a reduced workload and an equitable workload balance between women and men.	Household methodologies and labour saving technologies will rebalance work burden within the household, supporting women's workload reduction
3. The project design report includes one paragraph in the targeting section that explains what the project will deliver from a gender perspective.	Yes
4. The project design report describes the key elements for operationalizing the gender strategy, with respect to the relevant project components.	Yes. Gender has been mainstreamed throughout the three project components (see below)
5. The design document describes - and the project implements - operational measures to ensure gender-equitable participation in, and benefit from, project activities. These will generally include**:**	
5.1 Allocating adequate human and financial resources to implement the gender strategy	Each activity has been budgeted for The extension/producer organization specialist will be responsible for the implementation of these activities .
5.2 Ensuring and supporting women's active participation in project-related activities, decision-making bodies and committees, including setting specific targets for participation	The project has an overall target of 30% women's participation in the activities The project targets a minimum of 50 per cent women LFFS facilitators. Provision for on-site childcare facilities will be made, so as to enable women to cope with childbearing responsibilities while spending time away from home.
5.3 Ensuring that project/programme management arrangements (composition of the project management unit/programme coordination unit, project terms of reference for staff and implementing partners, etc.) reflect attention to gender equality and women's empowerment concerns	PMU will strive to archive a balanced representation of men and women among its staffing Project coordinator will be responsible for seeing that gender and poverty targeting is effective and will be mentioned in the ToRs. The Project Coordinator has overall responsibility for ensuring that the gender strategy is prepared and implemented. Within the PMU, the community development specialist will responsible for the planning and monitoring of the gender mainstreaming in the project. It is required relevant expertise in the field of gender and poverty inclusion. TORs annexed below. Service providers supporting the implementation of activities (particularly those directly dealing with producers and groups) should have a demonstrable commitment to pro-poor and gender inclusive approaches, youth etc. In order to ensure adequate knowledge of relevant gender issues and how to deal them during implementation of activities, service providers will benefit from training on gender awareness at year one and a

	refresher at year two.
5.4 Ensuring direct project/programme outreach to women (for example through appropriate numbers and qualification of field staff), especially where women's mobility is limited	At least 50% of LFFS will be women. Provision for on-site childcare facilities will be made for both participants and facilitators, so as to enable women to cope with childbearing responsibilities while spending time away from home.
5.5 Identifying opportunities to support strategic partnerships with government and others development organizations for networking and policy dialogue	The project will work in partnership with Ministry of Agriculture, Livestock and Fisheries to ensure all policy-related issues are addressed, Tanzania Dairy Board - and Livestock Institute of Tanzania (LITA) to impart training and knowledge to SHMDP beneficiaries. Likewise, SHMDP will make use of existing research institutions – TALIRI Uyole, private extensionists and private sector such as ASAS operating in the area.
6. The project's logical framework, M&E, MIS and learning systems specify in design – and project M&E unit collects, analyses and interprets sex- and age-disaggregated performance and impact data, including specific indicators on gender equality and women's empowerment.	The logframe specifies the number of women who would benefit from the project and relevant logframe indicators (i.e., all those dealing with people) are sex-disaggregated.

Attachment 4: Mainstreaming nutrition into project design

Introduction

The government of the United Republic of Tanzania has prioritized nutrition in national development plans, strategies and public expenditure. The five-year National Nutrition Strategy (2011-2016) was launched with an implementation Plan to guide actions by ministries, departments, agencies and local government authorities, as well as development partners. The Government is also tracking investments in nutrition. According to the Global nutrition report (2015), Tanzania is one of the first countries to undertake a comprehensive review of public expenditures on nutrition. The government expenditure on nutrition interventions was poorly focused on the most nutritionally at risk groups such as children under two and pregnant women. One of the recommendations was mobilization of resources - the government should encourage donors to fund the National Nutrition Strategy implementation plan by 2016; strengthen national capacity on nutrition interventions; and enhance partnership and coordinate nutrition interventions. A High Level Steering Committee on Nutrition has been created for developing a multi-sectoral action plan on nutrition from Region to Ward levels.

The livestock sector has been contributing towards achieving the twin objectives of household food security and income. Actions geared towards the multi-sectoral approach involved the commitments of livestock sector in promotion of livestock keeping and milk consumption. The current annual per capita consumption of milk (45 litres) translates to only 20% recommended value for healthy diet. World Health Organisation (WHO) recommends at least 200 litres of milk per person/ year[1]. A glass of milk (200mls) daily is a good vehicle for essential nutrients such as protein, calcium, phosphorus, zinc, iodine, magnesium, Vitamins A, B, C and a glass of milk contributes 134 kcal of energy/capita per day, 8 g of protein/capita per day and 7.3 g of fat/capita per day[2]. SHMDP will build on the government focus on milk promotion to influence the nutritional landscape particularly in regions with severe stunting burden.

Nutrition situation

Despite the overall improvement in national food security, little progress has been recorded on nutritional status over the past decade especially in rural areas. There are persistent problems with food utilization and chronic malnutrition in Tanzania. The traditional diet in Tanzania is mainly starch staples with an average daily consumption of calories from protein at 7.9 % which is below FAO/WHO recommendation (10-25 %).The Comprehensive Food Security & Vulnerability Analysis, Tanzania (2012) showed that food producers in Tanzania were most likely to be poor, food insecure and malnourished. Also in spite of the reduction in national rate of chronic malnutrition (stunting) from 42 % to 34.7 % (2010 to 2014), the prevalence was still found 'unacceptably high' and severe in certain regions and districts. The DHS report (2015 - 2016)[3] showed that the Southern Highlands regions had child stunting levels of 41.6% in Iringa , 49.4% in Njombe, 44.4% in Ruvuma and 37.7% in Mbeya. A recent study in Iringa, Njombe and Mbeya revealed the following as associated factors on child stunting- male sex, maternal absence, household diet diversity, access to improved water source and mother breastfeeding[4]. The food security evaluation in Mtwara and Lindi districts of south-eastern Tanzania reported an average household dietary diversity of 5.7 food groups[5]. When the project baseline study is done the household dietary diversity baselines for SHMDP Districts will be used and up-dated in the logical framework. In the interim, due to their proximity, the average for Mtwara and Lindi will be used. Women's workload also affects child nutritional status through the time spent on caring for the child. In Tanzania, 43% households do not have access to improved water source. A national survey reported that only 11.7% household members used soap for hand washing at critical times such as after defecating. Improved water source, sanitation and hand-washing are associated with decline in stunting burden.

[1] http://allafrica.com/stories/201412270021.html
[2] FAOSTAT, 2012
[3] Tanzania Demographic and Health Survey and Malaria Indicator Survey (2015-2016)
[4] Chiara Altare, Tefera Darge Delbiso, George Mutembei Mutwiri, Regine Kopplow, and Debarati Guha-Sapir (2016): Factors Associated with Stunting among Pre-school Children in Southern Highlands of Tanzania. *Journal of Tropical Pediatrics, 0, 1–19*
[5] The CARE Tanzania WE-RISE Project Evaluation: Improving Resilience, Income and Food Security (WE-RISE) program of CARE Tanzania (2016).

Proposed nutrition actions

Nutrition awareness and behavior change communication: This activity aims to reach out to project target groups in rural areas as well as small farmers in the urban and peri-urban cluster who are engaged in dairy value chain development. The aim is to facilitate behaviour change on milk and milk product consumption and for the utilization of income rise on nutritious food in family diet. Behaviour change communication will focus on influencing pattern of milk intake and household dietary intake. Social and behavior change communication has been identified as one of the main nutrition interventions avenue in National Nutrition Strategy towards sustainable changes in the country nutritional status.

Farmers in rural areas who are engaged in milk production (component 2) will be trained on the use of milk in enriching staple dishes, the use of manure and compost for home garden and improved sanitation and hygiene. The farmers in the urban and peri-urban cluster who are engaged in milk value chain (component 1) will be exposed to awareness campaign on relevance of milk and milk products. Also they will be trained on improved sanitation and hygiene at milk collection points, processing centres, markets, and households with an aim to influence the market environment, access to quality products and sensitization on food safety. The extension workers in collaboration with district nutrition officers will be responsible for carrying out these activities. Sokoine University in Morogoro will be engaged in development of the materials for nutrition education, behaviour change communication and cooking demonstrations. Possible collaboration with Partnership for Nutrition in Tanzania (PANITA) in dissemination of nutrition messages as regards to milk for good nutrition will be explored. PANITA is a civil society wing for Scaling up Nutrition (SUN) in Tanzania and a member of the district nutrition steering committees.

Value added products and recipe development: This activity will focus on project target groups in the urban and peri-urban cluster who are engaged in component 1 interventions. Milk consumption patterns and preferences have been a subject of study in Tanzania. Studies have shown that up to 80% of dairy products are purchased and consumed in form of raw milk followed by fermented milk and powder milk. The preference for raw milk is due to lower selling price and lack of refrigeration for preservation. The activities will include development of trainings materials, recipes of value added milk products and production of recipe book. The food science department at Sokoine University in Morogoro will conduct these activities. PANITA in partnership with extension workers and nutrition officers will promote value added products at household and community levels.

The rationale for promoting value added milk products (such as fermented milk, cheese, butter, dried milk) include: conserving the principal constituents of milk in periods of surplus production for sustainable food security and income; diversifying and enriching family diet for improved nutrition; and easier to transport than liquid milk for expanding market out reach. Although growth in production and consumption of livestock products and milk offers opportunities for smallholder farmers, it also presents risks to human health and nutritional status. For instance, while milk consumption is associated with a reduced risk of NCDs such as osteoporosis and type 2 diabetes, concerns have been expressed about high dairy consumption (milk fat) and cardiovascular disease and prostate cancer. The integration of nutrition awareness, promotion of milk and milk products will accelerate good dietary intake at households and add much needed diversity to plant-based diets. In addition, milk products have potential benefits to malnourished and human immunodeficiency virus (HIV) populations. The consumption of probiotic yoghurt improved gastrointestinal symptoms, nutrient intake and tolerance to antiretroviral treatment among a sample of people living with HIV in Mwanza, Tanzania[6]**.**

Milk Promotion: Milk consumption will be promoted in schools, household and communities as follows:

- **School milk programme:** The feasibility for school milk distribution pilot will be assessed during baseline survey and potential partnership with stakeholders including the various line ministries will be explored. The Africa Milk Project (AMP), an Italian milk co-operative in partnership with communities in Njombe, introduced a milk school programme. The milk programme has achieved an outreach of 24,000 pupils with associated improvement in school attendance. This approach can be scaled up with project facilitation in order to contribute to investments in nutrition and the multi-sectoral collective efforts to scale up nutrition in Tanzania. The project will support development of a simple curriculum for primary schools on the importance of dairy (for income and nutritional purposes) to be introduced in schools in the project

[6] Irvine, Hummelen and Hekmat, 2011

area within the Agriculture and Home Science subjects. Nutrition education under this curriculum will be targeted both at the school children and their parents. Nutrition messages will aim at promoting milk consumption at household. To supplement this milk consumption campaign, the project will first undertake a study on viability and distribution arrangements for school milk feeding. Selection of the pilot schools will take into consideration the presence and magnitude of malnourished children in a school. On the basis of the findings, the project will support the introduction of pilot "school milk feeding program" in 2 primary schools in each targeted district to test a sustainable integration of milk in parent-financed school milk feeding for children in primary schools. The project intends to reach 9600 pupils over an initial period of two years. In addition, the Steering Committee on Nutrition will be supported through capacity strengthening on prioritizing school milk programme and in coordination of the action plans among line sectors at region, district and ward levels. Selected MCCs participating in a pilot test for the supply of chilled, pasteurized loose milk (sub-component 1.3.5) will be involved and linked in the school milk programme.

- **National Milk Week:** SHMDP will build on existing national forum and events such as national milk week to promote awareness milk consumption and dairy products. The purpose of national milk week is to boost adequate milk consumption and utilisation of milk products. It is an opportunity for showcasing economic, health and nutritional viability of milk and dairy. In collaboration with the National Dairy Board, activities on milk promotion in the project including awareness campaign on value added products, food demonstration and food display will be promoted during the National Milk Week.

Capacity building

- **Nutrition officers:** The nutrition officers are charged with the responsibilities of coordinating the established High Level Steering Committee on Nutrition for a multi-sectoral action plan on nutrition from Region to Ward levels. To facilitate this coordination and ensure effective contribution from dairy sector to this multi-sectoral action plan on nutrition, the capacity of province and district nutrition officers will be strengthen through training sessions. A series of training, sensitization workshops and refresher courses will be organized to strengthen nutrition officers capacity on converging and coordinating possible linkage of dairy interventions with other sectors such as education sector in school milk programme. Technical specialist consultants in collaboration with the REACH focal point in Tanzania will conduct the training sessions.
- **Extension worker**: A nutrition module on dairy value chain will be developed and mainstreamed in the training plans for extension workers to influence sensitization on milk consumption and household dietary diversity. Agricultural extension responsibilities are predominantly focused on increasing crop/livestock production and their general awareness and integration of nutrition in their work is weak. Nonetheless, they could play a greater role, especially in encouraging greater diversity of food, which can lead to dietary diversity. Activities on home garden will be encouraged among target groups in the rural areas. Extension workers will support small farmers who keep cattle for milk production in training for effective manure utilization and vegetable garden management in order to accelerate family diet diversification. A consultant will be engaged to develop the nutrition-mainstreaming module and he/she will conduct the training sessions in collaboration with nutrition officers and possibly FAO partnership for extension workers. There is potential for strengthening capacity of the extension workers and farmers on nutrition through collaboration with the TALIRI Uyole Institute in the training workshops organised for smallholder dairy cattle farmers on varied technological packages.

Food survey: A food survey will be carried out during the baseline study. Data will be collected with a structured food survey questionnaire on prevailing nutrition knowledge, food attitudes and practices (KAP) in regards to milk and milk products. The study will provide a benchmark information to guide nutrition education, behaviour change communication and to track progress on nutrition outcomes for an evidence-based contribution from SHMDP. Information areas will include:

- consumption pattern and practices of milk and varied milk products
- milk availability, access, preference and dietary pattern
- Socio-cultural factors, food myth and taboos

The survey findings will generate information to complement the national data on milk consumption pattern in Tanzania. Good practices and lessons learned from the project actions to good nutrition will be disseminated through factsheets, technical reports, publications, meetings and workshops with stakeholders. In collaboration with other initiatives, a knowledge sharing platform will be developed at national and regional and district levels. The activities of food survey and knowledge products will be conducted through specialized consultancy services.

Nutrition nexus with gender and climate initiatives: The various project interventions as regards to gender and climate-smart initiatives will be linked to nutrition outcomes through monitoring and knowledge management. The nutrition focal point will be responsible for tracking and documenting progress of interventions as relate to nutrition. The available literature has linked malnutrition prevalence to poor feeding and care giving especially at the first 1000 days of life (maternal and child nutrition). For instance, time and labour saving technologies including improved cooking stoves, biogas, and fodder chopper at household level have the potential to mitigate any unintended adverse impact on feeding and care giving. Women account for the majority of the agricultural workforce and at the same time it is generally women who are responsible for feeding the children and the family; they have to contend with a very high workload and their own nutrition is often neglected.

Implementation of nutrition activities

The implementation of nutrition mainstreaming in SHMDP will cut across interventions in the three components of the project. Given the multi-sectoral nature of nutrition and multiple underlying factors of malnutrition, various stakeholders and partners will be engaged in the implementation. To ensure effective operationalization of activities, a nutrition focal person will be supported at the project coordinating unit to facilitate implementation of the recommended nutrition actions. Also the focal person will be responsible to track and document progress on nutrition outcomes in project interventions.

Indicators

a) **Goal:** Contribute to the creation of an inclusive modern, resilient, competitive dairy sector which delivers dairy products to all Tanzanians and other consumers in the region, improves rural and urban livelihoods, well-being, nutrition and brings benefits to the economy as a whole.

b) **Key Performance Indicator**: 10% reduction of child stunting.

c) **Project development objective**: To increase market opportunities and diversify sources of incomes of smallholder dairy farmers participating in the value chain from quality and nutritious dairy products, thus enhancing consumption, nutrition and climate resilience of rural livelihoods.

d) **Key Performance Indicators:** Increase in average milk consumption from 45 litres/cap p.a. to at least 60 litres/cap p.a.; and Increase in household dietary diversity score from 5.7 to 8.0.

e) **Output Indicator**: At least 3 milk-based products are developed; local recipes updated with new dishes; and number government staff (nutrition officers and extension workers) trained on nutrition-sensitive agriculture.

NUTRITION ACTIVITIES AND COSTS

Nutrition Activities			2018	2019	2020	2021	2022	Total Unit	Unit Cost (USD)	Total Cost '000
Component 1										
Baseline study										
Household nutrition assessment	No	1	-	-	-	-	-	1	102.326	
Feasibility for school milk program	Unit	1	-	-	-	-	-	1	25.000	
Food survey and Knowledge management										
Assessment of milk consumption and nutrition situation		Unit	1	-	-	-	-	1	11.628	11.7
Unit	**2017**	No	-	1	1	1	1	4	5.256	21.8
Milk Promotion and Behaviour Change Communication										
Recipe development and production of milk recipe book		Unit	-	1	-	-	-	-	5.256	5.4
Develop behaviour change communication materials for milk consumption		Unit	-	1	1	-	-	-	5.256	10.8
Awareness campaign and food demonstration		No	-	1	1	1	1	-	11.628	48.2
Milk consumption promotion in schools, household, community		Lumpsum	-	1	1	1	1	-	5.256	21.8
Improved distribution and sales of affordable milk and milk products										
Nutrition Awareness about benefits of milk	No	-	15	15	15	15	-	60	10.233	636.4
Pilot School Milk Program	No	-	2	3	4	5	6	20	20.465	429.4
Component 2										
Nutrition mainstreaming										
Develop module on nutrition-sensitive agriculture in the work plan of extension officers	Unit	-	1	-	-	-	-	1	23.256	23.7
Refresher course for regional and district nutrition officers and extension officers	course	-	1	1	1	-	-	3	605	1.9
Home gardening training and advisory services - /l	session	-	20	20	20	20	20	100	1.442	150.4
Component 3										
Nutrition sensitization workshops and refresher course for nutrition officers and members of the NSC										
Nutrition sensitization workshops for multisectoral nutrition steering committees (region, district and ward)	session	-	1	1	1	-	-	3	1.442	4.5
Develop joint district multisectoral nutrition annual work plans based on MTEF, with clear accountability matrixes	unit	-	1	-	-	-	-	1	27.907	28.4
Supervision visits to projects activities by the regional and district nutrition officers	pers-month	-	0.5	0.5	0.5	0.5	-	2	20.000	41.5
Sensitization of ward water and health committees on hygiene and sanitation ((Trainings and IEC materials)	No	-	1	1	1	1	-	4	5.256	21.8

	Male	Female	Total	Male	Female	Total	Male	Female	Total
Tanzania Mainland	6,407,396	6,897,608	13,305,004	15,462,594	16,161,325	31,623,919	**21,869,990**	**23,058,933**	**44,928,923**
Mbeya	427,864	470,248	898,112	869,874	939,424	1,809,298	1,297,738	1,409,672	2,707,410
Iringa	122,312	134,036	256,348	329,740	355,150	684,890	452,052	489,186	941,238
Ruvuma	160,857	177,963	338,820	507,827	530,244	1,038,071	668,684	708,207	1,376,891
Njombe	77,328	88,580	165,908	252,031	284,158	536,189	329,359	372,738	702,097

Percentage Distribution of Young Population (15-35 Years); 2012 Census	**Urban and Rural**		
	Male	**Female**	**Both sexes**
Tanzania Mainland	33.4 %	35.8 %	34.6%
Mbeya	34.7 %	36.7 %	35.7 %
Iringa	35.2 %	35.3 %	35.2 %
Ruvuma	32.9 %	34.5 %	33.7 %
Njombe	34 %	35.1 %	34.5 %

Household headship	**Household headship**			**Average Household size**	
	Male	**Female**	**Both sexes**	**Male Headed**	**Female headed**
Tanzania Mainland	6,005,826	3,020,959	9,026,785	3.5	7.3
Mbeya	401,587	229,006	630,593	3.2	6.1
Iringa	140,241	80,535	220,776	3.1	6.0
Ruvuma	213,059	86,946	300,005	3.1	8.0
Njombe	104,804	64,178	168,982	3.1	5.7

Distribution of Households Rearing Cows, Goats, Sheep, and Poultry by Region, Rural and Urban Areas during 2011/12 Agriculture Year; 2012 Census	**Number of Households**	**Households rearing (cattle, goats, chickens, pigs)**	**Percentage of Households rearing livestock**		
			Rural	**Urban**	**Total**
Tanzania Mainland	9,026,785	3,813,833	87.0	13.0	42.3
Mbeya	630,593	271,798	43.1	82.2	17.8
Iringa	220,776	112,252	50.8	85.7	14.3
Ruvuma	300,005	150,069	50	85.1	14.9
Njombe	168,982	90,430	53.5	87.4	12.6

	Rural		**Urban**	**Total**

Literacy Rates of Population Age 15 Years and Above	**Male**	**Female**	**Both sexes**	**Male**	**Female**	**Both sexes**	**Male**	**Female**	**Both sexes**
	77.50	64.90	70.90	95.00	89.80	92.20	83.20	73.10	77.90

HIV prevalence rate among 15-49 yrs (%), Source: TSED (Tanzania Socio Economic Database)	**2007-2008**			**2011-2012**		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
	3.9	6.3	5.8	4.7	6.8	5.3

Nutrition, Mainland, Source: TSED (Tanzania Socio Economic Database)	**2008-2009**	**2012-2013**
Underweight	15.9	12.5
Severely underweight	3.7	-

Infant mortality rate (Deaths per 1,000 live births), Mainland, Source: TSED (Tanzania Socio Economic Database)	**2003-2004**	**2004-2005**	**2007-2008**
Rural	70	60	-
Urban	81	63	-
Total	151	123	60

Children under-18 yrs who are orphans (%), Mainland	**2010**	**2011-2012**
	9.5	10.1

	2000	**2010**	**2014**
Mobile cellular subscriptions (per 100 people); *WDB indicators*	0.32	46.66	62.77
Internet users (per 100 people); *source WDB indicators*	0.12	2.9	4.86

Appendix 3: Country performance and lessons learned

Country performance

1. With a total value of loans of US$360 million (48% of the total estimated portfolio costs of US$769 million), IFAD's lending portfolio to Tanzania is the second largest (after Ethiopia) in the East and Southern Africa region. The Government has provided co-financing for US$72 million to IFAD-funded projects (or 9.6% of total portfolio costs). The remaining costs have been co-financed by the African Development Bank (parallel financing), the World Bank, the Government of Belgium and the Government of Ireland. In addition to loan, IFAD has approved 37 grants, most of which had regional coverage. IFAD piloted its country presence in late 2003, and out-posted a Country Programme Manager in 2008 and the first Country Director in 2014.

Lessons learned from IFAD's country programme in Tanzania

2. **Past results, impact and performance.** Based on the 2015 CPE and other key evidence-based evaluations, IFAD's support to Tanzania's agricultural and rural development has contributed to improved performance and impacts on IFAD's target groups, in both Mainland and Zanzibar. IFAD support has included financing being channelled through the ASDP I basket fund, and individual loan-funded investment projects to support priority strategic thematic areas (e.g., agricultural support services and livestock; agricultural marketing; value chain development; rural financial services and rural SMEs). Some of the main results and emerging impacts of the above investments have contributed to:

- Expanded rural infrastructure such as small-scale irrigation and market-access roads, and agricultural support services, have generated increased areas of crop production and improved yields/productivity, employment, household food security, assets and incomes. Good progress has been made on crops in the Mainland, but livestock-related activities and pastoralism have received less attention;
- Farmer empowerment (including women) by strengthening farmer groups, water user associations, and savings and credit associations, has enhanced IFAD target groups' capacities to participate and contribute to bottom-up participatory planning and implementation of agricultural development plans at the village, ward and district levels (district agricultural development plans [DADPs]);
- Through support for ASDPI, the introduction of a programmatic, sector-wide approach to implementing agricultural policies and strategies is in itself a significant achievement. This has included alignment and harmonization of key sectoral policies, institutional arrangements and development partner investments, including support to the Government's decentralization policies and mechanisms – for example, about 75% of ASDP funds were channelled through the DADPs.
- While it took a long time to the Government and development partners to agree on the ASDP content and the financing mechanisms, eventually this resulted in a programme that addressed sectoral needs, national priorities and had realistic objectives. However, the evaluation of ASDP I, including several impact thematic studies, highlighted variable results, and the need for further strengthening in leadership and coordination at national and local levels to achieve sustainable impacts; and
- Results are below planned targets regarding enhancing smallholder access to rural markets and financial services. Projects have been hampered by wide geographical dispersion of investments and early assumptions on the role of an inclusive private sector. Improvements are however ongoing facilitated by focused implementation support and MIVARF contributing to developing the new 2015 National Microfinance Policy.

3. **Lessons learned.** The main lessons learned from IFAD's support to the agricultural sector in Tanzania (for both Mainland and Zanzibar) include the following:

With respect to lending portfolio:

- Building on the results from ASDP I, IOE recommended that the new RB-COSOP 2016-2021 continue to provide programmatic support, while addressing the following key challenges and specific results-focused lessons:

- secure sustained political and leadership commitment by the agricultural sector lead ministries, local government authorities, development partners, and private sector for a sector-wide approach to agricultural development;
- ensure that adequate fiscal and human resources are effectively mobilized, channelled and managed throughout the budgetary cycle;
- accommodate different funding modalities beyond the basket fund, while securing coherence and alignment;
- expand the role of and provide appropriate support to an inclusive private sector;
- support farmer empowerment, based on improved operational strategies and mechanisms, for instance by scaling up the Farmer Field School (FFS) approach, which integrates a coordinated system of agricultural service delivery, including input-output markets; and
- achieve effective coordination in the sector through appropriate institutional arrangements, which can be enhanced through IFAD's implementation support.
- In Zanzibar, key impacts have been achieved through the introduction of FFS, which promote the integration of enhanced crop and livestock technologies and improved support services provided by community animal health workers (CAHWs). These interventions demonstrate cost-effectiveness and good sustainability prospects, with demonstrated spill-over effects to nearby farmers and their communities.
- The MUVI-MIVARF experience demonstrates that value chain development requires proper diagnostic assessment of key actors and their capacities to foster partnerships from the outset. Private-sector entrepreneurs such as wholesalers, processors and exporters, and other partners such as cooperative apex organizations, need to be involved during project design to better understand their interest and potential, and how they might internalize project incentives for their involvement and cooperation.
- IFAD support to traditional standalone projects has presented opportunities for more refined targeting at design and implementation, but has often entailed higher project management and supervision costs. At the same time, supporting the programmatic approach has also seen limitations, including geographical dispersion of limited resources, inadequate targeting to strategic groups and less than full participation by development partners.

With respect to non-lending:

- As proposed under the new RB-COSOP, there is need for IFAD to expand its non-lending support for catalysing knowledge management, partnership building and policy dialogue activities that are more closely connected to IFAD-funded operations. IFAD support to non-lending activities, involving knowledge management, partnership building and above all policy engagement, considering the large size and importance of the Tanzania programme, has received limited financial and technical support in the past due in part to inadequate human and financial resources in the IFAD country office.

Dairy project-specific lessons

4. There are numerous innovations in the IFAD-supported projects which have been shown to be successful, and can be scaled up through appropriate mechanisms and processes. For the SHMDP the most relevant include: (i) FFS-based innovations such as the Farmer Facilitators and the CAHWs (ASDP and ASSP/ASDP-L); (ii) warehouse receipt systems (AMSDP); (iii) enhanced access to finance by smallholders/"active poor" (RFSP); (iv) commodity value chain approaches for smallholders (MUVI and MIVARF); (v) introduction of participatory planning at the community level through the DADPs (ASDP); and (vi) introduction of public-private-producer partnership approaches and mechanisms (MUVI, MIVARF).

5. In addition to these IFAD-specific lessons learned, a recent review of successes and failures of dairy value chain development interventions in Tanzania[1] identified the following ten lessons, a number of which are of direct relevance to the design of the SHDMP:

6. ***Breed improvement.*** The purpose of animal breeding and selection is to improve and/or maintain genetically superior animals for higher production. A review of the Dutch-financed Smallholder Dairy Support Programme stated that flexibility and learning by doing played a significant role in the breeding strategy. At first the project's 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; and the results in terms of milk production and sales demonstrated that the change in approach was a clear success. A close sanitary monitoring of bulls remains necessary however to avoid spreading of diseases.

7. ***Increases in milk production realised.*** As smallholder milk production increases, so there is need to diversify the dairy products prepared and the market outlets for those products - particularly during the flush period each year. In Njombe, CEFA has started using up to 60% of the milk to make cheese to help absorb the surplus delivered at the factory, and ASAS in Iringa town and Tanga Fresh in Tanga region are both moving into 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 were being collected and then transported to Kenya for processing by Brookside.

8. ***Collective marketing.*** A variety of projects, in different locations and periods, have assisted to set up milk collection centres. Not only has this led to major increases in the quantities of milk collected, but also the quality of milk being delivered has tremendously improved over time. For example, at Muheza MCC in Tanga Region volumes of milk collected increased from 182,000 litres in 2002 to 944,000 litres in 2010.

9. ***Multi-stakeholder processes.*** The Tanga Dairy Platform was created in 2008 as an informal forum of the dairy value chain actors to exchange knowledge and co-produce solutions around common problems. The platform continues to meet every quarter to address problems related to market access, improving dairy production, and overcoming the strong seasonal fluctuations in milk supply. Among other achievements, it is an approach that 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.

10. ***Targeting of the poor*****.** Heifer Project International (HPI) has targeted poor farmers with a pass-on scheme for dairy cows; other projects have similarly targeted the very poor. However, because of the cost of investing in a good cow shed and the basic equipment required in a dairy farm, as well as the management requirements for improved animals, many of these farmers have been unable to provide for the dairy cows they have been given, and so their milk production potential has not been realised. Poverty targeting thus needs to be approached with care, and it must also go beyond the dairy cow owners themselves to identify other economic opportunities in the dairy value chain.

11. ***Financial services.*** Supporting the interventions with grants and at the same time providing and managing loans or credit services sends a wrong signal to the clients. Most projects are time-bound and so projects need to explore more sustainable means of developing market actors who would then take on the activities when the project comes to an end. Financing requirements of value chain actors can be addressed through project facilitated financial instruments after verification of scope and type of financial services requirements with an initial inventory of prospective clients at project start up. To this end, savings, insurance, leasing and loan facilities could be promoted as service options to dairy producers and aggregators such as MCCs, dairy processors, transporters and milk and dairy product vendors. Selective financial literacy activities will ensure that access to financial services in dairy value chains is secured for small scale producers that are currently unreached by formal financial services.

12. ***Limited intervention logic.*** The majority of the dairy development programs or projects have been focused on specific activities without following any clear intervention logic. This approach implies clear risks to the smallholder dairy farmers who have to handle a complex and highly 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 projects. Project designs should be include value chain interventions, which take a broader systems approach to achieve sectoral growth.

[1] Ogutu, C, L. Kurwijila and A. Omore (2014)

13. ***Heifer calf pass on.*** While HPI and its various partners have helped to increase the number of dairy cows in the country, countrywide distribution has created setbacks. Where farming households are not close to one another, extension services, milk collection and even organisation of farmers in some areas have become difficult to organise. The sparse distribution of dairy cattle has also been a major factor limiting the provision of services to farmers – particularly those provided by the private sector, such as AI, animal health and even feeds.

14. ***Focusing on quick wins.*** Some of the dairy development projects or interventions have had too short an implementation period, making it impossible to develop the value chain in a way that would enable the market to work for the farmers – particularly for a sector that is still in its infancy compared to the neighbouring countries. Therefore, project timeframe is an important consideration that needs to be determined according to the types of interventions proposed.

15. ***Insufficiently inclusive design.*** Despite the fact that dairy farming is largely a private and commercial activity, many dairy development projects have not consulted the private sector during the project design. Indeed, among the projects reviewed, less than 20% worked and engaged with the private sector right from design or strategy development, assessment of the needs and through implementation. Private sector entrepreneurs (wholesalers, processors and exporters) and other partners (cooperative apex organizations) need to be more actively involved during project design to better understand their interest and potential, and how they might internalize project incentives for their involvement and cooperation. Building trust among partners and improving knowledge of the fundamentals of value chain development are also essential for forging sound partnerships with private sector actors and other non-state partners -- both local and international.

16. Beyond Tanzania, some of the key lessons from the recently-completed Smallholder Dairy Commercialisation Project in Kenya were as follows:

- Effective targeting is required for progression of Dairy Groups to market-oriented dairy farming. The process of graduation of Dairy Groups was challenging to reach a level where significant surplus could be commercialized, and some groups struggled to graduate to business-oriented dairy farming. Targeting criteria should thus consider the groups' economic activity, level of organization and milk production;
- Good results for gender and youth integration were achieved. Strategies included: (i) setting quotas for women and youth access to services and activities supported by actions that facilitate their participation such as reserving 30% of leadership position to women; (ii) training sessions arranged at convenient times for women; (iii) introduction of gender-friendly technologies e.g. dairy goats, support to credit access; labour-saving technologies such as biogas and other energy saving devises; chaff cutters and small feed mixers; (iv) use of gender-sensitive participatory appraisal methodologies in the planning, implementation and monitoring processes; and (vii) sensitisation and capacity building on gender;
- Low quality of technical support to Dairy Groups affected development of results: The unavailability and inadequacy of County Cooperative Department Staff to provide expected support services to dairy groups led to poor target groups' results. Implementation modalities should be aligned to the pluralistic approach for extension and other service provision, to make up for capacity gaps in public extension services at county level;
- Subsidies for Artificial Insemination (AI) posed a challenge to private service providers: Some counties introduced different levels of subsidies to AI and animal health services to farmers. This posed a challenge for the SDCP-supported private service providers' business development. Through cooperation with the counties, SDCP should aim at facilitating a levelled playing field for operators and avoiding sudden changes in policies introducing unsustainable subsidies;
- Capacitation of small milk traders and operators requires a specific approach given their mobile and informal nature: SDCP should develop a specific approach to reach out to this target group including incentives and flexible training modalities adapted to their business schedules;
- Implementation of a Low-Cost Market Information System (LCMIS) was slow and results were limited. Setting up the LCMIS was a time-consuming process, while being out shadowed by new and

emerging technologies that render the SMS platform inadequate. Data collection and updating of the system were also challenging owing to the rate at which the information became obsolete in a rapidly dynamic milk marketing environment; and

- The school milk programme supported by SDCP did not yield expected development results: The introduction of the programme was expected to create an additional demand, supporting the milk commercialization objectives of the programme. However, given that the scheme was highly subsidized by SDCP, it was not sustainable. In addition, the programme did not target those most in needs for addressing chronic undernutrition (stunting), i.e. children in the age group are of 18-23 months. What's more, although milk plays its role as an animal sourced protein, in order to address undernutrition, a more comprehensive approach to increase dietary diversity (incl. consumption of micronutrient-dense vegetable and fruits) is required.

17. Finally learning from one of the most successful dairy industries in the world a 2008 Report from the Agribusiness Research and Education Network identified the following **key success factors** for New Zealand's dairy industry: (i) The evolution of industry structure to facilitate growth; (ii) farmer engagement in the development of industry policy, strategy, structure and operation; (iii) development of economies of scale; (iv) major disease-free status of national herd; (v) political support within New Zealand; (vi) continuing technological advance; (vii) political support in international markets; and (viii) successful development of international markets.

Appendix 4: Detailed Project Description

Development objective and impact indicators

1. The **overall goal** will be to contribute to the creation of an inclusive modern, resilient, competitive dairy sector, which delivers dairy products to all Tanzanians and other consumers in the region, improves rural and urban livelihoods, well-being and nutrition, and brings benefits to the economy as a whole.

2. The project **development objective** will be to increase market opportunities and diversify sources of income from the quality, nutritious dairy products of smallholder dairy farmers participating in the value chain, thus enhancing consumption, nutrition and the climate resilience of rural livelihoods.

3. The achievement of this will require the following **outcomes**:

- An increasingly modern, efficient and diversified value chain linking smallholder dairy farmers in the Southern Highlands to urban and rural consumers in the project area and other regions nationally and beyond;
- Increased on-farm production and productivity of smallholder dairy farmers based on increasingly commercialised and intensive, sustainable and resilient production systems; and
- An enabling policy and institutional environment that attracts and incentivises productive private investment along the dairy value chain.

4. The achievement of these outcomes will be assessed using the following **key performance impact indicators**:

- Annual volume of milk sold to processing enterprises by targeted farmers
- Percentage of targeted smallholder dairy farmers (M/F) in forward contract arrangements with buyers
- Average volume of milk produced by smallholder dairy farmers (M/F) in the project area
- Percentage increase in stakeholder satisfaction with dairy policy and institutional framework.

5. To achieve the objective and outcomes described above, the project will carry out activities that have been organized under three main **components**:

- Building efficient dairy value chains from producer to consumer
- Improving on-farm productivity
- Supporting an enabling policy and institutional environment

Component 1: Building efficient dairy value chains from producer to consumer (US$ 19.5 million)

6. The outcome of this component is development of an increasingly inclusive modern, efficient and diversified value chain linking smallholder dairy farmers in the Southern Highlands to urban and rural consumers in the project area and other regions in Tanzania and beyond. This will be achieved through three sub-components:

- Capacity building of farmer organizations for improved access to markets, inputs and services
- Investment in climate-smart quality milk collection and handling systems
- Improved processing and distribution of affordable quality milk and milk products

Background and rationale

7. The rationale for this component is that the dairy sector offers a pathway out of poverty for farming households if the dairy value chain is developed to effectively and profitably link producers of milk to final consumers of dairy products with increased quantities of hygienic, nutritious and safe dairy products. This component will address the problems in collection, processing, and distribution of milk and milk products from the farm gate to the final end consumer, and help link the players in the value chain to sources of investment and working capital to finance their operations. It will enable the dairy sector to efficiently collect and transport milk, process it so as to reduce bacterial contamination and extend its shelf-life, and package it into attractive and valued consumer products for domestic and regional markets. In doing so, it will improve market access and profitability for smallholder producers and private sector businesses involved along the value chain,

create new employment opportunities, and increase the commercial marketing of milk and milk products to final consumers in Tanzania and other countries in the region. Gradually the dairy value chain will become increasingly formalized, inclusive and sustainable.

8. The activities to be supported under this component focus on supporting existing and new enterprises – profitable and sustainable farmer companies, cooperatives and associations, self-help groups and MSMEs (both formal and informal, collectively referred to as Farmer Organisations) – involved in collecting, processing, and distributing milk and dairy products from the farm gate to the consumer. The primary focus of the component is the facilitation of business activities, providing adequate support to meet the technical, marketing, infrastructure and direct capacity building needs of the enterprises. The project will support enterprises (with the potential to be profitable) to obtain loans and other financial services from financial institutions and/or generate co-investment from private sector actors under mutually beneficial business partnerships. These private businesses will pull new supplies of milk into the supply chain and provide a more reliable and consistent market for producers, resulting in higher level of revenues to households keeping dairy cattle and creating additional employment opportunities in the supply chain. The dairy value chain will become more inclusive and resilient driven by use of appropriate energy and cost-saving technologies, access to markets (local, domestic and regional) and a range of financial services. Women and youth producers will be assisted in group organisational development, formulation of viable and bankable enterprise development plans and accessing financial services and submitting applications to rural financial institutions (banks, MFI, and larger SACCOs).

9. Overall, the rationale for the component (other than meeting increasing demand for dairy products) is to take up the increased milk production from targeted farmers expected to arise from investments in improved production and productivity (component 2) and convert it into nutritious and hygienic milk and dairy products to consumers, and to ensure that producers are rewarded for their efforts. The component will increase the quantity of milk being marketed, increase the efficiency of the value chain, and improve the quality of the milk and other dairy products reaching the consumer.

Description of activities

Sub-component 1.1. Capacity building of farmer organizations (FOs)

10. FOs are a key player in the aggregation of milk from individual smallholder farmers and for collective action in efforts geared at improved access to markets, inputs, and services. Where these exist and are strong, they play a key role in establishment and management of MCPs for aggregating milk from members (and from non-members) and either process and sell the milk directly to final consumers or enter into business partnerships with processors for contractual supply of milk. These FOs are the preferred mechanism for farmers to engage with the market, processors, and generally present the best option for increased production and delivery of quality milk from smallholder farmers.

11. Information from MALF shows that out of the approximately 55,468 smallholder dairy farmers in the five regions covered by SHMDP, only 25–30% are organised into various forms of FOs ranging from: self-help groups of 10–30 farmers registered under the Community Development departments of the District Councils as community-based organizations (CBOs); farmer associations; farmer groupings registered as non-governmental organizations (NGOs); primary and secondary farmer cooperatives; and a few registered as companies. Interventions under this sub-component are aimed at improving the commercial orientation, capacity for increased membership, effective service delivery; and improved supervisory oversight of FOs to ensure compliance with good governance and management practices organised around the following four broad activities:

12. ***Activity 1.1.1: Rapid mapping and capacity assessment of FOs*****:** Through a demand driven process, the project will commission a rapid mapping and capacity assessment of all existing dairy farmer organisations which express interest in working with the project to ascertain their operational and organisational capacity, and to identify and competitively select the FOs to be assisted under the project (around demand poles). For each selected district, the project intends to work with up to four FOs who demonstrate the highest potential for expanded membership and sustainable service delivery to smallholder dairy farmers. Provisions will be also made for supporting formation of federation level of the various dairy FOs where none exist and active interest is expressed by participating FOs. The following will be the specific activities to be carried out:

13. Call for expression of interest from FOs: The project will make announcements through local media, the District Councils' extension services infrastructure and other channels of reaching farmers informing dairy FOs in targeted districts to register with the MALF officers at each Ward if they are interested in participating in the project. The list of groups that show interest will then be compiled at the district level and consolidated for the project area to form a basis for further analysis of those to be selected.

14. Rapid mapping and capacity assessment of FOs: Using competitively recruited short-term service providers, the project will commission rapid mapping and assessment of the capacity of all FOs that have expressed interest in working with the project. FOs in each targeted district will be assessed along the four levels of market-oriented producer enterprises (MOPE[1]) and then ranked accordingly to provide a basis of recommendations on those best suited for support by the project. The exercise will also provide geographical location (GIS mapping), membership, and legal type of the FOs.

15. Participatory selection of FOs to be supported: Based on the results of the rapid mapping and capacity assessment of FOs in each targeted development pole, the project will hold a stakeholder review meeting[2] at each district to validate the results of the mapping exercise and select those to be supported by the project. The stakeholder meeting will bring together not more than 20persons representing key players in the dairy value chain in the district, including government officials, the private sector, development partners and representatives of farmers (outside dairy farming to avoid conflict of interest). It is expected that selected FOs will be at MOPE stage 1 or 2 but demonstrate significant capacity for development to stage 3. Only in exceptional cases will FOs in stage 0 be selected unless it is demonstrated that the production cluster from where members are drawn do not have an already existing FO at a more advanced stage of development[3]. Rather, new entrants into dairy farming and newly formed farmer groups of 20–30 members will be encouraged to join existing dairy FOs to build on economies of scale (see also Activity 1.1.3).

16. ***Activity 1.1.2: Support to FOs in preparation of enterprise development plans (EDPs)*****:** For selected FOs, the project will support the preparation of bankable EDPs to map out their investment plans towards achievement of the short and medium term goals, clearly identifying various sources of financing (equity/debt) and any remaining gaps that could be supported by the project. It is expected that while the preparation of EDPs will have to be driven and managed by the farmers to ensure ownership and commitment, the project will provide qualified facilitators to guide the FOs. Once prepared, it is expected that each EDP will be validated by the FO membership through a general assembly (Annual General Meeting) before presentation to financial institutions for appraisal and financing. At the same time, the FO will be at liberty to present the EDP to the project for competitive assessment and approval for part-financing of their financing gaps. A key criteria for assessment of the EDPs will be the extent to which project resources and incentives are used to leverage financial resources from the private sector, financial institutions and FO members.

17. ***Activity 1.1.3: Capacity building of FOs in line with their business plans*****:** For FOs who successfully develop bankable EDPs[4], the project will provide targeted capacity building support tailored to meet capacity gaps identified in the EDP. While it is expected that these will vary according to the stage of the FO, it is anticipated that these will generally fall under the following areas:

18. Organisational development: The project will work with specialised FO organisational development service providers and the cooperatives departments at each included district to provide support in: (i) formation and registration of FOs not properly constituted, including facilitation in preparation of their constitution, election of capable leaders, and selection of an institutional form that allows the FO to effectively do business; (ii) establishment of governance and management structures and systems; farmer mobilization, recruitment and establishment of representation structures reaching out to the grassroots; and (iii) training and capacity building on leadership and governance across all structures of the FO. To ensure women become active participants and take up leadership roles in FOs, the component will build on and utilize the Gender Action Learning System (GALS) methodology to promote equal access and participation of women and men to decision-making processes and roles.

19. Capacity building will include exposure visits to successful FOs in other parts of Tanzania and within the Eastern Africa sub-region. While it is the prerogative of FOs to decide their optimal membership, the project will encourage FOs to build membership to maximize economies of scale. Membership drives supported under the project will give special focus on encouraging newly formed L-FFSs constituted under component 2 to join FOs supported under the project.

[1] At MOPE 1, farmer organizations are already formed and involved in collective market activities but have low volumes and low profitability (losses). At MOPE 2, the FO is operational, formerly registered as a business-oriented institution and has operational structures, accountability systems and a constitution; hold regular meetings, maintain records, has an active bank account and a savings culture; and members have a collective operational culture. Volumes and organizational capacity however still limits the enterprise to marginal profitability. At MODE 3, the FO is formally organized as a business entity generating profit and engaged in value addition; has reliable trade relations, operational enterprise growth/investment plans; and has established institutional structures for sustainable business operations. At MOPE 0, the FO is poorly constituted and farmers still engage with the market individually.

[2] Constituted within the framework of the multi-stakeholder dairy platforms (MDPs) constituted and supported under component 3

[3] Special attention will be given to women and youth groups who may still be at MOPE 0 stage.

[4] Capable of attracting financing from members, the private sector (through partnership) or debt financing from financial institutions.

20. Capacity building in financial and business management: The project will provide training to key committees involved in financial management (Executive, Finance and Audit committees) as well as accounting staff employed by the FO. The idea will be to make sure that each participating FO adopts all key principles and practices in good financial and business management including planning and marketing.

21. Training and capacity building in technical areas: It is expected that dairy FOs supported under the project will grow to end up providing various services to their members and other dairy farmers in their areas of operation. Besides milk collection, chilling and marketing, the other services could include: processing; supply of animal feeds (hay, supplements, minerals); AI and animal health services (including drugs); and financial services through linkages to financial institutions operating in the vicinity or their own internal financial service windows. To support effective establishment and management of these business service areas, the project will finance specialized technical training to FOs on these areas. With respect to financial services, FO leaders and management staff will be trained on financial literacy, and principles of development through credit and entrepreneurship skills.

22. Modern information communication technology (ICT) for FOs: There are a number of technologies which are now available for dairy FOs which could significantly enhance efficiencies in service delivery. For example, the Agriculture Infrastructure (AGIN) information platform that allows farmer basic data and dairy related assets to be captured and build on through real-time updates at points of milk deliveries and relayed back (via mobile phone) to the farmer for his/her records, and made accessible to accredited business partners such as processors, financial institutions, input suppliers and service providers[5]. The project will facilitate a rapid review of ICT technologies available in the sub-region and support farmers to install a suitable one for their operations.

23. Linkages to financial institutions for financing of EDPs. The project will support participating FOs to establish linkages with financial institutions to access financial services. SHMDP will build on mechanisms already established under the MIVARF project for incentivising financial institutions to lend to agriculture. In addition, the project with develop a financial prizes mechanism[6] to part-finance up to 30% of investments of FOs, up to a maximum of USD 50,000 per FO provided they can secure the necessary loan finance through a FI.

24. ***Activity 1.1.4: Capacity building of district's cooperatives departments to perform required governance oversight to FOs:*** The project will provide capacity building support to cooperative officers in targeted districts in improved technical skills and mobility. The project will provide tailor-made refresher courses to cooperative officers at both the Moshi Cooperative University and at specialized dairy/cooperative institutions in the region. For improved mobility, the project will also finance the purchase of two motor-bikes per district to enable cooperative officers to easily reach dairy FOs[7] working with the project. A provision is also made for the running costs of the motorbikes (fuel, maintenance, annual insurance) which are expected to be incrementally taken up by the District Councils.

25. ***Implementation arrangements*****:** This sub-component will be implemented by the ZPMU in collaboration with the Moshi Cooperative University, the Tanzania Federation of Cooperatives (TFC) and the Tanzania Cooperative Development Commission. When necessary, specialized short-term service providers will be retained from reputable institutions in the Eastern Africa region to support the ZPMU in capacity building of targeted FOs and staff of the cooperatives department. Once trained, the staff of cooperatives department in each targeted district will become a key part of the implementation mechanism for capacity building of FOs.

Sub-component 1.2. Investment in climate-smart quality milk collection and handling systems

26. Milk is a highly perishable product and requires cooling within 2-3 hours after milking[8]. MCPs and MCCs offer to milk producers a place to collect and chill their milk to maintain quality – such facilities require premises with fixtures, appliances and equipment which meet required standards for milk testing, handling and preservation to maintain quality and food safety. These facilities also need year-round road accessibility. The focus of this sub-component is to expand and improve capacity utilisation of the infrastructure available in the project area for quality milk collection and handling; enhancing the quality milk handling system by

[5] Through such systems, volume of milk collected is easily cumulated for various collection points; any quality issues quickly detected and remedial actions taken (such as vet dispatched in an area/farmer with a cow with mastitis); and farmers can get input/cash advances based on records of milk delivered, etc.

[6] The criteria for selection will be clearly defined in the Project Implementation Manual (PIM) and will include clear demonstration of commitment from FIs, private sector and members to raise at least 70% of the investment costs.

[7] For FOs not registered as cooperatives, the cooperative officers will work closely with the relevant government departments (including District Livestock/ Veterinary Officers) to provide support under the project.

[8] Warm fresh milk should preferably be cooled immediately after milking to preserve quality and prevent spoilage. Cooling to 10 ^{o}C within 2 hours of milking and 4 ^{o}C within 3–4 hours is essential (FAO and WHO, 2011)

supporting improved capacity of milk transporters; and providing training for strengthening the system for enforcement of milk quality standards by relevant government authorities. The following will be the main activities of the project under this sub-component:

27. ***Activity 1.2.1: Mapping and appraisal of milk collection and transportation infrastructure:*** The project will support the rapid analysis of the infrastructure and transportation system for milk collection and chilling within the context of emerging production clusters, milk collection routes and evolving market outlets to determine the extent to which the current system meets current and potential demand, and identify gaps that need to be addressed. This study will identify the appropriate type, size and location of infrastructure required; and suitable financial and management models to provide a basis for possible shared responsibilities between farmers, their organizations (FOs), private sector and the project in Public-Private-Producer-Partnership (4Ps) modality arrangements. The study will also identify feeder road infrastructure required for year round accessibility; and access to clean portable water to identified MCP and MCC points will be also assessed and recommendations made on the most suitable approach for addressing any inadequacies. This study will be contracted to a consortium of a competitively recruited service providers within the first four months of project implementation to help minimize risk of elite capture in identifying priorities for infrastructure investments while ensuring that such investments will be driven by a market logic and responsive to the needs of each cluster. See Appendix 13: Rural infrastructure systems for dairy development.

28. ***Activity 1.2.2: Investment in milk collection infrastructure:*** Based on appropriate business partnership models identified under the infrastructure study (Activity 1.2.1 above), SHMDP will support the establishment and upgrading of at least 180 FO-led MCPs; construction/upgrading of up 60 satellite MCCs (of up to 2,000 litre/day capacity) and the construction/refurbishment of up to 25 centrally-located MCCs (of 5,000 litre/day capacity) to be developed into full dairy hubs. Project investments will vary for the three levels of milk collection facilities as follows:

29. MCPs at village/ward level: The 15 districts in the five regions targeted by the projected are estimated to have 48 already existing designated milk collection points. Some of these are merely a designated point without any shelter (under a tree/roadside), others are a verandah of a private/public building used for other purposes, while a few constitute premises specifically hired for the purpose of milk collection. While these vary in terms of level of infrastructure development, most fall short of the standards expected of a milk handling facility according to the Dairy Industry Regulations, 2007.

30. In total, it is estimated that the targeted project area will require at least 180 MCPs. The project will support the upgrading and establishment of 180 MCPs[9] through partnership arrangement with producers (FOs) and the private sector where the responsibility for construction or hiring of the premises[10] and its management will be in the hands of farmers; minor refurbishments (such as floor tiles); basic equipment for milk handling and testing; while the private sector will provide transportation services for milk from the MCP on contractual basis. For MCPs with sufficient milk volumes (of up to 500 litres/day), provisions will be made for possible upgrading to have some milk chilling facilities (solar powered where there is no electricity) particularly to preserve evening milk produced by farmers. The project will facilitate linkages with financial institutions for FOs to obtain loans for infrastructure development of MCPs where necessary

31. Satellite milk chilling centres (SMCCs): There is need for smaller satellite MCCs of 1,000 – 2,000 litres capacity. The project will support the establishment of 60 SMCCs through a partnership arrangement between farmers and the project aimed at building sustainable farmer-owned intermediate chilling facilities which can continue serving dairy farmers in the area even after completion of the project. Where a processor exists, the project will explore partnership arrangements with the processor providing the chilling equipment as well as technical backstopping to the FO in management of the facility. In such a situation, the project will facilitate linkages between the processor and financial institutions for procuring chilling equipment through loan financing, if required.

32. Central milk chilling centres (CMCCs): The project will support the establishment of 15 central MCCs with a capacity of up to 5,000 litres to handle milk from satellite MCCs and MCPs for delivery to processing facilities. Discussions with stakeholders suggest that it is possible for these to be established through a private sector-led partnership with the private sector willing to contribute up to 60% of the cost of establishment (construction/equipment), farmers contribute 30% while the project supports basic equipment for milk testing and handling, as well as training and capacity building for effective management. The project will facilitate linkages between the processor/farmers and financial institutions for making financing available, if required, to enable the investors to meet their respective contributions.

[9] It is expected that the project will support upgrading of 30 already existing MCPs and establishment of 150 new MCPs.
[10] This activity will give special consideration to women who would like to take part in MCPs given its ideal location and close proximity to their households and considering women's reproductive role in the household.

33. Training and capacity building of MCPs/MCCs management: Beyond the actual investments in infrastructure development, the project will support capacity building of the management, operation and maintenance of all MCPs and MCCs affiliated to the project through training and selective exchange visits in the region for peer-to-peer learning.

34. ***Activity 1.2.3: MCC road and water access infrastructure improvement*:** The development of any infrastructure will be preceded by feasibility studies to identify the costs, benefits and risk mitigation measures for the investment, including a baseline of key indicators. In addition, as a pre-condition to project investments, SHMDP will undertake adequate consultations to ensure that LGAs are prepared to cost-share investments and that arrangements are made with the relevant government agencies responsible for feeder roads to ensure commitment for continued maintenance of the road sections improved under the project. The project will support improved accessibility of these infrastructure developments as follows:

35. Feeder roads improvements: To support all weather accessibility of feeder roads connecting MCPs/MCCs to milk production clusters and market outlets, the project will support road improvements by carrying out spot improvements of sections deemed impassable during rainy seasons (basic access approach) and full upgrade. While investments will be demand-driven and responsive to the needs of each cluster, it is anticipated that the project will support up to 10 kms of spot improvements in each targeted district. As a pre-condition to project investments, adequate consultations and arrangements will be made with the relevant government agencies responsible for feeder roads to ensure commitment for continued maintenance of the road sections improved under the project.

36. Water access: To address inadequate supply of clean water to MCPs/MCCs, the project will support the sinking of boreholes or extension of piped water supply to facilities identified to be in need.

37. Electricity/solar energy: Besides collaboration with other programmes, the project will not make investments in grid electricity supply to MCPs/MCCs. Rather, the project will help catalyze partnerships in provision of alternative energy sources for powering milk chilling, basic equipment for milk testing and lighting[11]. Provisions are made for part-financing of solar powered milk chillers. Given that this technology is not readily available and tested in the project area, the project will finance the pilot-testing of promising technologies before rollout.

38. ***Activity 1.2.4: Support to milk collectors/transporters*:** To improve quality handling of milk at this segment of the value chain, the project will support better organisation and training of transporters in hygiene and appropriate handling of milk. SHMDP will support transporters to access financing for upgrading of transportation means (motor cycles, tri-cycles and even small light trucks). The project will pilot the use of refrigerated tanks on 3-wheeled motorcycles.

39. ***Activity 1.2.5: Capacity building support to milk inspectors*:** The licensing and regular inspection of all facilities/enterprises involved in milk production and handling is the responsibility of the TDB under the Dairy Industry Act, 2004. Within the districts, this mandate is delegated to certain designated officers within MALF (normally, milk and meat inspectors). An assessment of the capacity of districts to perform the expected functions related to maintenance of milk and dairy products standards[12] shows that significant improvements are required. The project will finance capacity building of milk inspectors from each district for enforcement of milk quality standards at MCPs, MCCs and other points of the dairy value chain. Capacity building will include skills development training through refresher courses and exposure study tours; and provision of motor bikes to enhance mobility.

40. ***Implementation arrangements*:** Interventions related to infrastructure development will be implemented by the ZPMU through direct contracting of civil works service providers procured in collaboration with District Councils involved and participating FOs. Capacity building services will be provided by competitively selected service providers contracted by the ZPMU.

Sub-component 1.3. Improved processing and distribution of affordable milk and milk products

41. The development of a modern processing industry composed of various plant sizes and supported by a vibrant distribution system for final products is crucial for the commercialization of the dairy sector and supply of quality milk and dairy products to consumers. This sub-component is aimed at increased diversification, value addition and processing of milk produced by targeted smallholder dairy farmers to meet the unmet and rapidly growing demand for quality milk and dairy products in the project area and other parts

[11] For adoption of quality based milk payment system which will be encouraged under the project, it is essential that advanced levels of milk testing is done at the MCP level to differentiate/grade milk from farmers. The equipment for this testing (*Lactoscan*) requires electric power.

[12] The role of these officers include sensitization of stakeholders on required standards (usually coupled with training on compliance), inspections/audits prior to licensing, and regular impromptu inspections to enforce compliance.

of Tanzania and provide market access to targeted farmers. It will also address marketing constraints faced by both informal and formal milk collectors and traders in the distribution and sale of quality milk to various market segments, and strengthen the linkages of business enterprises supported under the project with financial institutions for access to loans and other financial services they require to grow their businesses. The following are the main activities to be undertaken under the sub-component:

42. ***Activity 1.3.1: Market studies on processing, product diversification and distribution, and financial services:*** The project will support four targeted studies on (i) dairy processing in the project area; (ii) milk trade and distribution models; (iii) dairy market segmentation and growth potential; and (iv) financial services for dairy sector to guide project investments aimed at supporting improved processing and value addition, market expansion and efficient distribution and trade in milk and milk products

43. Dairy processing: will identify opportunities for improvements in production and sanitation; existing technologies available on better ways to process and improve shelf-life of milk products including cheese, ghee, butter and other products

44. Milk trade and distribution models: will assess the various milk and dairy products trading and distribution models and identify specific mechanisms for supporting those with significant prospects for increased employment of women and youth in the distribution of milk and other dairy products to various market segments

45. Dairy market segmentation and growth potential: will be undertaken to identify interventions required to increase the consumption of milk and dairy products in various market segments. The aim will be to investigate new outlets for milk in selected development poles in the Southern Highlands, adjoining regional markets and national markets, including Dar es Salaam as well as cross border regions.

46. Financial services for dairy sector: will estimate the potential for the flow of institutional finance for various investments under the project and would also prepare a cluster/district/region-wise banking plan, which would be implemented with the support of financial institutions operating in the project area.

47. ***Activity 1.3.2: Milk processing and value addition*****:** Based on the results of Activity 1.3.1 above, the project will conduct training and capacity building in best business practices for enterprise development for processing plants (especially small-scale cottage enterprises) for an assortment of products such as the production of fluid milk, yogurt, fermented milk, butter, ghee, cheese and other dairy products. SHMDP will ensure both youth and women's inclusion in training for milk processing, transporting and milk preservation. Training will include both classroom and on-site demonstration in Good Management Practices (GMPs) and Standard Operating Procedures (SOPs) in milk handling, processing, and packaging both in Tanzania and neighboring countries with significantly advanced dairy industries. An institution will be identified and given a refresher course in skill development so as to be able to train producers in all aspects of dairy processing. The institution will develop a set of training modules for producer groups, MCP and MCC staff, milk processors, and distributors/retailers.

48. The project will develop partnerships between vocational institutes, colleges and milk processors to establish internships for dairy science students in the practical aspects of dairy processing (small and medium enterprises). The project will investigate alternative packaging for different market segments to extend shelf-life of products and reduce costs to consumers¸ e.g. yoghurt in plastic cups with snap-on lids. SHMDP will assist participating processing enterprises to develop bankable business plans for financing. It is anticipated that up to five formal dairy processors will be supported to apply and receive loans from financial institutions for upgrading equipment and introducing new products. In the same way, it is expected that the project will support up to 25 small-scale informal processors to access financing from financial institutions to upgrade and formalize their processing enterprises[13] to improve better market penetration.

49. ***Activity 1.3.3: Milk trade and distribution*****:** Based on results of the study on milk trade and distribution models, the project will support the following areas: (i) train distributors, retailers and dairy entrepreneurs in best business practices including accounting, management, sales and marketing for dairy enterprises; (ii) train women and youth in best business practices for handling and distribution of products to retail outlets, hotels, restaurants, institutions; and (iii) conduct business trainings on how to establish and operate retail businesses selling dairy products in the development poles. Training will promote best practices for operating milk kiosks, dairy bars, restaurants, and other institutions and outlets; conduct workshops for entrepreneurs to discuss opportunities in distribution and merchandising of milk in the market; and how to conduct simple market research for improving sales and promotion activities. The project will conduct exchange visits for entrepreneurs (with special attention to women and youth) in Kenya, Uganda and Rwanda

[13] It is expected that investments made in addressing regulatory issues constraining the formalization of processing enterprises (and other actors in the dairy VC) under Component 3 will improve the business environment for growth and transformation of enterprises in the dairy sector.

to see how dairy outlets function in those countries. The project will also support business plan preparation for distributors and retailers (women and youth) to submit loan applications to rural financial institutions (RFIs - banks, MFI, and larger SACCOs) for loans for equipment and machinery and operating loans for milk kiosks, milk bars and other retail outlets in targeted development poles in the country.

50. ***Activity 1.3.4: Support for development and offering of financial products suited to the dairy sector*****:** An assessment of financial service providers in the project areas shows that the majority do not have suitable financial products (especially loans) for meeting the requirements of various actors in the dairy value chain and many continue to perceive lending to the sector as risky. To address these constraints and enhance the provision of financial services to the dairy sector in the project area, the project will closely collaborate with MIVARF to provide support to RFIs with interest in financing the dairy industry to develop and introduce appropriate products for the sector and leverage on mechanisms developed under MIVARF for de-risking lending to agriculture. The specific activities will include the following:

51. Product development: Through a competitive mechanism, the project will support development of specific financial products and services for various actors in the dairy value chain. Such support to RFIs will be performance-based against the implementation of a specific banking plan. Monitoring of RFIs' performance will include feedback from the recipients of new products.

52. Staff training and capacity building: To support rollout of developed financial products, the project will provide capacity building support to RFIs in training of their staff and establishment of appropriate internal systems for management of the dairy portfolio.

53. Linkages to mechanisms for risk reduction: The project will facilitate participating RFIs to access risk mitigation instruments available in the country such as credit guarantees, insurance, etc. developed under different initiatives including MIVARF to encourage lending to the agricultural sector. SHMDP will leverage all the guarantee schemes/options available in the country (e.g. by PASS, and Bank of Tanzania, etc.).

54. ***Activity 1.3.5: Investments in market diversification and expansion*****:** To support expansion of the market for milk and dairy products in the project area and other regions in Tanzania, the project will support the following initiatives

55. Support to school milk feeding programme: To support efforts towards increased milk consumption for improved nutrition especially for children, the project will use schools in the project area as an entry point to reach households. The project will support development of a simple curriculum for primary schools on the importance of dairy (for income and nutritional purposes) to be introduced in schools in the project area within the Agriculture and Home Science subjects. Messages under this curriculum will be targeted at both children (as consumers and future parents) as well as their parents. To supplement this milk consumption campaign, the project will support the introduction of pilot "school milk feeding program" in two primary schools in each targeted district to test a sustainable integration of milk in parent-financed school milk feeding for children in primary schools. Selection of the pilot schools will take into consideration the presence and magnitude of malnourished children in a school. Building on lessons learned from a similar initiative in Njombe, the project will introduce the "school milk feeding" with a 100% subsidy for the first year and gradually reduce the subsidy to zero by the third year for economically able parents while identifying public-private partnerships for sustaining continued supply of milk to children whose parents are categorized as economically unable.

56. Marketing campaigns for encouraging increased milk consumption: Under the auspices of TDB and the national dairy platform, the project will support targeted marketing campaigns aimed at increasing the consumption of milk in the targeted project area and the country as a whole. Support will include part-financing of milk consumption campaigns including the "milk week", print and electronic marketing campaigns, and trade shows.

57. Support to private sector-led market development: To support private sector-driven efforts for increasing product diversification and penetration in market segments not well covered, the project has made a provision for part-financing of innovative initiatives by the private sector in this area. This will be supported through a competitive financial prizes mechanism. The project will maintain an open window for the private sector to approach the project for support in investments related to product diversification, process engineering, and penetration of underserved market segments, among others. Key criteria will be the extent to which the private sector can demonstrate strong linkages to targeted smallholder dairy farmers, bankability of proposed initiatives and potential impact in growth of the dairy sector. This window of opportunity will be shared through project sensitization activities, the various clusters, MDPs as well as through printed materials.

58. ***Implementation arrangements****:* The ZPMU will be responsible for overall implementation of component 1 with the support of competitively recruited service providers and specialized partner institutions. Within the ZPMU the component will be headed by a Dairy Agribusiness Specialists (DAS) who will be supported by a team 10 qualified Dairy Agribusiness Advisors (DAAs) and Group Development Advisors

(GDAs) provided by a competitively recruited service provider firm with experience in the private sector dairy development in the region. These advisors will comprise the core of the Value Chain Support Team

59. The DAAs will support enterprises in making "dairy a business." DAAs will provide necessary hands-on instructions and mentoring for operators of the businesses conducting workshops, advising entrepreneurs in development of EDPs and assisting in linking producers and producer groups with interested financial institutions. The DAAs will work in teams with the regional and district livestock extension officers (RLEO and DLEO), cooperative development officers and milk inspectors in the targeted districts. The DAAs will also seek support from the private sector businesses which sell inputs and services such as feed, drugs, and equipment.

60. The responsibilities of the GDAs will be to establish and strengthen groups and cooperatives at the producer level (FFS) and at the value chain enterprise level which primarily will include cooperatives, self-help groups, and MSMEs. The advisors will educate producers to improve their bargaining power through organised milk collection and marketing as well as purchasing inputs and services to lower their costs and be competitive compared to imports.

Component 2: Increasing on-farm production and productivity (US$ 11 million)

61. The expected outcome of this component is increased on-farm production and productivity of smallholder dairy farmers based on increasingly commercialised, intensive, sustainable and resilient production systems. This will be achieved through three sub-components:

- Sustainable access of women and men smallholder farmers to services, inputs and assets
- Capacity building of service providers, extension workers and smallholder farmers
- Dissemination of climate smart technical and institutional innovations

Background

62. **Production systems.** Two main cattle production systems coexist in the Southern Highlands: the traditional agro-pastoral system and the intensive zero-grazing system. The traditional agro-pastoral system is characterized by a very limited consumption of inputs and services and low productivity and is mostly located in the rural areas. The herds are mainly composed of indigenous animals, and are usually mobile. The intensive zero-grazing system is found in areas with higher density of population and around peri-urban centres. The units are usually small with 1 or 2 cows kept on the farm and the dairy production is a complementary source of income. Under this zero-grazing production system, it is possible to consider two sub-types: the “poor smallholder”, with 1 to 3 animals, limited intensification (no or limited use of concentrates, and use of natural mating for reproduction, 8 litres per day and per cow) and the “better of smallholders”, with 3 to 7 exotic cows, raised under more intensive conditions (use of conserved fodder in dry season, concentrates, AI), and higher level of production (12 litres per day per cow).

63. **Animal health.** The animal health status of the cattle population in the region is negatively affected by the high occurrence of various animal diseases affecting production. East Coast Fever (ECF), Contagious Bovine Pleuropneumonia (CBPP), Foot and Mouth Disease (FMD), and mastitis are the most common diseases affecting the dairy herd. Vaccination against Transboundary Animal Diseases (TADs)[14] and zoonotic diseases[15], which is under the mandate of national veterinary services, is not done systemically, and diseases such as CBPP are not under control, although it has been ranked by the National Veterinary services as the n°1 priority disease affecting cattle (17% of occurrence at national level). The project area is also characterized by a very high prevalence and impact of tick borne diseases, ECF in particular (15% of occurrence at national level), which has a very high impact on mortality of calves (up to 60 %); Brucellosis and bovine tuberculosis are also known to be present, but their real occurrence and their impact on public health is unknown; the incidence and impact of mastitis is also significant especially in the more intensified areas.

64. The number of veterinary doctors in the area is insufficient, and private veterinarians in particular are almost absent (21 registered veterinary facilities in the five regions). Therefore, animal health services are mainly delivered by public extensionists working under private arrangements in parallel to their public extension mission, or by private service providers. These “paravets” usually hold a certificate or diploma in animal production or health. Community Animal Health Workers (CAHWs) exist in some areas, but their presence is limited, and this delivery model is not encouraged by authorities. As far as disease surveillance

[14] TADs are diseases that are of significant economic, trade and/or food security importance for a considerable number of countries; which can easily spread to other countries and reach epidemic proportions (FAO definition).
[15] A zoonotic disease, or zoonosis, is a disease that can be spread between animals and human.

and reporting is concerned, it is widely acknowledged that devolution had a very negative impact on the efficiency of reporting channels. Finally, the project area is equipped with one laboratory facility (Regional Veterinary investigation Centre) in Iringa.

65. **Animal feeding.** In extensive traditional systems, animals are fed from natural pasture and rangelands, except during the dry season where they can be complemented with crop residues such as cornstalks. In semi zero-grazing or zero-grazing systems, animals are fed with cut grasses from waste or communal land, crop residues and sometimes cultivated fodder. TechnoServe (2012) noted that a large majority of farmers do not plan ahead fodder and forage production. The ecosystem is yet very favourable to the cultivation of a wide variety of quality fodder and pasture species such as “Elephant Grass” (*Pennisetum purpureum*), “Guatemala grass” (*Tripsacum andersonii*), Bracharia spp., “Rhodes grass” (*Chloris gayana*), Silverleaf Desmodium, Calliandra spp. However, the availability of seeds and stem cuttings/splits limits their dissemination. In the high population density areas, fodder crops are integrated with other crops and used to protect soils against erosion. The activity of pasture production is the most labour-intensive and time consuming activity associated with dairy production. Better off farmers tend also to invest more into pasture production through the allocation of larger parcels of land to pasture but also by buying hay during the dry season.

66. The use of quality fodder is not optimal, legumes in particular are not commonly grown and associated with grasses, forage conservation for use during the dry season is anecdotic, and crop residues are not adequately valorised. Despite the availability of a wide range of cheap agricultural by products (sunflower cake, maize bran, rice polish etc.) which can be used as concentrate feeds without further processing, only the most intensive producers complement their animals with concentrate feeds throughout the year. This could be explained by the absence of proper distribution network for animal feeds, or by limited awareness on the potential benefits of this complementation. The impact on production of the long dry spell is therefore significant, and generates a high seasonality in milk production (up to 30 to 50% of production deficit in dry season depending on regions and systems).

67. **Water.** Availability and access to quality drinking water for animals can also constitute a serious production constraint; many animals are not watered appropriately, which affects their productivity, and deficit in quality water can also affect hygiene at the milking parlour. When animals are watered at water points, streams or rivers, this can lead to a number of environmental, health herd, and pasture utilization problems. Furthermore, fetching water for dairy animals and household consumption can be a time consuming chore that robes women and girls time for other activities.

68. **Genetics and reproduction.** The traditional agro-pastoral system is based on the local breed (East Africa Shorthorn Zebu), a small dual purpose animal, very resistant to diseases and drought, but not very productive (between 180[16] and 250[17] litres per lactation depending on sources) and not adapted to intensive production systems. The project area contains 1,309,000[18] heads of this indigenous cattle population. Thanks to their temperate climate, the Southern Highlands also contain a substantial population of between 99,000[19] and 120,000[20] cross-breed and pure exotic animals (mainly Friesian, few Ayrshire) with a good dairy potential (1,600 litres per lactation in average[21]).

69. In intensive zero-grazing systems, natural mating remains the most common mode of reproduction, and artificial insemination is used only by a minority of more advanced farmers. Natural mating gives better results in terms of fertility than AI, but results in some areas in problems of inbreeding, and the impact on spread of diseases is also unknown. The AI network is still rudimentary, except in high density areas such as Rungwe District in Mbeya Region. Quite a good number of inseminators have been trained and are present in the project area, but they practice a very limited number of AI per year, which affects the success rate of AI (inter-calving intervals of 600 days were recorded under the Dutch-financed Smallholder Dairy Support Programme, as a consequence of exclusive use of AI for reproduction). Inseminators also face recurrent problems of supply in liquid nitrogen. Consequently, the AI success rate in the area is low which does not encourage farmers to use this technology.

70. **Husbandry practices.** Reproduction performance indicators are low, both in the extensive (parturition rate of 0.5[22]) and intensive production systems (parturition rate of 0.7[23]), which could be related to

[16] ILRI. 2014
[17] LFMD. 2014
[18] MALF 2008 – latest Livestock census
[19] MALF 2008 – latest Livestock census
[20] Data gathered from regions during design mission May 2016
[21] 6 litres per day during 270 days; data collected from sample farmers during design mission May 2016
[22] MLFD, 2014
[23] MLFD, 2014

inadequate feeding during lactation, but also to poor husbandry practices and skills (heat detection, drying off management); milking practices and hygiene at milking parlour are inadequate, often leading to mastitis and milk quality issues.

71. **Extension.** The national extension guidelines recommend that each village should be covered by one livestock extensionist, and that this extension worker should be at least a diploma holder. The reality is however very different: the five sub-regions regions to be targeted by the project include 2,438 villages, which are covered by only 480 livestock extensionists. The ratio is therefore around one extension worker for five villages. The absence of transport facilities exacerbates the difficulties faced by the extensionist to reach out their targets (according to Tanzania Panel Data on livestock and Livelihoods, only 25% of farmers at national level have access to extension services). In terms of qualification, around 10% of them do not have the diploma level (certificate holders), and none of them are specialized in dairy production, this type of specialization being currently absent from training curricula offered from education institutions in the country.

72. The current national extension policy does not encourage moving towards privatization of extension services; however, private extensionists do operate in the area. They are usually young graduates who have not been able to find a job in the public sector, and deliver a range of livestock services including animal health and extension.

73. **Research and innovation.** Two major research institutions are active in the project area in the dairy sector: the Sokoine University of Agriculture, which is based in Morogoro but conducts some on-farm research in the area, and the Tanzania Livestock Research Institute (TALIRI) of Uyole, near Iringa, which conducts both on-station and on-farm research activities. Both are well staffed and equipped and are quite active in generating technical innovations for the dairy sector, in particular on animal feeding and pasture/fodder. However, the collaboration between these research organizations and extension is apparently far from optimal, and as a result, innovations hardly reach the farmers' level.

74. **Access to capital and improved livestock.** One of the main problems faced by farmers who want to establish or strengthen an intensive dairy production unit is the difficulty to access improved breed animals; the value of a good crossbreed animal in the area is around 1,000,000 Tsh and a very good pure Friesian in-calf heifer can reach 2,000,000 Tsh, which constitutes a significant investment for poor households, knowing that the setup of an intensive zero-grazing unit also necessitates to put up a cow shed and establish around one acre of pasture per cow. The government owned Livestock Multiplication Units (LMUs), who distribute animals at subsidized prices, are not adequately managed and stocked and they fail to respond to the demand. Two LMUs are present in the project area (Kitulo and Sao Hill) and produce and distribute around 180 heifers per year (MALF 2013). Several districts in the area have established "heifer-in-trust" or "pass-on-the-cow" schemes, with the support of NGOs, ASDP[24], or in partnership with banks, and the number of animals distributed through these mechanisms is around 10 times the number of animals distributed by LMUs according to MALF statistics.

75. **Climate change and environment.** Tanzania's climate is highly variable and complex, and climate trends already indicate that temperatures are rising and rainfall is becoming more erratic. Recent models show that average annual temperatures will rise by 1ºC by 2050, and the impact of climate change on temperatures and rainfall regimes is already affecting ecosystems livelihoods and infrastructures. This could have an impact on the productivity of exotic breeds, in particular in the hot season. Changes in rainfall patterns could also cause dramatic shifts in agro-ecological zones, and increase uncertainty in the onset and retreat of the rainy season. The real impact of climate change on rain patterns in the region is however uncertain, with contradicting opinions collected from farmers, and this should be investigated, as it could have a significant influence, negative or positive, on the fodder production, the duration and severity of the dry spell, and the emergence of animal diseases such as Rift Valley Fever which is often associated with flooding.

76. Livestock production is perceived as a significant contributor to Green House Gas emissions (methane mainly, but also CO2 and N2O). However it has been established[25] that GHG emissions can be reduced by intensification of production systems. The carbon footprint of milk produced in intensive system is much lower than the one produced in extensive ones. Indeed, when grazing is optimized and balanced this can reduce land degradation and pollution due to pressure on grasslands and ecosystems in general. Enhanced quality and digestibility of forage varieties improve the animal productivity and contribute to reduction of green gases emissions. Livestock crop integration is already good in intensive zero grazing systems, but could be reinforced.

[24] Agricultural Sector Development Programme
[25] FAO. Tackling climate change through livestock; 2013

Rationale and strategic approach

77. It is projected that the combined effects of population growth, changes in consumption patterns due to increased incomes and the emergence of the country's middle class, exacerbated by the expected impact of activities implemented under components 2 and 3, market demand for milk and milk products will significantly increase. The milk consumption level in the country has been projected to increase from the current 45 litres per capita to between 55[26] to 100[27] litres per capita by 2022; the total consumption in the project area is thus expected to increase significantly too, from the current 258 million litres today, up to 391 million in 2022. The rationale for this component will respond therefore to this increasing demand, nationally and within the project area, by improving the supply of quality milk.

78. Increasing the supply will also improve the equitable share of benefits accrued to smallholder men and women, as a result of the increase in value of the total production. If efforts will be primarily dedicated to increasing milk production, the production of meat and live animals will also benefit from the productivity enhancements, as well as crop production through better livestock-crop integration practices.

79. The project will also contribute to better nutrition, mainly by: (i) improving quality and safety of milk at production level (better hygiene at the milking parlour, better handling of milk at farm level, improvement of home based processing) and (ii) increasing the availability, access and consumption of milk and dairy products at household level. It is in particular expected that increased production and enhanced access to market will result in higher quantities of milk consumed at household level, since the evening milk is generally not marketed through the formal channels and consumed at home or sold in the neighbourhood.

80. The project will apply the One Health[28] concept in its approach for improving public health by: (i) reducing the impact of zoonotic diseases such as brucellosis and tuberculosis and (ii) improving milk safety at all stages of the value chain (farm to fork approach) including production, which will favourably reduce the potential threat of milk borne diseases.

81. In order to achieve this increase in milk production, the project will pursue a twofold strategy: (i) first by improving the productivity of existing smallholder dairy production systems and (ii) secondly by increasing their number, both by encouraging the creation of new intensive units and the transformation and modernization of existing traditional extensive production systems into intensive dairy systems.

82. One way the project will improve productivity is to test, pilot and support the adoption of technical innovations which improve the efficiency and the resilience of the production systems, improve the quality of the milk and reduce the seasonal fluctuations of the production.

83. If the intensification of livestock production is not managed properly, this can increase anthropogenic green gas emissions, biophysical degradation and lead to potential loss of biodiversity. It will therefore be critical to promote climate smart production practices and technologies which will be conducive to reduction of GHG emissions and restoration of the ecosystem through promotion of soil and water conservation measures, as well as manure and waste management.

84. As a general principle, this component will focus on the inclusion of the poorest households in dairy production, supporting their access to improved breeds of livestock and strengthening community-based groups.

Description of activities

Sub-component 2.1. Sustainable access of smallholder farmers to services, inputs and assets

85. This sub-component will focus on five main types of activities: (i) strengthening AI and breeding services; (ii) improving access to quality animal feeds and forage; (iii) improving the animal health status of the dairy herd; (iv) improving access to water for production; and (v) supporting asset building mechanisms for targeted households. The implementation of this sub-component will be closely linked to the implementation of sub-component 1.1. Capacity building of farmer organizations (FOs). FOs are a key player in the aggregation of milk from individual smallholder farmers and for collective action in efforts geared at improved access to markets, inputs, and services. A MCP or MCC could ideally offer services such as veterinary care, AI, extension, and sell inputs such as feeds and forage seeds to its members. Mechanisms that allow members to deduct the cost of services and inputs from the milk sales will be also established to facilitate access.

[26] If the current increase in milk consumption of 1.5 l p.c per year is maintained
[27] SAGCOT (undated)
[28] The "One Health" approach is defined by the World Organisation for Animal Health (OIE) as a collaborative and all-encompassing way to address, when relevant, animal and public health globally.

86. ***Activity 2.1.1. Strengthening AI and breeding services:*** The project will strengthen the existing network of artificial inseminators by providing initial training to existing service providers (private para-veterinarians and public extensionists) who wish to add this service to their current range of services, or to young graduates who wish to start this activity. Given the existing demand for AI in the region, it is not expected that this activity alone could provide a sufficient revenue and the project will encourage and support service providers to diversify their range of services. Refresher training for existing inseminators will be also provided.

87. The project will partner and build on the achievements of the Public-Private Partnership for Artificial Insemination Delivery (PAID) programme, implemented by the Land O'Lakes International Development Fund and funded by the BMGF, which will support the AI value chain by training AI technicians (300 in total, including 100 in the Southern Highlands), franchising them through a 4P arrangement, and supporting them with equipment and initially subsidized semen. This project also intends to establish a new, private based, liquid nitrogen distribution system.

88. The initial trainings will be organized in the National Artificial Insemination Centre (NAIC) in Arusha; 15 new inseminators (three per region) will be trained every year. Refresher trainings will be organized in partnership with NAIC in the regions and will focus mostly on hands-on sessions, in farms and abattoirs, to assess and improve the performance of inseminators. Two refresher sessions for 15 inseminators will be organized every year in two regions. Young diploma and degree holders will be targeted in priority for this activity and at least 30% of graduates trained will be women.

89. The project will provide AI starter kits to all newly trained inseminators. For private inseminators who face mobility issues and need to increase their geographic range of action to improve the sustainability of their businesses, the project will support the acquisition of motorcycles on a cost-sharing basis, under the same arrangement as for animal health service providers (see below).

90. The project will address the problem of supply, availability and conservation of liquid nitrogen and semen, at regional and district level by (i) conducting an audit of the semen and liquid nitrogen supply chain, aimed at identifying the weak links in the AI inputs delivery channel; (ii) supporting if necessary, and recommended by an audit, the refurbishing of the liquid nitrogen plant established by MALF in TALIRI Uyole in Iringa; (iii) supporting the creation of five regional AI cooperatives or associations, managed by inseminators (see activity below on inseminators'' organizations), where liquid nitrogen and semen will be stored and distributed; and (iv) supporting partnership between inseminators and regional cooperatives of inseminators with dairy MCCs and hubs, to enable access to AI through MCCs and hubs.

91. The project will support the creation of District level inseminators' organizations/groups. The purpose of these groups will be to: (i) improve access of members to AI inputs (semen, liquid nitrogen, consumables) and equipment, by sourcing and storing these inputs collectively; (ii) advocate and lobby with local authorities to defend the right and improve the working conditions of the profession; and (iii) access to reliable and sustainable AI markets.

92. To achieve this, the project will (i) organize sensitization workshops at regional level to brainstorm on benefits of pooling resources for private inseminators; (ii) organize exchange visits to countries where cooperative and associations of inseminators exist and collectively manage the supply chain (Mali); (iii) provide business mentoring and organizational and financial management support to the groups; (iv) support acquisition of liquid nitrogen and semen storage equipment; (v) facilitate win-win partnerships between these AI groups and dairy processors, farmers' groups, MCCs and hubs, so that these value chain actors could offer AI services in addition to the marketing services; and (vi) facilitate linkages with financial institutions to obtain financing for setting up their business enterprises.

93. Exclusive use of AI can also result in poor reproduction performance (long inter-calving interval), especially in zero grazing systems where detection of heats can be an issue[29]. Recourse to natural mating in conjunction with AI can therefore be a good option. The project will therefore support establishment of controlled community bull stations to enable farmers to access natural insemination services, but with clear guarantees on the sanitary and genetic aspects. These stations will be managed by individual farmers who are already engaged in dairy production, who already have good technical skills and sufficient feeding resources. Young private paravets could also be eligible for this support. They will purchase and own the bull and manage the station as a fully private business as it is already the case for some of them[30]. The project will support establishment of the bull shed, the selection and transport of the bulls (which should originate from different areas to avoid in-breeding, and have parents of ascertained genetic quality), and the initial veterinary check-up. In collaboration with the District veterinary services, the project will also ensure regular

[29] Detection of heat is easier when animals are free and in groups. In smallholder systems, the heats are difficult to detect.
[30] Natural service is charged 10,000 to 30,000 Tsh by the owner of the bull, compared to 30,000 to 40,000 Tsh for AI.

sanitary and technical follow up of these stations. The owner of the bull will be required to keep records of the services done, in order to trace and monitor genetic and sanitary aspects. If required, the project will provide linkages with financial institutions for purchase of bulls.

94. The use of crossbred cows is a key element in the project to improve productivity. However all production systems might not be able to accommodate the same level of exotic blood, and the same breeds. To ensure and sustain an appropriate genetic mix (type of exotic breed and % of exotic blood versus local) suitable for the various farm models supported by the project, an appropriate breeding strategy will be developed in partnership with research institutions at the beginning of the project.

95. ***Activity 2.1.2. Improving access to quality animal feeds and forage:*** One of the major constraints for small dairy farming is the dependency on seasonal pasture, the inadequate availability of concentrate feeds, agro-industrial by-products as well as quality seeds and vegetal material to establish pastures. The project will address this constraint by deploying a threefold approach based on: (i) provision of support to government pasture farms for testing, producing and distributing pasture seeds and stem cuttings/splits[31] appropriate to the agro-ecological conditions of each target district; (ii) support to private producers for the production and distribution of multiplication material tested by research centres; and (iii) support to establishment of a seeds and feeds marketing network involving private input dealers, MCCs and hubs. The project will also facilitate suitable linkages between the financial institutions and the private producers/ marketing companies for the production and distribution of feed and forage.

96. The two government farms that produce pasture seeds in the project area (TALIRI Uyole and Lagwira seeds farm) will be supported to improve and increase their production capacity of forage seeds and stem cuttings. The project will first commission an organisational and institutional audit of their seed production and marketing activities to identify the areas for improvement and possible support. The project could then support the two farms to improve the performance of their production systems, and establish a distribution networks based on private franchised outlets (possibly managed by paravets and/or farmers' organisations).

97. The project will provide to the two farms a variety of selected parental vegetal material of different species and varieties (pasture species, forage species for cut and carry systems or fodder conservation, forage shrubs and trees…) to be tested in various agro-ecological zones. In addition to forage yield and nutritional qualities, resistance to drought and climate change, and capacity of species to enhance soil and water conservation will be also taken into account to select the most adequate species and varieties. The research centres will then be supported to produce and distribute seeds and cuttings from the qualified species and varieties.

98. TALIRI Uyole could also be contracted by the project to inventory and analyse the quality and nutritional value of concentrate feeds, agro-industrial by products and crop residues available in the region, which can be used for feeding complementing dairy animals, particularly during dry season. Seasonal monitoring of on-farm feed availability with resulting recommendations for appropriate feed supplementation to balance rations will be undertaken yearly, and the resulting recommendations will be disseminated through the extensionsist network as well as the L-FFS.

99. The project will also support selected private farmers to establish seeds and stem cuttings production units. Public seed farms will be contracted to provide the parental vegetal material to these seeds producers, and provide them technical backstopping in partnership with extension workers. Other incentives such as fertilizer and equipment will also be provided to these producers as part of the starter kit.

100. Finally, in order to enable smallholder farmers to access to these quality tested forage seeds and animal feed, the project will support establishment of a seeds and feeds marketing outlet network involving private input dealers, MCCs and hubs, by facilitating commercial arrangements between private input dealers (agro-vet), farmers' groups, MCCs and hubs on the one hand, and seeds producers and animal feeds manufacturers/traders on the other hand.

101. Enhancement of animal feeding through use of quality pasture, fodder conservation, use of concentrates and supplements will also be included of the extension and FFS package in sub-component 2.2., as well as in the innovation agenda of sub-component 2.3.

102. ***Activity 2.1.3. Improving the animal health status of the dairy herd:*** Animal diseases are classified in two categories that determine who is responsible for their control. The TADs and the zoonotic diseases[32], fall under the responsibility of the Veterinary Authority (public veterinary services), while the other

[31] Some forage species such as elephant grass or Guatemala grass cannot be multiplied with seeds and must be multiplied using stem cuttings.
[32] A zoonotic disease is a disease that can be spread between animals and human.

diseases (production diseases: mastitis, parasites…) fall under the responsibility of private veterinary services. This classification will guide the project in the type of support it provides to veterinary services.

103. The project will therefore follow a twofold approach in the animal health domain: (i) Support to the public veterinary services, which in Tanzania, because of the devolved institutional dispensation, are composed of the National Veterinary Services, mainly in charge of the policy, regulatory and coordination aspects, and the District Veterinary Services, in charge of implementation. This support will address mainly the surveillance of TADs and the vaccination. (ii) Support to private veterinarians and para-veterinarians to enhance their capacities and outreach.

104. The animal disease surveillance mechanisms have been greatly affected by the devolution process. Coordination and communication between the two levels of administration, and between farmers and government, which is particularly key in surveillance, will need therefore to be reinforced. The project will support a set of activities aiming at improving the surveillance mechanisms: (i) public awareness campaigns, aimed at improving participation of farmers, extension workers, private vets and para-veterinarians in disease reporting; public meetings, radio messages in local language prepared and broadcasted, and brochures in local language distributed; (ii) consultation workshops organized to improve and formalize coordination and collaboration between the National Veterinary Services, the regional and district levels, the private animal health practitioners, and the farmers' groups, and define clear and simple reporting channels and mechanisms; (iii) reinforcement of reporting means at districs level (laptops with modem and internet airtime); (iv) support to the Regional Veterinary Investigation Centre in Iringa to improve its investigation capacities; and (v) support of coordinating role of the Zonal Veterinary Centre of Iringa, in charge of coordination of veterinary services in the project area, in particular in the area of control of TADs.

105. Vaccination against major public good diseases by National and District Veterinary Services will be supported to alleviate the impact of these infections on production, trade and public health. Vaccination against CBPP will be considered as the first priority since it is ranked so in the national disease prioritization framework. The project will support the coordination at zonal level, the vaccination campaign logistics (vehicles, cold chain equipment) and the vaccination costs (vaccines and administration) on the basis of cost sharing arrangements and decreasing project participation (from 80% in Year 2 to 20 % in Year 6). The project will also encourage the participation of the private sector to the vaccination through a public-private partnership or contractual arrangement.

106. ECF is a private good disease but its impact on production and on livelihoods is significant in the project area, and its control requires massive logistics both for vaccination[33], and prevention[34]. For these reasons, the control of ECF can be seen as a joint responsibility of the private and public sectors. The project will therefore support both entities for the different aspects of the control of ECF by supporting districts and communities to: (i) establish the logistics for the vaccination campaigns (liquid nitrogen supply and storage, transport and distribution of vaccine to villages) where the vaccines will be administered on a private basis; (ii) establish cattle crush in villages for spraying cattle that are not kept in zero grazing facilities, which are the most susceptible to be infested by ticks; and (iii) support awareness creation and information dissemination among cattle keepers for effective prevention of vectors and control of ECF using radio bulletins or talk shows, brochures and posters. ECF prevention will also be part of the FFS package.

107. The project will also strengthen the capacities and outreach of private veterinarians and para-veterinarians (certificate and diploma holders), by (i) providing refresher specialized training; (ii) supporting diversification of their service portfolio and source of incomes by helping provide other dairy related services such as AI, inputs provision, milk collection services, or even enter into milk production; (iii) supporting their outreach by facilitating the acquisition of motorcycles (see activity 2.2.2 below); and (iv) supporting creation of local professional organizations of veterinarians and paravets to improve their lobbying capacity and their access to inputs and services. Youth and women employment in private veterinary services will be promoted by applying gender sensitive selection criteria for selection of beneficiaries of training. The project will provide linkages with financial institutions for the private veterinarians and para-veterinarians to obtain financing for setting up their business enterprises.

108. ***Activity 2.1.4. Supporting access to water for production:*** The project will prioritise the selection of villages that already have adequate water supply for both human consumption and dairy production. The project will work closely with the district authorities to develop a water supply system for each village selected. In some villages, where milk production is already high and which are not yet on the district plan for water supply, the project will assist in the development of boreholes where feasible. The boreholes will be

[33] Vaccines must be stored in liquid nitrogen which is not easy to source, store and manipulate, and the vaccinated animals must be closely monitored because of possible side effects.
[34] Control of ticks which are the vectors of ECF, at community level requires collective infrastructures.

sited to serve a radius of 500m within the village and will be powered by solar energy to the extent possible. The district guidelines for development of community water system will be followed at all times.

109. The design and implementation of the water supply infrastructure will be led by the district officials, following the local government authority's guidelines. The formation of a community owned water supply organisation (COWSO) will be mandatory and they will be responsible for operation and maintenance. The COWSO will be trained by district officials, as is done under the Water and Sanitation Programme.

110. ***Activity 2.1.5. Supporting asset building mechanisms for targeted households:*** The project will support the incorporation of the most vulnerable households and youth who wish to embark in dairy production to production assets such as improved cattle, cowsheds and pasture. The modalities of this engagement will be threefold:

111. . The project will commission an assessment of the farm management procedures and practices of two livestock multiplication units (LMUs) located in the project area, in order to improve the sustainability of the farms and their contribution to the sector. The project could then support implementation of some of the audit recommendations, including provision of heifers (100) to each of the farms if the audit recommendations are properly implemented and include at a minimum a breakeven point financially partial restocking.

112. The project will assess and pilot existing mechanisms aimed at facilitating access to improved livestock for vulnerable rural youth. Of particular interest for this exercise will be the collective cowshed scheme which is being piloted in Zanzibar and in Rwanda with support from Heifer International; an exchange visit involving dairy farmers from the Southern Highlands will be organized to consider if this model could be replicated and piloted in the project area. A pilot programme targeting 150 youths operating in collective cowsheds could then be implemented for 15 groups of ten youth. Collective cowshed for 25-30 cows will be built by the project and the project will facilitate negotiations with village authorities to enable the group to access to communal land for the cowshed and fodder production. Access to water will also be facilitated by the project. The pilot will be reviewed during the mid-term review and scaled up if successful.

113. A pass on-the-gift programme will be implemented for 1,000 targeted very poor and vulnerable households without dairy cattle. Fifty groups of 20 households will be formed and 10 heifers will be provided to each group; the ten remaining households in the group will benefit from the next generation of heifers. In addition to the animals, the targeted households will benefit from a whole package of activities including training, extension services, group facilitation, etc. For the implementation of this activity, the project could partner with Heifer International.

114. As part of the direct targeting and empowerment strategy of the project, SHMDP will support ***financial literacy and leadership training for women farmers.*** This activity will also contribute to widen smallholder farmers' capacity to build assets required for dairy production, focusing on women. Financial literacy and leadership training are aimed at supporting women to: (i) manage changes in power dynamics that might occur in the household as a result of the value chain becoming more commercial; (ii) overcome the numeracy and self-confidence gap; and (iii) provide them with the necessary skills to gain access to financial services.

115. This activity will be a stepping stone for women to access trainings provided under component 1 – in a leadership pathway perspective. The activity will target 13500 women farmers who are engaged in production activities, prioritizing - but not limiting to - those in dual households. The roll-out strategy for training will follow additional information on socio-economic analysis of the project area (activity 2.3.3) and will seek to equally benefit all concerned districts, focusing on those communities with higher gender challenges. The selection of communities will be conducted by the with the zonal Extension & Producers' Organizations Officer, with the support of project the community development specialist.

Sub-component 2.2. Capacity building of service providers, extension workers and smallholder farmers

116. Together with sub-component 3.2 (Strengthening capacity for dairy training), this sub-component will address the capacity gaps related to production at both the farmers' level and the service provider/extensionist level.

117. ***Activity 2.2.1. Support existing network of public and private extensionists:*** In order to compensate the existing deficit in extensionists, the project will support the outreach of extensionists and their capacity to move quickly from one village to the other by providing motorcycles and extension kits. Motorcycles will be acquired directly by the extensionist, including for districts extensionists, in order to ensure the durability of the equipment. It is proposed to allocate a grant of 50% of the value of the motorcycle, and to facilitate access to bank financing for the rest. Banks should accept easily to finance this investment because of the possibility to use the motorcycle as collateral, and to be paid directly from salary deductions for public extensionists, which considerably reduces the risk.

118. In each district, the project will also support the re-organization of extension, in order to improve their efficiency and impact. An assessment of the organizational setup and of the extension delivery mechanism will be conducted, and based on this assessment, a transformation process will be initiated and supported.

119. ***Activity 2.2.2. Establishment of dairy farmers' field schools***: The project will assist dairy farmers and farm assistants to engage in a process of hands-on field-based learning over a production cycle covering "calf-to-calf" as a time-bound. It will assist the adaptation of improved technologies and practices in dairy farming and milk handling using methodologies focusing primary on facilitating smallholder dairy farmers to acquire and develop their knowledge, attitudes, and behaviour for increased milk productivity and quality, and improved nutrition.

120. Livestock Farmers Field Schools (L-FFSs) will be created when possible around similar production activities, and if possible anchored on existing interest groups/aggregation points such as village interest groups, dairy cooperatives, and hubs. By doing this, it is expected that L-FFSs will benefit from the existing group dynamics. L-FFSs will also strengthen existing groups, since the content of the training will cover technical, managerial and financial contents. A pilot of L-FFS in the project will make use of the Gender Action Learning System (GALS). This is a methodology aimed at (i) increasing awareness of gender roles in the households and communities; (ii) improving their capacity to negotiate their needs and interests'; and (iii) finding innovative, gender-equitable solutions in livelihoods planning and dairy value chain development. L-FFSs will target 12,750 dairy households and 5,250 farm assistants in a phased approach, in 240 FFSs (16 per district). The implementation process for this activity is presented in details in Attachment 1.

121. The main activities implemented under L-FFS will include:

- development of the FFS curriculum and training materials in local language(s)
- selection and the training of National Masters' Trainers (NMT)
- selection and the training of about 120 L-FFS facilitators (50% female)
- selection and training of 12,750 smallholder's dairy farmers and 5,250 farm assistants
- establishment and the facilitation of 240 FFSs, and 720 FFS groups
- supervision and guidance of the FFS Facilitators by the NMTs and District Extension officers
- regional exchange visits of FFS Masters' Trainers and selected FFS facilitators

Sub-component 2.3. Dissemination of climate smart technical and institutional innovations

122. In the scope of this sub-component, the project will strengthen collaboration between research centres (universities and TALIRI Research Institutes), the extension services, and the private sector, in order to enable technical innovations to be developed and disseminated at producers' level, and to enhance the participation of beneficiaries in research priority setting.

123. To address climate change challenges and the environmental impacts associated with dairy farming systems and strengthen the climate resilience of smallholder agro-pastoral farmers, the project will promote adaptation and mitigation measures according to each specific agro-ecological zone in the Southern Highlands. Dairy farming is a resource-intensive sector and the project will adopt a climate-smart innovation agenda that consists of: (i) supporting development of technologies to increase animal productivity through improved breeding, better animal feed, intensified pasture production and on-farm water availability and accessibility; (ii) improving livestock housing infrastructures; (iii) enhancing resource use efficiency along the dairy value chain (small-scale machineries powered by biogas or solar, rainwater harvesting systems, boreholes, concrete water pits, etc.); and (iv) reducing other externalities concomitant to dairy production (manure management, recycling of solid waste and wastewater, etc.).

124. ***Activity 2.3.1. Establishing local innovation platforms:*** Under this activity, consultation workshops between research organizations, extensionists, farmers and private sector actors will be organized in order to: (i) enhance collaboration between the different stakeholders and in particular facilitate partnerships between research and extension to deliver technical innovation at field level; (ii) help set research priorities in a participatory manner in line with farmers and private sector needs; and (iii) identify priority topics on which thematic innovation platforms could be established, and propose operating modalities and composition of these platforms (see below).

125. Thematic innovation platforms will be established at district level, to enable stakeholders to jointly (i) identify technical and institutional constraints faced by the production or other levels of the value chain, which could be addressed in research activities; (ii) identify existing local adaptation best practices in dairy farming; (iii) identify the technical innovations to develop, to test in research stations and pilot at farm level; and (iv)

collectively agree on innovative institutional arrangements that could improve the performance of the value chain.

126. Research centres will also be encouraged to partner with extension workers from the districts to: (i) implement joint research/extension training of farmers on prioritized technical topics; (ii) establish pilot and demonstrations at farm level; and (iii) organize information sessions for extensionists in research centres, in order to update extension workers on the technical innovations available or under development.

127. ***Activity 2.3.2. Supporting development and testing of technical innovations:*** The project will support research centres to identify, develop, test and pilot technical innovations which are adapted to the socio-economic, agro-ecological, technical context of smallholder dairy production in the Southern Highlands, including water and climate change related challenges. The research topics will be determined in the consultation fora mentioned in description of activity 2.3.1 above. Research could be conducted preferably on farm or on station, in collaboration with extension workers from the districts, and in conjunction with L-FFSs.

128. L-FFS groups will be the preferred entry points and delivery mechanism for promoting innovations at farmer level under this activity. Each L-FFS group will be supported to test and pilot in real conditions technical innovations developed under this activity. The FFS facilitator will suggest innovations to be tested in consultation with the trainees; and the proposal will have to be validated by the supervisor for project support to be released.

129. ***Activity 2.3.3. Supporting research and innovation.*** During the first two years of implementation of the SHMDP, research organizations will be contracted by the project to conduct baseline research, required to guide implementation of activities. This could include the following topics: mapping of feed resources, mapping of genetic resources, formulation of a breeding strategy, animal health surveys and disease impact evaluation, feeds analysis and seasonal monitoring of on-farm feed availability impact of climate variability on animal health and production, forage production, and emissions of Green-house gas (GHG) by dairy production systems.

130. In coordination with activity 3.1.2 (below), research organizations could also be contracted by the SHMDP to generate information and evidence to be used as basis for policy dialogue. This could include: (i) socio-economic analysis on various topics of interest for policy dialogue and (ii) utilisation of economic and policy models (LSIPT[35], Extrapolate[36]) to test policy options.

131. In addition, the project will build synergies with the two IFAD-funded Agriculture for Research for Development grants: The first grant recipient ILRI will assess incentive based interventions for reducing the impact of livestock in East Africa, and the second grant recipient CIAT will focus its research on climate smart dairy systems in East Africa through improved forages and feeding strategies.

132. ***Activity 2.3.4. Organization of regional exchanges with neighbouring countries for promotion of technical and organisational innovations:*** The project will organize exchange visits for various target groups (farmers groups, private service providers, district technical and extension staff, ministry staff, and other value chain actors) on technical and organisational arrangements, which would be of real value such as: (i) organizational models including 4P arrangements and stakeholders organization models for improved access to services, inputs and knowledge; (ii) technical innovations exchanges; (iii) policy dialogue mechanisms; (iv) research/extension arrangements; and (v) extension delivery models including L-FFS and GALS in the context of L-FFS.

133. ***Implementation arrangements:*** At zonal level, the component will be implemented under the responsibility of the ZPMU. Under the responsibility of the head of ZPMU, a team composed of (i) a Dairy Production Officer (DPO) and (ii) an Extension & Producers' Organizations Officer (EPOO), will support the implementation of the activities of this component at zonal and district levels. The DPO will be the component leader. When needed, the animal production expert will be supported with highly qualified consultants which could include (but not limited to): (i) animal health experts, in particular a specialist of disease surveillance and control of TADs, and a specialist of tick borne diseases; (ii) an AI/breeding specialist; (iii) a FFS expert; and (iv) an animal feeds and forage specialist. The main responsibilities and tasks of the two experts who compose the component team are detailed in Appendix 5.

134. At district level, the activities of his component will be implemented under the responsibility and coordination of the District Livestock Officer, assisted by district staff at headquarter level. The District Veterinary Officer will be specifically in charge of activity 2.1.3 (Improving the animal health status of the dairy

[35] Livestock Sector Investment Policy Toolkit is a model which can be used to build an economic model of the livestock sector in a region or a country and simulate and test various policy options and analyse their impact.
[36] Extrapolate, a Livestock Policy tool developed by FAO, could be used to support the formulation of the Dairy Master Plan, which could be derived from the National Livestock Master Plan currently being developed by ILRI.

herd), and the District Extension Officer of all activities under sub-component 2.2 (Supporting capacity building of service providers, extension workers and farmers).

Component 3: Supporting an enabling policy and institutional environment for dairy development (US$ 2.51 million)

135. The expected outcome of this component is to contribute towards an enabling policy and institutional environment that attracts and incentivises productive private investment along the dairy value chain. This will be achieved through two sub-components:

- Support to evidence-based and inclusive policy dialogue
- Strengthening institutional capacity for dairy training

Rationale

154. In the dairy sector, the regulatory and fiscal environment has been criticised by processors as being a disincentive to private investment, and it also undermines its viability and ability to compete with imports of processed milk and the informal sector. There also remain ambiguities in terms of the relative roles of public and private sectors along the value chain; a lack of a common vision for the sector, but also opportunities for the building of relations – and business opportunities – between the different players are lost. The Tanzania Dairy Board has a key role to play in both promoting and regulating the dairy sector, as well as convening stakeholders through the Dairy Development Forum, though due to its limited capacity it has to date been unable to fulfil its mandate in these areas.

155. SHDMP can make an important contribution to establishing an enabling policy framework that above all: (i) provides an incentive to investment along the dairy value chain; (ii) encourages actors in the dairy value chain to expand and upgrade their businesses and move gradually from the informal to the formal sector; and (iii) offers the sector the opportunity to compete with dairy imports on an even playing field. Experience from Kenya and Uganda shows the critical importance of a strong dairy board or equivalent, in bringing stakeholders together and promoting the sector based on a shared vision and understanding, and agreement as to the appropriate and complementary roles and responsibilities of the public and private sectors.

156. Component 3 will assist in addressing key policy and regulatory bottlenecks constraining the development of the dairy sector and transformation of the sector to a vibrant investment and commercialised sector that can increase the incomes of rural producers, improve production and milk consumption. This support will take advantage of the new initiatives in the livestock sector, to create a more positive and enabling business environment. In particular, it will take as its point of departure the Livestock Master Plan, and it will work closely with L-MIRA and support its efforts at policy and regulatory reform

Description of activities

Sub-component 3.1. Support to evidence-based and inclusive policy dialogue

136. There are three sets of activities proposed under this sub-component: (i) Strengthening stakeholder dialogue at all levels; (ii) conducting policy studies, analysis and follow-up; and (iii) strengthening the capacity of Tanzania Dairy Board.

137. ***Activity 3.1.1. Strengthening stakeholder dialogue at all levels:*** The Dairy Development Forum has provided a national forum for policy dialogue amongst dairy sector stakeholders, and it has had some success at bringing about pro-dairy sector policy change. However, the dialogue it has brought about has remained at national level and the same will be true of L-MIRA, which also has a national focus. Both lack linkages to local-level stakeholders and realities; and therefore support for policy processes at the district and zonal levels could provide an important complement to these other initiatives, and inform and enrich them, as well as having a more direct value at the local level.

138. The project would therefore start by identifying the relevant actors, institutions and activities in the dairy sector at district level, and inviting them to become members of a district-specific multi-stakeholder dairy platforms (MDP). Members would be drawn from the groups shown in the Box below, though membership would be open to all economic actors with a

Potential members of a district multi-stakeholder dairy platform:

- Livestock extension staff
- Any other relevant staff of district/ of MALF and its agencies
- Veterinarians/para-vets
- Input suppliers
- Artificial inseminators
- Groups/organizations of dairy producers
- Dairy processors (informal as well as formal)
- Milk traders / hawkers
- Milk transporters
- Large dairy farmers/livestock farms

legitimate interest in the sector: they may be expected to number around 30 or so per district.

139. The first task of the platform will be to define the district 'cluster' and contribute to the definition of a joint action plan and specific project activities within each cluster (see Appendix 5). It will therefore be necessary to identify its membership immediately at project start-up.

140. In establishing the platform as a forum for policy discussion, the ZPMU would conduct a short study intended to draw out the lessons from the Tanga Region stakeholder platform, and use these to inform the approach to be used under the project.

141. The project will then provide support to convene, facilitate and support as necessary regular multi-stakeholder forums in each of the participating project districts. From PY2 onwards, these are expected to be held in all project districts 4 times p.a.. The dialogue at these levels could be expected to enable the different stakeholders to understand better the perspectives of each other and build trust among them, which would in turn make it possible to: (i) identify local-specific policy constraints; (ii) better prioritise and target public sector support, through and beyond the project; (iii) identify win-win opportunities for greater collaboration; establish commercial relations between farmers and other private sector operators; and (iv) provide lessons and experience that could enrich the national level dialogue.

142. On the basis of the district level platforms, a zonal platform would also be established and supported. This would be expected to be made up in large part of members of the district platform, as well as those players (such as e.g. the Regional Livestock Advisors or ASAS dairies) whose involvement in the sector goes beyond the district level. The zonal platform would have similar scope as those at district level; though focusing on issues that go beyond district boundaries. In supporting the district and zonal levels, the project would also seek to broaden the membership of the national DDF by bringing in new stakeholders and representation of local level farmers' groups. The participation of women and women-led groups will be promoted both for district and zonal platforms through targeted awareness raising and information sharing.

143. ***Activity 3.1.2. Conducting policy studies, analysis and follow-up:*** The project would support the conducting of policy reviews and studies that could inform these policy processes. At this stage, it is possible to identify a number of potential study topics. These should all be confirmed by the Project Steering Committee; however, they might include for example:

- A review of taxation structure and levels across the dairy sector – and particularly for milk processors – and its implications for the development of the sector. Such a study would complement L-MIRA's focus on fees paid for registration, inspection, licensing etc.
- An assessment of the arrangements for management and operation of the Kitulo and Sao Hill Livestock Multiplication Units, and development of options aimed at enabling the LMUs to contribute more effectively to the development of the sector. Possible options might include enabling autonomous management, leasing out of farm facilities, etc
- A review of the organization of extension service delivery, and approaches for recognising or certifying private extension suppliers.

144. The need for relevant, policy-focused studies would emerge in the course of project implementation, emerging from three main sources: (i) discussion at the platforms and the issues identified by stakeholders there; (ii) issues emerging directly from the project implementation experience, as identified by the ZPMU; and (iii) from gaps identified by stakeholders in the other ongoing policy-related initiatives in the sector – particularly L-MIRA. A key role for all such studies would be to build on the Livestock Master Plan and the associated investment plan for the dairy sector, and to contribute assisting all stakeholders to arrive at a shared vision for the development of the dairy sector, and the appropriate and relative roles of public and private sectors. The findings of all studies and analysis could be presented to the national DDF, as well as to the Agricultural Sector Consultative Group under ASDP2.

145. ***Activity 3.1.3. Supporting the Tanzania Dairy Board:*** The TDB currently lacks the capacity to perform the critical roles mandated of it, relative to both the promotion and the regulation of the sector. It is beyond the scope of SHDMP to provide a comprehensive package of capacity-building support to TDB nevertheless, the TDB does has a crucial role to play in convening stakeholders from across the dairy sector and thus assisting the TDB to perform this relatively specific role can make an important contribution to the project to achieving its outcomes and overall development objective.

146. The project will therefore provide support to improve TDB's ability to respond to its mandated role of convening dairy stakeholders, to the extent that these enable TDB to contribute to the achievement of the objectives of SHMDP. The project would: (i) finance short- and medium-term consultancy requirements relative to specific tasks to be undertaken (though it would not finance line positions) – including for example, the preparation of policy briefs for discussion by dairy sector stakeholders and submission to government, or communication materials for its members; (ii) support training for TDB staff and its stakeholders – including,

potentially, for exchange visits to other dairy boards in the region); and (iii) support it in any other ways required for it to effectively fulfil its role as secretariat of an expanded and vigorous DDF, including the financing of the Forum itself.

147. An additional role consistent with its mandate that the project could support TDB to perform relates to certification: particularly certification of conformity to good practice, for the different players in the dairy value chain, and certification for training courses and their participants. In order to play this role, the project would assist TDB to (i) develop standards for each type of facility (these could be derived from the existing East African ones if they don't exist yet at national level); (ii) train TDB staff to conduct the certification on the basis of those standards; and (iii) develop guidelines for helping actors to comply with standards (again, drawing on those already prepared in neighbouring countries). A consultant would be competitively recruited in order to carry out these tasks.

Sub-component 3.2. Strengthening institutional capacity for dairy training

148. There is a chronic lack of dairy specialists in Tanzania, and it affects both the dairy processing industry, and the provision of public and private services to dairy producers, including extension. No institutions currently offer a specialized training curriculum, or specialization in dairy production or dairy technology. While creating opportunities for specialised dairy training in Tanzania needs to be a priority for Government, it is beyond the scope of this project to address issues of education and training policy, SHMDP will make some investment in capacity strengthening for dairy training relevant to its target regions if it is to achieve its objectives; this sub-component offers a set of proposals for doing so.

149. The project will work with the Livestock Training Agency (LITA) [37], supported by Sokoine University of Agriculture and the Director of Training in MALF, to carry out four sets of activities. First, it will develop tailored short-term training modules for key service providers and actors in the dairy value chain in the Southern Highlands: these training modules will particularly target extension staff and other private service providers such as inputs dealers, private vets and paravets, who are usually certificate and diploma holders, sometimes degree holders. Each one week training module will be administrated jointly by MALF/LITA Trainers and TALIRI researchers, to cohorts of 30 technicians. The training will be residential and will take place either in the MALF/LITA Training Centres, or in other regional training facilities. The training modules will contain both theoretical sessions and hands on sessions organized in farms and research stations. Three different training modules will be developed and administered, on: (i) Animal feeding and forage production; (ii) Genetics and reproduction; and (iii) Animal health, milk safety and quality (including milk in human nutrition).

150. At the end of the project, all public extensionists in the area (300 currently) should have followed the three modules mentioned above, as well as 50% of the private service providers (approx. 300 in total). The project will cover the costs of transport, accommodation and subsistence of the trainees, as well as the training costs.

151. Second, it will finance government staff, and part-finance selected non-government staff, to enable them to participate in the training modules developed. At the end of the project, all public extensionists in the area (300 currently) should have followed the three modules mentioned above, as well as 50% of the private service providers. The project will cover the costs of transport, accommodation and subsistence of the trainees, as well as the training costs.

152. Third, it will develop a pool of specialist trainers, potentially drawn from LITA, Sokoine University of Agriculture and the regions themselves, after training them at appropriate institutions. Potential training institutions could include the Naivasha Dairy Training Institute and the Egerton University in Nakuru in Kenya. Training of Trainers sessions could also be organized in the project area, with the support of international or regional trainers. Ten Trainers will be trained in each of the three specialities mentioned above (Animal feeding and forage production, Genetics and reproduction, Animal health and milk safety and quality).

153. Fourth, it will part-finance an initial cohort of participants in the six-month post-diploma specialization training course in dairy technology at Sokoine University of Agriculture. The participants will be selected by the project; dairy technologists already operating in formal or informal processing facilities in the region will be considered a priority. Fresh diploma holders who want to engage in dairy processing will also be considered if they have a concrete business project or employment perspectives in an existing processing facility.

154. ***Implementation arrangements:*** MALF will have overall responsibility of this component under its directorate of policy and planning (DPP). DPP will provide coordination support to the key public institutions

[37] LITA has six campuses in the country, including one in the project area, LITA Madaba, which will be the priority beneficiary of this partnership and support.

involved in the dairy industry stakeholders who are key in policy development. These include institutions in the (i) MALF such as TDB, Director of Veterinary Services, Veterinary Council, Research institutes (TALIRI)); and LITA; (ii) the Prime Minister's Office through Ministry of Local Government and Regional Administration; (iii) private sector represented by business member organizations such as Tanzania Milk Producers Association (TAMPA), the Tanzania Milk Producers' Association (TAMPRODA), Tanzania Chamber of Commerce and Industry and Agriculture (TCCIA), the Agriculture Council of Tanzania (ACT), Confederation of Tanzania Industries (TCI) and the Tanzania Private Sector foundation (TPSF), SAGCOT and National business council . DPP will be responsible in organizing stakeholders policy discussions and managing its core function of policy formulation.

Attachment 1: Detailed description of activity "2.2.2. Establishment of dairy farmers' field schools"

Livestock Farmers' Field Schools objectives and approach

1. The objective of the Livestock Farmers' Field Schools (L-FFSs) is to enhance the capacity of male and female smallholders' dairy farmers and farm assistants to improve their knowledge, attitude, and behaviour for increased milk productivity and quality. The project will assist the adaptation of improved technologies and practices in dairy farming and milk handling using methodologies focusing primary on facilitating smallholders' dairy farmers and farm assistants to acquire and develop their knowledge, attitudes, and behaviour. To this end, the project will adopt the L-FFS approach as the main channel for providing capacity building to targeted project's beneficiaries at farm level.

2. The FFS brings together a group of farmers and farm assistants to engage in a process of hands-on field-based learning over a season/production cycle as a time-bound activity, with a beginning and an end. For livestock-based FFS it may cover a "calf to calf" cycle. This initial basic learning cycle aims to strengthen farmers' and farm assistants' skills and knowledge for critical analysis, to test and validate new practices to make informed decisions on field management. The learning process in the FFS reinforces understanding of complex ecological relations in the field. The basic learning cycle also aims at enhancing group cohesion of participants to better work as a group and build the potential basis for more sustainable economic interest groups (milk collecting groups or cooperatives for instance). Through group dynamics exercises and discussions, FFS helps create a basic understanding of how groups function. The FFS also includes activities that encourage participants in critical analysis and evaluation, and planning for further action once the FFS basic learning cycle is completed.

3. A FFS is usually initiated by an extension staff or a skilled farmer who is trained by Master Trainers (MT) in season-long courses to become facilitators of their groups of farmers and farm assistants. The FFS teach basic agricultural and management skills. In addition to technical skills, facilitation skills, group dynamic and group building methods are also included in the training.

4. A pilot of FFS in this project will make use of the Gender Action Learning System (GALS). FFS provide a very suitable context for using GALS, for this methodology will support improved livelihood planning through more equitable decision making and workload distribution within the household.

5. FFS will also support the pilot of more efficient and resilient pasture production and natural resources management, In particular, FFS will be the starting point for the implementation of participatory natural resource mapping exercises that will also led to the identification and registration of communal grazing land suitable for more intensive and resilient pasture production. These mapping exercise will also seek synergies with ongoing Village Land Use Plans processes supported by district authorities and other development partners.

6. According to the GoT[1], 2,164 FFSs have been established in Tanzania, including 444 on dairy production. 188 dairy FFSs are reported to be operating in the project area according to the same source, including 161 in Ruvuma Region alone. These L-FFSs have been established under the ASDP I[2] programme in 2012; some of these L-FFS groups are reported to be still active to date, but probably with a reduced level of activity due to the absence of financial support. However, the project will document and build on the learn lessons learnt from this experience.

7. In this project, it is anticipated that during the course of the project, about 12,750 smallholder's dairy farmers and 5,250 farm assistants will be trained through the L-FFS approach in 240 FFSs. Out of these, 4,000 female farmers will be benefitting from the GALS.

8. The curriculum of the L-FFS will follow the natural cycle of the animals. It will expose dairy farmers to a large range of subjects including but not limited to: (i) animal health; (ii) husbandry practices and management of reproduction cycle; (iii) animal nutrition, improved pasture production and, land use; (iv) milk handling and hygiene; (v) animal genetic resources management; (vi) climate smart technologies and livestock crop integration; (vii) household economy; (viii) nutrition; and (ix) gender and participative planning and decision-making. During the L-FFS session, a specific attention will be given to discuss the benefits of establishing farmers' organizations to facilitate access to market, services and inputs. It is envisaged that FFS

[1] Basic data for livestock and fisheries sectors. MALF. 2013
[2] Agriculture Sector Development Programme

groups constitute the foundations to establish for instance milk collecting points, milk collecting centers or improved pasture production units on communal grazing lands.

9. The activities will be implemented under the responsibility of the extension / producers' organizations specialist who will be recruited within the ZPMU. A Coordination and Technical Committee (CTC) for the L-FFS activities of the project will be established. The mandate and the composition of the CTC will be detailed during the second design mission.

Description of implementation process

Development of the L-FFS curriculum and training materials

10. The development of the L-FFS curriculum and training materials will be the first step in the process. The main expected products of the activity will be (i) a modular ToT manual for L-FFS Facilitators and various training materials such as audio-visual support materials; and (ii) a number of simple factsheets and brochures for each modules of the training manual to give to farmers during the L-FFS' sessions. The development of the L-FFS should be based on curricula already developed and administered in the region, and its update should be done in close collaboration with already experienced L-FFS facilitators and Master Trainers, as well as the researchers, experts and lead farmers

11. The development of the L-FFS curriculum and training materials will be outsourced to a team of national consultants specialized in various subjects supported by a qualified international expertise to assist with technical and methodological aspects. The curriculum will follow the natural reproduction and production cycle of the animals. When preparing training materials, a specific effort will be made to be practical and operational and avoid being academic. The design, lay-out and translation of training materials will be done by a locally hired service provider. The project will finance (i) the general activities of the Coordination and Technical Committee including the organization of retreats and workshops; (ii) the national and international expertise; (iii) the translation, duplication and printing of training manual and materials; and (iv) the production of audio-visual support materials for the L-FFS facilitators.

Selection and training of National Master Trainers

12. The project will ensure the training of 5 MTs (one per region) in order to fulfil the needs of the project. The training of the national MTs will last a total of 12 months including: (i) a period of full-time residential training of 3 months in the project area; (ii) a one week study tour in a neighbouring country with proven experience in L-FFS; and (iii) a period of nine months of field practices of which three months with the support of the International Masters' Trainers (IMT), and the following six months alone with regular supervision visits of the IMT. MTs will be paid by the project.

13. The training of the MTs will be outsourced to a recognized and qualified IMT to be recruited in accordance with the procurement procedures of the project. The contract of the IMT will include a residential expertise in Tanzania for the first six months of the training and supervision missions (one mission per quarter i.e. a total of three missions of about two weeks) to supervise the MTs. The IMT will be responsible to: (i) organize and conduct the training of the national MTs; (ii) assist the CTC for L-FFS in the organization and planning of the L-FFS activities; and (iii) provide guidance and support the preparation of the training manuals and materials for the L-FFS. Two Master trainers that will integrate GALS will benefit from additional training, to be provided by expert organizations, with a good track of experience in Tanzania or neighbouring country.

14. The project will finance the (i) salaries, per diem, transport and operational costs of the IMT; (ii) residential training of MTs; (iii) salaries of MTs; (iv) field visits (per diem and transports); and (v) organization of meetings.

Selection and training of the L-FFS facilitators

15. The project will support the training (ToT) delivered by the national of Master Trainers to 120 facilitators in two steps: (i) in Year 2, training of 60 facilitators (1st generation of facilitators), in three groups of 20, selected within the farmers' and farm assistants' communities; and (ii) in Year 3, training of additional

60 facilitators (2nd generation of facilitators), still in 3 groups of 20, selected among graduated farmers of the 1st generation of facilitators[3]. Out of 120 facilitators, 24 will be trained to become GALS facilitators.

16. Prior to the selection of the facilitators, the MTs and the District staff will undertake field visits to sensitize and mobilize farmers in the 15 districts. The selection process will be done at community level under the supervision of the CCTC for the L-FFS and Representative(s) of the District offices (District extension officers and livestock officers). It will be done on a demand-driven basis, pre-defined criteria:

(a) Be a male or female smallholder dairy farmer and raising at least one dairy cow;

(b) Be an active member of the local communities recognized for being honest, open minded and active as well as a person of integrity;

(c) Have a minimum of literacy with writing and reading capacities to ensure better retention and transmission of knowledge; and

(d) Be a motivated and willing to invest time and effort in learning and training.

17. Female farmers will be particularly encouraged to apply and volunteer. The project will target a minimum of 50% of facilitators being women[4]. There will make provision for on-site childcare facilities and adapted programmes that will enable women, including those in charge of households, to cope with childrearing and other household responsibilities while spending time away from home.

18. The selected facilitators will be trained (ToT) by the national Master Trainers. For each generation of facilitators, ToT's sessions will be carried out over one year to allow covering the entire production cycle of the dairy production and be exposed to each and every steps of production from mating to birth, calf rearing, milking, and marketing in both dry and rainy seasons.

19. The ToT will be structured over three type of activities:

(a) *Residential training* (one week every month during one year, could take place in LITA Madaba) covering theoretical lessons on the concept of L-FFS methodology and the various technical aspects covered by the L-FFS (dairy production but also human nutrition, gender equity, cooperatives building, etc.);

(b) *Practical lessons and demonstration* with L-FFS groups, hosted at a farm of a group member. This will take the most part of the ToT sessions; and

(c) *Field visits and study tours* for NMTs and selected facilitators, to illustrate and demonstrate the diversity of experiences in FFS and dairy production, in the Country or in the Region (Uganda, Kenya, Rwanda). The GALS NMTs and will benefit from a specific one week exchange visit in a neighbouring country with proven experience of FFS implementing GALS.

20. The 1st ToT (60 facilitators) will start during the second year of the project. The 2nd ToT will start during the third year. The MTs will be responsible to plan and conduct the ToTs. They will be responsible for organizing classrooms and field works. Throughout the implementation process, the MTs will play a supervisory and coaching role of facilitators (one MT for 16 facilitators). The project has made budget provision for the MT's supervision missions (5 days per each quarter).

21. During the training of FFS facilitators, in year 2, 10 FFSs (as identified through mapping) will be opened close to the training venue to facilitate practical learning.

22. Refresher courses will be organized for all trained facilitators: one week residential refresher courses will be facilitated by the MT at regional level every two years.

[3] The training for the second generation of facilitators might be simplified and shortened since they have gone and graduated from a season-long FFS. They will be given facilitation skills and additional technical skills that may not be as intensive as the first training.
[4] This ratio might not be achievable for the first generation training that might require being away from home for a long time, because of the longer duration of the training. In this case, the project will increase their percentage in the second generation training to compensate.

Selection and training of beneficiaries and establishment of L-FFS

23. L-FFS will be established according to the roll-out schedule presented below:

Year	Y1	Y2	Y3	Y4	Y5	Y6	Total cumulated
Districts	Training of MTs	5	15	15	15	15	15
FFS *(GALS FFS)*		10[5]	60 *(12)*	180 *(36)*	240 *(45)*	240 *(45)*	240 *(45)*
Farmers *(GALS Farmers)*		250[2]	1,500 *(300)*	3,250 *(1,000)*	4,000 *(1,000)*	4,000 *(1,700)*	12,750 *(4000)*
Farm assistants				1,250	2,000	2,000	5,250

24. Prior to initiate their first group of L-FFSs, each facilitator will sign a contract with the project and their respective districts.

25. While being trained, facilitators will establish their first group of L-FFSs. In order to build a deep understanding of the subjects and create a strong connection among members, the group size will be limited to 25 male and female participants. The cycle of each L-FFS will last 1.5 year, which allows participants to assist to all steps of a cow production life cycle and to an entire production cycle of fodder. Every facilitator will be responsible to organize, train and follow 1 L-FFS group per year during their first year of exercise (each group meets once a week for half a day) and two L-FFSs starting from their second year of exercise. While the facilitators start working with two news L-FFS groups, they will also continue to assist and monitor activities of L-FFS trained the year before for a period of six months (meeting each group once every two weeks).

26. Smallholder's dairy farmers and farm assistants will be identified and selected on a demand-driven basis by the facilitators in close collaboration with the sector authorities. The selection criteria would include consideration on gender, youth and social inclusion as well as age, sex and wealth categories (as defined in the targeting strategy). The process will be supervised by the District authorities and the CTC.

27. During the period of running the FFS, one or two field days will be organized to allow the rest of the farming community to share what the group has learned in the L-FSS.

28. Overall the project will support the establishment and training activities of seven L-FFSs per facilitator of the 1st generation, and five L-FFS per facilitator of 2nd generation i.e. a total of 720 L-FFS groups and 12,750 farmers and 5,250 farm assistants, trained in 240 schools, during the project period. Within the L-FFS the project will finance: (i) honorarium of facilitators (10 dollars/day worked); (ii) purchase of one bicycle for each facilitator; and (iii) a lump sum for every FFS group to allow the purchase of demonstration materials and equipment (such as forage's seeds and vegetative materials, hay conservation, etc.) to test and pilot in real conditions technical innovations promoted by the project. The FFS facilitator will suggest innovations to be tested using this lump sum, in consultation with the trainees; and the proposal will have to be validated by the supervisor for the funds to be released.

29. All FFSs will include field based pre and post-tests for the participants. Participants with high attendance rates and who master the field skill tests will be awarded graduation certificates. This is a form of encouragement as for participants, the FFS is the first time that they have graduated from any school or received a certificate in recognition of their farming skills, a point of great pride to many families. The test

[5] FFSs opened close to training venue to facilitate practical learning during training of FFS facilitators.

results as well as some additional information on adoption and knowledge of the trainees should feed into the M&E system of the project. It is with this graduation of the first FFS that the selection of the second generation facilitators will take place; it will be done by the facilitator in agreement with the FFS group, taking into account criteria such as the technical capacity, leadership, trust by the group, passion to support others.

Supervision of L-FFS facilitators

The project will finance the regular supervision and guidance missions of the facilitators by the MTs and District extension officers and livestock officers. The objective of these mission will be to: (i) ensure continuous supports from dairy specialists; (ii) provide any needed technical and organizational support to both facilitators and FFS groups; and (iii) monitor and assess the quality of the trainings, and progressively disqualify facilitators who fail to fulfil their role in order to replace them.

Attachment 2: Land tenure measures -- enabling communal grazing land and youth group managed cowsheds through Village Land-Use Planning

1. Objectives and approach

The objective of the land tenure measures described in this Attachment is to provide an enabling environment for the secure and sustainable implementation of two pilots described in Appendix 4 being: (i) identify, secure and improve communal grazing land for intensive pasture production; and (ii) pilot cowshed schemes managed by youth.

The grazing patterns of dairy farmers in the five regions vary from district to district and depend on multiple factors including land availability and individual plot size (see Appendix 12B SECAP review note: "Grazing patterns and land tenure security"). Regardless the grazing pattern, pasture production and water collection are the most intensive and time consuming activities associated with dairy production. Cut and carry or grazing activities are usually carried out twice per day or alternatively employs several members of the family, especially women, youth and children. Forage activity becomes even more intensive during dry season when pasture availability is reduced and farmers have to walk longer distances to find (poor quality) pasture on "free" land. Moreover, it has been observed that some better off farmers with more than three cows that have increased their milk production and thus their incomes, have invested in the purchase of new plots to produce pasture and are often dependent (especially during dry season) on pasture produced by third parties, either young people for cut and carry activities or research institutes producing bales for sale. Against this framework, the identification and improvement of pasture production on communal grazing land seek to contribute to increase the volume of milk by intensifying pasture production while spreading the benefits of dairy production among marginalised groups without cows and with indirect or no access to land.

Similarly, the proposed piloting of youth group managed cowsheds on village land intends to target youth without cows and limited access to land. Young people are often working on the family plot and usually only access land through inheritance or when they marry or start a family. It is rare to encounter *inter-vivos* transfer of land to young people. Furthermore, the costs related to the construction of a cowshed and its management are additional obstacles for the inclusion of youth into the dairy production. In this context, the project will pilot collective cowsheds managed by young people that will be established on designated and secured village land. These cowsheds will allow for the introduction of youth to dairy while piloting and demonstrating a new cost and labour effective model for dairy production that could be eventually scaled up. To enable the pilot, the project will support land tenure measures to provide an enabling environment for the identification and secured allocation of village land for the cowsheds.

In addition to the support provided to participatory natural resources mapping exercises (see Appendix 4), the project will support district authorities with the implementation of Village Land-Use Plans (VLUPs) through which land uses will be identified and village land for communal grazing and youth managed cowsheds will be registered and secured with Certificates of Customary Rights of Occupancy (CCRO). Though the VLUPs, the project will enhance a participatory process for the secure allocation of land while contributing to land tenure security and natural resources management at village level.

2. Description of implementation process

A. Identification and improvement of communal grazing land

The project will support the identification and improvement of communal pasture land in order to increase the quality and quantity of pasture throughout the year, raise household labour efficiency and contribute to land tenure security and resilient natural resources management. The projects intends to build on existing cut and carry practices of youth and women to develop business opportunities around improved and more intense pasture production and distribution.

The project will firstly support the identification and allocation of accessible communal grazing lands through participatory process of mapping of natural resources and, where relevant, VLUPs. While the VLUP process will be led by district and village authorities (see section C: Process and associated costs for VLUP and communal land certification), the mapping exercises will be supported by TALIRI. In both cases, the project will ensure the inclusiveness and transparency of the processes in order to take into account the needs and claims of different land and natural resources users, including FFSs, traditional livestock keepers, crop farmers, etc. Moreover, the mapping should aim to encompass village boundaries in order to address intra-

village needs and support dairy farmers clusters. The identification and allocation of grazing land seeks to provide an enabling environment to the improvement and intensification of resilient pasture production. Thus, the mapping and VLUP exercises will take into account the suitability for more intensive pasture production, including potential infrastructure improvement (i.e. irrigation schemes) as well as the accessibility of grazing land, water points and stock routes for dairy farmers and other users. In the villages with an existing VLUP or where the VLUP will be supported, the allocation of communal land for grazing will be secured and formalised by the issuance of CCROs which will be registered in the Village and District Registries.

Once the communal land is allocated and secured, the project will facilitate the collaboration between FFSs, village authorities and research institutes/service providers to design a management plan for the improvement and intensification of pasture production on the grazing land. The design will take into account the opportunities and constraints of the context and will integrate adapted improvement measures that will include land preparation, communal grazing land use planning, selection of improved pasture species and varieties and climate smart adaptation technologies (especially for dry season) and eventual infrastructure improvement (irrigation, harvesting, processing and transport improved technologies). This process will seek synergies with FFS in term of (i) existing and new aggregations; (ii) capacity building on improved pasture production (see Attachment 1, Appendix 4); and (iii) identifying potential entrepreneurs in the village (especially among youth and women) that could be involved in new business opportunities created by pasture production.

B. Secure village land for youth group managed cowsheds

The project will support the establishment of cowsheds to be managed by youth groups and established on village land. Prior to the VLUP process, the project will support through FFSs the design of adapted business models for youth groups-managed cowsheds that will include information such as required size of the plot, planned land-use and infrastructure needs (i.e. connection to electricity grid and water supply system) but also on the entity and social structure that will manage the unit. These data will inform the negotiation during the VLUP.

In the selected villages where the piloting of youth groups-managed cowsheds will take place, the project will support the VLUP process and the negotiation among district authorities, village authorities and land users for the allocation of a suitable plot of land for the cowsheds and related pasture unit. The designated land for the cowsheds will be secured through the issuance of a communal CCRO that will be registered in the Village and District Registries.

C. Process and associated costs for village land use planning and land certification[1]

The Village Land Act, No. 5 of 1999 and its 2002 regulations, the Land Use Planning Act, No. 6 of 2007, and the Guidelines for Participatory Village Land-Use Planning, Administration and Management in Tanzania, (Second Edition, 2013) outline the process and associated costs for village land-use planning and land registration. The process is initiated at District level with the establishment of a multi-disciplinary District planning team (PLUM) which identifies priority villages and an action plan for village land-use planning. This is followed by introductory/sensitization meetings with the Village Council (VC) and Village Assembly (VA) and then Property Registration Authority (PRA) and community action planning processes facilitated in collaboration with the Village Council and Village Land Use Management Committees (VLUMC) and the participation of hamlet and various interest groups, including men, women, youth and various land users. The PRAs will collect socio-economic information, land use and land-use conflicts and future land-use needs, etc. and the CAPs will detail the actions for addressing land conflicts and future land use. The PRAs are followed by a village boundary survey, base map preparation, mapping of existing land use and compilation of bio-physical data, assuming this was not already collected during the PRAs. After this, draft village land-use plans and by-laws will be drafted, reviewed and revised by the VC and then the VA for final approval. The VLUPs are expected to cover all major land uses including for settlement, community/public facilities, crop farming, grazing, water sources, forest and wildlife reserves. Copies of the VLUPs are to be registered with the District Council and National Land Use Planning Commission. Once the plan is approved, land-use areas are to be demarcated, including with sign boards. Implementation of and compliance to the VLUP is monitored by the District PLUM, VC and VLUMC.

[1] Adapted text from BASIC Technical Annex-VLUP&TS-18-07-2014.

Land registration requires that a Village Land Certificate has been issued to the VC designating its physical area of jurisdiction, a VLUP has been approved and District and Village Land Registries (DLRs and VLRs, respectively) have been established. DLRs require office space, equipment and staff under the supervision of an authorized District Land Officer (DLO). The VLR require an office, preferably a room adjacent to the Village Executive Officer (VEO). Although systematic adjudication is preferred, the project will cover the costs of the issue of communal land certificate for grazing land and well as communal land certificate for the space that will be allocated to communal cowsheds and related pasture land. The project will seek synergies with district authorities and other development partners to widespread community sensitization on the importance of CCROs and increase the demand for the adjudication of individual CCROs

In the allocation of these CCROs, agreements or disagreements on boundaries and ownership or use are to be recorded. Once agreement has been reached, parcel identification numbers are provided and parcel boundaries are to be surveyed, using where possible, satellite imagery, ortho-photos, aerial photography or GPS. Parcel data is to be captured in the District Land Registry GIS and a map of land parcel boundaries are to be produced. Hard copies of parcel records and the parcel map are provided to the VLR. The parcel map is then publicly displayed for 30 days to allow for any objections which are to be lodged with the VEO. Subject to there being no objections, owners may request a CCRO. The DLO prepares a CCRO in triplicate and sends them to the VEO. The land owner signs the CCRO in front of the VEO and pays the requisite fees. The VEO and Village Chairperson co-sign the CCRO. All copies returned to the DLO who signs, seals, registers and laminates one copy which is returned to the owner. The DLO retains one copy and the other copy is retained by the VEO.

According to the NLUPC Guidelines[2], the cost for undertaking a VLUP exercise is estimated at ±5.2 million TSh or ±USD3,100 although the costs could be lowered over time to ±3.7 milliion TSh (±USD2,250). However, experience from various VLUP exercises suggest that the operational costs of village land-use planning could be higher, at about 10 million TSh (±USD6,000) and even around 60 million TSh (+USD35,000). The difference in cost depends on a range of factors including: size and location of the village, developmental focus, complexity of issues and level of detail required, etc. Costs can be reduced by providing land-use information to the PLUM team before the field exercise but also by negotiating contribution from villages authorities and other groups (i.e. dairy farmers groups).

Since district authorities are already undertaking VLUPS in their respective districts, the project will not include the costs for the initial investment in strengthening the capacity of DLOs to establish a geo-informatic system (computers, GIS, training, GPS, etc) and DLRs.

30. At village level, the project will provide the budget for the establishment and equipment of VLR, whose costs are estimated at ±1 million TSh (±USD600). However this does not include the construction or renovation of office premises. The cost of issuing 1 CCROs is estimated at ±16,700 TSh ((±USD 10).

Summary of Village Land Use Planning and Land Registration steps and costing

1. Preparation

1.1. Inception workshop
1.2. Establish District planning team
1.3. Village prioritization
1.4. Action plan

2. PRA for land use management

2.1. Introductory meetings with VC and VA
2.2. PRA with VCs and VLUMCs
2.3. Community Action Plan

3. Mapping existing land use

3.1. Village boundary survey
3.2. Base map preparation
3.3. Existing land use map
3.4. Bio-physical survey

4. Participatory VLUP

[2] Table 2.3 and 2.4

4.1. First draft VLUP and by-laws
4.2. Second draft VLUP and by-laws
4.3. Approval of final draft VLUP and by-laws
4.4. Demarcation of land use areas

5. Implementation of Village Land Administration

5.1. Issuance of Village Land Certificate
5.2. Establish District Land Registry
5.3. Establish Village Land Registry
5.4. Land parcel adjudication
5.5. Registration and CCRO issuance

6. Village Land Use Management.

6.1. Monitor implementation and compliance

Preparation of the VLUP: Steps 1 - 4	***5,157,000***	***3,096***
Implementation of Village Land Administration/village		
Establishing and equipping Village Land Registry	974,000	585
Issuance of CCROs[1.]	33'400	20
Total:	***6'164'400***	***3'701***

[1.] Assuming 2 CCROs per village with a unit cost of 16,700 Tanzanian Shillings or USD10 per CCRO

Appendix 5: Institutional and implementation arrangements

Lessons learned from past project implementation arrangements

1. In the context of previous reforms, the Government had established a strong aid coordination arrangement with its development partners based on the principles of: national ownership of the development process; alignment of the national budget with MKUKUTA/MKUZA (the National Strategy for Growth and Reduction of Poverty Phase II), with direct link to the public expenditure review; and harmonization of aid through the Development Partners Group (DPG) and the Joint Assistance Strategy for Tanzania. Of recent, the Five Years Development Plan (FYDP) 1 & 2 is aimed at positioning Tanzania on the road towards middle income country status. Tanzania is also a pilot country for the One UN (Delivering as One) Programme that aims at making the UN agencies pull together towards achieving national poverty reduction goals. IFAD is a member of the DPG and currently chairs its Agriculture Working Group. It is also an active member of the UN Country Management Team.

2. An analysis shows that the project's proposed targets are fully aligned with the FYDP II results framework for the agricultural sector. The design process for the SHMDP takes into account the ongoing reforms, the various government and development partner initiatives for the modernization of agriculture and inclusion of active participation by the private sector. It is consistent with the current focus on industrialization with more effort on agro-industries through support to financial services, marketing and value chains. It builds on the partnerships developed and lessons learned in the implementation of the Sector Wide Approach Programme (SWAp) of the Agriculture Sector Development Programme (ASDP) 1 as well as the IFAD-supported MIVARF and MUVI programmes (see also Appendix 3).

Lessons from ASDP

3. ASDP is a sector-wide approach (SWAp) which allows the Agriculture Sector Line Ministries (ASLMs) and other stakeholders to address issues of common concern to the development of the sector. It is a tool for attaining agricultural development, food security and poverty reduction. The Programme was financed through the Basket-Fund. About 75% of the programme resources were devolved to lower level, through grants to district agriculture development plans (DADPs), which were implemented by 136 local government authorities (LGAs). Implementation of the programme ended in 2014 with the design of ASDP2. The performance of the ASDP, though not without challenges, has shown that:

- ***A sector wide approach in agriculture is possible*** where sufficient political and donor commitment is in place, and where a well-resourced decentralization policy is pursued on to which local level agricultural development planning and implementation can be attached. It also clearly demonstrated that successful implementation requires strong sector leadership at all of the various levels and unwavering alignment of development aid to this approach. The SHMDP fits within the sector-wide approach of the newly designed ASDP2, which allows for stand-alone projects in line with national policies.
- ***Thinly spread resources result in fragmented results/impacts, generally difficult to measure.*** ASDP was launched as a national programme covering all districts in Tanzania Mainland. Initially, one of the options considered was a phased implementation, covering a few districts at a time. In hindsight, because of the scale and complexity of implementing a new programme nationally, phasing may have been a better option. This would have allowed for better focus and complementarities between programme interventions, thus a better programme impact. The implementation arrangement for both ASDP2 and SHMDP is focusing on the Southern growth corridor, and to further limit the spread of resources and ensure impact SHMDP will cover only 15 districts in five regions.
- ***Successful decentralization of agricultural sector support*.** The integration of the agricultural grants within the Local Government Development Grant (LGDG) and the decision to implement participatory District Agricultural Development Plans (DADPs) has been successful. The bottom-up planning processes has improved over time and has begun to provide a model for other sectors. Coordination between the ministry responsible for local

government and ASLM and the efforts to conduct impartial annual assessments of the quality of DADPs has demonstrated that performance-based funding can be implemented using national planning and financing mechanisms. The planning process of the SHMDP will be a participatory, bottom-up one, based on dairy value chain multi-stakeholders platforms (MDP). Incentives will be created, based on performance of the staff associated with implementation of the project. The annual assessment will be undertaken by the council management team of the district,

- ***Increased productivity needs to be linked to value addition, marketing and increased farmer income.*** ASDP1 focused mainly on basic production technology diffusion and processes. The lesson, based on field studies, is that many farmers are already knowledgeable about basic production techniques, except perhaps for new crops and new practices that emerge periodically. What lacks is focus on how farmers can increase their incomes by engaging in more profitable activities including value addition and improved market efficiency. Generation and dissemination of basic technologies must be pursued together with greater consideration of value chains, especially expanded access to marketing. SHMDP will focus on the entire milk value chain, from production with more emphasis on value addition through processing, market access, access finance and linkages of producers to processors.
- ***Little progress in farmer empowerment and organization strengthening.*** Creating and strengthening farmer organizations, or empowering farmers, is a topic covered in most projects and programmes, including ASDP. However, there is little qualitative or quantitative evidence of notable progress in this area, and thus achievement of limited progress in improving access to markets, as well as farmers' productivity and incomes. In view of the focus on a value chain approach, this area deserves significantly higher levels of attention to overcome critical constraints along the value chain, through collective action. The SHMDP will use Farmer Field School (FFS) approach in empowering producers. The dairy value chain stakeholders will be empowered to build strong a dairy value chain platform.
- ***Lack of clarity about how the public sector is to facilitate and enhance private sector involvement in the agricultural sector.*** Value chain development requires permanent consultation (from the design-on) and coordinated approaches with private sector actors (economic and associative) and with other international organizations. There is need for efforts both to develop private and public stakeholders' involvement and cooperation, and to enhance public capabilities for enabling strategic policy formulation and implementation. Furthermore, the low participation of private agribusiness sector and Private Service Providers (PSP) indicates the need for better planning and funding mechanisms at national and local levels to support the private sector involvement. The involvement and capacity strengthening of private and associative (FO, NGO, CSO) service providers would also allow for enhancing collaboration, alliances and increased efficiency. SHMDP will support efforts to enable stakeholders to reach agreement as to the appropriate roles of public and private sectors based around their respective mandates.
- ***Harmonized sector M&E challenging to implement.*** The design of the *ASDP M&E framework* was based around costly national statistical surveys that have not been timely in producing information about programme achievements. Equally, the planned annual services delivery surveys that would have given regular estimates of intermediate outcomes such as adoption of improved technologies were not implemented until 2008/9. In their absence, M&E reports were based on direct surveys of LGA authorities, and these have been incomplete and have contained inaccuracies. Finally, the short-list of M&E indicators fails to capture critical areas such as pace of empowerment, engagement of private sector, service reform and research outputs. There are several lessons to draw from the experience, including the importance of financing the surveys that provide critical annual performance assessments, for both outputs and outcomes; and the need to use M&E as a tool to track reform processes as well as measuring conventional benefits such as production and technology adoption. The project M&E system will be derived from the theory of change defined in the logframe, and it will serve to promote improved management, learning and accountability at the project and district levels.

Lessons from the IFAD-financed projects MIVARF and MUVI

4. Some of the key challenges identified by the Agricultural Marketing Policy of 2008 for limited access to markets were: (i) inadequate value addition in agricultural produce; (ii) inadequate adherence to grades, standards and quality; (iii) weak legal, regulatory and institutional framework; (iv) poor marketing infrastructure; and (v) inadequate access to financial services for agricultural marketing. The Kilimo Kwanza report indicated that Tanzania processes only one percent of the available raw materials. The weak agro-processing industry in Tanzania contributes to huge post-harvest losses estimated at 30-40% for cereals and 40-60% for fruits, vegetables and fish. Two sets of interventions are needed to address the weak market access and weak agro-processing challenges: (i) Capacity building support in the areas of market information, business services, mentoring, and linkage with markets and financial services for the rural entrepreneurs; and (ii) support for the district authorities to plan, execute and maintain marketing infrastructure in partnership with the private sector and communities for sustainability. Two IFAD-supported projects – the Market Infrastructure Value Addition and Rural Finance Project (MIVARF) and the Rural Micro, Small and Medium Enterprise Support Programme (MUVI) – sought to enable Government to respond to these challenges; their implementation experiences offer a number of lessons, including but not limited to the following:

- **Institutional capacity enhancement and system changes.** As stand-alone projects implemented within a wide geographical coverage, the two projects face challenges of coordination and involvement of LGAs, and its link with ASDP. However, MIVARF has been successful in providing for systemic changes in participating commercial banks and other MFI to enhance their capacity for sustained lending to the underserved rural areas of Tanzania, strengthening of rural SACCOS with improved governance and management systems, more conducive policy environment for rural enterprises and to some extent effective producer and marketing groups obtaining higher revenues from improved access to markets. SHMDP will operate through implementation units at the district level, comprising of existing staff, with the role of managing both human and financial resources. This set-up will improve ownership of the project by the LGAs and therefore the officers involved will as part of their duties ensure that the DADPs reflected the needs of the value chain development to ensure key issues are included. Additionally, the project will make use of the rural finance capacity built by MIVARF.

- **Pluralism in service delivery.** The two projects were designed to make use of private service providers in its implementation of activities, based on an expectation of the availability of service providers (SP) with proven expertise in the basic components of the projects, thus enhancing Public-Private-Producer Partnerships (4Ps). However, the limitations of service providers with know-how on value chains have proven a challenge during implementation, and have meant that in some cases the projects have had to invest in building capacity of SPs. SHMDP will have a stronger approach to results based contract management, with performance to be assessed every year and contracts continued only if performance reaches a minimum of 70% achievement. The SPs contracts will also be issued at the ZPMU with the daily management at the district level, which will also include feedback from recipients of the services. The recruitment of SPs will be based on competencies and a proven track record in the dairy sector.

- **Implementation: Roles and responsibilities.** MIVARF is implemented using a lean project coordination unit, and MUVI is managed within the Small Industries Development Organization (SIDO) with a decentralized structure of regional offices. Field implementation is through the use of value chain service providers. This approach has faced challenges especially on the new roles of contract management that were to be done by LGAs and SIDO. Roles and responsibilities should be clearly defined and communicated, especially in interventions that involve private sector actors. Value chain development requires proper diagnostic assessment of key actors and their capacities to foster partnerships from the outset. Private-sector entrepreneurs such as wholesalers, processors and exporters, and other partners such as cooperative apex organizations, need to be involved during project design to better understand their interest and potential, and how they might internalize project incentives for their involvement and cooperation.

SHMDP implementation approach

5. Investments in agriculture and implementation of agricultural policies and programmes in Tanzania are informed by the newly launched second Five Year Development Plan (FYDP II) 2016/17 – 2020/21 which takes into account the integration of the Five Year Development Plan (FYDP) and the National Strategy for Growth and Reduction of Poverty (NSGRP/*MKUKUTA*) planning frameworks. The theme of FYDP II "Nurturing Industrialization for Economic Transformation and Human Development" incorporates the main focus of the two frameworks, namely growth and transformation (FYDP) and poverty reduction (MKUKUTA). The FYDP II outlines new interventions to enable Tanzania industrialize in a way that will transform its economy and its society. It also outlines interventions carried over from predecessor plans. More importantly, and in tandem with the two predecessor Plans, FYDP II also implements Tanzania's Development Vision (TDV) 2025 which aspires to have Tanzania transformed into a middle income, semi industrialized nation by 2025.

6. Linking with the FYDP II, the project will be the first for MALF (livestock) under the ASDP2 framework and, in line with Government policies for agriculture, the project has been designed to promote private sector-led growth in the diary sector that is inclusive of poor rural smallholders. The sustainability of the results achieved will be ensured, on one hand by promoting the establishment of commercial relations along the value chain for milk and milk products, and on the other by promoting the establishment / strengthening of an enabling environment for private sector investment in the sector.

7. The policy and strategic context for the livestock sector is set by the 2006 National Livestock Policy (NLP), the 2010 Livestock Sector Development Strategy (LSDS) and most recently the 2015 Tanzania Livestock Modernisation Initiative. A Livestock Sector Master Plan is currently under development. There is no specific dairy policy or strategy, though a foresight analysis currently being conducted is expected to provide an indication of overall investment requirements for the sector. At the institutional level, the MALF is responsible for policy formulation, local-level capacity building and technical backstopping of service delivery, and monitoring and evaluation; while the LGAs at the district level are responsible for implementing government policies, and providing support services to the smallholder dairy sector. MALF has limited capacity relevant for the dairy sector; due to lack of specialised training courses, the dairy industry as a whole is short of dairy extension specialists and technologists.

8. The project's approach on policy dialogue will be to strengthen stakeholder dialogue at all levels. Dairy sector actors will be invited to become members of multi-stakeholder dairy platforms (MDP), which may include a number of the economic 'clusters', and contribute to the fine-tuning of the project activities at district level (noting that one MDP may go across district boundaries); identify and resolve local-specific policy constraints; prioritise public sector support; identify win-win opportunities for collaboration; and provide lessons and experience to enrich the national level dialogue. A zonal platform will be also established and supported, to focus on those issues that go beyond district boundaries; and help bridge the gap to the national level Dairy Development Forum (DDF) bringing to it new stakeholders and representation of local level farmers' groups. The participation of women and women-led groups will be promoted both for district and zonal platforms.

9. The project will also support the conducting of policy reviews and studies that could inform policy processes. A number of study topics have been predefined; including those related to taxation, regulation, multiple taxes, inspection, licenses by multiple government agencies, product licenses and registration etc, others would be identified during project implementation. All would be expected to contribute to assisting all stakeholders to arrive at a shared vision for the development of the dairy sector, and the appropriate roles of public and private sectors. The findings of all studies and analysis could be presented to the DDF and the inter-ministerial Agricultural Sector Consultative Group. SHMDP will assist the Tanzania Dairy Board (TDB) to respond to its mandated role of convening dairy stakeholders, thus contributing to the achievement of the objectives of SHMDP. The project would finance consultancies, training for TDB staff and stakeholders; and assist TDB to effectively fulfil its role as secretariat of an expanded and vigorous DDF. TDB will be supported to certify good practice for the different actors in the dairy value chain, training courses and their participants (see component 3).

10. SHMDP, which will have an implementation period of seven years, will be inclusive of the entire dairy value chain, from supporting increased quantity and quality of production to providing consumers with diverse quality dairy products. In doing so, it will support public and private production service providers – extension, input suppliers, AI and veterinary services; smallholder dairy farmers

and their organizations; informal traders / transporters, small private dairy operators and milk collection centre operators; and milk processors. The project will support the emergence of a diversity of sub-sector value chains, offering different products to different markets: in all cases the emphasis will on increasing the quantity of milk marketed and processed; promoting efficiency in the value chains; and ensuring the quality and safety of the final product.

11. Project support to processors (ranging from micro-enterprise to medium-scale enterprises) and others downstream in the value chain (traders / transporters, milk collection centre operators) will be complemented by support to smallholder dairy farmers themselves, to enable them to increase their production (quality and quantity) and productivity. This will done by assisting them to increase their technical skills – through extension and training services; enhancing their access to livestock; and building or strengthening their organizations for aggregated supply, reduced production and marketing costs, increased negotiating power in the market, and expanded project outreach to large numbers of poor producers. At the same time, the project will provide support to the providers of production services to smallholder dairy farmers (both public and private) – input supplies, AI, veterinary and extension services. Finally, project support to Government at national and district levels will aim both to contribute to the creation of an enabling policy and regulatory framework for the development and growth of the sector as a whole and enable Government to provide more effectively those public services on which the value chain depends.

12. The implications of the implementation approach for the arrangements to be established for managing the project include the following:

- As a project that will cover not just dairy production but also the entire value chain, the skills required both to manage and implement the project are beyond the mandate and traditional competencies of Government. This has implications for the way in which the project management staff are recruited; it also poses important questions of implementation capacity; and it will need to shape the approach used in identifying implementing partners.
- As a project that will look to engage with the private sector and catalyse private sector investment (from the farmer to the medium-scale processor), ensuring that the project activities reflect and respond to the issues that they confront will be critical: this will require involving them substantively in the project planning, implementation and oversight.
- There are opportunities to draw on the lessons from, and collaborate with, various other initiatives in the dairy sector; particularly the Bill and Melinda Gates Foundation (BMGF)-financed East Africa Dairy Development (EADD) Programme, focused on the development of integrated ‘hubs’ where groups of farmers can access inputs, services and markets to achieve a critical mass of supply; and
- The Livestock Micro Reforms for Agribusiness (L-MIRA), programme in Tanzania is a part of a regional programme also supported by BMFG. The objective of Tanzania L-MIRA project is to improve the competitiveness of the Dairy (and Poultry) Value Chains through targeted policy, legal, regulatory and institutional reforms. As both of these are ongoing initiatives, the implementation approach under SHMDP will need to be sufficiently flexible to ensuring complementarity and synergies.
- L-MIRA is linking with national institutions including the MALF, MITI, Ministry of Finance and Planning, Tanzania Private Sector Foundation and Tanzania National Business Council (TNBC). The SHDMP will be linked at national level structures and promote policy dialogue focusing at local government level (LGAs) through the Dairy Development Forum (in particular the multi-stakeholders forum at the zone and district levels) and at national level through the PSC and Dairy Development Forum (DDF) to be organised by the Tanzania Dairy Board (TDB). The Zonal project management unit (ZPMU) coordinator will synthesize and raise these issues at the national PSC. Tanzania Diary Board will present policy issues identified by the MDPs, and discussed at the DDF and PSC to be submitted to TNBC for further dialogue and decision making. MALF will also present policy issues at the ASDP2 policy forum the Agriculture Sector Consultative Group where all policy issues on the agriculture sector are discussed. In addition, as the National Livestock Master Plan (LMP) is being developed by MALF with support from ILRI, the project could support the formulation of the Dairy Master Plan, which will be derived from the LMP and would be providing a framework for SHMDP. Extrapolating, a Livestock Policy tool developed by FAO, could be used for this purpose.

- SHMDP will collaborate with many partners including; the Southern Agriculture Growth Corridor of Tanzania (SAGCOT) (on synergies and partnership); TALIRI (on proposed innovation agenda); TDB (support under the stakeholder dialogue); and Livestock Training Agency (LITA) (proposal for strengthening capacity for dairy) to explore potential roles and contributions. It is evident that SAGCOT whose focus is on the Southern Highlands is supporting and encouraging private sector and smallholder farmers investments in the southern corridor including the dairy sector. These initiatives will complement the SHMDP interventions (for both the private sector engagement and farmers organisations).
- TDB has a lean staff and capacity. It is represented at LGA level through the milk inspectors. The major role of TDB will continue to be: (i) to organise the DDF and (ii) support policy reforms by drawing on information from the dairy stakeholders and partners from LGA, zones and national levels. It will participate and represent stakeholders at the Project Steering Committee (PSC) and contribute to national policy fora dialogue.
- The project will provide some institutional support for more and better dairy training. To ensure that these efforts are built upon, Government needs to rethink its dairy training policy and practice. LITA-Madaba in Ruvuma region is the only livestock training institute in the project area. It has the basic training infrastructure and is mandated to offer certificate and diploma level training in animal production and animal health to extension officers and short courses for farmers on dairy production. It does not offer full course on dairy technology. The project will support a management audit of the institute to assess its capacity and gaps to provide quality training and mode of sustainability. Specifically, SHMDP will work with LITA-Madaba supported by TALIRI Uyole, Sokoine University of Agriculture and the Director of Training in MALF to: (i) Conduct specialised tailored short-term training in the dairy sector (up to six months post diploma) for key service providers and actors in the dairy value chain in the Southern Highlands; (ii) Finance government staff, and part-finance selected non-government staff, to enable them to participate in the training modules developed; and (iii) Develop a pool of specialist trainers, potentially drawn from LITA, Sokoine University of Agriculture and the regions themselves, after training them at appropriate institutions such as the Naivasha Dairy Training Institute in Kenya.
- It is recognised that because individual regions, and indeed districts, are at different stages of development of the dairy sector and face different constraints and opportunities for further growth, the project will need to tailor the activities it supports to the specific requirements of individual districts, building on their relative starting points and opportunities. This will require the development of a simple, rapid, multi-stakeholder planning process at district level as described in Attachment 2 (Using clusters in the implementation approach for Multi-stakeholder Diary Platforms).
- The relatively constrained project implementation period (7 years) demands that project activities start up as quickly as possible.

Organizational framework

Project oversight

13. A Project Steering Committee (PSC) chaired by Permanent Secretary of MALF will be responsible for overseeing project implementation and will meet twice a year to provide strategic direction and monitor implementation progress. Members of the PSC will include stakeholders in the dairy sector from both the public and private sectors including: MALF and its Environment Management Unit; Ministry of Industries, Trade and Investment; Ministry of Health; TDB; one or two Regional Administrative Secretaries of selected regions; representatives of District Executive Directors from the selected districts (regional and district representation will be on a rotating basis); and representatives of smallholders farmers organizations and processors (TAMPRODA and TAMPA). The SHMDP Coordinator will act as the secretariat of the PSC drawing on support from the MALF Director of Policy and Planning (DPP). The project will meet the costs of convening the meetings – particularly travel and DSA for those PSC representatives coming from outside Dar-es-Salaam.

14. The PSC will meet twice a year to provide strategic direction to project implementation and monitor implementation progress. It will be particularly responsible for:

- Coordination of the public-private sectors' initiatives at the ministerial level;

- Review and approval of the annual work plan and budget (AWPB) and the initial procurement Plan;
- Review of the PIM and its subsequent revisions;
- Ensure full transparency and accountability in project management;
- Review and follow-up of supervision and audit recommendations;
- Promotion of cooperation with all development partners; and
- Lead in studies and reviewing dairy sub-sector policies and strategies and identification of policy issues for Government follow-up.

Project execution

15. The programme will be executed by MALF. DPP will be responsible for overall coordination, in close collaboration with the Department of Livestock Technical Departments. DPP will have a specific role in the implementation of component 3, as within MALF it has the mandate and responsibility for policy development. As part of its role in the SHMDP, it will provide leadership for undertaking the proposed sector studies and reforms of the dairy industry. DPP will also develop strong links with dairy processors, associations and support strengthening of the TDB. Finally, DPP will also work closely with Department of Research and Training and LITA for capacity building and training in dairy science and various specialisations.

16. Specifically, the DPP will:

- Consolidate output of policy review discussion from districts and zonal dairy platform discussion;
- Organise stakeholder meetings on policy discussion at national level including stakeholders from both private and public;
- Initiate process of agreed policy review and follow-up supervision and audit recommendations;
- Follow-up on budget execution for the support provided to TDB and research and training institutions; and
- Organise contractual arrangement for agreed sector studies at national level in support for policy review and or strategies.

17. The DPP will oversee (eyes on hands off) a project structure that is based on a management unit at zonal level (ZPMU), plus district-level implementation units (DPIUs). This arrangement proposes that there will be no regional PMUs, and that the roles of the Regional Secretariats will continue to be adhered too. Hence, the Regional Secretariat represented by the Regional Livestock and Veterinary officer will also be supported to fulfil their role to provide oversight, monitoring, guidance and advice to the district councils consistent with the decentralization guidelines.

18. **Zonal Project Management Unit.** The project will be managed on a day-to-day basis by an autonomous Zonal Project Management Unit (ZPMU) established in the Southern Highlands to cover the five regions of the project area. It is proposed that its office would be in Mbeya. It will be staffed with qualified personnel to enable it to effectively support and supervise all project activities. Given the need for the ZPMU to be staffed with a range of expertise which may not be readily available in MALF, Government will competitively recruit from the national and regional market those staff with expertise which is not found in the MALF and for private sector functions. The ZPMU will also contract short-term specialist expertise, according to need.

19. The ZPMU will consist of the following contracted staff: Project Coordinator; Dairy Agribusiness Specialists (DAS); supported by 10 Dairy Agribusiness Advisers (DAA) and Group Development Advisers (GDA) contracted as service providers; Dairy Production Officer (DPO); Extension & Producers' Organisations Officer (EPOO), also responsible for the implementation of the gender strategy; Planning, M&E, Knowledge Management Specialist, also responsible for monitoring implementation of the climate-smart strategy; Finance Manager; and Procurement Specialist. Draft TORs for ZPMU staff are presented in Attachment 1. Support staff will include an administrative secretary, an administrative assistant, an accountant, procurement assistant and drivers. The project

will also finance vehicles for ZPMU staff, plus other costs including rent, equipment such as computers, printers, furniture, etc.

20. The ZPMU will be responsible for the overall planning of project activities; guiding, supporting and supervising project implementation; procuring goods and services; financial management of the project resources; and monitoring and reporting on implementation and financial progress. It will work with line ministries and government services including the Regional Secretariat and District Facilitation Teams (DPIU, see below) to define performance-based MoUs based on district AWPB and determine backstopping arrangements according to the needs and priorities of the clusters. These MOUs will specify the activities to be undertaken, expected outcomes, time frames, deadlines for submitting progress reports and indicators for monitoring and evaluation. The availability of project resources to districts will be partially conditional on overall implementation performance, and reporting of such performance. The ZPIU will also collaborate with smallholder dairy farmers, dairy processers and other value chain actors, service providers and relevant development initiatives. It will play a leadership role in terms of the project's private sector orientation and will be an advocate for a more private sector-friendly investment climate; it will ensure the project's commitment to poverty targeting, and – in particular – to involving women and youth in project activities; and it will also support climate-smart approaches for dairy development.

21. At an operational level, the ZPMU will:

- Take overall responsibility for the planning, management and supervision of all three project components and the activities under them;
- Assist the District Development Teams to prepare AWPBs for the project, consolidate these and submit the project AWPB to MALF and IFAD for review and approval;
- Conduct project-level procurement of good and services, and support district-level procurement as appropriate;
- In collaboration with participating districts, disburse and control the flow of funds for various contractual and partnership agreements, and ensure timely submission of supporting documentation;
- Manage relationships with, and backstop implementation by, the districts and with other partners e.g. research and training institutions, and service providers;
- Develop and implement a communication and knowledge management strategy to manage relations with the public, project partners, non-state actors and farmers;
- Establish arrangements for actively collaborating with other relevant development initiatives in the dairy sector; and
- Prepare implementation progress reports, based on a participatory monitoring and evaluation (M&E) system and a synthesis of all district reports, and submit these and financial reports to LGAs (at district and regional level), MALF and IFAD in a timely manner.

District Project Implementation Unit (DPIU). Project implementation at district level will follow the guidelines for decentralization by devolution (D by D). A small project implementation unit (DPIU) will be set up in the selected districts, and their offices equipped. The unit will be made up with already-existing, designated district-level staff (the District Facilitation Team), who will have the responsibility to implement the project activities as per their mandate, and to monitor and report on implementation and financial progress directly to ZPMU and to their Regional Secretariat. DPIU's team members will include the District Livestock Officer, Livestock Extension Officer, District Nutrition Officer, District Procurement Officer, District Treasurer and Community Development Officer, with overall guidance provided by the District Executive Director. The District Council Management Team (CMT) will be responsible for approving the district-level dairy AWPB and monitoring the progress of implementation. They will also approve the staff allowances to be paid to DPIU team members, based on the annual performance of the staff.

22. DPIU broad responsibilities will include:

- Leading the cluster development approach at district level (described below and Appendix 5) and organisation of the district Multi-stakeholder Dairy Platforms (MDP) with guidance from the ZPMU;
- Preparation, implementation and reporting of the district-level dairy AWPB. The AWPB will be formulated consistent with district agriculture development plans (DADPs) guidelines and overall District Development Plans;
- Collaborating with dairy processors, associations, service providers, the ZPMU and other dairy initiatives in the district. It will support links to research, farmers training, L-FFSs, strengthening FOs, extension officer's training, milk collection centres, dairy marketing hubs, private sector, civil society, and service providers;
- In collaboration with ZPMU, building capacity in dairy technologies by providing training to district, village extension officers and farmers;
- Procuring project services and facilities in liaison with ZPMU, contracting out dairy studies and other activities as per LGA guidelines;
- Managing performance-based contracts for capacity building service providers and community development, while ensuring that targeting mechanisms for inclusion of women and youth, and HIV/AIDS understanding, are addressed; and
- Reporting (Quarterly, annual) based on a participatory M&E system, and submitting project implementation progress and financial reports at CMT and later to ZPMU and Region Livestock Adviser consistent with LGA procedures, in a timely manner.

Village level

23. At village level, project implementation will be based on targeting using self-selecting criteria to identify beneficiaries of the project and focus on predetermined interventions on dairy value chain. A local level planning process will be adopted ensuring that village priorities are articulated. The prioritised activities will be identified through the farmers groups processed through the ward development committee and full council integrated in the DADPs. Consistent with focus on commercialisation and scope of identification of activities under the ASDP2, the SHMDP priority interventions at village and district level which are inclusive and integrated into the DADPs using existing LGA structures.

24. The DPIU will support implementation of project activities at the village level including: training of extension officers, farmers groups, service providers and provision of service to dairy farmers. The village extension officers will support farmers on management of the dairy units (for housing, forage, feeding, AI services and milking and disease control) for improved milk production and marketing. The village extension officers will facilitate links to L-FFS, farmers groups, and processors to ensure increased farmers knowledge on milk production and marketing and farmer's organisation. The project will support farmers through FOs, and their representatives will participate in the MDP to raise issues affecting dairy farmers, including during the local planning process. Four meetings per year will be organised, two of which will be organized to support the project planning and review processes.

Contracted service providers and Partnership Agreements

25. Project implementation will be structured around performance-based MoUs with LGAs and other government agencies, partnership agreement with key national or international partners, and service contracts with recruited service providers. Service providers will be contracted through competitive government procedures and based on renewable performance based service contracts to provide advisory services. These contracts will specify the activities to be undertaken, expected outcomes, the obligations and rights of each party, time frames, deadlines for submitting reports and indicators for monitoring and evaluation. To ensure uninterrupted service delivery during project implementation, MALF will draw multi-year agreements with LGAs and other key partners but provide for annual reviews to ensure strict adherence to achievement of results. All service contracts requiring multi-year engagement will be issued on an annual basis, renewable only upon achievement of clearly set performance targets.

26. The project will competitively select a qualified service provider to provide value chain advisory services: the DAA in the ZPMU and two groups of advisors stationed in each region: five DAAs and five GDAs. The DDAs and GDAs will do much of the day-to-day interaction with MSMEs along the dairy value chain. The DAAs will support the enterprises, providing the necessary hands-on instructions and mentoring for operators of the businesses, conducting workshops, advising entrepreneurs in development of business plans, and helping linking producers and producer groups to financial institutions. The DAAs will work in teams with the regional and district livestock extension officers. The GDAs will be responsible for establishing and strengthening groups and cooperatives at the producer and value chain enterprise levels, and assisting them to increase their margins by aggregating their supply for milk collection and marketing, and lower their costs of production by purchasing inputs and services for their dairy operations in bulk.

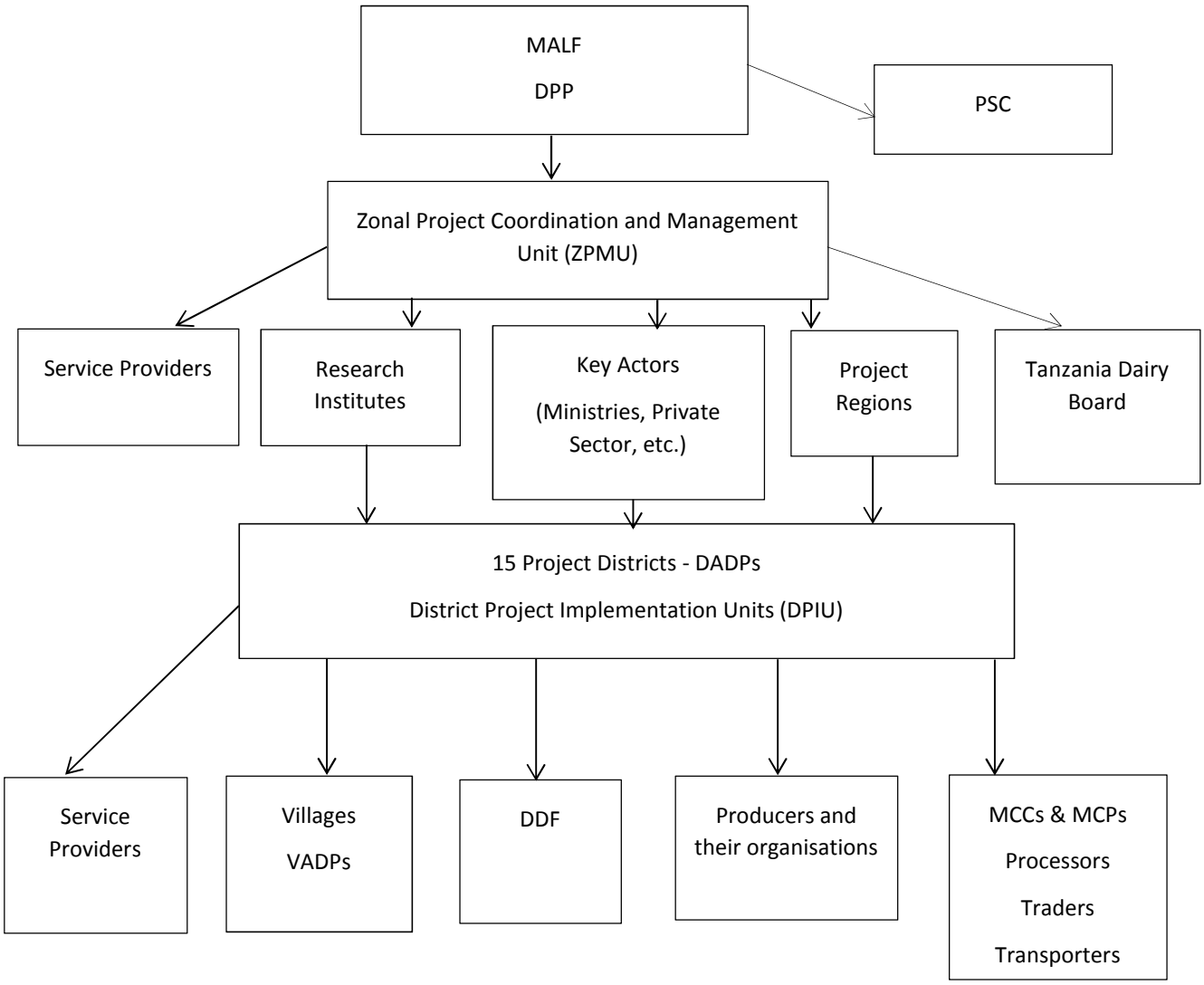
27. The project will competitively select qualified service providers to deliver specialized value chain advisory services as required based on a demand basis and depending on the skill gap and need identified along the value chain. The service providers will be recruited preferably within the region based on competence and retained on performance assurance. As part of the support delivered, service providers will be required to ensure that adequate capacity is built among recipients of their services at various levels including LGAs to guarantee their exit strategy and overall sustainability. The project is currently exploring options for engaging a preferred qualified service provider who could also co-finance with a contribution equivalent to between 10-25% the total contract – thereby establishing a partnership rather than a contractual relationship. Heifer International is currently considering such partnership arrangement with the MALF under SHMDP.

Implementation start-up

28. At the ZPMU level a Project Implementation Manual (PIM) for the whole programme will be prepared, however at the district level short elaborated user friendly guidelines will be prepared for each component. There will also be guidelines for programme staff procedures and financial management.

29. The business-oriented and value chain focus to all activities, the cluster approach, MDPs and its economic and value chain logic, and the commitment to performance and results at district level, will all need to be explained at project start-up and launch, to the participating regions and districts, implementing partners, collaborating institutions, and value chain actors. To this end, a series of launch workshops will be conducted. At the **national level**, key government policy- and decision-makers will be invited, as well as key stakeholders, including representatives of research institutes and other technical experts, key NGOs, private-sector bodies relevant to the dairy value chain, financial institutions, donor bodies and representatives of civil society. The **district-level** launch workshop will bring together the District Council and District technical departments, NGOs, development partner-funded projects, various private sector value chain stakeholders and non-state actors, and representatives of FOs. At **village level**, a sensitization workshop will be conducted by district departmental staff and the ZPMU to bring understanding about what the project is expected to do. Gender balance will be sought among participants at all levels.

Chart 1. Project structure outline



.Attachment 1 (a): Draft Terms of Reference for key staff of ZPMU

1) POSITION: Project Coordinator

Location: Mbeya - Southern Highlands milkshed

Reporting to: Department of Policy and Planning of MALF

Duties and responsibilities

General duties: Operating within the SHMDP and reporting to the Director policy and planning in Ministry of Agriculture, livestock and fisheries, he or she will be responsible for all matters pertaining to the effective implementation, management and coordination of activities and players of the SHMDP for effective delivery on the programme objectives. He/ she will also be responsible for leading the ZPMU team and managing the performance of ZPMU staff in their respective projects/units that include among others the FC, Technical Component, M&ES and various Contract Managers that may fall under his/her program. Specific focus will be on the following main activities:

- Creation of conducive business environment and promotion of entrepreneurship;
- Promotion of dairy value chain development;
- Promoting improved processing and competitiveness along the dairy value chain;
- Support to implementing districts to deliver on project output and out come
- Overall responsibility for the effective implementation of the SHMDP gender and targeting strategy

Qualifications

Educational Background:

Hold a university degree in one or more of the following: Project Management, agribusiness, Business Management/Administration, Organisational Development and any other relevant qualifications appropriate to the SHMDP (agro-business, dairy value chain development, agriculture economics, and entrepreneurship, etc.).

Experience:

This is a high-level professional position with a highly demanding mission to attain the desired outputs of SHMDP. Seasoned professionals with strong organizational and managerial experience are required. A solid understanding of the Program area and of the dairy sector, preferably in the East African is highly commendable. Other requirements are as follows:

- Five (5) year work experience at least in the management of projects in reputable institutions preferably with international multi- and/or bilateral development cooperation organisations; familiarity with policies and procedures of donors would be an added asset.
- Experience in the implementation and oversight of projects and programs and in the M&E and reporting of such activities.
- A high level of competency in English is essential, while working knowledge of Swahili would be an added advantage.
- Computer literacy is essential with a good working knowledge of Microsoft Word, Excel and PowerPoint, email and internet; knowledge of other specialised software (MS Access, MS Project, etc.) would be an advantage.
- Proven experience, ability of working in multi-disciplinary teams, and capacity of supporting professional human resource development of other team members and stakeholders in the agriculture sector.
- Should also have excellent PR, skilled in team building, communication, interpersonal relationships, influencing and negotiation skills.

2) POSITION: Dairy Agribusiness Specialist (DAS)

Location: Mbeya - Southern Highland Milkshed

Reporting to: Project Coordinator

The Dairy Agribusiness Specialist (DAS) will support the field implementation of the activities of the Highlands Milk Development Project in the Southern Highlands of Tanzania. The DAS will be stationed in the zonal office and will provide capacity building for dairy enterprises in five regions. The DAS will support the coordinator of the ZPMU in all aspects of implementation of the program. He/She will provide advice to individuals and groups on market oriented dairy enterprise development including enterprise planning, importance of effective marketing as a basis for enterprise plan, contract design and negotiation, and processing and marketing of milk and dairy products.

Duties and responsibilities

- Map out and analyze the collecting, transporting, cooling, processing technologies and practices, and distribution and retailing employed by the value chain actors along the value chains, including cottage industry, medium-size and household-based processing
- Carry out a dairy enterprise training needs assessment for the target groups, including gender considerations, during the baseline survey
- Identify opportunities for new business models for dairy input services offered by the milk chilling centers to its member-producers, e.g. Dairy Business Hub model
- Introduce the concept of enterprise approach and market oriented smallholder dairy development and encourage demonstration of market oriented activities
- Solicit, screen, advise and direct contract service providers (three to five persons) to develop and administer training modules suited to the needs of smallholder dairy farmers, transporters, processors and distributors/retailers including women, youth and other target groups on a Market-Oriented Dairy Enterprise Development. The DAS will advertise for three five dairy specialists to serve as short term contract consultants to serve on retainer basis for conducting training and advising activities at the zonal and district levels.
- Identify key problems and offer interventions in the use of existing technologies and practices with respect to the hygiene standards, quality and safety control, equipment, packaging, branding and marketing of dairy products
- Based on the analysis, propose recommendations (including new technologies, equipment, TA and training etc.) for improvement to enhance the value chain actors' capacity to add value and increase income;
- Assist the project's procurement officer in sourcing and procuring required new technologies, equipment, TA and training for participating enterprises throughout the dairy value chain.
- Assist the Director and Value Chain Development Coordinator with dairy value chain Development program implementation and reporting at regional level;
- Assist the Dairy Training Adviser along with the ABC group in delivering relevant TA and training and in preparing relevant training curricula, modules, hand out materials, diversified and adapted on the basis of the different needs of target sub-groups and gender; and
- Prepare necessary reports as required by the Project Coordinator and IFAD.
- Ensure the implementation of gender activities related to women and youth participation in the dairy agribusiness

In addition, the agribusiness specialist will have responsibility for coordination of the rural finance related activities of SHMDP. In particular this would include:

- preparation of annual work plan for rural finance related activities

- in collaboration with the procurement officer, drafting of Requests for Proposals (RFPs) for applicant service providers and inputting into technical evaluations of SPs
- monitoring and supervision of selected SPs and processing of reports and monitoring data for project reports
- proactive monitoring of project achievements against targets and management of problems and challenges together with the ZPMU team
- coordination and preparation of learning events and the conduct of the impact survey on capacity development in dairy value chain finance

Qualifications

Educational Background: MSc in business and/or agribusiness or Animal Science/production with a major in dairy science

Experience:

- At least 5 years of experience in the dairy industry in the business of dairy processing and marketing, with an understanding of technology management, packaging, and quality and safety control;
- Minimum 3 years practical working experience in project coordination;
- Computer literacy and proficiency (word processing, spreadsheets and data bases);
- Strong verbal and written communication skills;
- Ability to work efficiently under pressure and to meet deadlines;
- Willing to create and work in a team atmosphere with colleagues, and
- Well-organised and well oriented to details.

3) POSITION: Dairy Production Specialist (DPS)

Location: Mbeya -Southern Highland Milk Shed

Reporting to: Project Coordinator

The Dairy Production Specialist will support the field implementation of the activities of the Southern Highlands Milk Development Project. The DPS will support the coordinator of the ZPMU in all aspects of implementation of the program, with a particular focus on production and productivity aspects. He will be responsible for leading and coordinating the implementation of Component 2 “Improving on-farm productivity”.

Duties and Responsibilities

- Lead implementation of activities implemented under the Component at zonal level
- supervise and ensure quality control of all activities implemented under the Component at district levels
- Coordinate the mapping and analysis of existing dairy production systems and practices
- Identify key problems pertaining to the existing practices with respect to animal health, nutrition, forage production, genetics, animal husbandry
- Based on the analysis propose recommendations for improvement to enhance dairy farm production and productivity and increase incomes, including considerations related to different target sub groups and key challenges faced by women and youth
- Lead and coordinate the design of activities
- Be directly responsible for planning and reporting of activities Implemented at zonal level
- Support Districts for planning and reporting of activities Implemented at District level

- Prepare training materials and conduct (some of the) trainings
- Develop terms of reference and concept note for studies and consultancies
- Prepare and facilitate workshops
- Ensure secretariat of the technical platforms and committees established at zonal level

Qualifications

Educational Background: Minimum qualification: MSc in animal science or agriculture with a major in dairy science

Experience:

- At least 5 years of experience in coordination of rural development activities in the field
- At least 3 years of experience in development of dairy production;
- Minimum 3 years practical working experience in project coordination;
- Computer literacy and proficiency (word processing, spreadsheets and data bases);
- Strong verbal and written communication skills;
- Ability to work efficiently under pressure and to meet deadlines;
- Willing to create and work in a team atmosphere with colleagues, and
- Well-organised and well oriented to details.

4) POSITION: Extension & Producers' Organizations Specialist

Location: Mbeya -Southern Highland Milk Shed

Reporting to: Dairy Production Officer

The Extension & Producers' Organizations Specialist will support the field implementation of the activities of the Highlands Milk Development Project in the Southern Highlands of Tanzania. The EPOO will support the coordinator of the ZPMU in all aspects of implementation of the program, with a particular focus on capacity building and extension related matters. He will be responsible for leading and coordinating the implementation of Sub-component 2.2: Capacity building of service providers, extension workers and producers".

Duties and Responsibilities

- Lead implementation of activities implemented under Sub-component 2.2 at zonal level
- Supervise and ensure quality control of all activities implemented under the Sub-Component at district levels
- Coordinate the capacity analysis of service providers, extensionist and dairy producers
- Identify key problems pertaining to the existing practices with respect to extension and capacity building
- Based on the analysis propose recommendations for improvement to enhance capacities of producers, extensionists and other service providers
- Lead and coordinate the design of activities including in particular the design and roll out of the Farmers Field Schools (FFS) and the GALS
- Ensure the overall supervision and support to the FFS network and GALS inititative
- Lead and coordinate the provision of technical and institutional support to farmers groups
- Prepare training and extension materials and facilitate/conduct trainings
- Ensure secretariat of the FFS Coordination and Technical Committee
- Ensure the effective implementation of the gender strategy and its activities, in particular the achievement of the project's gender targets. women's leadership and financial literacy training and the GALS

Qualifications

Educational Background:

- Minimum qualification: Bachelor degree in agricultural education and extension, animal science/agriculture (with major in extension), community development or cooperative development
- Post graduate degree in a subject related to group development, extension and capacity building would be an added advantage

Experience:

- At least 5 years of experience in community rural development and extension
- Minimum 3 years practical working experience in the livestock sector at local level (LGA)
- Experience related to Farmers' Field Schools approach would be an added advantage
- Computer literacy and proficiency (word processing, spreadsheets and data bases);
- Strong verbal and written communication skills;
- Ability to work efficiently under pressure and to meet deadlines;
- Willing to create and work in a team atmosphere with colleagues, and
- Well-organised and well oriented to details.

5) POSITION: Planning, M&E/ Knowledge Management specialist
Location: Mbeya -Southern Highland Milk Shed

Reporting to: the Project Coordinator

Duties and Responsibilities:

Under the direct supervision of the Project Coordinator, the M&E and Knowledge Management Officer will be responsible for developing and managing the Project Learning System. This includes developing an open system with upwards and downwards accountability, and creating a culture where project staff and implementation partners on one hand contribute to the development of the M&E system, and on the other learn from experience and share knowledge and information between one another in an organic matter.

Specific responsibilities include but are not limited to:

- Oversee the development of a strategy and plans to ensure systematic, continuous learning, improvement and knowledge sharing;
- Develop the overall framework for an M&E System to measure and/or assess progress in terms of inputs, outputs, outcomes and impact, taking into account the Project Logframe, Theory of Change and broader project management requirements, as well as Government monitoring requirements and IFAD RIMS indicators;
- Develop a Management Information System (MIS) which defines the key indicators, data formats, sex and youth disaggregation, and the tools, procedures and responsibilities for data collection, transmission, processing and reporting;
- Supported by a short-term consultant, establish and operationalise a web-based M&E/MIS system, with a dashboard that offers real-time data input and availability;
- Train project staff and implementing partners in the M&E requirements; supervise and provide regular support to M&E activities at all levels; and provide coaching and mentoring, to build knowledge management, M&E, communication and other relevant skills and competencies of project and partnering staff;

- Ensure that all service provider contracts include specifications for the internal monitoring required of them, the reporting systems and the penalties for failure to report as specified;
- Monitor financial and physical progress; collate essential data to be included in quarterly, semi-annual and annual reports; and report back to the PCMU, other key project stakeholders and GOT/IFAD;
- Review and update regularly the Project Logframe;
- Define participatory methodologies and tools for assessing project performance and outcomes involving stakeholders;
- Guide and supervise organizations contracted to implement baseline and impact assessment studies;
- Identify the need for and draw up the TOR for specific project studies required;
- Facilitate the project's annual review workshops, Mid Term Review and completion review;
- Oversee development of annual work plans and budgets and support district-level planning and budgeting processes;
- Ensure that innovative experiences, learning and good practices are captured, synthesized, documented and shared continuously within the Project, and with in-country partners/service providers, IFAD and other regional and international partners;
- Commission short-term technical assistance and undertake any other duties that may be assigned to him/her by the Project Coordinator.
- Ensure collection and analysis of sex and youth disaggregated data, so as to track the implementation of gender strategy activities and monitor the achievement of its targets
- Ensure that methodologies elaborated by research institutions on measuring and monitoring project indicators related to environmental and climate risks management are well mainstreamed throughout project activities.

Qualifications:

Educational Background: Advanced degree in Project Management, Rural Development, Development or Agricultural Economics, or Business Administration. Knowledge on climate change issues in the smallholder sector would be advantageous.

Experience: Proven knowledge and practical experience of at least 5 years in project M&E and KM, preferably in agricultural / rural sector. Computer literacy (Microsoft office and statistical software).

Communication and result oriented management skills. Fluency in spoken and written English. Ability to guide and develop capacities of counterpart staff. Excellent drafting and communications skills.

6) POSITION: Finance Manager

Location: Mbeya -Southern Highland Milk Shed

Reporting to: the Project Coordinator

Duties and Responsibilities: Under the general supervision and authority of the ZPC, the Financial Controller will manage the departments of finance, accounting and audit of SHMDP with the assistance of one Accountant and the close collaboration with M&E Specialist. The specific duties are in three main areas – finances, accounting and audit – as well as any other assignment or relevant duties in the field of his/her competences as may be reasonably assigned by the ZPC.

Finances:

- Timely production of all financial statements as per recommended formats required by the financing agreements and by the national legislation applicable in Tanzania
- Management of project bank accounts with authority of joint signature with the ZPC;
- Payment of suppliers' invoices upon approval by ZPC;
- Approval of payments by cheques, petty cash or any other legal method;
- Daily, weekly and monthly follow-up of the project bank accounts in view of timely and sufficient replenishments of funds to avoid any disruption of the activities of the project;
- Preparation of withdrawals applications of project funds from the loan/grant accounts of project financiers as per directives and methods duly approved and directed by them.
- Consolidating accounts from the district
- Providing training to district on Public Financial Management

Accounting:

- Management of the department of accounting to ensure timely monthly, quarterly and annual production of financial statements with the assistance of a specific software like TOMPRO having a multi-site functionality;
- Presentation of accounts in accordance with national and international standards generally accepted and detailing accounts per nature, origin, destination, budget, location of the resources and expenditures;
- Strict, regular follow-up of the justification of expenditure to be provided by districts, and from external service providers;
- Establishment a cost effective system of protection of the Project assets and an efficient system of distribution of fuel and office consumables;
- Establishment of the M&E system and the connection between this system and the accounting system;
- Supervising the SHMDP Accounts.

Auditing:

- Prepare and facilitate audit missions as required by the financial agreements and the national legislation and ensure the follow-up of the recommendations of these missions;
- Collaborate with the project Internal Auditor with a view to improving the accountability, transparency and efficiency of the project operations.

Qualifications:

Educational Background: Professional certification in accounting or audit and/or Master's degree in economics, management or business administration.

Experience: practical experience of at least 5 years in project financial management and accounting procedures with internationally financed projects, with the Auditor General Office or with relevant public institutions; a good knowledge of computer applications in the above related matters.

Languages: The candidate should be fluent in both English and Swahili (reading, writing and speaking).

7) POSITION: Procurement specialist

Location: Mbeya -Southern Highland Milk Shed

Reporting to: The Project Coordinator

Duties and Responsibilities

- Coordinate all procurement activities in SHMDP
- Review and ensure that all procurement requests submitted for financing through are eligible and in accordance with IFAD guidelines and requirements as well as Nation Procurement Law;
- Determine the most appropriate method of procurement;
- Prepare annual procurement Plans in accordance with the strategic and action plans for the implementation of Project activities and ensure its implementation on a timely and efficient manner;
- Provide backstopping Support in procurement process at the district level.
- Help to identify, specify, estimate the cost of, and consolidate in packages (as appropriate) the procurement of goods as may be required by the Tanzania Public Procurement authority
- Prepare appropriate bidding documents; including specific procurement notices, standard contracts for goods and services, invitations for bids, etc.;
- Maintain and update records of standard unit costs, technical specifications for goods, and local and international vendors and facilitators;
- Participate in the evaluation of proposals/bids and contract negotiations
- Review and update procurement plans on a regular basis
- Advise the Zonal coordinator, the technical staff and other relevant staff of SHMDP and other agencies on guidelines and procedures for procurement of goods and services;
- Ensure that implementing entities are trained and adhere to National procurement procedures and guidelines and to those of respective Development partners Agencies;
- Ensure good filling system of all procurement documents;
- As necessary, assist sub-contractors in preparing bidding documents for goods, works, and services thereby ensure the most efficient use of resources;
- Perform any other duties as assigned by his/her superior.

Qualifications

Educational Background: Bachelor's Degree in public administration, or similar field,

Experience:

- Two years of experience directly relevant to the area of procurement,
- Familiarity with IFAD and National procurement procedures.
- Proven competence in the use of computer software applications including spreadsheets and word-processing packages.

8) POSITION: **Service Provider for the Multi Stakeholder Dairy Platform (MDP)**

Location: Mbeya -Southern Highland Milk Shed

Reporting to: ZPMU Dairy Agri-business Specialist

The Service Provider (SP) contracted for this aspect of the Project will play a key role in determining the future of the dairy sector in the SHMS. In order to ensure consistency across the Regions and Districts, that will account for differences, only one SP should carry out this process.

Requirements

The SP must have extensive knowledge of the dairy sector in Tanzania and specifically in the Southern Highlands. They must have a proven track record in the sector, studies, practical delivery and a clear awareness of key challenges facing the sector – policies, taxation, fees, transport, processing, forage, and other production

The SP will carry out the following tasks in order in each District:

- The first step should be to sensitize stakeholders in all relevant project areas to facilitate a greater understanding of the topic among government officials, NGOs, farmer associations and cooperatives, and, of course, the private sector.

The DAS at ZPMU will ensure coordination and consistency across Regions and Districts and ensure that the DAOs and the District Economic and Empowerment Officers take an active role in the process and supporting the SP as required at the District level, e.g. facilitating meetings, access to government officials, providing existing information, etc..

The sequence of the tasks is as follows:

Rapid Mapping

The objective of the rapid mapping exercise is to identify the main actors in the local value chain, including their demands, contributions and expectations. Based on the identification, the SP will develop clusters in relevant geographical areas (in consultation with the VC teams). The identified farmers will be approached depending on their supply potential, amongst others. Also service providers and agribusinesses will be mapped.

The initial rapid mapping of VC potential includes two parallel elements:

- Scouting and meeting with traders/buyers/processors to confirm specific demand for products and explore their interest working with producer groups in cluster areas.
- Mapping geographical production clusters, encompassing existing producer groups and other potentially interested groups, and estimating supply potential over time (to match identified/ potential demand from traders/buyers).

Cluster Development

After rapid mapping, the SP will be able to select the areas of inclusion for the Project and will have identified most of the VC actors to work with. Per area, the main VC actors will be grouped in a cluster. The SP will approach different actors individually to explain the purpose, discuss expectations and contributions and agree on the next steps.

- The SP will then hold a validation workshop (see MDP).

Multi-Stakeholder Dairy Platforms (MDP)

The MDPs will begin informally through the value chain validation workshop which will be held with processors, traders and businesses as well as representatives of producer groups. The aim of the workshop is to confirm:

- The scale and scope of the immediate market opportunity based on the perspectives of the private sector
- The credibility of buyers/traders being interested to buy increasing volumes of the scale likely to be produced from the identified production clusters at prices to be sufficiently attractive for producers to increase production, quality and meet demand
- The specific interest of sufficient numbers of traders, buyers and/or businesses to partner with the project and the producer groups in developing the local value chain

- That the project's instruments, modalities and resources are likely to be sufficient to make a meaningful contribution in addressing the likely bottlenecks and in stimulating accelerated growth of the local value chains

SP's, in conjunction with the DAS and District staff will organise follow-up MDP's bringing together the main actors to understand constraints and opportunities of the involved actors. Guiding the MDPs development the SP will ensure that the following critical purposes are achieved:

- Facilitate meetings between groups of buyers/agribusinesses and farmers/producer and other service providers (banks, nurseries, input suppliers, service centres, technical production consultancy providers etc.) to deepen mutual understanding and identify win-win opportunities for greater collaboration;
- Identify specific bottlenecks in the VC that can be tackled with the support of the project - e.g. through facilitating new/improved commercial relationship within the value chain, through co-investment to stimulate private investment in critical elements of the local VC and/or investment in public good infrastructure (the DAO and EEO should ensure that these public investments are included in the VADPs and into the DADPs);
- Identify the main bottlenecks and development of a road-map with immediate priorities - including who will do what and who will pay for what.
- Oversee delivery of a joint action plan developed with the main VC stakeholders in each cluster (producer, agri-businesses and service providers), the project and other development partners;
- Involved VC actors (via MDP strategy and action plan) to set priority areas for project support - e.g. main "types" of post-harvest/marketing investments to be prioritized for co-investment or TA support, critical public and market infrastructure for project investment, types of technical support needed).

Attachment 1(b) Draft Terms of Reference for Advisors of the Technical Advisory Group (TAG)

1. Dairy Agribusiness Advisor (DAA) - provided by the Service Provider

The project will engage specialists to part of an advisory group established by the Service Provider for day-to-day activities in the dairy enterprise value chain. The dairy agribusiness advisors (DAAs) will serve as consultant, advisor and mentor to enterprises and be a trainer of trainers (TOT). A specialist may require a two week orientation on smallholder dairy production and processing which could be done at Sokoine University of Agriculture (SUA) or at a dairy training centre.

Tasks

- Each advisor will become familiar with the target area. An initial visitation will be arranged after the appointment.
- The advisor/trainer will develop a work plan for how they plan to conduct activities in their districts. The work plan will be reviewed and approved by the DAA in the zonal office. Quarterly reports will be submitted to the DAA in the zonal office.

Working in a group setting the TAG will develop a training curriculum for milk traders, producer organizations, MCCs, small and medium-size processors, milk distributors, milk kiosk operators, retailers and others. The training toolkit will be have four modules:

- sanitation and hygiene standard
- milk collection, cooling and testing dairy processing – production
- carry out business plan development and see that applications are placed with commercial.

The dairy specialists will mentor extensionists at the district level and conduct trainings and provide advice to dairy value chain enterprises.

The TAG will use latest information technologies (IT) to disseminate information to stakeholders in the dairy value chain and communicate with extensionists.

The advisor will plan site visits to facilities to showcase how to do proper dairy business

Desired qualifications

- B.S. degree in agriculture, animal husbandry with a specialty in dairy science
- Five years of work experience after college in agribusiness and marketing.
- Able to conduct group training sessions.
- Knowledgeable in the use word processing and spreadsheets software.

2. Group Development Advisors - provided by the Service Provider

The project will engage specialists as part of the advisory group established by the Service Provider (SP) for day-to-day activities as group and cooperative development advisor (G/CDA). The G/CDA will focus on farmer's organizations and provide education and training on how to effectively manage such cooperation. The advisor will communicate clearly to farmers and value chain group enterprises the benefits of being in the group and involving them in decision making is important to enhance their commitment to the group.

Tasks

- Each advisor will become familiar with the target area.
- The advisor/trainer will develop a work plan for how they plan to conduct activities in their districts. The work plan will be reviewed and approved by the project's DAS in the zonal office. Quarterly reports will be submitted to the DAS.
- Working in a group setting the TAG will develop a training curriculum for group and cooperative members. Lead training sessions on roles of board of directors and management duties of cooperatives
- The dairy specialists will mentor extensionists at the district level and conduct trainings and provide advice to dairy value chain enterprises.
- The TAG will use latest information technologies (IT) to disseminate information to stakeholders in the dairy value chain and communicate with district and regional extensionists.
- The advisor will plan site visits to facilities to showcase the role of cooperatives

Desired qualifications

- B.S. degree in agricultural extension and education
- Five years of work experience after college in agricultural extension services
- Able to conduct group training sessions and be a motivation presence for producers and others on the role of cooperative
- Knowledgeable in the use word processing and spreadsheets software.

Attachment 1 (c): Draft Implementation arrangements for district government extension agents

A. District Livestock Extension Officers (DLEO) and Milk Inspectors (MI)

In each district there will be two to three government district livestock extension officers (DLEO) in addition to milk inspectors (MIs) conducting activities under Component 1. The DAA of the service provider will work with both groups to support businesses in the value chain. These will include transporters, processors (MSMEs), distributors, and marketing and sales personnel. The DAA will conduct training of trainers (TOT) trainings, supervise project interventions, assist in development of business plans, and facilitate entrepreneurs to obtain loans from financial institutions. DLEOs will collect market information to share with the project staff and other district livestock extension officers. The DLEO with the DAA will solicit support from private sector to co-operate in the trainings. The district MIs will be supported by the DAA to undertake trainings.

B. Regional and District Nutrition Officers (RNO and DNO)

The project will work with district nutrition officers (DNO) to promote use of milk and milk products in the household diet. The agents will hold workshops and trainings for women and youth groups on ways to incorporate milk in different meal plans. The agents will work closely with community health workers on distribution of education materials and cooking demonstrations. The professors at SUA in Morogoro will be engaged to provide supervision to these extension agents. Baseline survey will be done at the beginning of the project to measure the impact of nutrition programs on the health status of target groups

Attachment 2: Using clusters in the implementation approach for Multi Stakeholder Dairy Platforms

The project will support the development of the dairy value chain at the district level and beyond. As the value chain is shaped not by the district's boundaries but rather by economic opportunity. In geographical terms, we can talk about clusters of economic activity (dairy production, transportation, processing), within/across districts, and radiating from a source of demand or a point of aggregation for milk and milk products. It is in these clusters that the project would focus its efforts.

The purpose of this attachment is to outline the process that would be used at the start of the project implementation period to define the extent of those clusters, and the project activities that would then be implemented within them.

Cluster-based approach

Using best practice, SHMDP will adopt a cluster-based approach. A cluster is a geographic concentration of interconnected producers, businesses, suppliers, and associated institutions which creates direct and indirect synergies among them, resulting in market linkages (USAID, 2008). This means that a cluster approach will geographically group the key actors along the value chain in the same areas. In the case of the Southern Highlands this means that:

- The cluster will extend to those smallholder dairy farmers who are geographically located sufficiently close to the point of demand / aggregation to make their participation in the cluster and MDP economically viable for them and other value chain actors;
- The rapid assessment and cluster approach will also be used to identify the locations for MCPs or MCCs and well as learning and discussion groups / forums / L-FFS, etc.; and
- They may also choose to become a Federation representing a number of farmer organisations (or a more formalised forum for the value chain actors).

The key actors in the clusters include processors, input suppliers, producers, buyers, service providers and government agencies. The project will bring them together to discuss arising issues in multi-stakeholder meetings and develop an action plan together to tackle the issues. It can be seen as a 'stakeholder forum' which is a tool to create trust, address common issues and strengthen the value chain. If they are effectively going to address value chain constraints, clusters need to be used as a means to achieve an end not as an end in themselves.

A cluster is useful when (i) the value chain is highly unstructured throughout its segments (transportation, distribution, enabling environment), thus requiring interventions by numerous stakeholders who could not resolve any single issue alone; (ii) trust among stakeholders is weak and hence a special effort to create trust and 'social capital' is necessary; and (iii) obstacles to objectives (e.g. increased sales) need to be addressed by multiple stakeholders and value chain segments (USAID, 2008). Overall, a cluster approach will help to address value chain constraints by building stakeholders relationship as well as responding to market needs.

When applying a cluster-based approach the SHMDP teams will need to allow for the following points:

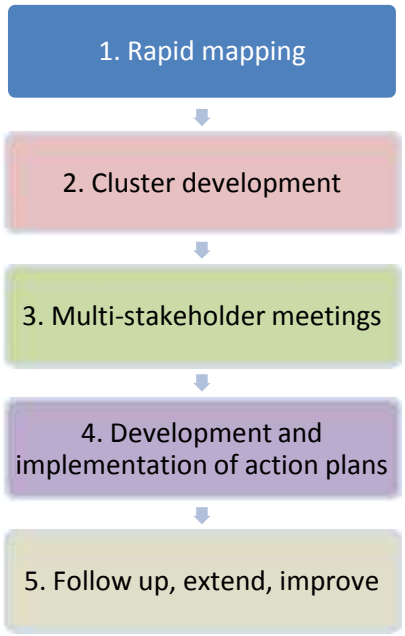
- With multiple stakeholders involved in clusters, leadership can create a challenge. In that case, honest brokers are required who take up the role of bringing the stakeholders together and stimulate trust. It is important that the brokers gain the respect of all stakeholders.
- To create trust among numerous stakeholders, it is very helpful to have a common goal and indicator e.g. increased sales and incomes (on a "fair" basis across the value chain).
- Quick wins and early accomplishments are essential in fostering trust. This should be incorporated in early, doable action plans.
- Through clusters, the stakeholders need to achieve demonstrable, quantifiable and successful results based on market demands: the value chain needs to focus on what buyers want not on what is currently produced. These wins will stimulate the stakeholders to continue in the same spirit of cooperation.

- Value chain enhancement requires the involvement of supporting institutions e.g. government (for e.g. policy, public goods, taxation, fees, etc.), research institutions, and so forth. To support the clusters, the stakeholders need to be able building on existing institutions, TDB, MDP as this will contribute to sustainability.

Outline of SHMDP process in the value chain cluster[1]

The definition of value chain clusters forming the basis of the MDPs, the identification of actors within them, and – with their active participation – the development of cluster-level action plans will be critical to the project implementation approach. Given the need to start project activities as soon as possible after project effectiveness, the process is envisaged as a rapid one, lasting in each district no more than 6 weeks from the start of the process to implementation of the action plan.

The mains steps in the process in the value chain cluster are:



Each of these main steps is summarized below.

Rapid mapping (total 2 weeks per district)

The objective of the rapid mapping exercise is to identify the main actors in the local value chain, including their demands, contributions and expectations. The identified farmers will be approached, and processors, service providers and agribusinesses will be mapped. The mapping will be done, on a contracted basis through the ZPMU to ensure consistency across the project districts.

The initial rapid mapping of value chain potential includes two parallel elements:

- Scouting and meeting with traders/buyers, processors to confirm specific demand for products and explore their interest working with producer groups in cluster areas.
- Mapping geographical production clusters, encompassing existing producer groups and other potentially interested groups, and estimating supply potential over time (to match to identified demand from traders/buyers).

Rapid mapping will be carried out for all key dairy production locations.

MDP identification (total 1 week)

After rapid mapping, the DPIU teams will be able to select the areas of action in each district and will have identified most of the value chain actors to work with. Per area, the main value chain actors will

[1] This process was developed by SNV as a key implementing partner of PADEE in Cambodia and based on the original experience of the joint IFAD-Government-SNV High Value Agriculture project in Nepal.

be grouped in a MDP. The different actors will also be approached individually to explain the purpose, discuss expectations and contributions and agree on the next steps.

A first concrete action will be a validation workshop (see description of component 3).

MDP development (total 1 week)

The MDPs in SHMDP are a central element of the approach to facilitate inclusive development of each value chain actor. They will begin informally through the value chain validation workshop. This workshop will be held with buyers, processors, traders and businesses as well as representatives of producer groups. This activity will involve all key staff in the project, however the initial workshops should be closely coordinated/guided by the ZPMU (for consistency) and implemented by the district teams. The aim of the workshop is to confirm:

- The scale and scope of the immediate market opportunity based on the perspectives of the private sector
- The credibility of buyers/traders being interested to buy increasing volumes of the scale likely to be produced from the identified production clusters at prices likely to be sufficiently attractive for producers to increase production and meet demand
- The specific interest of sufficient numbers of traders, buyers and/or businesses to partner with the project and the producer groups in developing the local value chain
- That the project's instruments, modalities and resources are likely to be sufficient to make a meaningful contribution in addressing the bottlenecks and in stimulating accelerated growth of the local value chains.

The MDPs for the value chain serve several critical purposes:

- Facilitate meetings between groups of buyers/processors and farmers/producer and other service providers (banks, nurseries, input suppliers, service centres, technical production consultancy providers etc.) to deepen mutual understanding and identify win-win opportunities for greater collaboration
- Identify specific bottlenecks in the vale chain that can be tackled with the support of the project - e.g. through facilitating new/improved commercial relationship within the value chain, through co-investment to stimulate private investment in critical elements of the local value chain and/or investment in public good infrastructure;
- Identify the main bottlenecks and development of respective road-map and immediate priorities - including who will do what and who will pay for what
- Oversee delivery of the agreed joint action plan in each cluster (producer, agri-businesses and service providers), the project and other development partners
- Involved value chain actors (via MDP strategy and action plan) to set priority areas for project support - e.g. main "types" of post-harvest/marketing investments to be prioritized for co-investment or TA support, critical public and market infrastructure for project investment, types of technical support needed.

Development and implementation of MDP action plan

The main value chain stakeholders in each MDP will develop a joint action plan facilitated by the DPIU team. The initial action plan needs to focus on immediate market opportunities or tackle the most immediate localized bottlenecks. Over time, the plan should fit in an agreed vision for the value chain and move towards more coordinated actions. The plan needs to address more strategic opportunities or constraints that may affect longer term growth and vibrancy of the local dairy sector as well as developing critical local service markets necessary for sustaining growth. The action plan should also feed into sub-regional and national processes of VADPs and DADPs to ensure that resources become available to address the plans.

Participatory monitoring and reporting

The DPIU teams in cooperation with the ZPMU will monitor and report on progress against defined milestones for the development of the value chain. This should be based on an evolving results chain and by applying an adapted set of principles and practices. All monitoring done will be captured in the MIS system of the project and guided by the M&E team.

Appendix 6: Monitoring and Evaluation

Results-based management

1. Planning, monitoring, evaluation and learning and knowledge management are critical functions for turning a project design document into an living set of activities, consistently focused on achieving project results and development impact. Overall responsibility for these functions under the project will lie with the Planning, M&E/KM (PMK) Officer in the Zonal Project Management Unit (ZPMU).

2. SHMDP will be guided by a results-based management approach which aims to ensure that all processes, services and activities of implementing partners will contribute to the achievement of project targets within the framework of the project's theory of change. As part of this approach, planning, monitoring and evaluation will be results-oriented to maintain the link between project activities and project development objectives, and to enable the tracking of progress towards outputs, outcomes, impact and sustainability.

3. The project will be implemented across 15 districts[1] with activities implemented by different implementing partners[2] each with their own organisational structures. Project activities will be directed at multiple stakeholders, including milk processors, traders and small private dairy operators; milk collection centre operators, production service providers and above all smallholder dairy farmers. All of them are expected to play a role in the planning of project activities, while a key dimension of the M&E and learning function will be to understand how the project has changed their behaviours as economic players in the dairy value chain.

Annual Work Planning

4. Planning will be guided by the project's logframe, and in particular the project development objectives and outcomes sought. However, the activities and outputs defined in the logframe are not set in stone, and the planning process must be sufficiently flexible to allow modifications to be made to the activities and outputs, so long as these are aimed at enabling the higher level objectives to be achieved more effectively and efficiently. What is critical then is an explicit statement of the planned results with clear identification of how planned activities are expected to lead to those results.

5. Starting with the preparation of the AWPB for Project Year 2, there will be a formal process to review the previous year's performance, generate lessons learned and incorporate the experience in the coming year's AWPB. It should analyse and summarize the previous year's performances and challenges, highlighting the rationale and recommendations for the proposed activities. In addition, it will review and document the planning system including the local level planning and the approval processes.

6. As such, and particularly from PY2 onwards, the AWPB will be informed by an assessment of implementation progress and results, and will describe the strategic direction of the project for the coming year, along with results expected (targets) under each component and how those results will be achieved – the details of planned activities. This will be complemented by a resource plan, budget (including a Procurement Plan) and risk analysis for each result. The AWPB will include plans for training and technical assistance, M&E (describing the specific M&E related activities to take place) and procurement for the year in question, wherever warranted.

7. An annotated outline of the AWPB will be provided in the Programme Implementation Manual.

8. The overall draft project annual work plan and budget (AWPB) will be made up as an aggregation of a series of separate lower-level work plans. Each of the participating districts will develop its own AWPB, with priorities determined through a stakeholders workshop or platform, and it will be approved by the district council. This will help to build ownership at the district level, and the taking on of responsibility for implementation, monitoring and evaluation by district organs.

[1] Songea DC, Songea TC, Mbinga, Madaba, Rungwe, Busokelo, Mbeya Rural, Mbeya City, Iringa DC, Mufindi, Mafinga Njombe TC, Makete and Ludewa, and Mbozi
[2] DPP-MALF, TDB and LITA

9. AWPBs will also be prepared by the ZPMU for the activities under its responsibility; the various implementing partners – DPP-MALF, TDB and LITA, and any contracted service providers; and, collectively, these will be reviewed by the ZPMU, adjusted where necessary, and compiled into a draft project AWPB. The Planning, M&E/KM Officer in the ZPMU will provide guidance and support to each of the entities preparing their work plans; at the district level the District Executive Director would lead the planning process.

10. After finalisation at the level of the ZPMU, the Project Coordinator will present the draft AWPB to the Project Steering Committee for review and approval, after which it will be sent to IFAD 60 days prior to the end of each project year for no objection.

Monitoring & Evaluation

Purpose and scope

11. **Purpose**. The M&E function within the project will serve three distinct functions. The first will be one of ***management***: to provide timely information that enables the managers of the project to confirm whether implementation and financial performance are proceeding as planned and the project's outputs, outcome and impact are being achieved; to verify that the project's strategic approach is valid; and to take corrective action as necessary. The second will be an ***accountability*** function: it will provide the information that enables Government to report on its performance to IFAD and confirm its compliance with the provisions of the financing agreements. The third function will be a wider ***learning*** purpose: generating knowledge which can serve to inform policy processes at district, provincial and national levels. The M&E system is defined with these diverse purposes in mind.

12. **The logframe**. The M&E system will be derived from the project logframe. Based on the hierarchy of objectives for the project defined there, the system will be used to generate data systematically on project impact, outcomes, outputs and implementation progress for each defined project outcome. Wherever appropriate, data will be disaggregated by district.

13. **Indicators**. The indicators used to measure progress, results and impact will include: (a) the indicators defined in the logframe; (b) those identified by the ZPMU and project implementing partners as critical for management, accountability and learning; as well as (c) those of relevance to the project that contribute to IFAD's Results and Impact Measurement System (RIMS), which is a system for measuring and reporting the results and impact achieved by IFAD-financed projects.[3]

14. The approach used to measure and assess progress, results and impact at the different levels of the project hierarchy of objectives will be broadly as follows.

- **Impact** – the extent to which the project has achieved its development objectives – will be assessed using rigorous, mixed-methods approaches. It will draw on both formal quantitative surveys and a range of participatory methods – which facilitate both the measurement of impact, and also a thorough understanding of who it is that benefits, as well as the nature, dimensions of the impacts achieved, and the factors that have combined to drive that impact.[4] The approach used will be the same for both baseline and completion studies, so as to allow a meaningful before and after comparison, preferable using panel data. The surveys will elicit data at the impact and outcome level according to the results framework as well as socio-demographic data and other relevant information for targeting, planning (as regards the baseline survey) and evaluation. IFAD mandatory RIMS indicators will also be included. It is essential that the baseline survey be conducted prior to commencement of project implementation in order to adequately inform project planning.
- **Outcomes** – the short- and medium-term changes coming about as a result of the project interventions – will be monitored every supervision / implementation support mission to ensure the project is on track vis-à-vis its intended results and allow timely decision-making if the results are not being achieved as expected. Some of the outcomes can be measured by implementing partners on the ground as part of their day-to-day reporting, while other outcomes may need to be captured through annual outcome surveys. Regular outcome monitoring will allow the project's progress reports to IFAD to describe progress according to

[3] IFAD is currently revising RIMS and SHMDP will align with the updated version of the system.
[4] See, for example, the Participatory Impact and Learning Approach (PIALA) http://www.ifad.org/english/piala/index.htm

the results framework, theory of change and logframe and thereby inform project management of the likelihood of reaching development objectives and outcomes. It will be important to start outcome monitoring at the time of the baseline survey and continue on a regular basis to allow tracking of the validity of the proposed theory of change / results chain.

- **Output** monitoring focuses on measuring the progress of activity implementation and achievement of outputs against annual targets set in the AWPB. It involves tracking both physical implementation of activities and budget expenditure, so as to allow the integration of physical and financial reporting with ensuing cost-effectiveness and efficiency analyses. Each implementing partner contributes to output and AWPB progress monitoring, in real time and quarterly reports submitted to the relevant line agencies and compiled at ZPMU level. Output monitoring should then be linked with observed changes from the outcome monitoring to give a full picture of progress.

- **Implementation progress monitoring** will measure and report on use of project inputs and achievement of project sub-outputs. Input monitoring will serve to measure and report on the provision and use of resources – financial and physical – in support of the project activities, against allocations defined in the project AWPB. It will involve the collection of data – at the levels of district, region and national level – related to the allocation and use both of project funds and human resources, as well as procurement of goods and services. Progress monitoring should be conducted using information technology such as tablets, mobile phones, survey software, geographic information systems, etc. Project beneficiaries and field-level implementers will be the first link in the chain of reporting, which subsequently continues to the district and national levels of implementing agencies and to the ZPMU, MALF and IFAD on a quarterly and semi-annual basis respectively.

15. In addition, the M&E system will collect and analyse information about a number of key dimension of performance, including: project outreach; the effectiveness of the targeting strategy and target group specific benefits – including employment creation; the performance of key value chain clients; the cost-effectiveness of implemented activities; and the environmental impact and vulnerability (incl. climate risk and greenhouse gas emissions).

- **Outreach** will be measured as the number of people and households drawn from the project target group benefitting from project interventions. Primarily this will be smallholder dairy producers – as participants in dairy farmer field schools, as sellers of milk and as members of marketing groups or cooperatives; but it will also include those who benefit from increased employment opportunities and incomes, as on-farm labour, as production service providers and as players in the milk and milk product value chain.

- **Targeting** effectiveness will be assessed through tracking of results by different socio-economic groups, as well as women and youth. The needs and realities of these groups are different, project interventions will be different and following on this, measurement of results must be able to clarify whether benefits are accruing to all sub-target groups effectively. Thus, wherever possible, measurement at the different levels should be broken down by gender, and recognise youth as a separate and specific group.

- **A client data base** – a data base of all actors in the post-production value chain and their performance – would be established as a critical part of the M&E system. With such a database, the project would know its clients better; understand their operational progress, financial viability etc; and be able to show clear linkages between outputs, outcomes and impact. The client database has to be systematic, and have a potential for a high level of responsiveness from implementing partners in data capture. For this purpose, a more user-friendly electronic interface would be explored backed by some form of incentive system for the frontline users.

- **Cost-effectiveness** of interventions and of the project overall will be assessed in two ways: (i) day-to-day tracking of AWPB and procurement combining physical and financial progress; (ii) as part of thematic studies of specific project interventions; and (iii) as an end-of-project assessment of the cost of bringing people out of poverty, of increased milk productivity, of improved milk collection systems and other core aspects of the project as per the development objective and core outcomes.

- **Environment impact and climate risk** will also collect data on monitoring of environmental impact, track progress and identify problems and opportunities linked to the implemented activities along the value chain. The team will establish modifications, adaptation and mitigation actions required in order to reduce the probability of any negative environmental impact in compliance to the SECAP (Social Environmental and Climate Assessment Procedures). To ensure effective mainstreaming of environmental issues into the SHMDP activities, the field monitoring of environmental indicators as well as feedback mechanisms will be included in the supervision, implementation support missions and reporting, as well as the mid-term review. In addition, this process will also entail carrying out thematic studies following international standards[5] for which international expertise will be sought.

16. **Use of M&E findings**. M&E data will be used to inform discussion within the ZPMU and with project implementers and stakeholders as to financial and implementation progress being achieved, and the relevance, effectiveness and efficiency of the project activities and implementation approach. M&E Review meetings should be held with project managers and implementers at least quarterly; and annual reviews will be conducted to provide the opportunity for dialogue between the project managers, implementers and project beneficiaries and target group.

17. As part of the process of designing the M&E system, a performance dashboard for participating districts will be established, which will allow for real-time monitoring of key indicators. Performance against these indicators will be assessed, and a system will be established to incentivize strong performance by linking annual financial allocations to the districts to the physical and financial progress achieved.

18. **A baseline study** will be carried out either prior to or immediately upon start-up in order to inform overall project planning, ensure benchmarks and realistic targets are set for outcomes and impact, determine climate risk and environment-related benchmarks (see draft TOR in Attachment 2). The baseline study will assess both the socio-economic level of beneficiaries and group beneficiaries; and the knowledge, attitude and management practices of smallholder dairy farmers[6]. It will also include a benchmarking of key aspects related to milk processing, milk collection centres, upstream and downstream service providers, and dairy extension services.

19. The subsequent completion (impact) study will follow the same methodology as the baseline study to allow meaningful comparison, although the scope of the impact evaluation may be broadened to cover other aspects of project relevance, effectiveness, efficiency, impact and sustainability to adequately inform the project's completion report.

20. **A midterm review** will be conducted in year three of project implementation. The review will assess the relevance (i.e. internal and external validity of project design), effectiveness (progress towards targets), and efficiency (funds disbursed vis-à-vis achievements) of the project; and it will provide the basis for changes in the project implementation approach, project activities and overall targets, as necessary. Any suggested changes should be assessed and endorsed by IFAD.

21. Field visits and joint implementation review missions will be carried out on a regular basis by project staff, IFAD supervision teams and government representatives. Qualitative data will be sought on these field visits to complement quantitative data in the performance monitoring processes. Missions will validate results reported through RIMS and in general.

The M&E system

22. M&E data will be captured, analysed and presented through a web-based M&E system, capable of producing reliable and easily accessible project-related information. This will allow for real-time inputting of data; their automatic aggregation; timely decision making by managers; and open access to, and sharing of, results among all project stakeholders for enhanced knowledge all levels. The IT infrastructure will therefore include a software package for collecting, storing, processing and disseminating data, customised for SHDMP that can also link to Government systems for

[5] See *Bulletin of the International Dairy Federation 445/2010:* A common carbon footprint approach for dairy. The IDF guide to standard lifecycle assessment methodology for the dairy sector. International Dairy Federation; Brussels 2010.
[6] See e.g. FAO and IDF. *Guide to Good Dairy Farming Practice*. Animal Production and Health Guidelines. No. 8. Rome, 2011.

sustainability after project closure. Options include open access software like Open Data Kit[7]. This has the additional advantage of allowing IT-supported data collection tools (e.g. mobile phones or tablets) to be used to feed data simply, and in real time, into the M&E system.

> The IFAD-supported Coastal Communities Development Project in Indonesia uses a combination of its website (www.ccdp-ifad.org), twitter, facebook and whatsapp to report and share data, information and even photos on project activities and implementation performance, in real time. A dashboard providing disaggregated data on project performance is updated weekly and shared; and this is fed into weekly meetings to review performance and identify necessary follow-up actions.
>
> Collectively, these have contributed to a collective recognition of the value of M&E in its broadest sense, the emergence of a culture of information sharing and communication among key project stakeholders, an understanding that M&E is a shared rather than a delegated responsibility, and a spirit of competition among the districts whose performance is

23. The M&E system should include a dashboard, to provide key implementation and financial performance data. Initially this could be updated on a monthly basis. The dashboard, which should be fully operational by the end of the first year of implementation, will promote transparency and sharing of information, and allow for real-time monitoring of implementation and financial progress, and comparison and benchmarking among the project-supported districts. Under other IFAD-supported projects, this approach has contributed to: (i) a recognition by all stakeholders of the value of M&E, (ii) the creation of a culture of information and knowledge sharing, and (iii) competition around performance between the participating districts.

24. Upon project effectiveness, an M&E consultant will be recruited to establish the M&E System, and provide ongoing support for the set-up and implementation of the project's M&E system, in line with the conceptual framework and proposed main features of the M&E approach. In doing so, he/she will work closely with the PMK Officer. Draft TOR are shown in Attachment 1.

25. While the web-based M&E system is being established, the PMK officer will initiate the project's M&E activities, in particular developing an M&E plan and associated M&E manual[8]; and will be expected to ensure that relevant data at all levels are collected from the start of PY1.

Learning and knowledge management

26. The learning and knowledge management agenda under the project will serve above all to draw lessons from the project implementation experience that can contribute to Government's efforts to strengthen the policy and institutional framework for the dairy sector. However, it will also provide the basis for the project's communications – internally, to project stakeholders and participants, and to wider, though targeted, audiences. It will draw heavily on the M&E function to shape its priorities, as well as lessons from other similar studies in the sector to inform project implementation.

27. Case studies ('snapshot studies' under the three components listed in Attachment 3) will be carried out on specific issues needing further investigation and analysis to support or guide project implementation. The studies themselves would be contracted out by the ZPMU to suitably qualified and experienced consultants. It is expected that their principal scope will be policy-related, and that they will serve to: (i) assess the impact (at national and district level) of specific existing policies on dairy value chain operators and offer options for changes to policies as and when necessary; (ii) evaluate approaches piloted under the project, to identify successes and opportunities for scaling up both to other districts and through national strategies and/or programmes; (iii) capacity and organization of the extension service delivery to smallholder farmers; (iv) analyze effectiveness of DDF and TDB in addressing policy issues and carrying out their mandates of promoting and regulating the sector; and (v) understand market dynamics and address capacities of value chain actors. They will also seek to provide answers on key issues that can improve the relevance, effectiveness and efficiency of the project.

[7] https://opendatakit.org/

[8] This will detail the project results chain and the M&E framework, with the indicators to be used to monitor/evaluate the results achieved (based upon the project logframe); the scope, organisation and contents of the M&E system as a whole and the management information system (MIS) that contributes to it; the roles and responsibilities; how data will be collected, analysed, reported, used and otherwise managed (tools and methods); a timeline for M&E related activities; staffing and capacity building plan; budget; etc.

28. For each study topic, a 'learning plan' will be developed. This will identify the learning stakeholders/partners and describe the knowledge products and dissemination strategy, and it will serve to ensure that the study feeds into a larger process of reflection at the project level and, where appropriate, beyond. The studies themselves would be contracted out to suitably qualified and experienced consultants.

29. Other knowledge and communication products may include policy briefs, emerging from the case studies; extension materials; as well as a project website, brochures, newsletters, press releases and programmes for TV/radio/internet. SHMDP will draw from the expertise of and collaborate with MALF for the production of relevant knowledge products and communication materials.

Implementation responsibilities

30. Reflecting the project's implementation arrangements, overall responsibility for project planning, M&E and knowledge management will lie with the PMK Officer in the ZPMU, as per draft TOR shown in Attachment 1, Appendix 5 (Draft TORs for key staff of ZPMU**).** He/she will be supported to establish the M&E system and train relevant staff by the M&E Consultant.

31. However, the M&E system will be decentralised and participatory in nature, with responsibilities for M&E data inputting lying with those individuals/agencies that are responsible for the implementation of the activities in question. Data flows will be both upstream and downstream with implementers reporting raw data upwards to the ZPMU (and feeding into the management information system (MIS) of the MALF as relevant); and subsequently the ZPMU sharing analysed information, results and lessons downwards all the way to the field level. The web-based nature of the M&E system will facilitate this. Parallel with the continuous data flows, thematic studies and evaluations will be carried out by external experts.

32. Responsibility for monitoring and reporting on activities at the district level will lie with the DPIUs responsible for implementing them, under the guidance of head of planning unit; and the level of project funding made available to the districts will depend not only on their implementation performance but also their reporting that performance. All players in the dairy value chain will be encouraged to monitor and record their own performance, as part of the management of their businesses: the client data base will draw on those data.

33. Specialised studies – the baseline and subsequent impact studies; the environmental impact and climate risk study; and the case studies of the KM agenda – will be contracted out to consultancy firms, policy research institutions or universities, according to approved terms of reference and following competitive selection procedures.

34. Relevant training and capacity development specifically on aspects relevant to the project M&E (e.g. participatory monitoring and evaluation, use of information technology in M&E, risk monitoring, carbon footprint assessment, etc.) will be availed of as required and in line with the AWPB training plan and the capacity development plan of the M&E manual.

Attachment 1: Draft Terms of Reference for Consultant to set up M&E system

Objective of the assignment

The objective of the assignment is to establish a data capture, storage and retrieval system capable of producing reliable and comprehensible management information available at the right time to allow decision- making and enhancement of knowledge at all levels (beneficiaries, project staff, service providers, Government, IFAD, etc.).

When established, the PM&E system for SHDMP is expected to provide the necessary tools and procedures that will be used to:

- collect data from the field;
- record data in a consistent manner;
- transmit data to a central place;
- store data safely, well organised, easily accessible;
- process data so that it can be used; and
- present information to management and other stakeholders, in reports and through other means.

General scope of the post

GASIP requires the services of an M&E consultant to develop a web-based Monitoring and Evaluation System that will provide a quick and easy access to project-related information. The M&E consultant will be responsible for establishing and providing ongoing support for the set-up and implementation of the project's M&E system, in line with the conceptual framework as well as the features of the proposed M&E system.

The database software must be a user-friendly and custom-built. It must serve as a powerful evaluation tool that provides a link between activity implementation (outputs) and cost (efficiency monitoring). It is expected that the M&E System that will be set up will have the following attributes among others:

- Effortless data capture, storage and retrievability;
- A very simple and easy mode for data cleaning and analysis;
- Presence of drop-down menus to make preferred choices;
- Ability to provide different pre-defined levels of access to various project personnel based on their job function;
- Ability to generate tables and undertake basic transformations of data like frequencies, summation, etc;
- Ability to generate graphics that could be exported into documents;
- An action-oriented user's manual (not only a narrative);
- Wide and easy accessibility, combined with security features that make possible data protection, use of usernames & passwords, automated backup plan and audit trail of users;
- Ability to prevent double counting of farmers/people receiving services from more than one service provider

Organizational relationships

The consultant will be answerable to the Project Coordinator, and will report on a day-to-day basis to the PMK Officer.

Operating responsibilities and tasks

The consultant will among others:

- She/he will do this by assessing the current state of the Project M&E matrix, and of performance questions and indicators, the objective hierarchy and assumptions, and by

considering who is using/will use this information. The system should include monitoring for outcome reporting based around the Theory of Change..

- Define the choice of software according to database requirements such as the main tools for data collection, recording and management, degree of user-friendliness, possibilities of updating the database as well as the technical facilities available in the field.
- Provide technical advice for the procurement and installation of appropriate hardware and software for M&E information.
- Install hardware and software for M&E information and arrange for the training of operators of the system.
- Make (to be agreed with Project Coordinator) return visits to the project to review information management and make adjustments, as necessary.

Qualifications and experience required

The consultant must have:

- Computer/data processing specialisation, with at least five years of experience in developing and implementing M&E systems for IFAD sponsored projects and in setting up and maintaining management information systems in rural development projects;
- Proven experience with the logical framework approach, outcome monitoring against the Theory of Change and other strategic planning approaches, M&E methods and approaches (including quantitative, qualitative and participatory);
- Willingness to undertake regular field visits and interact with different stakeholders.
- Leadership qualities and personnel and team management skills (including mediation and conflict resolution).

Duration of assignment

The assignment, involving setting up the system and initial staff training is to be concluded within a period not exceeding two (2) calendar months.

Attachment 2: Draft Terms of Reference for a baseline study

Scope of the baseline study

The objective of the consultancy is to provide information on the situation of the project target group at the start of the project. This will enable SHMDP to assess, in the future, the extent to which project objectives are being achieved. The baseline survey is expected to collect quantitative and qualitative data regarding the agricultural and marketing activities for selected commodities, as well as household characteristics of target group households, in selected districts. This will involve the following.

- Collect quantitative baseline data for key outcome and impact indicators of the project. This data will be used to make comparisons in the future, when similar survey work will be conducted.
- Provide qualitative, contextual baseline information for the dairy value chain and on the households and livelihoods of smallholder dairy farmers, which will lead to a better understanding of the currently existing production and market-related activities. This information should include the role and importance for rural households of income obtained from marketing dairy produce; the extent to which smallholders access and participate in the value chain and markets for milk; the nature of the relationships between smallholder producers, small traders, and other market operators; the available service institutions and the services they provide; and the marketing environment, including market infrastructure, market access, market information and the regulatory framework.
- Collect qualitative information on the needs, constraints, opportunities and priorities as seen by smallholder producers, farmer groups and market operators regarding the production, marketing and processing of milk, which will assist the project in further defining appropriate interventions.
- Prepare a draft study report, present the findings of the baseline study to key stakeholders at a workshop, and incorporate the feedback in a final study report.

A standard questionnaire developed by IFAD exists for data collection on a limited number of indicators, and is available for information. However, a separate questionnaire will have to be developed because data must be collected on an expanded set of outcome and impact indicators.

The standard sample size used by IFAD in baseline/impact surveys, 900 households, is expected to be used. However, this may be modified in discussion between the consultant and SHDMP. The survey findings, presented in a baseline study report, will be used in the future to assess the impact of the project, through small repeat surveys that will start at mid-term, as well as a large survey at completion of the project.

Specific tasks to be included

- Review the project as described in the Project Design Document and Project Implementation Manual. Make suggestions to the ZPMU regarding the quantitative and qualitative data to be collected.
- Identify a sampling method that ensures adequate representation by the different actors in the dairy value chain – particularly smallholder producers and their groups, transporters, MCC operators, processors; as well as a control group in non-SHDMP districts
- Determine for which quantitative indicators secondary data can be used and for which indicators data needs to be collected through a questionnaire survey.
- Determine an appropriate sample size for the questionnaire-based quantitative data collection that allows for disaggregation by poverty strata, and other factors considered relevant.
- Prepare a draft questionnaire that incorporates survey questions related to project indicators in dialogue with the ZPMU
- Select data collection methods and prepare data collection tools for qualitative data in dialogue with the ZPMU.

- Carry out enumerator training, which should include field testing of the questionnaire and revision as needed, giving particular attention to their capacity to observe unexpected results as well as probing in order to obtain good quality data.
- Collect and analyze secondary data, from multiple sources where available.
- Carry out quantitative and qualitative data collection according to plan, while ensuring that the quality of the data is to a high standard.
- Clean and enter the quantitative data from the questionnaires using appropriate software.
- Analyse and interpret the quantitative and qualitative information collected during the baseline study.
- Include "context assessment", an analysis of temporary or permanent external influences at the time of the survey that may influence the results and are important to note for future reference.
- Prepare a draft baseline survey report, present this to the ZPMU and other key stakeholders and solicit for feedback.
- Prepare a final baseline survey report.

Methodology

It is expected that the consultant will combine the use of secondary data sources, quantitative and qualitative methods of data collection. The baseline data collection methodology should involve private sector players, farmers, market operators and other stakeholders. For qualitative data collection, the use of participatory approaches such as focus group discussions, semi-structured interviews and other PRA tools is expected.

Interviews will be conducted at the household level. The consulting form should prepare sampling method(s) that should allow for the selection of (i) the districts where the survey will be conducted, and (ii) the households that will be interviewed in each district. The sampling method(s) for selecting both districts and the households who will be interviewed should be proposed by the consulting firm and submitted to the Government of Tanzania for approval as part of the inception report. To allow that the information obtained from the baseline survey is representative of the different agro-ecologic zones in the program area, the sampling method should be selected accordingly.

Coordination and consultation

The contract for the baseline study will be supervised by the ZPMU. The consultant will report to the Project Coordinator. Upon signing the contract, the consultant will work under the direct supervision of the PMK Officer of SHMDP, with whom regular consultations are expected to take place, to discuss progress and ensure that the consultant delivers what the project requires as a baseline.

The consultant will prepare a detailed work schedule for the assignment prior to commencement of the actual work, and discuss this with the ZPMU.

Expected outputs and reporting

The following specific outputs are expected during the assignment.

- The consultant will prepare a detailed work schedule for the assignment prior to commencement of the actual work, and discuss this with the ZPMU.
- After completing the field work, the consultant will prepare an outline for the draft survey report and discuss this with the ZPMU.
- The consultant will prepare a draft report, submit this to the ZPMU and make a presentation on the main findings and the report to key stakeholders of the project in a workshop.
- The quantitative data in the baseline survey report should be presented in detailed and summarized tables for project indicators, disaggregated by gender and youth, which should

be accompanied by explanation and analysis covering the survey process, the meaning of the data, and statistical significance.

- Presentation of the qualitative and contextual data, on priority commodities, production and marketing activities, household status, and needs, constraints, opportunities and priorities as identified by the target group, should indicate how it complements the quantitative data. One or more sections with conclusions should make clear what implications the findings have for the SHMDP implementation strategy and interventions, and for collection of data in the future for comparison.
- The consultant will incorporate feedback from the workshop and the ZPMU in a final report, which should contain an executive summary. All reports should be prepared in the English language.
- The consultant will submit three hard copies and an electronic version on CD of the final report to the PSU. The CD should also include the full quantitative survey data set, entered in or exported to MS-Excel. The consultant is expected to keep, for at least 3 years, the original questionnaires completed during the interviews.

An **Inception Report**, which will detail the consultant's services together with survey design and approaches to be adopted. The Inception report should be presented to the client before the field work, and should comprise the following documents: a draft questionnaire, the proposed methodology and time length for the field work, the proposed sampling method, the proposed structure of the final report, any comments and suggestions to the current TORs.

A **Final Report** that includes all the relevant findings and recommendations. It is suggested that both the draft and the final reports have the following outline (to be discussed at the inception report): (i) Background; (ii) Objectives of the Study; (iii) Methodology; (iv) Discussion of the Results; (v) Conclusions and Recommendations; and (vi) Annexes (Questionnaires, Relevant Tables, List of Interviewed government institutions, etc).

The final baseline survey report will essentially be structured around the project impact indicators. The quantitative data should be presented in detailed and summarized tables for each indicator, which should be accompanied by text and analytical comments including information on the survey process, the meaning of the data, and statistical significance. The format of the report will be agreed upon by the consultant and the ZPMU.

Outputs or deliverables

- Hard copies of the baseline survey responses/survey instruments.
- A checklist of all survey interviews/questionnaires.
- A cleaned up data set in any statistical package agreed with ZPMU, preferably MS Excel and SPSS.
- A report outlining "context assessment", an analysis of temporary or permanent external influences that influence the survey results.
- Three hard copies and one electronic copy of the Baseline Report with all relevant appendices and annexes as may be deemed necessary.

Timetable

The consultant is expected to prepare a comprehensive proposal which will include a realistic proposed time frame showing the different stages involved in the assignment and their duration.
The consultant is expected to deliver the draft study report within ?? days from signing the contract with SHMDP, and to deliver the final study report within ?? days from the stakeholders workshop.

Activity	Indicative time frame
Familiarization with the project, preparation of questionnaires and sampling methods	1.5 week
Submission of the documentation for Inception Report (including final design of the survey and draft questionnaires), and Inception Report	0.5 week

Incorporation of comments received during Inception Report and preparation of final questionnaires	1 week
Data collection	5 weeks
Preparation of the draft report	3 weeks
Submission of the draft report and discussion with the Client	2 weeks
Incorporation of comments received during discussion of draft report, and submission of the final report	3 weeks
TOTAL	16 weeks

The entire exercise is expected to take about 2 months, as indicated in the table below.

Week	1	2	3	4	5	6	7	8	9
• Development of an inception report highlighting proposed methodology/ approach, survey instruments etc • Finalization of indicators and preparing the questionnaire/survey instruments									
• Enumerator training and field testing									
• Field data collection									
• Data cleaning, entry and analysis									
• Draft report preparation									
• Report presentation and finalization									

Consultants' qualifications

The assignment is to be carried out by a reputable institution with appropriate qualifications and expertise including the following:

- proven expertise in designing and conducting quantitative and qualitative socio-economic surveys and baseline studies;
- high level of experience with rural development projects and their evaluation, including a thorough understanding of the use of the logical framework;
- an understanding of commodity value chain development and agricultural commercialization;
- ability to involve district authorities, farmers, NGOs, private sector operators and other stakeholders in agricultural commercialization in the exercise as needed;
- excellent analytical, communication and report writing skills.

The appointed firm (the consultant) must evidence extensive experience and proven ability on undertaking surveys and data analysis. The research team should have:

- A Senior Team Leader, with Master's Degree in one of the following fields: Agronomy, Agriculture Economics, Economics, Rural Development or related areas, with a minimum of 5 years' experience in leading teams in sectoral baseline surveys in rural areas and data analysis.
- A Statistician with at least 5 years of experience
- Two Agronomists with at least five years' experience
- The following expertise areas are required for these tasks:

- Survey sampling weighting techniques
- Survey questionnaire design and field data collection
- Multilevel data analysis and report writing

It is required that each member of the team proposed by the consultant is professionally qualified in his/her role of experience to the role s/he will input to the study.

The consultant will also require support and administrative staff that should be part of the budget.

The Consultant is expected to respond to the client's requirements and to deliver an end result that meets the client's quality and timing needs.

Submission of proposals

Interested consultants should submit a technical and financial proposal in separate envelopes as follows.

Technical Proposal

- Demonstrate a clear understanding of the scope of work.
- Describe in detail the proposed methodology and approach by the consultant to undertake the assignment.
- Numbers, roles and qualifications of proposed staff, outlining their experience with carrying out similar work and including CVs and references.
- Documentation of previous work of a similar nature carried out by the institution.
- Time schedule indicating the sequence and duration of key activities.

Financial Proposal

- A financial proposal indicating fee rates and overview of reimbursable expenses.

Suggested selection criteria

The evaluation of proposals and selection of the consultant shall be conducted in accordance with Government Procurement Guidelines.

The selection criteria shall include the following scoring:

- specific and relevant experience of the consultant related to the nature of the assignment - 30 points;
- adequacy of the proposed work plan and methodology in light of the requirements described in these TOR - 30 points;
- qualifications and competence of the proposed staff – 40 points.

Attachment 3: Analytical studies to be undertaken under components 1, 2 and 3

Name of study	Objectives	Timeline	Responsible
Component 1			
Rapid mapping and capacity assessment of FOs	- Identify and categorize all dairy farmer organizations by basic information; - Assess capacity selected farmer organizations	By Q2, PY1	Farmer institutions consultant(s)
Rapid review of dairy sector related ICT technologies	- Identify suitable dairy related ICT technologies available in the sub-region for adoption by FOs	Q1, PY2	Agriculture sector ICT consultant
Mapping and appraisal of milk collection and transportation infrastructure	- Identify and assess capacity of existing milk collection infrastructure (MCPs & MCCs) - Based on milk production estimates, dairy herd concentration and milk collection routes, estimate gaps in milk collection infrastructure (and suitable locations) - Based on identified MCP and MCC infrastructure (and locations for new ones), identify road, water and electricity accessibility gaps that need to be addressed	Q4, PY1	Consortium of agribusiness and infrastructure consultants
Market studies: - Processing gap analysis	- Identify opportunities for improvements in processing, including product diversification, technologies for improved efficiencies	Q4, PY1	Dairy Processing Consultant
- Milk trade and distribution models	- Assess current milk trade and distribution models and identify those with significant prospects for employment of youth and women;	Q4, PY1	Marketing Consultant
- Dairy market segmentation and growth potential	- Market segmentation of the dairy sector and identification interventions required to increase milk consumption in the various segments	Q4, PY1	Dairy Value Chain Consultant
- Financial services for dairy sector	- Estimate potential flow of institutional finance to the dairy sector and prepare banking plan to be implemented with participating financial institutions	Q4, PY1	Rural Finance Consultant
Component 2			
Typology of dairy production systems	- Understand diversity of production system and determine main types - Describe characteristics and dynamics of each system type - Analyse strength, constraints and support needs of each system (and adjust targeting of activities accordingly)	Should start ASAP. Would take 6 months if done by student, 2 if by consultant	PMU Could be entrusted to a university student (master)

Technical performance of dairy herds	- For each production system, establish main productivity criteria (reproduction, dairy production, mortality, etc…) - Provide indicators on performance of herds	At baseline (should be part of typology above), mid-term and completion	PMU
Economic impact of animal diseases	- Establish economic impact of main animal diseases at production system and macro level - Rank animal diseases	Y1 or 2	Research centers (TALIRI, SUA) with support of international research organization (ILRI)
Fodder and feeds mapping and analysis	- Identify available fodder and feed varieties and sources (including agro-industrial by products) - Estimate cultivated area for each pasture specie, quantities available and locations for pasture and feeds - Analyse nutritional value of available fodder and feeds	Y2 or Y3	Research centers (TALIRI, SUA) with support of international research organization (ILRI)
Seasonal monitoring of on-farm feed availability	- Update initial mapping - formulate recommendations for appropriate feed supplementation	Yearly	Research centers (TALIRI, SUA) with support of international research organization (ILRI)
Organisational and management audit of forage production farms (2)	- Identify reasons for poor performance of government LMUs - Propose new management modalities to improve performance and sustainability	Y2 or Y3	Independent consultancy firm
Participatory assessment of collective cowshed scheme in Zanzibar and Rwanda	- Assess performance of collective cowshed scheme - Consider specific measures and required infrastructures to ensure its success in the SHMDP context	Y1 or Y2	PMU and stakeholders
Mapping of genetic resources and development of a breeding strategy	- Identify and map genetic resources for dairy production - Identify needs for improvement and/or conservation - Formulate recommendations for breeding strategies adapted to various production systems	Y1	Research centers (TALIRI, SUA) with support of international research organization (CIRAD-ILRI)
Study on impact of climate variability on animal health and production	- Assess impact of climate change on production systems performance - Assess impact of climate change on epidemiology of animal diseases - Suggest mitigation measures to be promoted by project	Y3 or Y4	Research centers (TALIRI, SUA) with support of international research organization (CIRAD-ILRI)
Assessment of carbon footprint and emissions of Green-	- Assess contribution of smallholder dairy production systems to GHG emissions	Y2 to Y5	Research centers (TALIRI, SUA) with support of

house gas (GHG) by dairy production systems	- Identify climate smart practices to reduce GHG emissions, to be promoted by the Project		international research organization (CIRAD-ILRI)
Component 3			
Review of the organization of extension service and approaches for recognising or certifying private extension suppliers	- Determine organisation structure of extension services, its approaches - Identify procedures and criteria for recognising/certifying private extension suppliers	Y1	DPP by recruiting consultants such as SUA,
An assessment of the arrangements for management and operation of the Kitulo and Sao hill Livestock Multiplication units	- Develop options for enabling LMUs to contribute to development of the sector on a sustainable basis - establish improved cost effective and efficient management operation and arrangements	Y1-2	DPP by recruiting consultants such as SUA, Mzumbe university or management institutes
Conduct dairy sector studies and reforms as identified by the zonal platforms and DFF	- clear understanding of the dairy performance and challenges - identify reforms in the sector - determine policies influencing the sector	Y1-3	DPP and ZPMU will contract services to reputable consultancy company recruited from the market
Assessment of effectiveness of DDF in addressing policy issues	- To determine contribution of DDF in facilitation of policy at national - To determine the management of DFF as a policy dialogue platform at local level	Y1	DPP and ZPMU will contract services to reputable consultancy company recruited from the market
Assessment of the Tanzania Dairy Board (TDB)	- Develop business/ management plan to identify options for enabling TDB to contribute to development of the sector on a sustainable basis - establish improved cost effective and efficient management operation and arrangements	Y1-2	DPP and ZPMU will contract services to reputable consultancy company recruited from the market

Appendix 7: Financial Management and Governance

1. A Financial Management Assessment (FMA) has been undertaken as part of the project design. The objective of the FMA is to provide assurance that there will be sufficiently strong financial management systems and controls in place to properly manage, control and report on project finances. This is in order to ensure that project funds will be used effectively and efficiently for the purpose intended. The FMA involves assessing: (i) the inherent risk at country level; and (ii) the project specific risk.

Country context and inherent risk

2. According to the recent Transparency International Corruption Perception Index of 2015, Tanzania was ranked 117 out of 168. The score dropped to 30 down from 31 and 33 in 2014 and 2013, respectively showing a slow deterioration as per the CPI assessment that has moved the country from medium risk rating to a high risk rating. The IFAD's 2015 Rural Sector Performance (RSP) provides a score of 4 for the country's accountability, transparency and corruption in rural areas. The 2013 PEFA assessment reflects slight changes in some of the key areas ranked poor in the 2010 assessment with main improvements being noted in compliance with controls and quality and timeliness of the reports. Overall the Country Inherent risk is high.

Project specific risk

3. IFAD currently has an existing portfolio of 3 projects; Market Infrastructure, Value Addition and Rural finance Support Programme (MIVARF), Rural Micro, Small and Medium Enterprise Support Programme (MUVI) and Bagamoyo Sugar Infrastructure and Sustainable Community Development Programme (BASIC) that are at different stages of the project cycle with MUVI closing in March 2017.

4. These current projects are rated medium risk. With risk mitigation actions that have been on going, there has been a slight improvement in the performance of the portfolio. The current weaknesses noted in the projects give an overall reflection of some of the key challenges that the country faces as a whole as given in the international assessment reports (PEFA).

5. Based on the learning lessons drawn from the current portfolio, risk mitigation measures have been in-built into the SHMDP project design to address the issues noted in the financial management aspects of the project where possible and thus with the analysis as given below the overall project risk rating at design is thus given as ***medium***.

Summary of the implementation arrangements

6. The SHMDP project is envisaged to be implemented in 15 districts of the 5 regions within the country which also fall within the current project area of the current projects; MIVARF and MUVI. The Project will be executed by MALF and will be managed on a day to day basis by an autonomous Zonal project management unit (ZPMU) that is proposed to be located in Mbeya region. At the district level, the project will be coordinated by a team based on the current existing district staff and will include the District Treasurer for purposes of Financial Management in relation to funds to be disbursed to the district. These funds will mainly cover for the monitoring of project activities at the District level. For other activities, the procurement processes will be managed at the districts level and the related payments will be made by the ZPMU. The districtteam will report back to the ZPMU. Where necessary, the contracted service providers will be handled directly from the ZPMU.

7. The FM assessment was carried for the ZPMU and one of the participating district as a representation of the prevailing structure in all the other districts. Completed assessments are included as Attachments to this Appendix including the district organogram that reflects the staffing.

The project will therefore run stand-alone financial management arrangements but utilizing government structures at the district level for district-level activities

Financial management and disbursement arrangements for SHMDP

a) Organization and staffing

8. The Zonal Project Management Unit (ZPMU) proposed to be located in Mbeya City Council, will be directly responsible for project implementation in the five regions of the Southern Highlands. A qualified Finance Manager and an Accountant will be recruited or appointed to carry out day to day financial management functions of the project with the help of support staff proposed in the design. Other staff of the ZPMU will also be either recruited or appointed by Government.

9. At the district level, the financial management function will be delegated to the existing finance staff within the districts. Attachment 3 below represents a typical organization chart of the District offices and highlights the districts' finance staff positions that will be in charge of SHMDP implementation, in addition to their other duties and responsibilities.

10. The Zonal PMU staff in charge of finance will be responsible for the overall accounting, financial management and reporting for the project. Accounting data will be consolidated at ZPMU level and captured in its dedicated accounting software in accordance with IFAD requirements (by components, expense categories, financiers, etc.).

11. Districts' staff in charge of finance that will be in charge of SHMDP in addition to their other responsibilities, will be responsible for capturing, authorizing and recording all SHMDP-related accounting data in the EPICOR system using the coding earmarked for the transactions of the project. In particular they will be required to deliver, among other, on the following accounting, financial management and audit responsibilities for the project at the district-level: capturing, authorizing and recording SHMDP-related transactions in EPICOR system, recording, management and safeguarding of assets purchased by the project; monthly, quarterly and annual financial reporting required for the project; management of the district account, including its monthly and quarterly reconciliation.; carry internal audit (only internal auditor) and facilitate external audits (all finance staff). Payment to suppliers, contractors or consultants contracted for project implementation at the district will be done at the ZPMU level for all procurement processes managed at the district level. .

The current financial management challenges faced in the ongoing projects have a bearing on the staff skills and capacities and so attention will be paid in ensuring that well qualified staff is recruited or appointed with IFAD providing no objection clearance. Start-up training for the staff in IFAD procedures and guidelines will be provided and extended to also the district staff in the project. Mentoring and coaching will be advocated and more intensive support will be provided during missions on issue-specific areas to ensure the staff have the skills and capacity to manage the project well. The duties, responsibilities including qualifications of the Finance Manager will be in accordance with the terms of reference provided in Attachment 1, Appendix 5. As such, the overall rating for SHMDP organization and staffing remains "medium", after the mitigation measures proposed.

b) Budgeting and Financial Reporting

12. The project will follow the same budgeting cycle with the Central Government and LGAs (July-June) that is compatible with IFAD cycle. The project will be profiled and allocated code(s) within the district's EPICOR financial management system, to allow for ease of accounting data capturing and recording at the district level . The project will be included as part of the district planning and budgeting process, and aligned to the district planning calendar. District accounting follows a chart of account predetermined by Government.

13. Financial reporting will be done on a monthly, quarterly and annual basis. Project's financial reporting will consolidate all financial reports, including from the districts and implementing partners. The Project will be required to submit monthly financial reports to the Ministry of Finance. IFAD also requires quarterly, annual activity and financial reports from the project. Since consolidation is done by the ZPMU, districts and implementing partners will be required to submit monthly, quarterly and annual activity and financial reports to the ZPMU.

The project will ensure that the dedicated accounting software to be procured will have a budgeting module that will allow for easy monitoring of the budget. Budgeting guidelines will be developed with timeframes and clear responsibilities among the participating parties and incorporated in the PIM to ensure that budgets are timely done. An 18 month procurement plan will be developed at project start. This will ensure that there is timely implementation, minimized budget overruns and low budget execution. The above measures will help bring down the assessed risk from High to medium

c) Disbursement arrangements and funds flow

i. Disbursements from IFAD will largely follow the standard methods as spelt out in the Loan disbursement handbook and will be clearly spelt out in the Letter to the Borrower. IFAD will disburse the loan proceeds through a USD designated account to be opened at the Central Bank of Tanzania. This account will be at the Central level only and not the Zone, as the Central Bank does not allow USD-denominated dollar account for projects in decentralized structures. The funds will flow into this account through the Imprest method of disbursement by way of replenishments.

ii. In addition to the designated account, the project will open two project accounts in local currency with commercial banks at the Zonal level agreeable to IFAD; one will be to receive funds from the IFAD designed account and the other will be for Counterpart funds accordingly.

iii. The Authorized Allocation shall be calculated on the basis of the first six months of expenditure, currently estimated at USD 1.5 million. Depending on the cash flow requirements in subsequent years, the Authorized Allocation may be increased to a maximum of USD 2 million upon discussions and agreement with IFAD. Certain conditions need to be met by both MALF and ZPMU for IFAD to make the first disbursement of project funds to the DA:

- The first Annual Work plan and Budget (AWPB) needs to have received IFAD"s no-objection;
- SHMDP to open a Designated Account in USD at the Central level in the Bank of Tanzania and a project operations account in Tanzanian shilling at the zonal level, in a commercial bank agreeable to IFAD;
- A draft Project Implementation Manual submitted to IFAD for approval;
- Key personnel need to have been recruited, including a Finance Manager;
- Project Steering Committee needs to have been established.

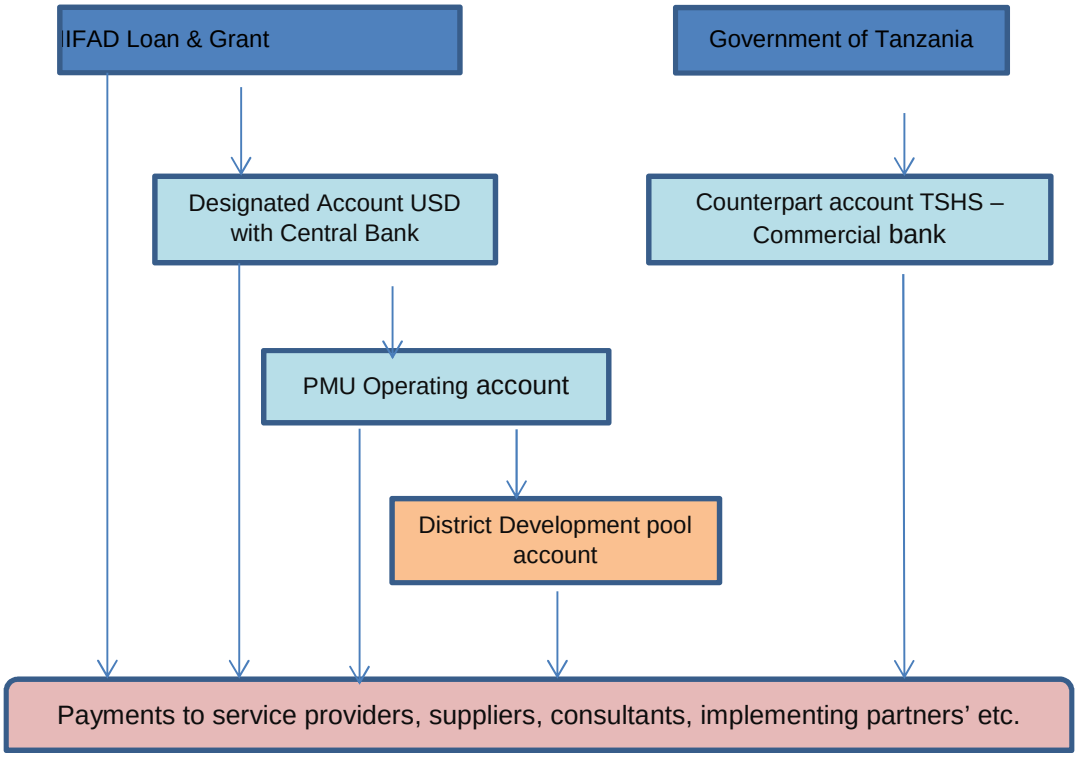
iv. Payments will be made directly by the ZPMU and MALF out of the project accounts which will be managed at the ZPMU level (for the Operation account) and at the central level by MALF (for the DA). Clear signing authority will be included in the PIM. Direct payment where necessary will follow IFAD procedures for the authorized limits of USD 100,000 for direct payments.

v. The SOE threshold based on the challenges that have been prevailing in the portfolio is thus recommended at USD 50,000 for both the ZPMU and the districts. All expenses below the threshold will be reviewed based on IFAD guidelines on risk based disbursement during project supervision missions. The initial threshold will ensure the project and the district adopts the culture of proper accountability/supporting documentation and record keeping.

vi. For implementation at the district level, funds will flow directly from the Project operations account into the District Development Account (DDA), which is a single account for all development projects of the district. Transfers to the district will be made by way of advance to the district on a quarterly cycle on the basis of approved quarterly work plans. Transfer of funds to the district will be only for the monitoring and follow-up activities of the project at the district level.

vii. According to the government chart of accounts coding, an income code will be created in EPICOR to record the funds in the district books. EPICOR system provides for expenditure attribution and control. The system will generate electronic receipts for every transfer received, with information on activities to which the funds are earmarked. The receipt will be issued to the project once the funds have been received and coded in the district system. The process flow provides for adequate segregation of duties and internal audit unit in the district will review transaction relating to the project which too will enhance control. Expenses will be charged against this code for double entry book keeping. Replenishments of the DDA will only be effected on justification of 70% of the previous advance and 100% for previous ones, with proper reconciliations. Districts will not be able to carry forward funds from one budget year to the next.

Figure 1. Funds flow diagram



The project design is straight forward with limited funds disbursements to selected implementing agencies (eg* DPP-MALF, TDB and LITA*). Most of the payments will be made directly by the ZPMU

to suppliers and service providers and thus minimizing the risks of varied advances except funds that will be disbursed to the districts for the monitoring and follow-up of project activities. Although the ZPMU may not have experience managing IFAD funds, it's expected that training at startup and close supervision will be provided. Expenses to be met at district level are of a regular nature and are tagged to the approved quarterly work plans that will be funded after accountability of previous advance. The assessed internal control framework in the district provides a strong assurance for proper use if well adhered to. On the other hand, lessons learnt from ongoing portfolio point out to a medium risk for disbursement and funds flow aspects in projects. Based on the said experience and the above risks, the risk is considered to remain medium after the proposed mitigation measures.

d) Internal controls

14. The project implementation unit will elaborate the internal controls that will be applicable to the project in the PIM. These shall be beefed up by controls at the district level that will follow government established procedures. None adherence to the procedures within the government structure has been one of the noted weaknesses in other projects that are ongoing. Under the project close supervision is envisaged and a control environment will be enforced right from the project start. IFAD will pay close attention during supervision and will work with the ZPMU staff to ensure compliance is adhered too.

e) Accounting system and procedures

15. The Zonal PMU will have its own dedicated computerized accounting system for its accounting, financial reporting and budget control. A chart of accounts and related codification for the Project will be developed to meet IFAD and GoT requirements. The accounting software to be procured should be able to provide cost attribution by financier, category and component. It should also have a multicurrency capability and have an integrated budgeting and asset modules to minimize manual interventions.

16. At district-level, Districts' accounting, budget control and financial reporting will be done through the EPICOR accounting system currently in use in all districts. District accounting currently follows a chart of account predetermined by Government. The project will be provided with a code to allow SHMDP-related transactions to be included in the district's accounting system. The project will, on the other hand, not be required to import district data in its own accounting system as transfers to districts will be expensed by the ZPMU in accordance with the IPSAS accounting standard in place. In the event that disbursement modalities to the districts change during project implementation, importation of district data will require a codification according to the chart of account developed for the project's dedicated software, to allow financial reporting according to IFAD requirements. EPICOR accounting system is the current recommended accounting system for LGAs. It allows currently the reporting by funding sources or donors and can track expenses according to the same sources. However it is not widely installed in all LGAs as the 2013/14 consolidated report on LGAs audit pointed out to 27 LGAs not having EPICOR installed, out of 90 LGAs sampled. Moreover, the report has revealed the following limitations with EPICOR:

i. EPICOR does not align with International Public Sector Accounting Standards (IPSAS)-accrual basis of accounting used by LGAs. The EPICOR accounting package operates as a cash-commitment control tool which captures cash transactions only and ignores the accrual transactions. Therefore, to finalize the Council"s final accounts, manual adjustments and consolidation of accounts have to be done;

ii. Reconciliations cannot be done with EPICOR computer installed at the Council, pressing the need for accountants to travel to Dodoma (PMO-RALG Office) at the end of every quarter in order to prepare three months reconciliations;

iii. PlanRep (an MS Access database application) is used by LGAs for budget and planning instead of EPICOR. The information captured in PlanRep has to be re-entered manually in the General Ledger in EPICOR (financial management system) due to lack of an automated interface;

iv. Underutilization of the accounting system as assets Management and procurement modules are not put into use.

17. Transfers will flow from the ZPMU Operations Account to the District Development Account (DDA), on a quarterly basis and in accordance with the approved annual work plan and budget. Quarterly funds release to the district will be made only for the monitoring and follow-up of project activities at the district level. . EPICOR accounting system will account for quarterly funds received, using its electronic receipt system. Controls will be put in place to ensure that district allocations are used for their intended purpose and that EPICOR provides for expenditure attribution and control. Quarterly expenditure reports will be provided through the EPICOR system and supplemented with supporting documents.

A project implementation manual that will incorporate all the financial management aspects including authority limit will be drafted and approved before first disbursement. A dedicated accounting software right from the onset of the project will reduce the risks of inconsistencies in the financial statements. None timely implementation of the proposed mitigation measures may trigger recurrent problems faced in the ongoing projects. It's recommended the accounting software be procured during the start-up phase. The risk assessed at design is medium.

f) Internal audit

18. With regards to internal audit, SHMDP will be included in the audit plan of the MALF's internal auditors. For district-based transactions, the internal auditor at the district will also include SHMDP in the audit plan. Where necessary, the AWPB of the project will also allocate funds for the annual audit of the project by MALF and districts. In particular the internal auditor of MALF will be required to provide assurance that the project's risk management, governance and internal control processes are operating effectively. A review of the current audit report indicate that procurement (value for money, compliance with procedures), contract management and filing of supporting documents are the most common issues found in projects. The scope of internal audits covered mainly systems audit, compliance audit, value for money, budget and payroll audits. The function was found to be independent as the functional reporting is made directly to the audit committee (for MALF) and the District Director (for the district). In terms of staffing, it is noted that MALF has 8 internal auditors headed by a chief internal auditor and the district has one chief internal auditor supported by 5 auditors. The mission found that the internal audit capacity at the MALF and district may not be adequate in terms of number of staff and skills, considering the findings of the consolidated report on LGA audits. Internal audit reports will be availed to IFAD's mission teams for review during mission.

The internal audit function of MALF and districts will ensure that the project's risk management, governance and internal control processes are operating effectively. The internal audit capacity at both levels still need strengthening in terms of number and skills. Howevertheir independence seems assured, considering their reporting line to senior management. Close supervision of the project will ensure that internal audit plans at MALF and districts do include SHMDP. Funds for annual audits by MALF and districts will be included in the project AWPB. The quality and timeliness of their audit reports will also be monitored. Based on the said measures and the assessed capacity, the residual risk is assessed as "medium".

g) External audits

19. The current project portfolio within the country is being audited by the Auditor General. A review of these reports shows satisfactory ratings as per IFAD guidelines for both the financial statements and the quality of the auditors work. However the timeliness in the submission of the report has not always received a satisfactory rating.

20. SHMDP's Financial Statements will be prepared in accordance with International Public Sector Accounting Standards (IPSAS) - accrual basis in accordance with the Government of Tanzania provisions to move to IPSAS accrual basis by 2016/17.

21. It's recommended therefore to maintain the Auditor General as the appointed auditor for the SHMDP project. The Auditor General will be formally appointed in accordance with IFAD General Conditions of

funding requiring the Auditor to be appointed within 90 days of the project entry into force. IFAD guidelines on project audits will be shared and the audit conducted accordingly. In addition to the audit opinion on the financial statements, the auditors shall provide opinions on (i) the statements of expenditure and (ii) the operation of the Designated Account. A management letter, addressing the adequacy of accounting and internal control systems is mandatory and forms part of the audited financial statements. The ZPMU shall deliver the audited set of financial statements to the Fund within six months after end of the fiscal year ending on 30 June.

Timely submission of the reports will require advance planning and proper financial record keeping. Once this is addressed through the accounting software and skilled accounting staff, the foreseen audit risk is reduced to a low rating.

h) Implementation Readiness

22. Based on the financial management arrangements proposed above, key actions have been drawn to address the risks noted in the financial management and audit aspects of the project. The table below summarizes the said actions and recommends responsibilities and timelines for their execution. It will also be essential in providing inputs for the conditions precedent to first disbursement and in identifying the critical areas to be reviewed or assessed during start-up and implementation support missions.

FM Actions Summary: The actions needed to mitigate FM risks are summarised below:

	Action	Responsible Party / Person	Target Date / Covenants[1]
1	Recruitment of qualified staff to implement the project	GoT, with IFAD no-objection for Coordinator and Director of Finance mainly	Conditions precedent to first disbursement
2	Appointment of district accountant and internal auditor responsible for SHMDP	ZPMU and districts	At project start-up
3	Start-up training and capacity building on IFAD procedures and guidelines, to SHMDP and districts staff	IFAD	At project start-up
4	Development of PIM	ZPMU	Conditions precedent to first disbursement
5	Development of procurement plan	IFAD and ZPMU	At project start-up
6	Initiate procurement for ZPMU's dedicated accounting software	ZPMU	At Project start-up
7	Development of Annual Work Plan and Budget	ZPMU	Conditions precedent to first disbursement
8	Open designated account and operations account	ZPMU and MALF	Conditions precedent to first disbursement
9	Supervision and implementation support	IFAD	Regular
10	Codification of EPICOR system to include SHMDP	Service provider contracted by PCMU	At project start-up

[1] Indicate if covenants are required in Financing Agreement for each of these: effectiveness condition or disbursement condition or dated covenant.

i) FM Supervision plan

23. The project will be supervised directly by IFAD. From start-up to the first two to three years of implementation, the project will be supervised twice a year, every six months. Annual implementation support/supervision missions will follow once the project has reached maturity and has achieved good implementation performance, including in financial management and audit.

24. Some of the key areas to be reviewed and assessed during supervision are the following:

- Fiduciary aspects, including but not limited to: (i) accounting and reporting systems, including EPICOR functionality with regards to budget monitoring and control, expenditure attribution and control and financial reporting; (ii) operations of Special and Project Accounts including exchange rates used and the reconciliation of the Special Account; (iii) spot-check of a sample of SOEs and Withdrawal Applications to verify adequacy, completeness and validity of claims; (iv) system and mechanisms for monitoring financial progress against the AWPB, including commitment control arrangements; (v) efficiency and effectiveness of the current arrangements for flow of funds and execution of payments, including the adequacy and timeliness of counterpart fund contributions; (vi) adequacy of the internal controls in place; and (vii) mechanisms for ensuring and certifying the fulfillment of contractual obligations by service before effecting payments;
- Re-assessing the project's fiduciary risk using the risk-based methodology;
- Assessment of internal audit function at MALF and districts and the inclusion of SHMDP in audit plans;
- Execution rate of the AWPB, including actions/measures to improve implementation performance;
- Financial performance by comparing expenditure to date, by component, against original approved plans;
- Review of external audit by Comptroller and Auditor General (CAG);

Attachment 1: Financial management assessment of ZPMU

	Initial Risk	Risks	Proposed Mitigation	Final Risk
Control Risks				
1. Organization and Staffing	M	• ZPMU staff not familiar with IFAD procedures and rules • Internal audit of SHMDP not carried out • Non-compliance with regulations and procedures, including IFAD ones • No familiarity with IFAD anti-corruption policy	• Recruitment of Finance Manager in accordance with TORs (Attachment 1, Appendix 5) • Start-up and continuous training and capacity building on regulations and procedures in place • Inclusion of SHMDP in internal audit plan • Familiarization on IFAD anti-corruption policy	M
2. Budgeting	H	• Low budget execution • Budget overruns	• Dedicated accounting system of SHMDP provides for budget control and monitoring • Proper budget planning to avoid low budget execution and unused funds • Development of 18 months procurement plan at start-up	M
3. Funds flow and Disbursement Arrangements	M	• Low budget execution • Low turnover of withdrawal applications • Low counterpart funds	• Proper budget planning to avoid low budget execution • Implementation support • Clear guidelines for retiring of advances to implementing partners • Close follow-up with MALF for counterpart funds provision	M
4. Internal Controls	M	• Non-compliance with internal control procedures and rules	• Internal audit of ZPMU • Strict follow-up and review by supervision and external auditors on past internal control issues • Capacity building to concerned staff, including on procurement • Development of PIM	M
5. Accounting Systems, Policies & Procedures	M	• Accounting system not meeting IFAD requirements in terms of reporting • Non-compliance with regulations and procedures	• Procurement of dedicated accounting system meeting IFAD requirements • Configuration of accounting system for ease of reporting according to IFAD requirements • Frequent internal audit missions	M
6. Reporting and	M	• SHMDP reports not meeting IFAD	• Codification/configuration to allow reporting according to	L

Monitoring		requirements • Delayed submission of financial reports	IFAD requirements • Strict follow-up by internal auditor and supervision missions	
7. Internal Audit[2]	M	• No internal audit of SHMDP • Internal audit report lacking expected quality/content	• Internal audit of MALF to include SHMDP in audit plans • Strengthening of internal audit through capacity building and implementation support	M
8. External Audit[3]	M	• Delayed submission of external audit report • External audit report lacking the expected quality/content	• GoT to ensure external audit is timely and of good quality • Close follow-up with CAG on quality issues in audit reports	M
Fiduciary Risk @ Design	**M**			**M**

[2] The Office of Audit and Oversight (AUO) internal audit capacity development project includes an assessment of internal audit capacities in counterpart ministries which may also provide useful feedback.
[3] The impact of External Audit findings etc. are covered by the ARTS system – and therefore need not be duplicated in this assessment

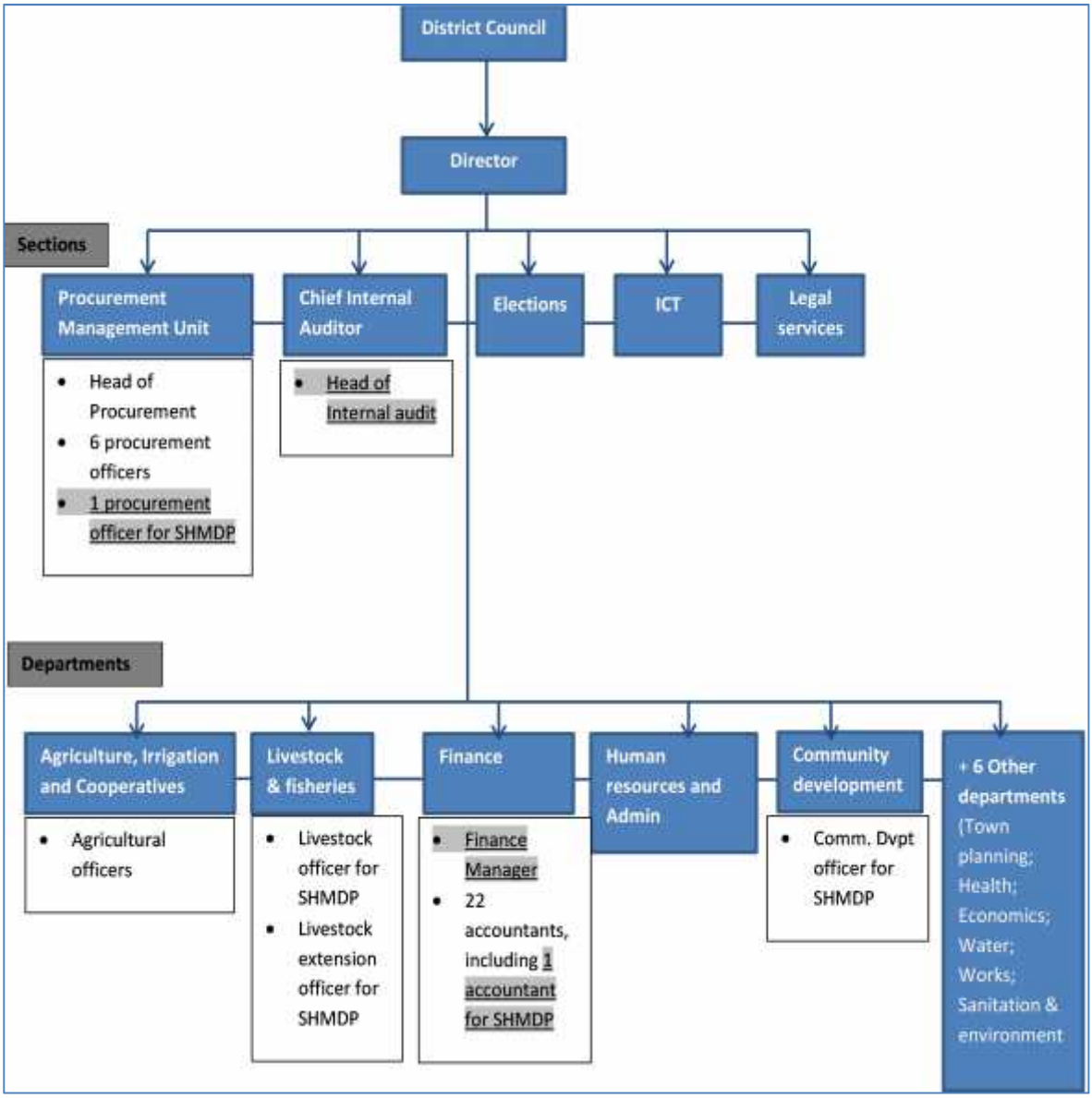
Attachment 2: Financial management assessment of Mbeya district

	Initial Risk	Risks	Proposed Mitigation	Final Risk
Control Risks				
1. Organization and Staffing	M	• District staff not familiar with IFAD procedures and rules • Internal audit of SHMDP not carried out at district • Non-compliance with regulations and procedures, including IFAD ones • No familiarity with IFAD anti-corruption policy	• District to ensure that one of the existing accountants is responsible for SHMDP and other tasks will not affect his/her deliverables for the project • Inclusion of SHMDP in internal audit plan • Training and capacity building on regulations and procedures in place • Familiarization on IFAD anti-corruption policy	M
2. Budgeting	H	• Low budget execution • Budget overruns • Budgeting planning done outside the system, using PlanRep and re-entered manually in EPICOR	• Proper budget planning to avoid low budget execution and unused funds • Configuration of EPICOR for budget planning purposes • Putting in place a robust cash flow forecasting system to avoid inter-borrowing between projects and ensure funds predictability • Guidelines for budget planning and control to be included in PIM	M
3. Funds flow and Disbursement Arrangements	H	• Low budget execution and disbursement • Utilization of funds for non-intended purposes • Non-traceability of funds • Inter-borrowing between district accounts	• Effective execution of control measures put in place to ensure expenditure attribution and control • Codification of EPICOR system to include SHMDP • Putting in place a robust cash flow forecasting system to avoid inter-borrowing between projects and ensure funds predictability • IT support for the accounting system in case of issues related to traceability of funds, expenditure attribution and control	H
4. Internal Controls	M	• Non-compliance with internal control procedures and rules	• Internal audit of district to include SHMDP in audit plans • Strict follow-up and review by supervision and external auditors on past internal control issues raised • Capacity building to concerned staff, including procurement to ensure value	M

			for money and avoid procurement issues noted with districts • Development of PIM	
5. Accounting Systems, Policies & Procedures	M	• SHMDP transactions not captured in EPICOR system • Non-compliance with regulations and procedures • EPICOR is not aligned with IPSAS-accrual basis of accounting used by LGAs • Complete reconciliations cannot be performed with computers having EPICOR 9.05 at the LGAs • Network problem affecting timely generation of reports from system • Assets management and procurement modules in EPICOR not put into use • Non-existence of accounting system in selected districts	• Codification of EPICOR system to include SHMDP • Codification according to the chart of account developed for zonal PMU's dedicated software, in order to allow financial reporting according to IFAD requirements • Frequent internal audit missions • **Mitigation measures beyond the responsibility of SHMDP:** o Configuration of non-functional modules in EPICOR o Strengthening capacities in use of EPICOR o Improving network infrastructures at LGA level	M
6. Reporting and Monitoring	M	• SHMDP transactions not captured in EPICOR system • Delayed submission of financial reports	• Codification according to the chart of account developed for ZPMU's dedicated software, in order to allow financial reporting according to IFAD requirements • EPICOR system to allow for expenditure attribution and control, to avoid use of funds for non-intended purposes • Strict follow-up by internal auditor and supervision missions	L
7. Internal Audit[4]	M	• SHMDP not included in internal audit of district • Weaknesses in internal audit capacity and quality	• Internal auditor to include SHMDP in audit plans • Capacity building and implementation support of internal audit staff	M
8. External Audit[5]	M	• Delayed submission of external audit report • External audit report lacking the expected quality/content	• GoT to ensure external audit is executed adequately and on time • IFAD to follow-up with CAG/MALF on issues with audit report	M
Fiduciary Risk @ Design	**M**			**M**

[4] The Office of Audit and Oversight (AUO) internal audit capacity development project includes an assessment of internal audit capacities in counterpart ministries which may also provide useful feedback.
[5] The impact of External Audit findings are covered by the ARTS system – and therefore need not be duplicated in this assessment.

Attachment 3: Organization chart for Mbeya district council



Attachment 4: IFAD Anti-corruption policy

In accordance with its Policy on Preventing Fraud and Corruption in its Activities and Operations (Anticorruption Policy), adopted by the Executive Board in December 2005, IFAD applies a zero-tolerance policy towards fraudulent, corrupt, collusive or coercive practices in projects financed through its loans and grants. 'Zero tolerance' means that IFAD will pursue all allegations falling under the scope of this Policy and, if allegations are substantiated, appropriate sanctions will be applied on the parties or entities involved.

Among the remedies available to IFAD under the General Conditions for Agricultural Development Financing, are the suspension and cancellation of a loan and/or grant. IFAD may suspend, in whole or in part, the right of the Borrower/Recipient to request withdrawals of funds after giving notice to the Borrower/Recipient that credible allegations of coercive, collusive, corrupt or fraudulent practices in connection with the Project have come to the attention of IFAD, and the Borrower/Recipient has failed to take timely and appropriate action to address the matters to the satisfaction of IFAD.

IFAD may cancel, in whole or in part, the remaining amounts in the Loan and/or Grant Accounts, after consultation with the Borrower/Recipient, if IFAD thereafter determines that coercive, collusive, corrupt or fraudulent practices were engaged in by representatives of the Borrower/Recipient or any Project Party, and no timely and appropriate action was taken to remedy the situation. All payments made relating to any coercive, collusive, corrupt or fraudulent practice by any representative of the Borrower/Recipient or any Project Party, shall be considered ineligible for IFAD financing and shall be refunded to IFAD.

Under the General Conditions for Agricultural Development Financing, by notice to the Borrower/Recipient, the Fund may require that all bidding documents and contracts for procurement of goods, works and services financed by the Financing include provisions requiring bidders, suppliers, contractors, sub-contractors and consultants to: (i) allow full inspection by the Fund of all bid documentation and related records; (ii) maintain all documents and records related to the bid or contract for three years after completion of the bid or contract; and (iii) cooperate with agents or representatives of the Fund carrying out an audit or investigation.

IFAD takes all possible actions to protect from reprisals individuals who, in good faith, report coercive, collusive, corrupt or fraudulent practices in its project or grant activities. The primary responsibility for enforcing the Anticorruption Policy lies with the Borrower/Recipient, and the first defence for controls shall be exercised by Project staff, Implementing Partners and Counterparts. Pursuant to this, the Borrower/Recipient shall have the responsibility to incorporate pertinent provisions of the Anticorruption Policy in its contracts with project staff, cooperating/implementing partners, suppliers/consultants or any other third party entities. Given IFAD's zero tolerance described in the above paragraph, it is important that the project staff and all stakeholders of the project are familiar with IFAD's Anticorruption Policy as well as the national anticorruption policies and whistle blowing procedures.

Appendix 8: Procurement

A. Background

1. Significant public spending takes place through the public procurement system. A well-functioning procurement system ensures that money is used effectively for achieving efficiency in acquiring inputs for, and value for money in, delivery of programs and services.

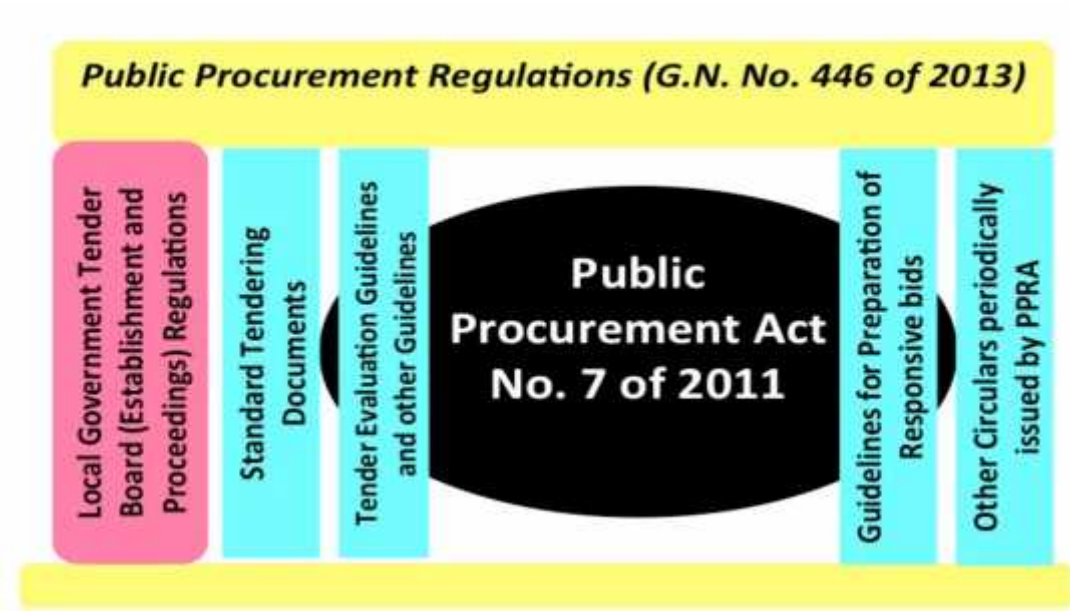
2. For the purpose of this project, the review of the Borrower/recipient's procurement system is made up of two categories: the Overarching country assessment and the Project-specific assessment.

B. Overarching Country Assessment[1]

3. Public procurement in Tanzania is governed by the Public Procurement Act (PPA) which decentralizes procurement system and provides mandates for each procuring entities to carry out procurement functions within the approved budget and be accountable for all procurement decisions made. This is in line with the current public procurement set-up that is based on devolution of procuring authority to procuring entities (eg Ministries, Departments and Agencies (MDAs), Local Government Agencies (LGAs)).

4. The PPA further provides for the establishment of policy, regulatory and operational bodies with their objectives and mandates, public procurement principles, procurement methods and processes as well as prohibitive actions in public procurement such as fraud and corruption. It also sets out public procurement controls/audit mechanisms and a complaints resolution system.

Figure 1. **Public Procurement Regulatory framework**



5. In terms of institutional set up, the PPA clearly separates the functions of an accounting officer, tender board, procurement management unit, as well as user department and evaluation committee and makes them accountable for their individual procurement decisions and actions.

6. **The Public Procurement Regulatory Authority (PPRA)** was established in 2005 under the PPA and its Public Procurement Regulations (PPR), 2005 as a regulatory and supervisory agency. It has the power to audit procurement proceedings and report on them.

7. It has the following main objectives: (i) to ensure the application of fair, competitive, transparent, non-discriminatory and value for money procurement standards and practices; (ii) to set standards for the

[1] Source : https://ppra.go.tz/index.php and 2013 Tanzania PEFA report http://goo.gl/LwbJjN

public procurement systems in the United Republic of Tanzania; (iii) to monitor compliance of procuring entities; and (iv) to build, in collaboration with the Public Procurement Division and other relevant professional bodies, procurement capacity in the United Republic of Tanzania.

8. The core functions of the PPRA are provided under Section 9 of the Act and can be summarized into six categories as follows: i) to offer advisory services on public procurement issues to public bodies and any other person; ii) to monitor and enforce compliance with PPA; iii) to issue standard bidding documents and guidelines for the better carrying out of procurement activities; iv) to implement measures aimed at building procurement capacity in the country; v) to store and disseminate information on procurement opportunities and tender awards; and vi) to determine, develop, introduce, maintain and update related system to support public procurement by means of information and communication technologies including the use of public electronic procurement.

Challenges in Procurement

9. Based on the 2014 Annual Performance Evaluation Report of the Tanzania PPRA2, the following major challenges were noted in procurement in general:

- The Annual Performance Evaluation Report has not received adequate attention by relevant authorities responsible for taking necessary actions. The information contained in the report could also assist procuring entities to improve compliance and performance in procurement;
- Inefficiency in handling procurement operations by procuring entities resulting in time and cost overruns in project implementation;
- Inadequate capacity in applying the procurement law by procuring entities and economic operators;
- Failure by some procuring entities to comply with the requirement for submission of information to the Authority as per Public Procurement Regulation thereby hindering effective delivery of Authority's services;
- Slow pace of procuring entities to utilize systems and tools, including Procurement Management Information System (PMIS), developed and rolled out by the Authority to facilitate their operations and reporting;
- Misconception by key stakeholders of e-procurement system in accordance with Public Procurement Act (PPA) as well as inadequate cyber security environment and capacity towards implementation of a fully-fledged e-procurement system in Tanzania; and
- Weak contract management, which affects achievement of best value for money.

Public Expenditure and Financial Accountability Assessment Report (PEFA).

10. Based on the most recent PEFA available for Tanzania[3], the PPRA is becoming more effective in monitoring the procuring activities of MDAs, its compliance assessments and associated reports becoming a useful tool. The compliance assessments indicate an increasing degree of compliance with the PPA and its regulations and an increasing degree of transparency, indicating that the procurement system is demonstrating increasing value for money in the purchases of goods and services.

11. The report also provides an assessment of the national procurement system in Tanzania. Below are the main findings.

Minimum requirements	Meets requirements (Yes or No)	Explanations
i) Transparency, comprehensiveness and competition in the legal and regulatory framework.		
Be organized hierarchically and precedence is clearly established	Yes	The Public Procurement Policy Department (PPPD) of the MoF was created in 2009 and has taken over some of the policy making responsibilities assigned to the PPRA in the 2004 Act. Sections 5-6 of the

[2] *https://www.**ppra**.go.tz*
[3] See 2013 Tanzania PEFA report http://goo.gl/LwbJjN

		2011 PPA explicitly provide for it, but it is not yet effective as the revised PPR has not yet been gazetted.
Be freely and easily accessible to the public through appropriate means	Yes	The Act itself is only in English, but PPRA has had its standard bidding documents translated into Swahili and all procuring entities can easily access these documents and other translated operational guidelines through PPRA's website (e.g. guidelines for responding to Requests for Quotations).
Apply to all procurement undertaken using government funds	Yes	All users of public funds have to apply the PPA 2004 (and soon the PPA 2011). This includes the Defence Forces and the PPPs (also regulated by a PPP Act)
Make open competitive procurement the default method of procurement and define clearly the situations in which other methods can be used and how this is to be justified	Yes	While the Act does not explicitly state that open tender is the default method, it specifies the principles of public procurement as maximising competition, economy, efficiency and Value for Money
Provide for public access to all of the following procurement information: government procurement plans, bidding opportunities, contract awards, and data on resolution of procurement complaints;	No	All bidding opportunities that are beyond the threshold of Request for Quotation (RfQ) or that do not allow using the Government Procurement Service Agency (GPSA) for Common User items framework contracts have to be published
Provide for an independent administrative procurement review process for handling procurement complaints by participants prior to contract signature.	No	The 2011 PPA, once effective, improves the legal framework for complaints and appeals: Section 96 provides for the AO to establish an independent review panel within or outside the procurement entity in the event of a complaint.

C. Project-specific assessment

12. A detailed assessment[4] of MALF was carried out and procurement practices within the ministries were evaluated. Below is a quick reference table highlighting the main findings in line with the requirements contained in IFAD's Procurement Guidelines.

Area	Rating	Comment
Procurement planning		
Bidding documents		Technical specifications developed by user departments are normally not adequate or complete
Pre-qualification		
Advertisement		
Communications between bidders and the procuring agency		
Receipt of bids and opening		Bids not securely stored in tender box or other lockable facility

[4] Rating follows the traffic light system that uses the following colors for rating purposes: green (fully satisfactory); orange (partially satisfactory) and red (unsatisfactory).

Bid examination and evaluation		Evaluations are sometimes completed after the bid validity period
Contract award and effectiveness		
Contract administration		• No contract monitoring system in place • No process to monitor delivery of goods and services to verify quantity, quality and timeliness • Contracts amendments not handled promptly • Contracts not completed on schedule and within the originally approved contract price
Organization and functions		Not all staff had access to the national procurement regulations
Support and control systems		
Record keeping		• Contract administration records not maintained properly • Record of contract prices not maintained for future reference

13. Based on the above risks, the following measures will be carried out at project start-up in order to mitigate the above-identified risks:

- IFAD procurement support to districts and MALF on common procurement issues rated as "partially satisfactory". In particular, for contract administration purposes, current IFAD templates for contract management will be shared with the project during start-up activities;
- Capacity building support to ensure familiarization and compliance with governing procurement regulations and IFAD requirements.

D. Procurement management in the context of SHMDP

Procurement principles.

14. Responsibility for project implementation and procurement lies with the Government. IFAD's Project Procurement Guidelines[5] and Procurement Handbook[6] will guide the Borrower in the implementation of the Project's procurement activities.

15. An assessment of the national procurement systems and specifically of the procurement practices of the lead implementing agency has determined that these are not incompatible with IFAD's guidelines and hence the national procurement system will be followed. Nevertheless, weaknesses highlighted above will need to be addressed at start-up and close follow up is necessary throughout the life of the project.

16. **Project specific principles** governing project procurement will be the following:

- Procurement is carried out in accordance with the Financing Agreement, the Letter to the Borrower and the Project Implementation Manual and any subsequent changes reflected in IFAD's mission reports (e.g. supervision reports, mid-term reviews, etc..);
- Procurement is to be conducted within the project implementation period (from the date of effectiveness to the date of completion). Procurement cannot be undertaken between the date of completion and the closing date;
- Procurement must not exceed the availability of funds duly allocated by the financial agreement;
- Procurement Plans must be consistent with the approved Annual Work Plan and Budget (AWBP); and
- **the principle of value for money must be sought**: Best value does not necessarily mean the lowest initial price option, but rather represents the best return on investments, taking into consideration the unique and specific circumstances of each procurement activity; the balance

[5] https://www.ifad.org/documents/10180/cd15e696-26e2-45df-abcc-3d4611a9a20b
[6] https://www.ifad.org/documents/10180/dd363a70-bb9a-4f89-aa3c-09d5cbb22e6a

of time, cost and quality required; and the successful overall outcome of the contract in meeting its original objectives.

17. **District capacity in procurement**. Despite some notable improvements in the way local governments have conducted public procurement, major deficiencies remain. According to the recently released Comptroller and Auditor General (CAG) Report of 2014/157, which has revealed that many of the country's local government authorities complied with the requirements of the public procurement law, weaknesses were noted in the areas of contract management as well as application of the Public Procurement Act and its regulations.

18. The CAG report highlights the need for capacity building, increase of resources, close supervision and monitoring of the councils found to have inadequate compliance level.

19. The report named the councils which failed to comply with the requirements of the public procurement law as city councils for Arusha, Mbeya and Tanga. And municipal councils for Moshi and Kinondoni. The list also includes town and district councils for Arusha, Mpanda, Chamwino and Mpwapwa.

20. Others are Ushetu, Chunya, Muheza, Monduli, Handeni, Sengerema, Karatu, Iramba, Shinyanga, Kilindi, Tabora, Tunduma, Kondoa, Tarime and Manyoni.

21. According to the report, non - compliance with the requirements of the public procurement law contributes significantly in hindering the respective local government authorities from achieving efficiency, effectiveness and economy in their procurement.

22. The public procurement law requires procuring entities to choose appropriate procedures that cause the procurement to be carried out in a manner that ensures best value for money.

Procurement arrangements for SHMDP

23. The procurement of goods, works and services will be carried out in accordance with government regulations, with the addition that it should comply with IFAD"s prior-review procedure to be specified in the Letter to the Borrower. The ZPMU to be established will be responsible for the procurement of goods at the national and zonal level. A Procurement specialist will be recruited to carry out all procurement activities for the central and zonal level.

24. Procurement at the district-level will be delegated to the District's Procurement Management Unit (PMU) which is responsible for all procurement actions at the district. IFAD considers the procurement capacity of the district to be satisfactory, despite issues noted above. However, no funds transfer will be made to the districts for the said procurement actions as payments will be done at the ZPMU level for procurement initiated and completed at the district level. In order to achieve greater efficiency, bulk procurement will also be considered by the ZPMU for goods, works or services to be delivered/rendered at the district.

25. The PMU is staffed by a Head of Procurement who is supported by a number of procurement officers. District procurement will follow Government procedures and processes related to procurement. Procurement personnel at the district will be paid using Government resources and thus not reflected in the project cost tables. The Council Tender Board will be responsible for the advertisement of tenders and the approval of the evaluation recommendations coming from the PMU. The evaluation committee will be appointed by the Council Director.

Procurement methods, ceilings and timeline

26. The procurement methods and ceilings that will guide the programme are the followings (in Tsh):

[7] Source: https://www.ppra.go.tz/index.php/news-archive/487-local-governments-need-more-efforts-to-comply-with-procurement-law-cag

Method	Goods	Works	Consultancy services
International competitive tendering	No limit	No limit	No limit
National competitive tendering	800 M	3 Billion	1 Billion
Restricted tendering	400 M	1.5 Billion	500 M
Competitive quotations	80 M	100 M	300 M
Single source	500 M	800 M	150 M
Minor value procurement	10 M	20 M	7.5 M

27. Procurement processing time to be used in the Programme is the following:

Method	Number of days
International competitive bidding	45
National competitive bidding	30
Restricted tendering (national)	21
Restricted tendering (international)	30
National shopping	7
International shopping	14

Procurement issues to be considered in the context of SHMDP

28. Based on the issues noted in procurement at national and district levels, the project is expected to implement the following measures in order to mitigate the main risks identified .

Issues	Mitigation measures
Inadequate and incomplete TORs, technical specifications and Bill of Quantities (BOQ)	Capacity building and Technical assistance
Inadequate contract administration	Continuous capacity building and strict follow-up and supervision
Non-compliance with procurement regulations	Technical assistance and/or capacity building
Inefficiencies in procurement processes	Strict follow-up and supervision
Inadequate capacity in procurement	Technical assistance and/or capacity building
Inadequate record keeping	Capacity building
Improper Receipt of bids and opening	Capacity building and/or technical assistance
Bid examination and evaluation requiring improvements	Capacity building and/or technical assistance

Attachment 1: 18-month procurement plan

GOODS

Component	Description	Unit	Quantity	Unit Cost	Total Cost	Proc. Method	Procuring entity	Planned vs Actual	Bid preparation	IFAD no-objection	Bid invitation date	Bid closing/opening	Bid evaluation	IFAD no-objection	Contract signature
Component 1	Motorbikes for district cooperative officers	no	15	2,500	37,500	ICB	ZPMU	Plan	1-Apr-17	Yes	15-Apr-17	30-May-17	13-Jun-17	Yes	23-Jun-17
								Actual							
	Motorbike for district milk inspectors	no	15	2,500	37,500	ICB	ZPMU	Plan	5-Apr-17	Yes	19-Apr-17	3-Jun-17	17-Jun-17	Yes	27-Jun-17
								Actual							
	Provision of AI starter kits to all newly trained inseminators	kit	15	2,233	33,495	LCL_SHOPPING	ZPMU	Plan	1-May-17	Yes	6-May-17	13-May-17	27-May-17	Yes	6-Jun-17
								Actual							
	Support to outreach: provision of starter kits, motorbikes for para vets	no	120	1,116	133,920	LCL_SHOPPING	ZPMU	Plan	16-Jun-17	Yes	15-Jun-17	22-Jun-17	6-Jul-17	Yes	16-Jul-17
								Actual							
	Provision of material per collective cowshed	unit	15	12,500	187,500	LCL_SHOPPING	District	Plan	1-Jun-17	Yes	6-Jun-17	13-Jun-17	27-Jun-17	Yes	7-Jul-17
								Actual							
Component 2	Provision of motorcycles as outreach support for extensionists	no	300	1,116	334,800	ICB	ZPMU	Plan	1-Jun-17	Yes	15-Jun-17	30-Jul-17	13-Aug-17	Yes	23-Aug-17
								Actual							
	Provision of extension kits as outreach support for extensionists	kit	300	500	150,000	LCL_SHOPPING	ZPMU	Plan	8-Jun-17	Yes	13-Jun-17	20-Jun-17	4-Jul-17	Yes	14-Jul-17
								Actual							
	Provision of animals (individual pass on the cow)	no	500	930	465,000	LCL_SHOPPING	ZPMU	Plan	4-Aug-17	Yes	9-Aug-17	16-Aug-17	30-Aug-17	Yes	9-Sep-17
								Actual							
	Provision of animals (youth groups)	no	150	930	139,500	LCL_SHOPPING	ZPMU	Plan	5-Aug-17	Yes	10-Aug-17	17-Aug-17	31-Aug-17	Yes	10-Sep-17
								Actual							
Component 4	VehiclesZPMU	Number	5	24,884	124,420	ICB	ZPMU	Plan	1-Apr-17	Yes	15-Apr-17	30-May-17	13-Jun-17	Yes	23-Jun-17
								Actual							
	Office materials_ZPMU	Number	10	3,000	30,000	LCL_SHOPPING	ZPMU	Plan	3-Apr-17	Yes	8-Apr-17	15-Apr-17	29-Apr-17	Yes	9-May-17
								Actual							
	Vehicles_District Facilitation Team	Number	15	24,884	373,260	ICB	District	Plan	1-May-17	Yes	15-May-17	29-Jun-17	13-Jul-17	Yes	23-Jul-17
								Actual							
	Motobikes_District Facilitation Team	Number	15	2,702	40,530	NCB	District	Plan	15-May-17	Yes	25-May-17	24-Jun-17	8-Jul-17	Yes	18-Jul-17
								Actual							
	Equipment (PC)_District Facilitation Team	Number	15	3,000	45,000	LCL_SHOPPING	District	Plan	5-May-17	Yes	10-May-17	17-May-17	31-May-17	Yes	10-Jun-17
								Actual							

WORKS

Component	Description	Unit	Quantity	Unit Cost	Total Cost	Proc. Method	Procuring entity	Planned vs Actual	Bid preparation	IFAD no-objection	Bid invitation date	Bid closing/opening	Bid evaluation	IFAD no-objection	Contract signature
Component 1	Infrastructure upgrading for existing MCPs and MCCs														
	MCPs	no	10	2,000	20,000	NCB	District	Plan	10-Jan-18	No	24-Jan-18	23-Feb-18	9-Mar-18	No	23-Mar-18
								Actual							
	MCCs	no	5	10,000	50,000	NCB	District	Plan	15-Jan-18	No	29-Jan-18	28-Feb-18	14-Mar-18	No	28-Mar-18
								Actual							
	Infrastructure development for new MCPs and MCCs														
	MCPs /a	no	30	2,000	60,000	NCB	Beneficiaries	Plan	N/A	No	N/A	N/A	N/A	No	N/A
								Actual							
	Satelite MCCs /b	no	5	20,000	100,000	NCB	Beneficiaries/ Private sector	Plan	N/A	No	N/A	N/A	N/A	No	N/A
								Actual							
	Central MCCs /c	no	2	20,000	40,000	NCB	Private sector	Plan	N/A	No	N/A	N/A	N/A	No	N/A
								Actual							
	Spot improvement of feeder roads	no	30	20,000	600,000	NCB	District	Plan	1-Feb-18	Yes	15-Feb-18	17-Mar-18	31-Mar-18	No	14-Apr-18
								Actual							
	Water infrastructure for MCCs /d	no	3	20,000	60,000	NCB	District	Plan	5-Feb-18	Yes	19-Feb-18	21-Mar-18	4-Apr-18	No	18-Apr-18
								Actual							
	Support building of cattle crush in villages	no	15	2,326	34,890	LCI_SHOPPING	District	Plan	3-Mar-18	Yes	17-Mar-18	24-Mar-18	7-Apr-18	No	21-Apr-18
								Actual							
Component 4	Office rehabilitation	lumpsum	1	50,000	50,000	NCB	ZPWU	Plan	1-May-17	Yes	15-May-17	14-Jun-17	28-Jun-17	No	12-Jul-17
								Actual							

SERVICES

Component	Description	Unit	Quantity	Unit Cost	Total Cost	Proc. Method	Procuring entity	Planned vs Actual	RFP preparation	IFAD no-objection	Invitation date	Closing/ opening	Evaluation (T thom F)	IFAD no-objection	Contract signature
Component 1	Mapping and capacity assessment of existing FOs	study/district	5	15000	75000	NCB	ZPMU	Planned	1-May-17	Yes	15-May-17	14-Jun-17	28-Jun-17	Yes	12-Jul-17
								Actual							
	Organizational development of farmer organizations	Lumpsum			254500	NCB	ZPMU	Planned	1-Jan-18	Yes	15-Jan-18	14-Feb-18	28-Feb-18	Yes	14-Mar-18
								Actual							
	Assessment of available technologies for FOs	no	1	30,000	30,000	LCI_SHOPPING	ZPMU	Planned	1-Jun-17	Yes	15-Jun-17	15-Jul-17	29-Jul-17	Yes	12-Aug-17
								Actual							
	Capacity building of district cooperative departments (refresher training)	no	15	5000	75,000	LCI_SHOPPING	ZPMU	Planned	1-Jun-17	Yes	15-Jun-17	22-Jun-17	6-Jul-17	Yes	20-Jul-17
								Actual							
	Mapping and analysis of milk collection and transportation infrastructure	no	5	15,000	75,000	LCI_SHOPPING	ZPMU	Planned	1-Jul-17	Yes	15-Jul-17	22-Jul-17	5-Aug-17	Yes	19-Aug-17
								Actual							
	Organization, capacity assessment and business plan support for milk collectors and transporters	lumpsum	-	-	117,100	NCB	ZPMU	Planned	1-Feb-18	Yes	15-Feb-18	17-Mar-18	31-Mar-18	Yes	14-Apr-18
								Actual							
	Capacity building of milk inspectors	lumpsum			101500	LCI_SHOPPING	ZPMU	Planned	1-Feb-18	Yes	15-Feb-18	22-Feb-18	8-Mar-18	Yes	22-Mar-18
								Actual							
	Milk processing gap analysis for Southern Highlands	no	1	35,000	35,000	NCB	ZPMU	Planned	1-Jun-17	Yes	15-Jun-17	15-Jul-17	29-Jul-17	Yes	12-Aug-17
								Actual							
	Milk trade and distribution models study	no	1	45,000	45,000	NCB	ZPMU	Planned	10-Jun-17	Yes	24-Jun-17	24-Jul-17	7-Aug-17	Yes	21-Aug-17
								Actual							
	Market expansion and diversification studies	no	1	20,000	20,000	NCB	ZPMU	Planned	3-Jul-17	Yes	17-Jul-17	16-Aug-17	30-Aug-17	Yes	13-Sep-17
								Actual							
	Study on viability and distribution arrangements for school milk feeding pilot	no	1	35,000	35,000	NCB	ZPMU	Planned	4-Jul-17	Yes	18-Jul-17	17-Aug-17	31-Aug-17	Yes	14-Sep-17
								Actual							
Component 2	Mapping of feed resources	unit	1	20,465	20,465	LCI_SHOPPING	ZPMU	Planned	1-Aug-17	Yes	15-Aug-17	22-Aug-17	5-Sep-17	Yes	19-Sep-17
								Actual							
	Mapping of genetic resources	unit	1	20,465	20,465	LCI_SHOPPING	ZPMU	Planned	10-Aug-17	Yes	24-Aug-17	31-Aug-17	14-Sep-17	Yes	28-Sep-17
								Actual							
	Animal health surveys and disease impact evaluation	unit	1	40,930	40,930	LCI_SHOPPING	ZPMU	Planned	15-Jul-17	Yes	29-Jul-17	5-Aug-17	19-Aug-17	Yes	2-Sep-17
								Actual							
	Feeds analysis	unit	1	20,465	20,465	LCI_SHOPPING	ZPMU	Planned	20-Jul-17	Yes	3-Aug-17	10-Aug-17	24-Aug-17	Yes	7-Sep-17
								Actual							
Component 3	Facilitation for District multi stakeholder forum	no	36	2,200	79,200	LCI_SHOPPING	ZPMU	Planned	15-Jul-17	Yes	29-Jul-17	5-Aug-17	19-Aug-17	Yes	2-Sep-17
								Actual							
	Facilitation for Zonal multi stakeholder forum	no	1	10,000	10,000	LCI_SHOPPING	ZPMU	Planned	20-Jul-17	No	3-Aug-17	10-Aug-17	24-Aug-17	No	7-Sep-17
								Actual							
	Facilitation for Study of Tanga forum	no	1	10,000	10,000	LCI_SHOPPING	ZPMU	Planned	15-Jul-17	No	29-Jul-17	5-Aug-17	19-Aug-17	No	2-Sep-17
								Actual							
	PCMU policy studies	no	1	30,000	30,000	LCI_SHOPPING	ZPMU	Planned	1-Aug-17	Yes	15-Aug-17	22-Aug-17	5-Sep-17	Yes	19-Sep-17
								Actual							
	TDB short term consultancies	pers-month	3	15,027	45,081	LCI_SHOPPING	ZPMU	Planned	1-Jul-17	Yes	15-Jul-17	22-Jul-17	5-Aug-17	Yes	19-Aug-17
								Actual							
	Training for TDB staff	no	1	20,000	20,000	LCI_SHOPPING	ZPMU	Planned	10-Jul-17	Yes	24-Jul-17	31-Jul-17	14-Aug-17	Yes	28-Aug-17
								Actual							
Component 4	Gender awareness training for implementing partners	no	1	11,828	11,828	LCI_SHOPPING	ZPMU	Planned	10-Jul-17	No	24-Jul-17	31-Jul-17	14-Aug-17	No	28-Aug-17
								Actual							
	Rapid mapping and cluster development	no	15	79,376	1,190,640	NCB	ZPMU	Planned	14-Jun-17	Yes	28-Jun-17	28-Jul-17	11-Aug-17	Yes	25-Aug-17
								Actual							
	Baseline survey	no	1	66455	66,455	NCB	ZPMU	Planned	8-Aug-17	Yes	22-Aug-17	21-Sep-17	5-Oct-17	Yes	19-Oct-17
								Actual							
	Gender studies for baseline, mid-term review and at completion	no	1	9,302	9,302	NCB	ZPMU	Planned	8-Jun-17	Yes	22-Jun-17	22-Jul-17	5-Aug-17	Yes	19-Aug-17
								Actual							
	Set-up of electronic participatory M&E system and MIS	Lumpsum	1	60,000	60,000	NCB	ZPMU	Planned	13-Jun-17	Yes	27-Jun-17	27-Jul-17	10-Aug-17	Yes	24-Aug-17
								Actual							
	Assessment of milk consumption and nutrition situation	unit	1	11,828	11,828	NCB	ZPMU	Planned	8-Jun-17	Yes	22-Jun-17	22-Jul-17	5-Aug-17	Yes	19-Aug-17
								Actual							
	Publication and dissemination of the milk consumption and nutrition situation report to nutrition stakeholders and no		1	5,256	5,256	NCB	ZPMU	Planned	2-Feb-18	Yes	16-Feb-18	16-Mar-18	1-Apr-18	Yes	15-Apr-18
								Actual							
	Knowledge Management	Lumpsum	1	45,000	45,000	NCB	ZPMU	Planned	12-Jun-17	Yes	26-Jun-17	26-Jul-17	9-Aug-17	Yes	23-Aug-17
								Actual							

Appendix 9: Project Costs

A. MAIN ASSUMPTIONS FOR COST ESTIMATION

1. **Introduction.** This Appendix describes the assumptions underlying the derivation of the project costs, presents the summary and detailed cost tables and the financing plan. Project cost estimates are based on field data as of August 2016.

2. **Project period.** The project will have a duration of 7 years with a probable start date in 2017.

3. **Inflation**. The Economist Intelligence Unit (EIU) forecasts that inflation will slow from 5.6% in 2015 to 5.2% in 2016. In line with the EIU estimates, the annual local inflation rate has been set at about 6.1% year on year for the whole project period with the exception of year 1 (6.5%) to reflect the inflationary pressure posed by a rebound in global oil and food prices. Foreign inflation was set at 1.2% per year in line with World Bank estimates (see Table 1 in Attachment 1).

Table 1. Inflation rates (%)

	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7
Local	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Foreign	1.2	1.2	1.2	1.2	1.2	1.2	1.2

4. **Exchange rate.** The initial exchange rate for the cost estimate has been set at US$ 1.00: Tanzanian Shilling (TSh) 2150, the rate prevailing in April 2016. The Base Exchange rate for this analysis has been set at TSh 2150 for the whole project period. Project costs are presented in both TSh and US dollars.

5. **Salaries.** The gross salaries include the obligatory employer's contribution of 5% for the National Social Security Fund (NSSF).[1] In absence of any civil works, no physical contingencies have been defined.

6. **Base costs**. The base costs are broadly derived from the experience of the on-going IFAD projects in Tanzania and regional projects in Rwanda.

7. **Taxes and duties.** The imported items for the Project attract custom duties of 15-25%, and a Value-Added Tax (VAT) of 18% is levied on most goods, works and some service. There is zero VAT charged on salaries, training and workshops and international consultancy. The government will finance the cost of all taxes on goods and services procured under the Project as per the Loan agreement together with a cash advance to the project of US$ 3.5 million to cover the National Social Security Fund contributions and training taxes for service providers and Programme staff.

8. The Foreign exchange (FE) represents the direct and indirect imported inputs embodied in the cost.

9. **Expenditure accounts.** The expenditure categories considered are in accordance with IFAD Circular IC/FOD/02/2013 on standardization of expenditures categories. The expenditure accounts are shown in Table 2 including tax assumptions and the average foreign exchange rates.

Table 2. Expenditure accounts

Description	Foreign Exchange (%)	Taxes & Duties (%) /a
I. **INVESTMENT COSTS**		
A. Civil works	40	15
B. Vehicles	75	25
C. Goods, equipment & materials	30	15.3
D. Training, Studies and Workshop		
E. Consultancies, TA	20	0
F. Training & Workshop	20	0

[1] Covers all employees in the private sector including Non Governmental Organizations that are not covered by the Government's pension scheme.

II. RECURRENT COSTS		
A. Salaries and Allowances	0	0
B. Operating Costs	30	15.3

a/Taxes are indicated at unit costs.

10. **Project Structure.** The project has three components as follows:

- Building efficient dairy value chains from producer to consumer
- Improving on-farm productivity and
- Supporting an enabling policy and institutional framework

B. PROJECT COSTS

11. **Total project costs.** The total project investment and incremental recurrent costs, including physical and price contingencies, are estimated at US$ 41.27 million (TZS 104 billion). Price contingencies make up 4% of the project costs and physical contingencies represent 1%. The foreign exchange component is estimated at US$ 10.6 million (25%). Taxes make up approximately US$ 3.4 million or 8% of total project costs. The total baseline costs are US$ 39.23 million, while price contingencies account for US$ 1.5 million. Table 3 below presents a breakdown of the costs by SHDMP components. The detailed cost tables and summary tables are presented in Attachments 1 and 2 to this Appendix.

Table 3. Project cost by component

	(TZ '000)			(US$ '000)				
	Local	Foreign	Total	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
A. Building efficient dairy value chains from producer to consumer								
1. Capacity building of farmer organization (FOs)	11 562 646	3 980 779	15 543 425	5 378	1 852	7 230	26	18
2. Investment in milk collection and handling infrastructure	12 180 126	5 442 349	17 622 475	5 665	2 531	8 197	31	21
3. Improved processing and distribution for milk and milk products	6 446 035	2 327 212	8 773 247	2 998	1 082	4 081	27	10
Subtotal	30 188 808	11 750 339	41 939 147	14 041	5 465	19 507	28	50
B. Improving on-farm productivity								
1. Supporting access to services, inputs and assets	7 178 967	2 917 260	10 096 228	3 339	1 357	4 696	29	12
2. Capacity building of service providers, extension workers and farmers	7 701 780	2 811 104	10 512 884	3 582	1 307	4 890	27	12
3. Dissemination of climate smart technical and institutional innovations	2 608 290	358 082	2 966 372	1 213	167	1 380	12	4
Subtotal	17 489 038	6 086 446	23 575 484	8 134	2 831	10 965	26	28
C. Supporting an enabling policy and institutional framework								
1. Supporting evidence-based and inclusive policy dialogue	2 704 394	676 098	3 380 492	1 258	314	1 572	20	4
2. Strengthening institutional capacity for dairy training	1 622 204	405 551	2 027 755	755	189	943	20	2
Subtotal	4 326 597	1 081 649	5 408 246	2 012	503	2 515	20	6
D. Project Planning and Management								
1. Project Management	9 897 184	2 407 571	12 304 754	4 603	1 120	5 723	20	15
2. Monitoring and Evaluation	989 245	274 461	1 263 706	460	128	588	22	1
Subtotal	10 886 428	2 682 032	13 568 460	5 063	1 247	6 311	20	16
Total BASELINE COSTS	62 890 871	21 600 466	84 491 337	29 252	10 047	39 298	26	100
Physical Contingencies	516 000	344 000	860 000	240	160	400	40	1
Price Contingencies	14 391 910	4 664 111	19 056 021	1 192	387	1 579	25	4
Total PROJECT COSTS	77 798 781	26 608 577	104 407 358	30 684	10 594	41 278	26	105

C. FINANCING PLAN

12. **Financing Plan.** The project is to be financed by the Government of Tanzania, IFAD, beneficiaries and a development partner. IFAD will finance approximately 78% of the project costs (US$ 32.12 million) through a loan to the government on highly concessionary terms over a period of seven years, and the development partner (Heifer International) will co-finance the 12% of total costs (US$ 5 million). The government will finance the taxes and duties (US$ 3.6 million, representing 8.7% of total costs) and also the NSSF contribution for all staff employed by the project. In addition, the government will provide office space and second some government staff to Zonal Project Management Unit. The details of financing arrangements are shown in Table 4.

Table 4. Financing plan by component

	Development Partner		Govt		IFAD Loan		Beneficiaries		Total		Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Taxes
A. Building efficient dairy value chains from producer to consumer											
1. Capacity building of farmer organization (FOs)	1 344	17.8	625	8.3	5 560	73.8	-	-	7 529	18.2	625
2. Investment in milk collection and handling infrastructure	1 770	19.8	1 042	11.7	6 125	68.5	-	-	8 937	21.7	1 042
3. Improved processing and distribution for milk and milk products	181	4.3	425	10.0	3 645	85.8	-	-	4 250	10.3	425
Subtotal	3 294	15.9	2 092	10.1	15 330	74.0	-	-	20 716	50.2	2 092
B. Improving on-farm productivity											
1. Supporting access to services, inputs and assets	251	5.1	634	13.0	3 560	72.8	442	9.0	4 887	11.8	634
2. Capacity building of service providers, extension workers and farmers	1 454	28.5	219	4.3	3 307	64.8	126	2.5	5 107	12.4	219
3. Dissemination of climate smart technical and institutional innovations	-	-	13	0.9	1 422	99.1	-	-	1 435	3.5	13
Subtotal	1 705	14.9	866	7.6	8 289	72.5	568	5.0	11 429	27.7	866
C. Supporting an enabling policy and institutional framework											
1. Supporting evidence-based and inclusive policy dialogue	-	-	0	-	1 628	100.0	-	-	1 628	3.9	-
2. Strengthening institutional capacity for dairy training	-	-	0	-	974	100.0	-	-	974	2.4	-
Subtotal	-	-	0	-	2 602	100.0	-	-	2 602	6.3	-
D. Project Planning and Management											
1. Project Management	-	-	616	10.4	5 309	89.6	-	-	5 925	14.4	450
2. Monitoring and Evaluation	-	-	16	2.6	590	97.4	-	-	605	1.5	16
Subtotal	-	-	632	9.7	5 898	90.3	-	-	6 530	15.8	466
Total PROJECT COSTS	5 000	12.1	3 590	8.7	32 120	77.8	568	1.4	41 278	100.0	3 424

Attachment 1: Summary Cost Tables

Table 1

Republic of Tanzania
Southern Highlands Milksheds Development Project
Components Project Cost Summary

	(TZ '000)					(US$ '000)				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
A. Building efficient dairy value chains from producer to consumer										
1. Capacity building of farmer organization (FOs)	11 562 646	3 980 779	15 543 425	26	18	5 378	1 852	7 230	26	18
2. Investment in milk collection and handling infrastructure	12 180 126	5 442 349	17 622 475	31	21	5 665	2 531	8 197	31	21
3. Improved processing and distribution for milk and milk products	6 446 035	2 327 212	8 773 247	27	10	2 998	1 082	4 081	27	10
Subtotal	30 188 808	11 750 339	41 939 147	28	50	14 041	5 465	19 507	28	50
B. Improving on-farm productivity										
1. Supporting access to services, inputs and assets	7 178 967	2 917 260	10 096 228	29	12	3 339	1 357	4 696	29	12
2. Capacity building of service providers, extension workers and farmers	7 701 780	2 811 104	10 512 884	27	12	3 582	1 307	4 890	27	12
3. Dissemination of climate smart technical and institutional innovations	2 608 290	358 082	2 966 372	12	4	1 213	167	1 380	12	4
Subtotal	17 489 038	6 086 446	23 575 484	26	28	8 134	2 831	10 965	26	28
C. Supporting an enabling policy and institutional framework										
1. Supporting evidence-based and inclusive policy dialogue	2 704 394	676 098	3 380 492	20	4	1 258	314	1 572	20	4
2. Strengthening institutional capacity for dairy training	1 622 204	405 551	2 027 755	20	2	755	189	943	20	2
Subtotal	4 326 597	1 081 649	5 408 246	20	6	2 012	503	2 515	20	6
D. Project Planning and Management										
1. Project Management	9 897 184	2 407 571	12 304 754	20	15	4 603	1 120	5 723	20	15
2. Monitoring and Evaluation	989 245	274 461	1 263 706	22	1	460	128	588	22	1
Subtotal	10 886 428	2 682 032	13 568 460	20	16	5 063	1 247	6 311	20	16
Total BASELINE COSTS	62 890 871	21 600 466	84 491 337	26	100	29 252	10 047	39 298	26	100
Physical Contingencies	516 000	344 000	860 000	40	1	240	160	400	40	1
Price Contingencies	14 391 910	4 664 111	19 056 021	24	23	1 192	387	1 579	25	4
Total PROJECT COSTS	77 798 781	26 608 577	104 407 358	25	124	30 684	10 594	41 278	26	105

Table 2

Republic of Tanzania
Southern Highlands Milksheds Development Project
Expenditure Accounts Project Cost Summary

	(TZ '000)					(US$ '000)				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
I. Investment Costs										
Civil w orks	5 160 000	3 440 000	8 600 000	40	10	2 400	1 600	4 000	40	10
Vehicles	606 598	1 819 794	2 426 392	75	3	282	846	1 129	75	3
Goods, equipment and material	20 080 842	8 606 075	28 686 918	30	34	9 340	4 003	13 343	30	34
Consultancies	9 864 566	2 466 142	12 330 708	20	15	4 588	1 147	5 735	20	15
Training & Wshop	16 021 123	4 005 281	20 026 404	20	24	7 452	1 863	9 315	20	24
Total Investment Costs	51 733 129	20 337 291	72 070 421	28	85	24 062	9 459	33 521	28	85
II. Recurrent Costs										
A. Salaries & allow ancies	8 210 334	-	8 210 334	-	10	3 819	-	3 819	-	10
B. Operating costs	2 947 408	1 263 175	4 210 583	30	5	1 371	588	1 958	30	5
Total Recurrent Costs	11 157 742	1 263 175	12 420 917	10	15	5 190	588	5 777	10	15
Total BASELINE COSTS	62 890 871	21 600 466	84 491 337	26	100	29 252	10 047	39 298	26	100
Physical Contingencies	516 000	344 000	860 000	40	1	240	160	400	40	1
Price Contingencies	14 391 910	4 664 111	19 056 021	24	23	1 192	387	1 579	25	4
Total PROJECT COSTS	77 798 781	26 608 577	104 407 358	25	124	30 684	10 594	41 278	26	105

Table 3

Republic of Tanzania
Southern Highlands Milksheds Development Project
Expenditure Accounts by Components - Totals Including Contingencies
(US$ '000)

	Building efficient dairy value chains from producer to consumer			Improving on-farm productivity			Supporting an enabling policy and institutional framework					
	Capacity building of farmer organization (FOs)	Investment in milk collection and handling infrastructure	Improved processing and distribution for milk and milk products	Supporting access to services, inputs and assets	Capacity building of service providers, extension workers and farmers	Dissemination of climate smart technical and institutional innovations	Supporting evidence-based and inclusive policy dialogue	Strengthening institutional capacity for dairy training	Facilitating specialized financial services to the dairy value chain	ect Planning and Management: Project Management	Monitoring and Evaluation	Total
I. Investment Costs												
Civil works	-	4 359	-	224	-	-	-	-	-	-	-	4 583
Vehicles	38	38	-	-	493	-	-	-	-	566	-	1 136
Goods, equipment and material	4 024	2 389	2 690	3 918	628	-	-	-	-	147	102	13 898
Consultancies	2 539	566	247	414	391	103	816	64	-	557	223	5 922
Training & Wshop	927	971	1 227	331	3 594	633	812	909	-	24	280	9 709
Total Investment Costs	7 529	8 323	4 164	4 887	5 107	736	1 628	974	-	1 294	605	35 249
II. Recurrent Costs												
A. Salaries & allowancies	-	613	-	-	-	613	-	-	-	2 759	-	3 986
B. Operating costs	-	-	86	-	-	86	-	-	-	1 871	-	2 043
Total Recurrent Costs	-	613	86	-	-	699	-	-	-	4 630	-	6 029
Total PROJECT COSTS	7 529	8 937	4 250	4 887	5 107	1 435	1 628	974	-	5 925	605	41 278
Taxes	625	1 042	425	634	219	13	-	-	-	450	16	3 424
Foreign Exchange	1 929	2 796	1 128	1 414	1 356	173	326	195	-	1 146	131	10 594

Table 4

Republic of Tanzania
Southern Highlands Milksheds Development Project
Project Components by Year -- Base Costs
(US$ '000)

	Base Cost							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
A. Building efficient dairy value chains from producer to consumer								
1. Capacity building of farmer organization (FOs)	180	1 000	1 657	1 982	1 467	872	72	7 230
2. Investment in milk collection and handling infrastructure	114	1 623	1 705	1 675	1 550	1 410	120	8 197
3. Improved processing and distribution for milk and milk products	164	461	966	1 041	946	469	33	4 081
Subtotal	458	3 083	4 328	4 698	3 963	2 751	225	19 507
B. Improving on-farm productivity								
1. Supporting access to services, inputs and assets	-	1 706	1 039	676	730	374	172	4 696
2. Capacity building of service providers, extension w orkers and farmers	802	574	418	742	684	1 112	558	4 890
3. Dissemination of climate smart technical and institutional innovations	170	275	178	248	180	232	97	1 380
Subtotal	972	2 555	1 635	1 666	1 593	1 717	827	10 965
C. Supporting an enabling policy and institutional framework								
1. Supporting evidence-based and inclusive policy dialogue	227	295	295	315	220	220	-	1 572
2. Strengthening institutional capacity for dairy training	-	228	346	354	3	12	-	943
Subtotal	227	523	641	669	223	232	-	2 515
D. Project Planning and Management								
1. Project Management	1 841	645	657	645	645	645	645	5 723
2. Monitoring and Evaluation	212	50	126	50	50	99	-	588
Subtotal	2 053	695	783	695	695	744	645	6 311
Total BASELINE COSTS	3 711	6 857	7 386	7 729	6 475	5 444	1 697	39 298
Physical Contingencies	-	95	77	77	77	75	-	400
Price Contingencies								
Inflation								
Local	71	487	889	1 330	1 450	1 569	668	6 465
Foreign	8	32	57	83	93	92	22	387
Subtotal Inflation	79	519	946	1 414	1 544	1 661	690	6 852
Devaluation	-56	-394	-720	-1 081	-1 182	-1 287	-553	-5 273
Subtotal Price Contingencies	22	126	226	333	361	374	137	1 579
Total PROJECT COSTS	3 733	7 077	7 690	8 139	6 914	5 892	1 834	41 278
Taxes	365	554	631	672	658	470	74	3 424
Foreign Exchange	1 298	1 801	1 923	2 039	1 785	1 454	295	10 594

Table 5

Republic of Tanzania
Southern Highlands Milksheds Development Project
Expenditure Accounts by Years -- Totals Including Contingencies
(US$ '000)

	Totals Including Contingencies							
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
I. Investment Costs								
Civil works	-	1 058	873	883	894	875	-	4 583
Vehicles	1 057	79	-	-	-	-	-	1 136
Goods, equipment and material	391	2 149	2 959	3 215	3 108	1 897	178	13 898
Consultancies	1 174	1 182	1 087	1 095	648	589	147	5 922
Training & Wshop	364	1 754	1 906	2 070	1 378	1 635	602	9 709
Total Investment Costs	2 986	6 223	6 825	7 264	6 028	4 996	927	35 249
II. Recurrent Costs								
A. Salaries & allowancies	481	567	574	581	588	595	602	3 986
B. Operating costs	267	287	291	294	298	301	305	2 043
Total Recurrent Costs	747	854	864	875	885	896	907	6 029
Total PROJECT COSTS	3 733	7 077	7 690	8 139	6 914	5 892	1 834	41 278

Table 6

Republic of Tanzania
Southern Highlands Milksheds Development Project
Components by Financiers
(US$ '000)

	Development Partner		Govt		IFAD Loan		Beneficiaries		Total		For.	Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exch.	Taxes)	Taxes
A. Building efficient dairy value chains from producer to consumer													
1. Capacity building of farmer organization (FOs)	1 344	17.8	625	8.3	5 560	73.8	-	-	7 529	18.2	1 929	4 975	625
2. Investment in milk collection and handling infrastructure	1 770	19.8	1 042	11.7	6 125	68.5	-	-	8 937	21.7	2 796	5 098	1 042
3. Improved processing and distribution for milk and milk products	181	4.3	425	10.0	3 645	85.8	-	-	4 250	10.3	1 128	2 698	425
Subtotal	3 294	15.9	2 092	10.1	15 330	74.0	-	-	20 716	50.2	5 853	12 771	2 092
B. Improving on-farm productivity													
1. Supporting access to services, inputs and assets	251	5.1	634	13.0	3 560	72.8	442	9.0	4 887	11.8	1 414	2 839	634
2. Capacity building of service providers, extension w orkers and farmers	1 454	28.5	219	4.3	3 307	64.8	126	2.5	5 107	12.4	1 356	3 532	219
3. Dissemination of climate smart technical and institutional innovations	-	-	13	0.9	1 422	99.1	-	-	1 435	3.5	173	1 249	13
Subtotal	1 705	14.9	866	7.6	8 289	72.5	568	5.0	11 429	27.7	2 943	7 620	866
C. Supporting an enabling policy and institutional framework													
1. Supporting evidence-based and inclusive policy dialogue	-	-	0	-	1 628	100.0	-	-	1 628	3.9	326	1 303	-
2. Strengthening institutional capacity for dairy training	-	-	0	-	974	100.0	-	-	974	2.4	195	779	-
Subtotal	-	-	0	-	2 602	100.0	-	-	2 602	6.3	520	2 082	-
D. Project Planning and Management													
1. Project Management	-	-	616	10.4	5 309	89.6	-	-	5 925	14.4	1 146	4 328	450
2. Monitoring and Evaluation	-	-	16	2.6	590	97.4	-	-	605	1.5	131	458	16
Subtotal	-	-	632	9.7	5 898	90.3	-	-	6 530	15.8	1 278	4 786	466
Total PROJECT COSTS	5 000	12.1	3 590	8.7	32 120	77.8	568	1.4	41 278	100.0	10 594	27 259	3 424

Table 7

Republic of Tanzania
Southern Highlands Milksheds Development Project
Disbursement Accounts by Financiers
(US$ '000)

	Development Partner		Govt		IFAD Loan		Beneficiaries		Total		For.	Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exch.	Taxes)	Taxes
1. Civil works	1 770	38.6	701	15.3	2 112	46.1	-	-	4 583	11.1	1 833	2 049	701
2. Vehicles	-	-	274	25.0	695	63.5	126	11.5	1 095	2.7	822	-	274
3. Good, equipment & materials	1 509	10.8	2 137	15.3	9 851	70.7	442	3.2	13 939	33.8	4 200	7 602	2 137
4. Consultancies	267	4.5	0	-	5 626	95.5	-	-	5 893	14.3	1 179	4 715	-
5. Training & Wshop	1 454	14.9	0	-	8 284	85.1	-	-	9 738	23.6	1 948	7 791	-
7. Salaries & allowancies	-	-	166	4.2	3 820	95.8	-	-	3 986	9.7	-	3 986	-
8. Operating costs	-	-	313	15.3	1 731	84.7	-	-	2 043	4.9	613	1 118	313
Total PROJECT COSTS	5 000	12.1	3 590	8.7	32 120	77.8	568	1.4	41 278	100.0	10 594	27 259	3 424

Table 8

Republic of Tanzania
Southern Highlands Milksheds Development Project
Expenditure Accounts by Financiers
(US$ '000)

	Development Partner		Govt		IFAD Loan		Beneficiaries		Total		For.	Local (Excl.	Duties &
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exch.	Taxes)	Taxes
I. Investment Costs													
Civil w orks	1 770	38.6	701	15.3	2 112	46.1	-	-	4 583	11.1	1 833	2 049	701
Vehicles	-	-	284	25.0	726	63.9	126	11.1	1 136	2.8	852	-	284
Goods, equipment and material	1 509	10.9	2 126	15.3	9 821	70.7	442	3.2	13 898	33.7	4 169	7 602	2 126
Consultancies	267	4.5	0	-	5 655	95.5	-	-	5 922	14.3	1 184	4 738	-
Training & Wshop	1 454	15.0	0	-	8 255	85.0	-	-	9 709	23.5	1 942	7 768	-
Total Investment Costs	5 000	14.2	3 112	8.8	26 569	75.4	568	1.6	35 249	85.4	9 981	22 156	3 112
II. Recurrent Costs													
A. Salaries & allow ancies	-	-	166	4.2	3 820	95.8	-	-	3 986	9.7	-	3 986	-
B. Operating costs	-	-	313	15.3	1 731	84.7	-	-	2 043	4.9	613	1 118	313
Total Recurrent Costs	-	-	478	7.9	5 551	92.1	-	-	6 029	14.6	613	5 103	313
Total PROJECT COSTS	5 000	12.1	3 590	8.7	32 120	77.8	568	1.4	41 278	100.0	10 594	27 259	3 424

Table 9

Republic of Tanzania
Southern Highlands Milksheds Development Project
Disbursements by Semesters and Government Cash Flow
(US$ '000)

	Financing Available				Costs to be Financed	Govt	
	Development Partner	IFAD Loan	Beneficiaries		Project		Cumulative
	Amount	Amount	Amount	Total	Costs	Cash Flow	Cash Flow
1	-	1 610	63	1 673	1 867	-194	-194
2	-	1 610	63	1 673	1 867	-194	-388
3	-	3 197	53	3 250	3 539	-289	-676
4	-	3 197	53	3 250	3 539	-289	-965
5	-	3 488	29	3 518	3 845	-327	-1 292
6	-	3 488	29	3 518	3 845	-327	-1 619
7	291	3 376	54	3 721	4 069	-348	-1 967
8	291	3 376	54	3 721	4 069	-348	-2 315
9	682	2 404	30	3 116	3 457	-341	-2 656
10	682	2 404	30	3 116	3 457	-341	-2 997
11	1 184	1 485	30	2 699	2 946	-247	-3 244
12	1 184	1 485	30	2 699	2 946	-247	-3 491
13	342	500	25	868	917	-49	-3 541
14	342	500	25	868	917	-49	-3 590
Total	5 000	32 120	568	37 688	41 278	-3 590	-3 590

Attachment 2: Detailed Cost Tables

Table 1: Building efficient dairy value chains from producer to consumer– Detailed Costs

Table 2: Improving on-farm productivity - Detailed Costs

Table 3: Establishment of Dairy Farmer Field Schools – Detailed Costs

Table 4: Policy and Institutional Strengthening – Detailed Costs

Table 5: Project Planning and Management - Detailed Costs

Table 1

Republic of Tanzania
Southern Highlands Milksheds Development Project
Table 1. Building efficient dairy value chains from producer to consumer

Detailed Costs	Unit	Quantities								Unit Cost (TZ '000)	Unit Cost (US$)	Totals Including Contingencies (US$ '000)							
		2017	2018	2019	2020	2021	2022	2023	Total			2017	2018	2019	2020	2021	2022	2023	Total
I. Investment Costs																			
A. Capacity building of farmer organizations (FOs)																			
1. Capacity assessment and preparation of EDPs																			
a. Mapping and capacity assessment of all existing farmers organization	Study/district	5	-	-	-	-	-	-	5	32.250	15.000	75	-	-	-	-	-	-	75
b. Formation and registration of FOs not properly constituted and registred	Farmer Organizatior	-	10	10	10	-	-	-	30	5.375	2.500	-	25	26	26	-	-	-	77
c. Preparation of 5-year Business Plans (primary and secundary FOs)	no	-	20	20	20	-	-	-	60	12.900	6.000	-	122	124	125	-	-	-	371
Subtotal												75	148	149	151	-	-	-	524
2. Capacity building of selected Farmer Organizations																			
a. Organizational development of farmer organizations																			
Establishment of governance and management structures & systems	Farmer Organizatior	-	10	15	15	10	-	-	50	10.750	5.000	-	51	77	78	53	-	-	259
Farmer mobilization, recruitment & establisment of representation structures	no	-	10	15	15	10	-	-	50	21.500	10.000	-	102	155	156	106	-	-	518
Capacity building on leadership and governance- across all structures of the FO	no	-	10	15	15	10	-	-	50	10.750	5.000	-	51	77	78	53	-	-	259
Capacity building on entrepreneurship, business and financial management	no	-	10	15	15	10	-	-	50	10.750	5.000	-	51	77	78	53	-	-	259
Organizational development of farmer organizations	no	-	-	-	-	-	50	-	50	10.750	5.000	-	-	-	-	-	267	-	267
Subtotal												-	255	386	391	264	267	-	1 563
b. Technical & management support in establishment of business service units																			
Milk collection and marketing	no	-	10	15	15	10	10	-	60	10.750	5.000	-	51	77	78	53	53	-	313
Processing	no	-	5	5	5	5	-	-	20	10.750	5.000	-	25	26	26	26	-	-	104
Input supply	no	-	10	15	15	10	10	-	60	10.750	5.000	-	51	77	78	53	53	-	313
AI, AH & Extension services	no	-	10	15	15	10	10	-	60	10.750	5.000	-	51	77	78	53	53	-	313
Subtotal												-	178	258	261	185	160	-	1 041
c. Agricultural Information Communication Technology for FOs																			
Assesment of available technologies	no	1	-	-	-	-	-	-	1	64.500	30.000	30	-	-	-	-	-	-	30
Customization, installation and training (including hardware)	no	-	10	20	20	10	-	-	60	21.500	10.000	-	102	206	209	106	-	-	622
Operational support for initial period	no	-	10	20	20	10	-	-	60	4.300	2.000	-	20	41	42	21	-	-	124
Subtotal												30	122	247	250	127	-	-	776
d. Linkages to financial institutions for financing of EDPs																			
Support in FO meetings and completion of RFI documentation for loans	Farmer Organizatior	-	10	20	20	10	-	-	60	10.750	5.000	-	51	103	104	53	-	-	311
Provision for competitive financing to FOs to leverage RFI financing	Farmer Organizatior	-	-	10	20	-	-	-	30	86.000	40.000	-	-	412	834	-	-	-	1 246
Provision for competitive financing to FOs to leverage RFI financing	Farmer Organizatior	-	-	-	-	20	10	-	30	86.000	40.000	-	-	-	-	844	427	-	1 271
Subtotal												-	51	515	938	897	427	-	2 828
Subtotal												30	606	1 406	1 840	1 472	854	-	6 209
3. Capacity building of district cooperative departments																			
a. Refresher training of district cooperative officers	no	15	15	-	-	-	-	-	30	10.750	5.000	75	76	-	-	-	-	-	152
b. Study/exchange visits for cooperative officers	no	-	15	15	-	-	-	-	30	10.750	5.000	-	76	77	-	-	-	-	154
c. Motorbikes for district cooperative officers	no	-	15	-	-	-	-	-	15	5.375	2.500	-	38	-	-	-	-	-	38
d. Mobility facilitation allowances for cooperative officers	no	-	30	30	30	30	30	30	180	5.160	2.400	-	73	74	75	76	77	78	453
Subtotal												75	264	151	75	76	77	78	797
Subtotal												181	1 018	1 707	2 067	1 548	931	78	7 529

B. Investment in milk collection and handling infrastructure																			
1. Mapping and analysis of milk collection and transportation infrastructure	no	2	3	-	-	-	-	-	5	32.250	15.000	30	46	-	-	-	-	-	76
2. Establishment of milk collection infrastrucutre																			
a. Infrastructure upgrading for existing MCPs and MCCs																			
MCPs	no	-	10	20	-	-	-	-	30	6.450	3.000	-	31	62	-	-	-	-	92
MCCs	no	-	5	5	-	-	-	-	10	21.500	10.000	-	51	52	-	-	-	-	102
Subtotal												-	81	113	-	-	-	-	195
b. Infrastructure development for new MCPs and MCCs																			
MCPs /a	no	-	30	30	30	30	30	-	150	6.450	3.000	-	92	93	94	95	96	-	469
Satelite MCCs /b	no	-	5	10	15	15	15	-	60	43.000	20.000	-	102	206	313	317	320	-	1 258
Central MCCs /c	no	-	2	4	4	3	2	-	15	43.000	20.000	-	41	82	83	63	43	-	313
Subtotal												-	234	381	490	475	459	-	2 039
c. Training and capacity building on management of milk collection infrastructure																			
MCPs staff training and exchange visits	no	-	40	50	30	30	30	-	180	2.150	1.000	-	41	52	31	32	32	-	187
MCCs staff training and exchange visits	no	-	12	19	19	18	17	-	85	10.750	5.000	-	61	98	99	95	91	-	444
Subtotal												-	102	149	130	127	123	-	631
Subtotal												-	417	644	620	601	582	-	2 865
3. MCC road and water access infrastructure development																			
a. Spot improvement of feeder roads	no	-	30	30	-	-	-	-	60	43.000	20.000	-	672	680	-	-	-	-	1 352
b. Spot improvement of feeder roads	no	-	-	-	30	30	30	-	90	43.000	20.000	-	-	-	688	696	705	-	2 089
c. Water infrastructure for MCCs /d	no	-	6	6	6	6	6	-	30	43.000	20.000	-	134	136	138	139	141	-	688
d. Support in off-grid energy connectivity (solar etc)	no	-	5	10	10	10	5	-	40	10.750	5.000	-	28	57	57	58	29	-	229
Subtotal												-	834	873	883	894	875	-	4 359
4. Support to milk collectors/transporters																			
a. Organization and capacity assessment of milk collectors and transporters	no	-	5	5	5	-	-	-	15	10.750	5.000	-	25	26	26	-	-	-	77
b. Training of milk transporters on milk quality, hygiene, testing and handling	no	-	45	45	45	45	-	-	180	2.150	1.000	-	46	46	47	47	-	-	187
c. Support in business plan preparation for transporters for linkages with RF	no	-	45	45	45	45	-	-	180	2.150	1.000	-	46	46	47	47	-	-	187
d. Pilot testing of mobile chilling tanks (on 3 wheeled motor-bikes)	no	-	5	5	5	-	-	-	15	21.500	10.000	-	51	52	52	-	-	-	155
Subtotal												-	168	170	172	95	-	-	605
5. Capacity building of milk inspectors																			
a. Refresher training of district milk inspectors	no	-	15	-	-	-	-	-	15	10.750	5.000	-	76	-	-	-	-	-	76
b. Study/exchange visits for milk inspector	no	-	5	5	5	-	-	-	15	10.750	5.000	-	25	26	26	-	-	-	77
c. Motorbike for district milk inspectors	no	-	15	-	-	-	-	-	15	5.375	2.500	-	38	-	-	-	-	-	38
d. Mobility facilitators allowances for milk inspectors	no	-	15	15	15	15	15	15	90	5.160	2.400	-	37	37	38	38	38	39	227
Subtotal												-	177	63	64	38	38	39	418
Subtotal												30	1 642	1 749	1 739	1 628	1 495	39	8 323

C. Improved processing and distribution for milk and milk products																			
1. Support to value addition and processing of milk and milk products																			
a. Milk processing gap analysis for Southern Highlands	no	1	-	-	-	-	-	-	1	75.250	35.000	35	-	-	-	-	-	-	35
b. Technical and financial feasibility studies support to MCCs and processors	no	-	3	3	3	3	3	-	15	21.500	10.000	-	31	31	31	32	32	-	156
c. Demand-driven technical training of processors /e	no	-	3	3	3	3	3	-	15	21.500	10.000	-	31	31	31	32	32	-	156
d. Exposure study tours and exchange visits for processors	no	-	3	3	3	3	3	-	15	10.750	5.000	-	15	15	16	16	16	-	78
e. Business plan preparation and linkage to financial institutions	no	-	3	3	3	3	3	-	15	10.750	5.000	-	15	15	16	16	16	-	78
f. Support to informal processors (training and capacity building)	no	-	5	15	15	10	5	-	50	10.750	5.000	-	25	77	78	53	27	-	260
g. Infrastructure development for processing	no	-	-	3	4	4	-	-	11	107.500	50.000	-	-	155	209	211	-	-	574
h. Infrastructure development for processing	no	-	-	-	-	-	4	-	4	107.500	50.000	-	-	-	-	-	214	-	214
Subtotal												35	117	325	381	359	336	-	1 553
2. Organization and capacity building of milk distributors, agents and traders																			
a. Milk trade and distribution models study	no	1	-	-	-	-	-	-	1	96.750	45.000	45	-	-	-	-	-	-	45
b. Mobilization, formulation and strengthening of sector associations /f	no	-	3	3	3	3	3	-	15	4.300	2.000	-	6	6	6	6	6	-	31
c. Training and capacity building of milk collectors and traders (including certification)	no	-	300	500	500	500	200	-	2 000	215	100	-	31	52	52	53	21	-	208
d. Support in establishment of model milk kiosks/bars /g	no	-	15	15	15	15	-	-	60	4.300	2.000	-	31	31	31	32	-	-	124
e. Pilot-testing of improved milk distribution (chilling tanks, tri-cycles etc)	no	-	5	5	10	10	10	-	40	10.750	5.000	-	25	26	52	53	53	-	209
f. Technical support in development of franchising models for milk distribution /h	no	-	1	1	1	-	-	-	3	21.500	10.000	-	10	10	10	-	-	-	31
Subtotal												45	103	125	152	144	81	-	650
3. Support to development and offering of financial products for dairy																			
a. Study on potential financial services	no	1	-	-	-	-	-	-	1	53.750	25.000	25	-	-	-	-	-	-	25
b. Support in product development (including financial leveraging resources)	no	-	2	3	3	2	-	-	10	107.500	50.000	-	102	155	156	106	-	-	518
c. Staff training and capacity building	no	-	2	3	3	2	-	-	10	10.750	5.000	-	10	15	16	11	-	-	52
d. Linkages for risk reduction	no	-	2	3	3	2	-	-	10	10.750	5.000	-	10	15	16	11	-	-	52
Subtotal												25	122	185	188	127	-	-	647
4. Milk market diversification and expansion																			
a. Market expansion and diversification studies /i	no	1	1	1	1	1	-	-	5	43.000	20.000	20	20	21	21	21	-	-	103
b. Pilot parent-financed school milk-feeding program																			
Study on viability and distribution arrangements for school milk feeding pilot	no	1	-	-	-	-	-	-	1	75.250	35.000	35	-	-	-	-	-	-	35
Development and introduction of curriculum of dairy in primary schools	no	-	50	100	100	100	100	-	450	1.398	650	-	33	67	68	69	69	-	306
Milk distribution to schools /j	no	-	-	9 600	9 600	9 600	-	-	28 800	43	20	-	-	198	200	203	-	-	601
Subtotal												35	33	265	268	271	69	-	942
c. Domestic market promotion campaigns	no	-	1	1	1	1	-	1	5	43.000	20.000	-	20	21	21	21	-	22	105
d. Market expansion trade fairs, study tours & exchange visits	lumpsum	-	1	1	1	1	-	-	4	86.000	40.000	-	41	41	42	42	-	-	166
Subtotal												55	115	347	351	356	69	22	1 315
Subtotal												161	457	982	1 072	984	487	22	4 164
Total Investment Costs												372	3 116	4 438	4 878	4 161	2 914	138	20 017

C. Improved processing and distribution for milk and milk products																			
1. Support to value addition and processing of milk and milk products																			
a. Milk processing gap analysis for Southern Highlands	no	1	-	-	-	-	-	-	1	75.250	35.000	35	-	-	-	-	-	-	35
b. Technical and financial feasibility studies support to MCCs and processors	no	-	3	3	3	3	3	-	15	21.500	10.000	-	31	31	31	32	32	-	156
c. Demand-driven technical training of processors /e	no	-	3	3	3	3	3	-	15	21.500	10.000	-	31	31	31	32	32	-	156
d. Exposure study tours and exchange visits for processors	no	-	3	3	3	3	3	-	15	10.750	5.000	-	15	15	16	16	16	-	78
e. Business plan preparation and linkage to financial institutions	no	-	3	3	3	3	3	-	15	10.750	5.000	-	15	15	16	16	16	-	78
f. Support to informal processors (training and capacity building)	no	-	5	15	15	10	5	-	50	10.750	5.000	-	25	77	78	53	27	-	260
g. Infrastructure development for processing	no	-	-	3	4	4	-	-	11	107.500	50.000	-	-	155	209	211	-	-	574
h. Infrastructure development for processing	no	-	-	-	-	-	4	-	4	107.500	50.000	-	-	-	-	-	214	-	214
Subtotal												35	117	325	381	359	336	-	1 553
2. Organization and capacity building of milk distributors, agents and traders																			
a. Milk trade and distribution models study	no	1	-	-	-	-	-	-	1	96.750	45.000	45	-	-	-	-	-	-	45
b. Mobilization, formulation and strengthening of sector associations /f	no	-	3	3	3	3	3	-	15	4.300	2.000	-	6	6	6	6	6	-	31
c. Training and capacity building of milk collectors and traders (including certification)	no	-	300	500	500	500	200	-	2 000	215	100	-	31	52	52	53	21	-	208
d. Support in establishment of model milk kiosks/bars /g	no	-	15	15	15	15	-	-	60	4.300	2.000	-	31	31	31	32	-	-	124
e. Pilot-testing of improved milk distribution (chilling tanks, tri-cycles etc)	no	-	5	5	10	10	10	-	40	10.750	5.000	-	25	26	52	53	53	-	209
f. Technical support in development of franchising models for milk distribution /h	no	-	1	1	1	-	-	-	3	21.500	10.000	-	10	10	10	-	-	-	31
Subtotal												45	103	125	152	144	81	-	650
3. Support to development and offering of financial products for dairy																			
a. Study on potential financial services	no	1	-	-	-	-	-	-	1	53.750	25.000	25	-	-	-	-	-	-	25
b. Support in product development (including financial leveraging resources)	no	-	2	3	3	2	-	-	10	107.500	50.000	-	102	155	156	106	-	-	518
c. Staff training and capacity building	no	-	2	3	3	2	-	-	10	10.750	5.000	-	10	15	16	11	-	-	52
d. Linkages for risk reduction	no	-	2	3	3	2	-	-	10	10.750	5.000	-	10	15	16	11	-	-	52
Subtotal												25	122	185	188	127	-	-	647
4. Milk market diversification and expansion																			
a. Market expansion and diversification studies /i	no	1	1	1	1	1	-	-	5	43.000	20.000	20	20	21	21	21	-	-	103
b. Pilot parent-financed school milk-feeding program																			
Study on viability and distribution arrangements for school milk feeding pilot	no	1	-	-	-	-	-	-	1	75.250	35.000	35	-	-	-	-	-	-	35
Development and introduction of curriculum of dairy in primary schools	no	-	50	100	100	100	100	-	450	1.398	650	-	33	67	68	69	69	-	306
Milk distribution to schools /j	no	-	-	9 600	9 600	9 600	-	-	28 800	43	20	-	-	198	200	203	-	-	601
Subtotal												35	33	265	268	271	69	-	942
c. Domestic market promotion campaigns	no	-	1	1	1	1	-	1	5	43.000	20.000	-	20	21	21	21	-	22	105
d. Market expansion trade fairs, study tours & exchange visits	lumpsum	-	1	1	1	1	-	-	4	86.000	40.000	-	41	41	42	42	-	-	166
Subtotal												55	115	347	351	356	69	22	1 315
Subtotal												161	457	982	1 072	984	487	22	4 164
Total Investment Costs												372	3 116	4 438	4 878	4 161	2 914	138	20 017
II. Recurrent Costs																			
Agribusiness Specialist/zonal	pers-month	24	24	24	24	24	24	24	168	7.525	3.500	85	86	87	88	89	90	91	613
Field mission perdiems /k	day	80	240	240	240	240	240	240	1 520	116	54	4	13	13	14	14	14	14	86
Total Recurrent Costs												89	99	100	101	102	104	105	699
Total												461	3 215	4 538	4 979	4 263	3 017	243	20 716

\a IFAD contribution-10 milk cans; milk testing equipment; floor + painting
\b Up to 1000 litres capacity (60% IFAD)
\c 5000 litres capacity (20% IFAD Contribution)
\d Borehole/piping
\e Including qualifying MCCs
\f All levels
\g Inc. artisans
\h Including financing arrangements - linked to lead processors
\i Targeted and demand-driven
\j 2 schools per district; 2 times per week; Prim 1 4
\k based on 5 days per region per month

Table 2

Republic of Tanzania
Southern Highlands Milksheds Development Project
Table 2. Improving on-farm productivity

Detailed Costs	Unit	Quantities 2017	2018	2019	2020	2021	2022	2023	Total	Unit Cost (TZ '000)	Unit Cost (US$)	Totals Including Contingencies (US$ '000) 2017	2018	2019	2020	2021	2022	2023	Total
I. Investment Costs																			
A. Supporting access to services, inputs and assets																			
1. Strengthen artificial insemination services																			
a. Conduct training of 15 new inseminators per year in Arusha	participant	-	15	15	15	15	15	-	75	1.540	716	-	11	11	11	11	11	-	56
b. Regional refresher trainings (in region, in farms and in abattoirs)	course	-	2	2	2	2	2	-	10	6.490	3.019	-	6	6	6	6	6	-	31
c. Provision of AI starter kits to all newly trained inseminators /a	kit	-	15	15	15	15	15	-	75	4.800	2.233	-	34	35	35	35	36	-	175
d. Supporting national/regional/district AI centres /b																			
Refurbishment of TALIRI liquid nitrogen plant in Mbeya	no	-	-	-	1	-	-	-	1	215.000	100.000	-	-	-	104	-	-	-	104
Setup of 5 regional liquid nitrogen and semen storage centers	no	-	-	-	2	2	1	-	5	32.250	15.000	-	-	-	31	32	16	-	79
Subtotal												-	-	-	136	32	16	-	183
e. Support the creation of local inseminators organizations																			
Sensitization workshops at regional level	no	-	1	1	2	2	-	-	6	13.200	6.140	-	6	6	13	13	-	-	38
Exchange visits to countries on private AI sector	no	-	-	1	-	1	-	-	2	48.400	22.512	-	-	23	-	24	-	-	47
Support to establishment of regional cooperative of inseminators	lumpsum	-	-	1	1	1	1	1	5	59.400	27.628	-	-	28	29	29	30	30	146
Subtotal												-	6	58	42	66	30	30	231
f. Support the establishment of bull stations																			
Installation of station: bull shed, transport, vetrerinary check up	lumpsum	-	15	15	15	15	15	-	75	1.613	750	-	11	12	12	12	12	-	59
Veterinary follow up	district/ls	-	15	30	45	60	75	-	225	258	120	-	2	4	6	8	10	-	28
Subtotal												-	13	15	17	19	22	-	87
Subtotal												-	71	125	247	170	121	30	763
2. Improving animal feeding and forage production																			
a. Support to reorganization of production and distribution systems at Uyole and Lac	lumpsum	-	-	2	-	-	-	-	2	129.000	60.000	-	-	124	-	-	-	-	124
b. Supporting research centres for production and distribution of pasture																			
Provision of quality selected parental vegetal material	kg seed	-	60	60	60	60	-	-	240	55	26	-	2	2	2	2	-	-	6
Contracting research centres for producing seeds and splits	ha	-	20	20	20	20	-	-	80	2.200	1.023	-	21	21	21	22	-	-	85
Contracting rearch centres for supporting private seeds producers	visit	-	270	270	270	270	-	-	1 080	220	102	-	28	28	29	29	-	-	115
Supporting research centres for production and distribution of pasture seeds an	lumpsum	-	-	-	-	-	1	-	1	116.100	54.000	-	-	-	-	-	58	-	58
Subtotal												-	51	51	52	52	58	-	263
c. Support private producers for production and distribution of pasture s																			
Provision of quality selected parental vegetal material, fertilizer, equipment	ha	-	5	10	15	20	-	-	50	1.100	512	-	3	5	8	11	-	-	27
Provision of technical advice and follow-up	producer	-	20	40	60	80	-	-	200	660	307	-	6	13	19	26	-	-	64
Contracting private producers for producing seeds and splits and distribute them	ha	-	20	40	60	80	-	-	200	220	102	-	2	4	6	9	-	-	21
Support private producers for production and distribution of pasture seeds and s	lumpsum	-	-	-	-	-	1	-	1	123.410	57.400	-	-	-	-	-	61	-	61
Subtotal												-	11	22	34	45	61	-	173
d. Support to the establishment of a seeds and feeds marketing network																			
Support access of MCCs and hubs to animal feeds	subsidy/tonne	-	75	75	75	75	75	-	375	430	200	-	15	15	16	16	16	-	78
Subtotal												-	77	212	101	114	135	-	639

3. Improve the animal health status of the dairy herd																			
a. Support surveillance and reporting networks in the 5 regions																			
Awareness campaigns /c	no	-	-	15	-	-	-	-	15	22.000	10.233	-	-	158	-	-	-	-	158
Organize meetings between stakeholders to establish reporting channels /d	no	-	-	15	-	-	-	-	15	11.000	5.116	-	-	79	-	-	-	-	79
Support to Districts for communication and reporting /e	district	-	-	15	-	-	-	-	15	6.600	3.070	-	-	47	-	-	-	-	47
Support to Zonal Vet Labs	lab	-	-	1	-	-	-	-	1	161.250	75.000	-	-	77	-	-	-	-	77
Subtotal												-	-	362	-	-	-	-	362
b. Support vaccination against CBPP by National VS																			
Support coordination of TADs control by zonal vet centre	lumpsum	-	-	1	-	-	-	-	1	86.000	40.000	-	-	41	-	-	-	-	41
Support vaccination costs (cost sharing, decreasing)'	no	-	157 300	-	157 300	-	-	-	314 600	2	1	-	112	-	114	-	-	-	226
Support vaccination costs (cost sharing, decreasing)'	no	-	-	-	-	-	-	157 300	157 300	2	1	-	-	-	-	-	-	119	119
Subtotal												-	112	41	114	-	-	119	386
c. Support prevention and vaccination against ECF																			
Support vaccination logistics at District level	no	-	15	-	-	-	-	-	15	11.000	5.116	-	78	-	-	-	-	-	78
Support building of cattle crush in villages	no	-	15	-	15	-	-	-	30	5.000	2.326	-	36	-	36	-	-	-	72
Support building of cattle crush in villages	no	-	-	-	-	-	-	15	15	5.000	2.326	-	-	-	-	-	-	38	38
Sensitize on need for prevention through tick control	no	-	15	-	-	-	-	-	15	11.000	5.116	-	78	-	-	-	-	-	78
Subtotal												-	192	-	36	-	-	38	266
d. Support private veterinarians and para-vets																			
Provide refresher specialized training	course	-	30	-	30	-	-	-	60	1.540	716	-	22	-	22	-	-	-	44
Support to outreach: provision of starter kits, motorbikes for para vets /f	no	-	120	120	120	-	-	-	360	2.400	1.116	-	136	138	140	-	-	-	414
Support to outreach: provision of starter kits, motorbikes for para vets /g	no	-	-	-	-	120	120	-	240	2.400	1.116	-	-	-	-	141	143	-	284
Support to the creation of local professional organizations /h	unit	-	15	-	15	-	-	-	30	6.000	2.791	-	43	-	44	-	-	-	86
Subtotal												-	201	138	206	141	143	-	829
Subtotal												-	504	541	357	141	143	156	1 843
4. Support access to water for production																			
a. Boreholes with solar pumps	no	-	10	-	-	-	-	-	10	43.000	20.000	-	224	-	-	-	-	-	224
b. Establishment and training of COWSO	no	-	10	-	-	-	-	-	10	4.300	2.000	-	20	-	-	-	-	-	20
Subtotal												-	244	-	-	-	-	-	244
5. Support asset building mechanisms for targeted households																			
a. Assessing mechanisms aimed at facilitating access to improved livest																			
Audit of government multiplication farms /i	no	-	1	-	-	-	-	-	1	50.600	23.535	-	24	-	-	-	-	-	24
Participatory evaluation of collective cowshed scheme in Zanzibar /j	visit	-	1	-	-	-	-	-	1	31.680	14.735	-	15	-	-	-	-	-	15
Subtotal												-	39	-	-	-	-	-	39
b. Piloting innovative mechanisms for targeted beneficiaries																			
Selection of potential beneficiaries (individual pass on the cow plus youth groups	meeting	-	15	-	-	-	-	-	15	2.200	1.023	-	16	-	-	-	-	-	16
Provision of animals (government farms)	no	-	-	200	-	-	-	-	200	2.000	930	-	-	192	-	-	-	-	192
Provision of animals (individual pass on the cow)	no	-	500	-	-	-	-	-	500	2.000	930	-	474	-	-	-	-	-	474
Provision of animals (youth groups)	no	-	150	-	-	150	-	-	300	2.000	930	-	142	-	-	147	-	-	289
Provision of material per collective cowshed	unit	-	15	-	-	15	-	-	30	26.875	12.500	-	191	-	-	198	-	-	389
Subtotal												-	822	192	-	345	-	-	1 359
Subtotal												-	861	192	-	345	-	-	1 398
Subtotal												-	1 757	1 070	704	770	399	186	4 887

B. Capacity building of service providers, extension workers and farmers																			
1. Support existing network of public and private extensionists																			
a. Refresher and specialized thematic training	session	-	60	60	60	60	60	-	300	1.540	716	-	44	44	45	45	46	-	224
b. Support outreach of extensionists																			
Provision of motorcycles	no	300	-	-	-	-	-	-	300	2.400	1.116	337	-	-	-	-	-	-	337
Provision of extension kits	kit	300	-	-	-	-	-	-	300	1.075	500	151	-	-	-	-	-	-	151
Subtotal												488	-	-	-	-	-	-	488
c. Support re-organization, planning and reporting of extension services																			
National consultancy on re-organization of extension services	no	-	1	-	-	-	-	-	1	12.320	5.730	-	6	-	-	-	-	-	6
Workshop on re-organization of extension services	no	-	5	5	5	-	-	-	15	4.400	2.047	-	10	11	11	-	-	-	32
Subtotal												-	16	11	11	-	-	-	37
Subtotal												488	60	55	55	45	46	-	749
C. Dissemination of climate smart technical and institutional innovations																			
1. Establish local innovation platforms /k																			
Organize consultation w /shop betw een research institutes, extensionists, farmers	no	-	3	2	-	3	2	-	10	4.400	2.047	-	6	4	-	6	4	-	21
Organize joint training sessions of farmers /l	district	-	15	15	15	15	15	-	75	6.600	3.070	-	47	47	48	49	49	-	240
Organize information and training sessions in reasearch centersers /m	no	-	120	120	120	120	120	-	600	550	256	-	31	32	32	32	33	-	160
Subtotal												-	84	83	80	87	86	-	421
2. Organize regional exchanges with neighbouring countries to promote tec																			
National and regional exchanges for farmers groups and extensionists /n	no	-	15	-	15	-	15	-	45	7.700	3.581	-	55	-	56	-	57	-	168
Regional exchange visits to Kenya and Eastern Uganda on FFS /o	no	-	1	-	1	-	-	-	2	45.100	20.977	-	21	-	22	-	-	-	43
Subtotal												-	76	-	78	-	57	-	211
3. Support research institutions for intelligence gathering, socio-economic																			
a. Baseline research and mapping to guide implementation																			
Mapping of feed resources	unit	1	-	-	-	-	-	-	1	44.000	20.465	21	-	-	-	-	-	-	21
Mapping of genetic resources	unit	1	-	-	-	-	-	-	1	44.000	20.465	21	-	-	-	-	-	-	21
Animal health surveys and disease impact evaluation	unit	1	-	-	-	-	-	-	1	88.000	40.930	41	-	-	-	-	-	-	41
Feeds analysis	unit	-	1	-	-	-	-	-	1	44.000	20.465	-	21	-	-	-	-	-	21
Subtotal												82	21	-	-	-	-	-	103
b. Support generation of data and evidence as basis for policy dialogue																			
Socio economic analysis /p	pm	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-
Use of economic and policy models to feed the policy dialogue /q	pm	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-
Subtotal												-	-	-	-	-	-	-	-
Subtotal												82	21	-	-	-	-	-	103
Subtotal												82	181	83	158	87	144	-	736
Total Investment Costs												570	1 998	1 208	918	903	588	186	6 372
II. Recurrent Costs																			
A. Livestock Specialist	pers-month	12	12	12	12	12	12	12	84	7.525	3.500	42	43	43	44	44	45	45	307
B. Extension/producer organization specialist	pers-month	12	12	12	12	12	12	12	84	7.525	3.500	42	43	43	44	44	45	45	307
C. Field mission perdiems /r	day	80	240	240	240	240	240	240	1 520	116	54	4	13	13	14	14	14	14	86
Total Recurrent Costs												89	99	100	101	102	104	105	699
Total												659	2 097	1 308	1 019	1 005	692	291	7 071

\a Starter kits
\b (storage of semen and storage or production of liquid nitrogen).
\c 10,000 USD per district campaign (radio, meetings, leaflets)
\d 5000 USD per meeting.
\e It includes 1 set of a computer, a modem, and airtime. Approx 3000 USD/ district
\f mortorbike + vet kit 1000 USD
\g mortorbike + vet kit 1000 USD
\h it includes meetings per districts.
\i 1000 per day fee and DSA international expert x21 days + flight
\j 12 pax 100 USD DSA transport 500 USD 7 days
\k Through strengthening collaboration betw een research organizations, extensionists, farmers and private sector
\l 1/ditrict/year 3000 USD /session including transport accomodation and fees of reserchers
\m all 240 extensionists every 2 year 200 USD /pax /session
\n it includes 10 pax for 6-day trip (per diem USD 50/pax and air ticket 500)
\o It includes a 8-day trip for 10 pax 8 (250 USD DSA + ticket 500).
\p pm- Component 3 dairy policy studies
\q pm- Component 3 dairy policy studies
\r Based on 10 days per region per month

Republic of Tanzania
Southern Highlands Milksheds Development Project
Table 3. Establishment of dairy farmers' field schools

Detailed Costs	Unit	Quantities 2017	2018	2019	2020	2021	2022	2023	Total	Unit Cost (TZ '000)	Unit Cost (US$)	Totals Including Contingencies (US$ '000) 2017	2018	2019	2020	2021	2022	2023	Total
I. Investment Costs																			
A. Establishment of dairy farmers' field schools																			
1. Preparation and production of training and learning materials																			
Coordination and Technical Committee (CTC) for the FFS	meeting	3	3	3	3	3	3	-	18	6.600	3.070	9	9	9	10	10	10	-	57
National consultant	pers-month	12	-	-	-	-	-	-	12	19.800	9.209	111	-	-	-	-	-	-	111
International consultant	pers-month	1	-	-	-	-	-	-	1	28.600	13.302	13	-	-	-	-	-	-	13
Service provider (translation)	lumpsum	1	-	-	-	-	-	-	1	13.200	6.140	6	-	-	-	-	-	-	6
Service provider (printing)	lumpsum	1	-	-	-	-	-	-	1	26.400	12.279	12	-	-	-	-	-	-	12
Technical Assistance to develop module materials /a	unit	-	1	-	-	-	-	-	1	50.000	23.256	-	24	-	-	-	-	-	24
Subtotal												152	33	9	10	10	10	-	224
2. Training of national Master Trainers (MT)																			
International MT trainer /b	pers-month	-	4	1	1	1	-	-	7	38.700	18.000	-	73	19	19	19	-	-	130
National MT trainer	pers-month	-	4	-	-	-	-	-	4	9.900	4.605	-	19	-	-	-	-	-	19
Cost for lodging /c	lumpsum	-	5	5	5	5	-	-	20	1.100	512	-	3	3	3	3	-	-	11
Subtotal												-	95	21	21	22	-	-	159
3. Training of FFS Facilitators																			
Selection of facilitators	lumpsum	1	1	-	-	-	-	-	2	22.000	10.233	10	10	-	-	-	-	-	21
TOT for facilitators	no	60	60	-	-	-	-	-	120	3.960	1.842	111	113	-	-	-	-	-	224
Refresher for facilitators	no	-	-	-	60	60	60	-	180	550	256	-	-	-	16	16	16	-	49
Subtotal												121	123	-	16	16	16	-	293
4. Support to FFS Implementation																			
Selection of farmers	lumpsum	1	1	1	1	1	-	-	5	11.000	5.116	5	5	5	5	5	-	-	26
Facilitation for FFS facilitators /d	pers-day	-	520	3 120	9 360	12 480	12 480	-	37 960	22	10	-	5	33	100	135	136	-	409
Supervision of facilitators /e	pers-day	-	10	60	180	240	240	-	730	110	51	-	1	3	10	13	13	-	39
FFS group starting capital	lumpsum	-	10	60	180	240	240	-	730	400	186	-	2	12	35	47	48	-	143
Bicycles for facilitators	no	60	60	-	-	-	-	-	120	100	47	3	3	-	-	-	-	-	6
L-FFS innovation funds	no	-	10	60	180	240	-	-	490	2.150	1.000	-	10	62	188	253	-	-	513
L-FFS innovation funds	no	-	-	-	-	-	240	-	240	2.150	1.000	-	-	-	-	-	256	-	256
Subtotal												8	26	115	337	453	453	-	1 393
5. Regional exchange visits to Kenya and Eastern Uganda on FFS	no	-	1	-	1	-	-	-	2	45.100	20.977	-	21	-	22	-	-	-	43
6. Integrating GALS within FFS																			
Exchange visit in Rwanda /g	no	-	1	-	1	-	-	-	2	32.250	15.000	-	15	-	16	-	-	-	31
Training of FFS Master Trainers	no	-	1	-	1	-	-	-	2	86.000	40.000	-	41	-	42	-	-	-	82
Training of FFS facilitators on GALS	session	-	-	15	15	15	-	-	45	6.450	3.000	-	-	46	47	47	-	-	141
Regional/international supervision	pers-month	-	1	-	1	-	1	-	3	43.000	20.000	-	20	-	21	-	21	-	63
National Supervision	pers-month	-	1	1	1	1	1	-	5	10.750	5.000	-	5	5	5	5	5	-	26
FFS group allowance for GALS	number	-	200	220	220	-	-	-	640	215	100	-	20	23	23	-	-	-	66
Business skills building and GALS	farmer	-	100	150	150	150	-	-	550	215	100	-	10	15	16	16	-	-	57
Business skills building and GALS	farmer	-	-	-	-	-	5 575	5 575	11 150	215	100	-	-	-	-	-	595	602	1 198
Financial literacy and leadership training for women farmers	farmer	-	3 000	4 000	4 000	2 545	-	-	13 545	54	25	-	76	103	104	67	-	-	351
Women leadership traing / mentoring	session	4	4	4	4	4	4	-	24	20.000	9.302	37	38	38	39	39	40	-	231
Subtotal												37	226	231	312	175	662	602	2 246
Total												319	524	376	718	676	1 141	602	4 358

\a Modules on production for household consumption and nutrition for milk, dairy products and household consumption
\b it includes training in Y2, and one supervision mission each year for the remaining project duration
\c cost of accomodation
\d 2 sessions / month 10 USD /session
\e 2 supervision / facilitator/year 50 USD/day
\f It includes a 8-day trip for 10 pax 8 (250 USD DSA + ticket 500).
\g it includes a 5-day study visit for 10 pax (7 days DSA, local trasnport, air fares).

Table 4: Policy and Institutional Strengthening

Republic of Tanzania
Southern Highlands Milksheds Development Project
Table 4. Policy and Institutional Strengthening

Detailed Costs	Unit	Quantities							Unit Cost (TZ '000)	Unit Cost (US$)	Totals Including Contingencies (US$ '000)							
		2017	2018	2019	2020	2021	2022	2023 Tota			2017	2018	2019	2020	2021	2022	2023	Total
I. Investment Costs																		
A. Supporting evidence-based and inclusive policy dialogue																		
District multi stakeholder forum /a	no	36	60	60	60	60	60	- ##	4.300	2.000	72	122	124	125	127	128	-	698
Zonal multi stakeholder forum /b	no	-	2	2	2	2	2	- 10	21.500	10.000	-	20	21	21	21	21	-	104
Study of Tanga forum /c	no	1	-	-	-	-	-	- 1	21.500	10.000	10	-	-	-	-	-	-	10
Dairy policy studies /d	no	1	2	2	2	1	1	- 9	64.500	30.000	30	61	62	63	32	32	-	279
TDB short term consullancies /e	pers-month	3	3	3	3	-	-	- 12	32.308	15.027	45	46	46	47	-	-	-	185
Training for TDB staff /f	no	1	-	-	1	-	-	- 2	43.000	20.000	20	-	-	21	-	-	-	41
DDF /g	lumpsum	1	1	1	1	1	1	- 6	107.500	50.000	50	51	52	52	53	53	-	311
Subtotal											228	300	304	329	232	235	-	1 628
B. Strengthening institutional capacity for dairy training																		
1. Develop tailored short-term training modules for key service providers																		
Training costs (training facility, consumables trainers) /h	participant	-	180	180	180	-	-	- ##	1.075	500	-	92	93	94	-	-	-	278
Accomodation costs trainees	participant	-	180	180	180	-	-	- ##	538	250	-	46	46	47	-	-	-	139
Subtotal											-	137	139	141	-	-	-	417
2. Develop a pool of specialist trainers																		
ToT in Kenya /i	session	-	5	5	5	-	-	- 15	6.600	3.070	-	16	16	16	-	-	-	47
ToT in Tanzania training and trainers costs /j	session	-	-	5	5	-	-	- 10	73.700	34.279	-	-	177	179	-	-	-	355
ToT in Tanzania trainees accomodation costs /k	session	-	-	5	5	-	-	- 10	5.500	2.558	-	-	13	13	-	-	-	27
Subtotal											-	16	206	208	-	-	-	429
3. Part-finance an initial cohort of participants post-diploma training course at Sokoine University																		
Part-finance an initial cohort participants post-diploma training course /l	no	-	20	15	10	5	-	- 50	1.500	698	-	14	11	7	4	-	-	36
4. Strengthening institutional capacity on cross-cutting issues (environement, nutrition, land)																		
Refresher training course for multisectoral nutrition steering committees (region,district and ward)	session	-	1	-	1	-	1	- 3	3.100	1.442	-	1	-	2	-	2	-	5
Support of development of joint district multisectoral work plan (for nutrition)	unit	-	1	-	-	-	-	- 1	60.000	27.907	-	28	-	-	-	-	-	28
Develop module on nutrition-sensitive agriculture in the work plan of extension officers	unit	-	1	-	-	-	-	- 1	50.000	23.256	-	24	-	-	-	-	-	24
Refresher course for regional and district nutrition officers and extension officers	course	-	1	1	1	-	-	- 3	1.302	605	-	1	1	1	-	-	-	2
Refresher training of ward water and health committees on hygiene and sanitation ((Trainings and IE	no	-	1	-	1	-	1	- 3	11.300	5.256	-	5	-	5	-	6	-	16
Refresher training of ward land and environment committees (Trainings and IEC materials)	no	-	1	-	1	-	1	- 3	11.300	5.256	-	5	-	5	-	6	-	16
Subtotal											-	65	1	13	-	13	-	91
Subtotal											-	232	356	369	4	13	-	974
Total											228	533	660	698	236	248	-	2 602

\a 15 districts, with a slower start in PY1. Cost assumes 4 meetings/ year/district for 30 participants, room hire, coffee/lunch, facilitator, transport
\b assumes 50 participants, and same costs items as above
\c Study to draw out the lessons from the Tanga stakeholder forum, and so shape the forums under this project
\d Some of the studies have been defined, others to be defined.
\e Assumes consultancies – to be defined – relative to DDF role. Could include for preparation of policy briefs
\f o be defined – must be relative to DDF / convening role. Could include visits to KDB
\g Contribution to DDF, including to ensure district/zonal membership
\h It cincludes 3 trainer 200 USD per day * 5 days, and equipement = 5000 USD / session
\i It includes 7 days DSA (200 USD), transport (500 USD) and 7 days training fees (1000 USD).
\j It includes 5 trainers (@ 500 USD/day) + 5-day DSA (200 USD) + flights + training facility (2000 USD).
\k For 10 pax @50 USD for 5 days.
\l cost 2 M/ student.

Table 5

Republic of Tanzania
Southern Highlands Milksheds Development Project
Table 5. Project Planning and Management

Detailed Costs	Unit	Quantities 2017	2018	2019	2020	2021	2022	2023	Total	Unit Cost (TZ '000)	Unit Cost (US$)	Totals Including Contingencies (US$ '000) 2017	2018	2019	2020	2021	2022	2023	Total
I. Investment Costs																			
A. Zonal Project Management Unit																			
Office rehabilitation	lumpsum	1	-	-	-	-	-	-	1	107.500	50.000	50	-	-	-	-	-	-	50
Vehicles	Number	5	-	-	-	-	-	-	5	53.500	24.884	125	-	-	-	-	-	-	125
Office materials	Number	10	-	-	-	-	-	-	10	6.450	3.000	30	-	-	-	-	-	-	30
Gender awareness training for implementing partners /a	Number	1	-	1	-	-	-	-	2	25.000	11.628	12	-	12	-	-	-	-	24
Subtotal												217	-	12	-	-	-	-	229
B. Support to MALF /b																			
1. Vehicles	no	1	-	-	-	-	-	-	1	53.500	24.884	25	-	-	-	-	-	-	25
2. Equipment (PCs)	no	2	-	-	-	-	-	-	2	6.450	3.000	6	-	-	-	-	-	-	6
Subtotal												31	-	-	-	-	-	-	31
C. Regional Project Management Unit																			
1. Equipment (PC) /c	no	5	-	-	-	-	-	-	5	6.450	3.000	15	-	-	-	-	-	-	15
D. District Project Management Unit																			
1. Local planning and VC support																			
Rapid mapping and cluster development /d	no	15	-	-	-	-	-	-	15	79.376	36.919	557	-	-	-	-	-	-	557
2. Logistic support																			
Vehicles	Number	15	-	-	-	-	-	-	15	53.500	24.884	375	-	-	-	-	-	-	375
Motobikes	Number	15	-	-	-	-	-	-	15	5.810	2.702	41	-	-	-	-	-	-	41
Equipment (PC)	Number	15	-	-	-	-	-	-	15	6.450	3.000	45	-	-	-	-	-	-	45
Subtotal												462	-	-	-	-	-	-	462
Subtotal												1 019	-	-	-	-	-	-	1 019
E. Monitoring and Evaluation																			
Baseline survey	Number	1	-	-	-	-	-	-	1	142.877	66.455	67	-	-	-	-	-	-	67
Midterm survey	Number	-	-	1	-	-	-	-	1	142.877	66.455	-	-	68	-	-	-	-	68
Completion survey	Number	-	-	-	-	-	1	-	1	95.251	44.303	-	-	-	-	-	47	-	47
Gender studies for baseline, mid-term review and at completion	Number	1	-	1	-	-	1	-	3	20.000	9.302	9	-	10	-	-	10	-	29
Set-up of electronic participatory M&E system and MIS	Lumpsum	1	-	-	-	-	-	-	1	172.000	80.000	80	-	-	-	-	-	-	80
Subtotal												157	-	78	-	-	57	-	292
F. Knowledge management																			
1. Knowledge Management	Lumpsum	1	1	1	1	1	1	-	6	96.750	45.000	45	46	46	47	47	48	-	280
2. Food survey and Knowledge management																			
Assessment of milk consumption and nutrition situation	unit	1	-	-	-	-	-	-	1	25.000	11.628	12	-	-	-	-	-	-	12
Publication and dissemination of the milk consumption and nutrition situation	no	-	1	1	1	1	-	-	4	11.300	5.256	-	5	5	5	6	-	-	22
Subtotal												12	5	5	5	6	-	-	33
Subtotal												57	51	52	52	53	48	-	313
Total Investment Costs												1 496	51	142	52	53	105	-	1 900

II. Recurrent Costs																			
A. Salaries and Allowancies																			
1. Salaries																			
a. Zonal Project Management Unit																			
Project Coordinator	pers-month	12	12	12	12	12	12	12	84	9.245	4.300	52	53	53	54	54	55	56	377
Financial specialist	pers-month	12	12	12	12	12	12	12	84	6.450	3.000	36	37	37	38	38	38	39	263
M/E Specialist	pers-month	12	12	12	12	12	12	12	84	6.450	3.000	36	37	37	38	38	38	39	263
Procurement officer	pers-month	12	12	12	12	12	12	12	84	6.450	3.000	36	37	37	38	38	38	39	263
Assistant accountant	pers-month	12	12	12	12	12	12	12	84	4.300	2.000	24	24	25	25	25	26	26	175
Administrative secretary	pers-month	12	12	12	12	12	12	12	84	2.580	1.200	14	15	15	15	15	15	16	105
Drivers	pers-month	48	48	48	48	48	48	48	336	1.290	600	29	29	30	30	30	31	31	210
Subtotal												228	231	234	236	239	242	245	1 656
b. Medical Insurance for Project staff	lumpsum											23	23	23	24	24	24	25	166
c. NSSF contribution	lumpsum											23	23	23	24	24	24	25	166
Subtotal												274	277	280	284	287	291	294	1 987
B. Operational costs																			
Operational costs for Vehicles /e	Vehicle	26	26	26	26	26	26	26	182	13.375	6.221	163	165	167	169	171	173	175	1 181
ZPMU field mission perdiems /f	days	100	360	360	360	360	360	360	2 260	116	54	5	20	20	20	21	21	21	128
Field mission perdiems for districts officers /g	days	600	1 800	1 800	1 800	1 800	1 800	1 800	11 400	116	54	33	99	100	101	103	104	105	644
Operational costs for motobikes /h	Motobike	15	15	15	15	15	15	15	105	1.452	676	10	10	10	11	11	11	11	74
Communication fees	per-annum	1	1	1	1	1	1	1	7	21.500	10.000	10	10	10	10	11	11	11	73
Steering/technical comity meetings	Number	2	2	2	2	2	2	2	14	2.150	1.000	2	2	2	2	2	2	2	15
Inter comity meetings	Number	2	2	2	2	2	2	2	14	3.225	1.500	3	3	3	3	3	3	3	22
Office running costs	per-annum	1	1	1	1	1	1	1	7	54.051	25.140	25	26	26	26	27	27	27	184
Travel expenses	month	12	12	12	12	12	12	12	84	7.938	3.692	45	45	46	46	47	47	48	323
Subtotal												296	380	384	389	394	398	403	2 644
Total Recurrent Costs												570	657	665	673	681	689	697	4 630
Total												2 065	708	806	725	734	794	697	6 530

\a Training for staffs and partners on IFAD Targeting and Gender Policies, approaches and tools, 10-15 person, 4 days
\b PMU at national level
\c One PC per region
\d foreseen in quarter 1&2 of Y1.
\e Insurance, fuel and maintenance (25% of purchase value); 1 national+ 5 zonal + 5 regional+ 15 district vehicles
\f Based on 5 days/month for three PMU staff. Days in year 1 reduced. Government rates
\g Based on 10 days/month for each specialist (five in zonal area). Days in year 1 reduced. Government rates
\h Insurance, fuel and maintenance (25% of the purchase value)

Appendix 10: Economic and financial analysis (EFA)

I. INTRODUCTION

1. This Appendix presents the financial and economic analysis (EFA) of SHDMP, both to determine the viability of expanding volumes of quality milk and dairy products produced, marketed and consumed and to assess the attractiveness of the project as a whole. The analysis follows recommendations for good practices of IFAD and is based on the experiences of similar projects in Tanzania and other countries. The Appendix is structured as follows: (i) project benefits; (ii) financial analysis; and (iii) economic benefit-cost analysis, including a sensitivity analysis.

II. PROJECT BENEFITS

2. The project benefits are expected to lead to increased income and livelihoods, improved food security and nutrition, and reduced vulnerability in rural areas. Benefits would derive from:

- Improved on-farm productivity of smallholder dairy producers based on increasingly commercialized and intensive, sustainable and resilient production systems as a result of the adoption of improved dairy farming practices and access to high-quality dairy inputs, extension services and financial services;
- Reduced milk losses and improved milk processing for value addition;
- Increased adoption of dairy industry technologies and increased capacity among processors;
- Increased quantities of hygienic and safe dairy products;
- Enhanced milk quality, food security and nutrition status both at farmer household level and at the national level;
- Increased economic activity in rural areas through higher profitability and viability of MCCs and dairy processing plants;
- Employment opportunities to traders, transporters and milk bars; and
- Incremental tax revenues as a result of increased volume of taxable income.

3. The expected benefits would go beyond the PDO and intermediate results indicated in the results framework.

4. **Un-quantified benefits**. While the benefits of milk consumption increases at household level have not been estimated or included in the economic analysis, they are reported to be significant given that estimated national chronic malnutrition accounts for 34.7% in Tanzania. Milk consumption is important for human nutrition as it provides essential nutrients and contributes to general health and condition of people. Particularly for children in the first two years of their life milk consumption contributes to long term health and physical and mental development. Women inclusion as members in farmer groups is expected to lead to a significant impact on women given that poor women generally lack decision-making power, control over household income, and access to land.

5. At the national level, the improved quality and efficiency of milk production would increase the value and volume and substitute for imported powder milk and dairy prodcuts thus contributing to an improved trade balance. Lastly, the project would generate incremental tax revenues attributable to increased volume of taxable production and processed products (VAT).

6. Primary increases in incomes would be largely dependent on dairy farmers and traders/ entrepreneurs adopting improved husbandry and market technologies, which the project will promote directly through the combined access to: training and technical assistance, demonstrations, equipment and technologies, facilitation to capital investments, improved market access, support to market linkages and private sector development within demand poles.

III. FINANCIAL ANALYSIS

7. A number of indicative economic activities which may be supported by SHMDP were identified during the project design process. Eight illustrative models were prepared to demonstrate the financial viability of potential investments: three production models, and five enterprise models. The financial

analysis is only applied to the project activities that lend themselves to it and where sufficient data are available. The capacity building activities have not been separately analysed in so far as their impact is to a certain extent accounted for in the analysed activities' output. The financial analysis of SHDMP will be conducted at farmer level and at enterprise level.

Objectives and approach

8. The objectives of the financial analysis are:

- Examine the financial viability of the project interventions at the individual dairy household (adoption of new technologies) and the impact on cash flow of adopting dairy farmers;
- Assess the financial and operational suitability of the milk collection points (MCPs), milk chilling centres (MCCs), milk traders and dairy processing plant; and
- Set a basis for the economic analysis.

9. The foundation of this analysis is the illustration of the interrelationships between the primary producers, and the medium- and small-scale milk collection points, and dairy processors in the value chains potentially supported by SHDMP. To demonstrate these interrelationship, models for the following value chains have been defined:

- Better husbandry, improved vaccination, animal feeding and of dairy herds lead to greater productivity of livestock to meet the demand for milk from the milk collection centres and dairy processing; and
- Improved hygiene, milk testing and better management and access to finance result in improved quality of milk, reduce milk spoilage and increased milk marketed to fulfil the demand of the dairy industry.

Methodology and key assumptions

10. The methodology used is the cost-benefit analysis which is based on the valuation in monetary terms of project costs and benefits.

11. The parameters for the models are based upon the information gathered during the validation and design mission in Tanzania: interviews with local government officials, farmers groups and private sector stakeholders (processing plant, milk collection centre); a review of available documents and statistics as well as information from the previous and ongoing IFAD-supported projects. In particular, information on input requirements for various operations, capital costs, prevailing wages, yields, farm gate and market prices of agriculture and non-agriculture produce, and farm-to-market transport costs were collected. Conservative assumptions were made both for inputs and outputs.

12. **Prices.** Prices reflect those actually paid/received by the farmer/entrepreneur/processors. These were collected during the field visits in specific locations of the regions visited during the field visits: Ruvuma, Iringa, Njombe, Mbeya, Songwe and from other IFAD-funded operations. A list of prices used in the analysis is found in Attachment 1 to this Appendix.

13. **Labour.** The labour used in dairy farming is basically family labour, which has been valued at TZS 1166. The unskilled labour in the dairy processing plant/MCCs is valued TZS 17 000 daily and the skilled labour including MCC manager, veterinary and others range from TZS 22 900 to TZS 50 000 daily. Economic prices of labour costs were adjusted based on a conversion factor of 0.88 to account for the unemployment rate, which is reported at 12%[1].

14. **Interest.** The current market interest rate in Tanzania is about 18-22% for agricultural loans which is used for short and long-term loans. The rate of 10% has been used in this analysis, as the financial analysis uses constant prices.

15. **Tax**. The normal tax rate in Tanzania is 30%. There is a fuel levy of TZS. 263 per litre and in addition an excise duty of TZS 217 per litre. This in total is about 15% of the price of fuel of TZS 1 800 used in the financial analysis.

[1] Unemployment rate in Tanzania decreased to 10.30% in 2014 from 10.70% in 2011. From 2001 until 2014, the unemployment rate in Tanzania averaged 11.46%, reaching an all-time high of 12.90% in 2001 and a record low of 10.30% in 2014, National Bureau of Statistics (NBS) - Tanzania.

16. **Internal Rate of Return.** The selection criterion for the IRR is to accept all sub-projects for which the IRR is above the opportunity cost of capital, i.e. 10%. Using the IRR as the measure, the models' sensitivity to the changes in parameters can be assessed by varying the cost of investments, production costs and revenues. In keeping with IFAD guidelines, a discount rate of 10% has been used in the financial analysis as the opportunity cost of capital for economic agent in Tanzania. It is the weighted average interest rate charged by commercial banks during the design mission (April 2016). For more details, please refer to Appendix 14 on Tanzanian rural finance sector.

17. Detailed physical and financial parameters for the models are presented in the Attachments to this Appendix.

Smallholder dairy farm models

18. These models were developed using the herd growth model interface (Livestock Sector Investment Policy Toolkit) for simulating bio-economic performances of herds of tropical domestic ruminants[2]. It is designed to calculate different livestock production outputs (live weights, meat, milk, skin and hides, manure) and financial outputs that can be used in the calculation of economic and financial performance indicators such as IRR and NPV.

19. Three farm models were developed by the livestock specialist on the basis of livestock practices in Tanzania: (i) mixed farms with extensive cattle production model, in which the vaccination campaign supported by the project will lead to decrease mortality rate and improve production; (ii) mixed farms with semi-intensive dairy production model; and (iii) mixed farms with medium-scale intensive dairy production model in which the enhancement of animal feed, health services and AI will result in the increase of milk production, reduced mortality rate and increased parturition rate.

20. The models take into account the "with-project situation" and the "without-project situation", the incremental being the project benefits. In the "without-project situation", due to low husbandry capacities and poor access to inputs (feed and health), dairy farmers are facing low parturition rate and high mortality rate, as well as low productivity of milk per cow. Moreover, the difficulties in accessing the market reduce the incentives to invest for increasing milk production. In contrast, in the "with-project situation", dairy farmers are expected to increase their milk production owing to a better access to veterinary services, and high-quality production inputs (including knowledge and changes in behaviour).

21. Revenues stem from milk sales, milk consumed at home (self-consumption), cattle sales (offtake) and manure. The prices used in the financial analysis are the farm-gate prices paid to farmers based on field findings.

22. Regarding home milk consumption, it is assumed in the farm models that all milk consumed at the farm is valued at market prices. The milk consumed at the farm by the calf is not considered as a benefit. It is considered as a cost, required to allow the herd to expand and to generate revenues from the sales of animals. These are reflected by the farm model as revenues from sales of animals.

23. The sales of animals (for breeding and meat) are also part of the benefits of each production model.

24. The labour used in dairy farming is basically family labour. The family labour remuneration is the net income stream, as the household is the recipient of the incremental net benefit. Family labour cost has been evaluated at TZS 1166.

25. Table 1 shows the Production Summary results and the comparison of income in the 'without' and 'with project' scenarios for the selected livestock models. Incremental increases are expected to range from low of TZS 566 339 for the mixed farms with extensive cattle production model to a high of TZS 3.5 million for mixed farms with medium-scale intensive dairy production model. They also present an interesting return to labour. The Summary of the production models are presented in Table 1 below.

[2] This model was developed by the Agricultural Research Centre for International Development (CIRAD). The model is built on Microsoft Excel and uses demographic equations to simulate livestock population dynamics over a given period of time. The model parameters used comprise parturition rate, mortality rate, prolificacy rate, and offtake rate.

Table 1. Farm models - summary of financial analysis results

Production systems						
	Traditional agro-pastoral		Zero grazing standard		Zero grazing intensive	
Nb of herds 15 districts	90,000		47,000			
TARGETED HH / herds	10,000		30,000		4,000	
TARGETED / animals	70,000		129,000		15,000	
	WITHOUT	WITH	WITHOUT	WITH	WITHOUT	WITH
Number of heads / herd	17		4.3		10.9	
adult female /herd	7.5	7.5	2	3	5	7
milk production ltrs per day	2	3	8	11	12	15
milking period	150	170	250	275	270	300
parturition rate	0.60	0.65	0.70	0.75	0.75	0.80
Mortality juvenile	25%	20%	20%	15%	15%	9%
Mortality sub-adult	10%	8%	10%	7%	7%	4%
Mortality adult	5%	3%	5%	3%	4%	2%
Concentrate per day adult (kg)	0	0	2	4	4	5
Cost concentrate per kg			300	300	300	300
Veterinary costs per year/AI	5,000	10,000	30,000	60,000	60,000	75,000
AI cost per year/AI	0	0	10,000	30,000	30,000	30,000
Milk ltrs produced /cow /year	300	510	2,000	3,025	3,240	4,500
Milk ltrs produced/HH/year	1,347	2,504	2,857	6,548	12,354	24,213
Milk incomes/HH	673,502	1,251,905	1,714,009	3,928,869	7,412,419	14,527,795
Incomes sales of animals/HH	752,265	1,541,232	508,236	737,774	1,674,803	2,354,452
Total incomes/HH	1,425,766	2,793,137	2,222,245	4,666,643	9,087,222	16,882,247
Expenditure / HH	636,256	1,437,288	1,147,582	2,599,384	4,661,763	8,937,363
Net Benefit / HH	789,510	1,355,849	1,074,663	2,067,258	4,425,458	7,944,884
Incremenal Net benefit		566,339		992,596		3,519,426
Quantity of milk / area	13,470,032	25,038,102	85,700,475	196,443,444	49,416,126	96,851,968
Total income/area (million)	14,258	27,931	66,667	139,999	36,349	67,529
Total benefit/area (million)	7,895	13,558	32,240	62,018	1,770	31,780

Dairy Value chain models

26. Five enterprise/value chain models have been developed: three operating models of milk collection points (MCP) and chilling centres (MCCs), a dairy processor and milk traders/transporters. The main difference between MCPs/MCCs models lays in the type and scale of their operations and storage capacities.

27. **Model 1** depicts a **milk collection point (MCP) with capacity from 200 to 500 litres/day**. It is assumed to be operating with 3% milk spoilage and low quality milk in the without-project situation. In the with-project situation, the MCP will reduce the losses by 2% thus increasing the quantity of milk collected and sold, and improved quality milk by reducing bacterial contamination. It was assumed a solar fridge to face the lack of access to grid electricity.

28. In **Model 2,** a **milk collection centre (MCC 500L) with capacity from 500 to 2000 litres/day**. In the without-project situation, it is assumed to be operating with 5% milk losses, with low quality milk and difficult management. In the with-project situation, the MCC will upgrade some equipment, purchase a new cooling tank more performing and reduce milk spoilage.

29. **Model 3** describes a **MCC that will increase its milk storage capacity from 2500 to 5000 litres/day** at full development (Y2). In the with-project situation, the MCC will upgrade some equipment, purchase a new cooling tank more performing and reduce milk spoilage.

30. In the with-project situation, models 1, 2 and 3 will have their organization and management capacities strengthened by the project. The models include the calculations of revenue and expenditure, to assess their profitability over a period of 15 years and a cash-flow statement to assess if the cumulated annual cash-flow is always positive (financial sustainability) and thereby establish the required credit conditions from a financial institution.

31. The investment cost comprises the cost for infrastructure/equipment and for the incremental working capital stream. For some models, it was also assumed short-loan for working capital at interest rate 18%. Revenues are milk sales to processors and the incremental residual value of the working capital. Post-harvest losses during transport and milk handling have been assumed to be

10%, and gradually reduced to 7%. MCCs use hired labour which is paid monthly. The overall management of the milk collection points is mostly assured by farmer organizations while that of model 3 by a private company. The details of the financial results are presented in Tables 2 and 3.

32. In keeping with IFAD guidelines, a discount rate of 10% has been used in the financial analysis as the opportunity cost of capital for economic agent in Tanzania. It is to be noted that the analysis performed here is the assessment of the investment worth, which is the return to all resources engaged, MCC's own contribution and/or from a financial institution.

33. **Model 4: Expansion of raw milk trading**. This model illustrates the expansion of a business of a milk trader/transporter in response to favourable market signals (and to increase in production stimulated by the project intervention). The investment of TZS 6.45 million (USD 3 000) to buy a three wheel bike with 300 litres of capacity and upgrade his/her milk ice boxes to insulated ones, includes a loan medium-term for 80% of the investment cost. It is assumed that the business is operational for 12 months a year with an average of 25 working days per month. The model includes also an assistant to sale at the daily labour cost of TZS 7000.The without project scenario includes a daily purchase of 100 litres, while in the with-project case it is assumed to increase up to 300 l/day. It was also assumed an average purchase price of raw milk at TZS 750, and transportation cost to markets is assumed to be 10% of total revenues. The investment would occur in the Year 1 and would generate an increase in income of TZS 2.8 million 000 (USD 1 162) by the second year of the investment (full development). The investment cost could be repaid fully in Year 2. The model records an internal rate of return of 41.2% and a NPV of TZS 9.7 million (USD 4 530). The benefit/cost ratio is of 1.1. This model is extremely sensitive to price and costs changes because of the nature of the business requiring high working capital to purchase raw materials.

34. **Model 5: Expansion of a small-scale dairy plant**. The model depicts a dairy enterprise consisting of a medium milk processing unit of a capacity of about 5000 tons/year. At WOP, the enterprise works at 65% of its operation capacity. Under WOP conditions, the market expansion of livestock farmers and of the processing enterprise is constrained by an absent local demand for, and supply of, raw milk and inefficient milk collection networks, thus making potential raw milk supply particularly costly.

35. The limited availability of milk for processing is mostly determined by the small size of the herds of subsistence smallholder dairy farmers (averaging two milking cows), their low productivity due to inappropriate livestock feeding practices, limited availability of veterinary services, and poor livestock husbandry practices. Limited access to short and medium-term financing and access to market prevent smallholder farmers from increasing herd sizes and investing in the rehabilitation and upgrading of their farm. It is assumed that the enterprise would benefit from the increased milk production and improved quality of milk as a result of project interventions on the dairy farmers and milk collection centres. The enterprise would receive project support in terms of technical assistance, training in business enterprise development for investing in extended shelf-life for attractive high-value consumer products for domestic and regional markets.

36. The enterprise would invest TZS 269 million (USD 125 000) to rehabilitate and upgrade its dairy plant. At full development (Y 5), the above-mentioned investment would result in increased milk processed. The investment leads to an additional production of 87.5 tons of cheese, 225 tons of pasteurized milk and 156 tons of yogurt per annum at full development (YR 5). The IRR on the stream of net benefits is 43.5%. However, the model is sensitive to changes in incremental revenues and production costs as shown in Tables 2 and 3. A decrease in selling price by 10% would make the investment unviable. The investments would lead to the creation of a local market for raw milk, which would be served by many dairy farmers who, seeking the newly arisen market opportunity, would invest in the growth of their enterprise. The impact on employment is expected to be positive, with an additional employment of 11 full time person's equivalent. In addition, additional jobs absorbed by the dairy enterprise would be accompanied by a corresponding upgrade in skills as required by the modernised dairy processing plant.

37. The viability of the MCPs/MCCs, and dairy plant expansion would be highly dependent on the assurance of a steady and quality supply of raw milk by the smallholder dairy farmers who would have increased, over a five year period, their milk yield/cow (from 5 to litres/year or 8 to 12 litres/year depending on the production system). Smallholder farmers' decision to invest in milk production is likely to stem from: (i) provision of support measures provided by the project veterinary support (health

services and AI), enhancement of animal feed, and by the processing enterprise such as guaranteed outlet; and (ii) increased access to market by improved milk collection and transport as well as access to short and long-term credit financing favoured by a substantial decrease in the financial risk of the smallholder farm due to (i), and (ii) above. The Summary of the enterprise value chain are presented in Tables 2 and 3 below.

Table 2. Value chain models - summary of financial analysis results (TZS 000)

Models	Value chain models	Investment costs (TZS 000)				Annual Net Benefits(TZS 000)		
		Loans	Grant	Beneficiary Contribution	Total	WOP Project	WP -Full Develop	Incremental
1	Milk Collection point (200L)	6,626	6,450	1,657	8,283	500	7,885	7,385
2	Milk Chilling Centre (500 L)	78,992	21,500	19,748	98,740	1,710	17,787	16,077
3	Milk Chilling Centre (2500L)	58,915	21,500	14,729	73,644	33,730	86,553	52,823
4	Milk trader/transporter	6,536		1,634	8,170	1,095	4,890	3,795
5	Dairy processing plant	215,000		53,750	268,750	483,883	763,107	279,224

*WOP-without project, WP-with project at full production

Table 3. Value chain models - summary of financial analysis results (USD)

Models	Value chain models	Investment costs (USD)				Incremental annual net benefits per 1 USD invested	IRR (%)	NPV (USD)
		Loans	Grant	Beneficiary Contribution	Total			
1	Milk Collection point (200L)	3,082	3,000	770	3,852	0.9	40.5%	11,722
2	Milk Chilling Centre (500 L)	36,740	10,000	9,185	45,926	0.2	14.3%	10,825
3	Milk Chilling Centre (2500L)	27,402	10,000	6,851	34,253	0.7	30.5%	96,438
4	Milk trader/transporter	3,040	-	760	3,800	0.5	41.2%	4,530
5	Dairy processing plant	100,000	-	25,000	125,000	1.0	43.5%	539,617

*WOP-without project, WP-with project at full production

38. **Summary.** The main results of the financial analysis for the value chain models are a significant increase in gross and net returns from each model compared with and without-project situation. The NPV, ranges from USD 4 530 and USD 539 617, while the FIRRs from 14% to above 44%[3]. FIRR are moderately high, particularly for milk traders as the investment costs are moderately low, which reflects as to how the inadequate technical assistance on business management and modern technology and financial services have prevented the development of milk and dairy products potential. However, it is to be noted that in all models the farmers/entrepreneurs would experience in the first two-three years a drop in their cash income so it would important that they are aware of the shortfall and make sound financial management of their revenues. This reflects as how critical is not only the access to credit but also the provision of training to improve their planning, management and financial skills.

39. Sensitivity analysis was undertaken to assess the impact on the financial returns of changes in: (i) output and input milk prices; (ii) operating costs; and (iii) investment costs. The switching values show in Table 4 indicates that the MCC expansion (2500L) and the dairy processing plant models are equally highly sensitive to changes in price assumptions and production costs than it is to variations in investment and it would not be commercially viable if benefits decreased by 16/18%, which underlines the importance of securing a strong outlet market.

[3] The FIRR is an indicator to measure the financial return on investment of an income generation project and is used to make the investment decision. The FIRR is obtained by equating the present value of investment costs (as cash out-flows) and the present value of net incomes (as cash in-flows) and thus finds out the break-even interest rate.

Table 4. Summary of the financial returns- Switching values

Models	Value chain models	NPV (USD)	IRR (%)	Switching Values % *				
				Incremental Revenues	Incremental Inflows	Incremental Production Costs	Incremental Investment Costs	Incremental Outflows
1	Milk Collection point (200L)	11,722	41%	-9%	-9%	10%	147%	10%
2	Milk Chilling Centre (500 L)	10,825	14%	-1%	-1%	1%	21%	1%
3	Milk Chilling Centre (2500L)	96,438	31%	-16%	-16%	8%	321%	19%
4	Milk trader/transporter	4,530	41%	-5%	-5%	6%	172%	5%
5	Dairy processing plant	539,617	44%	-18%	-17%	23%	408%	21%

* The switching values show percentage by which the costs would need to rise or benefits decrease before the NPV reached zero, associated with each of the values (at 10% financial opportunity costs in Tanzanian Schelling)

IV. ECONOMIC ANALYSIS

NPV =US$ 12.62 million; EIRR =16.6%

40. **Project beneficiaries and phasing**. The project intervention area consists of 15 districts in five regions targeted on the basis of cattle population and milk production, market development potential and level of poverty, food insecurity and malnutrition. For a total of 67,575 beneficiaries, it is estimated that there would be: (i) 44,000 dairy smallholders in the five targeted regions; (ii) 3,000 non producers rural women; (iii) 5,250 farm assistants; (iv) 3,000 youth engaged in production systems; (v) 150 pilot group of very poor youth with no livestock who receive dairy animals; and (vi) 12,175 other rural non-producers beneficiaries in the dairy industry.

41. The target group covers different socio-economic categories of dairy smallholders: (i) 30,000 mixed farms with semi-intensive dairy production owing 1-3 cows; (ii) 4,000 mixed farms with medium-scale intensive dairy production owing 3-7 cows; and (iii) 10,000 mixed farms with extensive cattle production owing small herds of less than 10 local cows. Beneficiaries of off-farm activities (e.g. absorbed by the services of the value chain, AI, milk traders, etc.) will be about 12,175, and the total number of job opportunities created equal to 11,400.

Table 5. Project beneficiaries and phasing

Aggregation of Beneficiaries	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Total
Mixed farms with extensive cattle production	-	1,500	2,000	2,500	2,500	1,500	-	10,000
Mixed farms with semi-intensive dairy production	-	2,000	4,000	10,000	10,000	4,000	-	30,000
Mixed farms with medium-scale intensive dairy production	-	500	1,500	1,000	1,000	-	-	4,000
Total supported dairy farmers		**4,000**	**7,500**	**13,500**	**13,500**	**5,500**	**-**	**44,000**
Non-producer rural women		600	600	600	600	600	-	**3,000**
Farm assistants		656	1,969	1,313	1,313	-	-	**5,250**
Youth engaged in production systems		600	600	600	600	600	-	**3,000**
Pilot group of very poor youth			50	50	50		-	**150**
Jobs opportunities created		**1,856**	**3,219**	**2,563**	**2,563**	**1,200**	**-**	**11,400**
Rural value chain actors		**1,826.3**	**3,043.8**	**3,043.8**	**3,043.8**	**1,217.5**	**-**	**12,175**
Total number of beneficiaries	**-**	**7,683**	**13,763**	**19,106**	**19,106**	**7,918**	**-**	**67,575**

42. **Key parameters**. The period of analysis is 15 years to account for the phasing and gestation period of the proposed interventions. The scenario presented in the economic analysis is conservative; the analysis that appears below is indicative and demonstrates the scope of profitability originated from the conditions prevailing at the time of the preparation. In conformity with IFAD guidelines, a 10% discount rate has been used to reflect the social opportunity cost of capital in Tanzania.

43. **Benefit stream**. The analysis attempts to identify quantifiable benefits that relate directly to the activities undertaken following implementation of the components, or that could be attributed to the project's implementation. The incremental quantifiable benefit stream comprises the following main two elements: (i) increased productivity at farm level (44,000 beneficiaries); (ii) value chain activities

by the dairy enterprises (12,175 beneficiaries); (iii) other employment creation (11,400 beneficiaries, valued at the economic opportunity cost of labour); and (iv) economic impact of investments in rural roads on the livelihoods of rural people (valued at 10% of the incremental benefits at farm level).

44. The methodology used is the economic cost-benefit analysis that reflect the economic value to society of goods and services, often referred to as “economic opportunity costs” or “social opportunity costs”. It is based on the above aggregation of individual incremental net benefits calculated through the models developed in the financial analysis, subject to some adjustments highlighted hereafter and in accordance with the targets set in the logical framework.

45. In calculating the overall benefits from the first element (increased productivity), the following was taken into account:

- Based on the profile of the target groups, it was assumed the following: (i) 30,000 mixed farms with semi-intensive dairy production owing 1-3 cows; (ii) 4,000 mixed farms with medium-scale intensive dairy production owing 3-7 cows; and (iii) 10,000 mixed farms with extensive cattle production owing small herds of less than 10 local cows. The benefit stream was based on the financial models presented in the previous section. The incremental net economic benefits were multiplied by the number of HH, following a gradual increase of such benefits over the period of seven years. It is estimated that at least 20% of the milk is consumed at household level.
- No financing flows have been undertaken in the calculations as they are either already reflected in the project costs or represent transfer payments (loans and taxes).

46. With regards to value chain and production models the following assumptions were made:

- In order to compute the benefit of this investment, it was calculated the net incremental benefits which start accruing from Y2 considering the gradual increase of such benefits as follows.

Table 6. Adoption rates

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
MCCs/MCPs	10%	20%	30%	40%	60%	70%	70%
Milk traders & dairy processing	30%	60%	70%	80%	80%	80%	80%
Dairy farmers	0%	40%	50%	60%	80%	80%	80%

- It was also assumed that 70% of enterprises (MCP/MCCs) and 80% milk traders and dairy plant would achieve operational sustainability. Table 6 shows also the adoption rates for the dairy production models. Based on the investment in milk collection infrastructure, the following table shows the phasing taken into account to prepare the aggregation of the value chain models.

Table 7. Value chain models phasing

Value Chain models								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Total
MCPs	-	40	50	30	30	30	-	180
MCCs Satellite (500 litres)	-	5	10	15	15	15	-	60
MCCs Central (2500 litres)	-	7	9	4	3	2	-	25
Milk trader/transporter	-	300	500	500	500	200	-	2,000
Dairy processing	-	3	3	3	3	3	-	15

47. **Cost Stream.** The incremental economic costs have been calculated by the removal of price contingencies, subsidies and other transfers, and taxes/duties, using the COSTAB software. The total

economic cost of the project amounts to about US$ 26.52 million until year 7, and after the project ends the annual cost is estimated in US$ 250,000 for maintenance of infrastructure and extension services.

48. **Economic milk price.** A specific conversion coefficient for milk of 0.8 has been calculated on the basis of data F.o.b. New Zealand export price for Skimmed Milk Powder, based on the Global Trade, NZ national Statistics (average 2016) and the World Bank commodities price data (January 2016), using the import parity prices method. All values are given in constant 2016 prices.

49. **Other conversion factors**. For hired labour, a specific conversion factor of 0.88 has been assumed to account for underemployment in rural area (12%). For equipment, a conversion factor of 0.82 has also been retained to take into account VAT embodied in the financial prices.

50. **Summary.** Given the above benefit and cost streams, the base case economic internal rate of return (EIRR) is estimated at 16.6%. The base case net present value (NVP) of the project's net benefit stream, discounted at 10%, is US$ 12.62 million. The summary of economic analysis is presented in Table 8 in USD 000 and constant 2016 value.

Table 8. Economic analysis

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Incremental Benefits Value Chain	-	310,422	1,049,261	1,890,558	2,775,995	3,454,117	3,835,685	4,083,817	4,199,386	4,281,148
Incremental Benefits at Dairy Farms	-	- 610,691	- 2,531,158	- 5,773,426	- 10,148,488	- 7,747,138	- 2,922,407	729,770	2,269,470	3,586,035
Incremental Benefits Job Creation - increased income	-	501,188	1,370,250	2,062,125	2,754,000	3,078,000	3,078,000	3,078,000	3,078,000	3,078,000
Incremental Benefits Roads Rehabilitation	-	20,092	- 11,165	- 182,074	- 461,849	- 121,502	399,128	789,159	954,686	1,094,518
Total Economic Benefits	-	221,011	- 122,812	- 2,002,816	- 5,080,343	- 1,336,523	4,390,405	8,680,745	10,501,541	12,039,701
Total Project Costs	*2,063,509*	*4,816,661*	*5,167,423*	*5,247,481*	*4,536,620*	*3,897,627*	*797,373*	*250,000*	*250,000*	*250,000*
Cash Flow	- **2,063,509**	- **4,595,650**	- **5,290,235**	- **7,250,297**	- **9,616,963**	- **5,234,150**	**3,593,032**	**8,430,745**	**10,251,541**	**11,789,701**

EIRR	16.6%	
NPV	12,618	US$ 000

51. **Sensitivity analysis.** Economic returns were tested against changes in benefits and costs and for various lags in the realisation of benefits. In relative terms, the EIRR is resilient to changes in benefits and costs, the project will yield an EIRR of 15% by either a 10% decline in benefits or an over 10% increase in costs, and a reduction of the NPV by 50%. A one-year delay in project benefits reduces the EIRR to 13% but it will have a significant impact on the NPV. A two-year delay will make the NPV negative and reduce the EIRR to 10%. The results are presented in Table 9.

Table 9. Sensitivity analysis results

Δ%	Link with the risk matrix	IRR (%)	NPV (000 US$)
	Base case	**16.6%**	**12,618**
-10%	Combination of risks affecting output prices, yields and adoption rates	15.2%	4,976
-20%		13.6%	2,405
10%	Increase of input prices or construction material	15.3%	5,731
20%		14.2%	3,914
1 year-delay of benefits	Risks affecting adoption rates and low implementation capacity	13.3%	1,975
2 years-delay ofbenefits		10.1%	(2,808)

Attachment 1: Excel files (available in the PLF)

Appendix 11: Draft outline of the Project Implementation Manual (PIM)

Annotated table of contents

	Section and Sub-Section	Notes
Part 1: Introduction, Purpose, Strategy And Cross-Cutting Issues		
1	**Introduction**	
	Introduction to SHMDP	
	Introduction to the PIM	
	Intended users of the PIM	
2	**Purpose Of SHMDP**	
	Reason for SHMDP	Brief summary of the diagnosis that lead to the design of SHMDP
	Theory of Change	Description of the expected outcomes based on the goal and project development objective. The strategy outlines how the changes will be promoted, which needs to be closely monitored for planning and M&E.
3	**Implementation Strategy**	Describes key elements of the SHMDP approach, how these elements work together, the assignment of roles, the approach to implementation in different Districts
4	**Principles and Approach**	
	Market-driven	Define how the market orientation of SHMDP will be mainstreamed in all activities
	Private sector-led	Define how private actors (farmers, businesses, processors etc) will lead the investment prioritization and project activities. Explain role of "clusters" for MDPs, contract farming facilitation and other tools in achieving this. Relate this to the functioning of the VC Fund and other project activities.
	Inclusiveness	Defines core principles of SHMDP for inclusive dialogue and participation at all levels
	Gender Mainstreaming	Defines core principles for mainstreaming gender in SHMDP
	Nutrition Mainstreaming	Defines core principles for nutrition mainstreaming in SHMDP
	Mainstreaming Climate Smart / Resilience	Defines how Climate Smart / climate resilience is mainstreamed in all parts of SHMDP
Part 2: Components, Outputs And Activities		
5	**Component 1: Building efficient dairy value chains from producer to consumer**	
	Capacity building of farmer organizations for improved access to markets, inputs and services	Capacity building of farmer organizations for improved access to markets, inputs and services
	Investment in climate-smart quality milk collection and handling system	Investment in climate-smart quality milk collection and handling system
	Improved processing and distribution of affordable quality milk and milk products	Improved processing and distribution of affordable quality milk and milk products
6	**Component 2: Increasing on-farm productivity**	
	Supporting access of women a	Describes how provision of services and inputs (including water) to smallholder dairy producers will be strengthened to enable them to intensify their production. Also defines how access to production assets, including improved livestock, will be facilitated through various arrangements.
	Supporting capacities of wome	Describes how capacity of farmers, services providers and

		extensionist will be strengthened to enable dissemination, adoption and implementation of improved husbandry practices. Also defines implementation arrangement for Farmers' Field Schools (FFS) and training of extensionists and service providers.
	Development and dissemination of climate smart technical and institutional innovations	Shows how development and dissemination of climate smart innovations for intensified and sustainable dairy production will be supported, and defines the technical topics for which development of innovations will be required.
7	**Component 3: Supporting an enabling policy and institutional environment for dairy development**	
	Strengthening stakeholder dialogue at all levels	The process for evidence-based and inclusive policy dialogue Will be defined
	Strengthening of capacity for dairy training	Capacity for dairy training strengthened through existing training agencies both short term and higher level sector specialists

Part 3: Implementation arrangements		
8	**Roles And Responsibilities**	
	The SHMDP Steering Committee	Include Terms of Reference for Steering committee and Code of Conduct for SC Members
	MALF	As Executing Agency Including relative roles, mandates and responsibilities of DGDT and DICO
	Zonal Project Management Unit	Include roles, responsibilities and also organizational arrangements Describe how the participation of the private sector and farmers will be achieved
	District Project Implementation Units	Relative roles , responsibilities and engagement with ZPMU
9	**Planning, budgeting**	
	Results based planning and resource allocation	
	Preparation and consolidation of the AWPB	
	Key approval and reporting instruments	
10	**Monitoring, Evaluation And Reporting**	
	Overview	
	DCED Standard and RIMS+	Describe how these work together as a single unified M&E framework and system
	Results chains	Describe their purpose and how they should be prepared. Describe how they are to be used communicating the project, identifying intervention points and tracking key indicators of change in the VC
	M&E Matrix	Provide template and guidance for preparing a practical M&E Matrix to guide development of MIS and other M&E activities.
	MIS	Describe main elements of MIS and process to develop, test and use it. Describe main audience and users of expected information, reports and analysis.
	Major Impact Survey	Describe main required surveys
	Other Surveys	Outline expect requirements for other surveys, including annual outcome survey
	Reporting	

10	**Knowledge management and communication**	
	KMC Strategy	Outline purpose and process for preparation
	KM Themes	Outline initial set of KM theme and KM product deliverable over first 24 months
	Communications	Describe purpose and types of communication. Describe roles, responsibilities and resources for communication at each level in the project
11	**Financial Management, Procurement And Administration**	
	Financial Management	Describe detailed practices and procedures.
	Procurement	
	Administration	
12	**Implementation Work Plan**	
	Work Plan	Presents a consolidated, Gantt-Chart format implementation plan including highlighting of critical path and cross-linkages between components

Appendix 12A: Compliance with IFAD policies

Alignment with IFAD Policies

Policy	Alignment with IFAD Policy
IFAD Strategic Framework 2016-2025: « Enabling Inclusive and Sustainable Rural Transformation »	Aligned: IFAD's fifth Strategic Framework covers the period 2016-2025. It serves as an overarching policy guideline to provide direction to IFAD's work, and as a key instrument for consolidating IFAD's development effectiveness. The new framework builds on and reinforces many of the strategic thrusts of the previous one (2011-2015). It responds to the new global environment and positions IFAD to play a crucial role within it – by enabling the transformation of rural areas in a manner that is both more inclusive and sustainable. The framework has four purposes: 1. to situate IFAD relative to current and emerging development challenges and within the larger global development architecture, and to define its activities in terms of their contribution to the 2030 sustainable development agenda (Agenda 2030); 2. to define and present IFAD's overarching development goal, principles of engagement, strategic objectives, outcomes and pillars of results delivery; 3. to give orientation to the development of country strategic opportunities programmes (COSOPs) and IFAD-supported investment projects, global and regional grant-funded programmes, and new policies and strategies; and 4. to provide overall coherence to IFAD's work and guide managers and staff across the entire organization so as to enable them to contribute more effectively to the Fund's overall development goal. Its 10-year timeframe is a long one, and so to ensure its relevance amid changes in the broader development context a mid-term review will be carried out in 2020 to determine the need for any substantive reorientations.
Country level policy engagement	Consistent with best practice. IFAD does not have a corporate policy on country level policy engagement, this being a relatively new area of intervention and a corporate commitment in IFAD 10 exclusive to COSOPs, however the project dovetails with what IFAD has come to be considered good practice. IFAD promotes policy engagement in projects in order to reach two main objectives: (i) help create an enabling environment for implementation and achieving the project's impact, and (ii) help create the conditions for a large number of rural population to out of poverty. It is a key element of the scaling up agenda. IFAD's role is not intended to advocate for specific policy outcomes; it is rather to assist governments to use the project experience in the design or reform of policies, and to facilitate dialogue among national stakeholders on key policy issues. The program is in line with these objectives and principles, seeking to create and provide spaces for policy strengthening, formulation and implementation in a consultative way, led by the government and including multiple actors in the dairy value chain. These results will help in creating a more comprehensive and implementable policy environment for the dairy sector in Tanzania.
Targeting policy	Aligned. The SHMDP targeting strategy is based on inclusiveness and will include very poor, poor and resourceful poor households as direct beneficiaries. The project will adopt several targeting mechanisms: direct and self-targeting, enabling environment, as well as ensuring procedural and operational measures. The strategy will be assessed at various stages of the project life to readjust or reinforce whenever it is needed.
Gender equality and women's empowerment policy	Aligned. The project will bring an innovative feature to the FFS by integrating the Gender Action Learning System. This will lead to: (i) equitable share of participation and benefits for women and men involved in dairy farming, (ii) improve their decision-making capacities at household and community levels and (iii) ensure equitable share of workloads in dairy and domestic activities. In addition, SHMDP will foster economic empowerment of women in the off-farm economy.
Rural finance policy	Aligned. The SHMDP is consistent with IFAD's Rural Finance Policy (2009) which has six guiding principles to be applied at the micro, meso and macro levels: (i) support access to a variety of financial services; (ii) promote a wide range of financial institutions, models and delivery channels; (iii) support demand driven and innovative approaches; (iv)

	encourage – in collaboration with private sector partners – market-based approaches that strengthen rural financial markets, avoid distortions in the financial sector and leverage IFAD's resources; (v) develop and support long-term strategies focusing on sustainability and poverty outreach; and (vi) participate in policy dialogues that promote an enabling environment for rural finance. Bankable business plans developed by milk sellers and processors will receive technical support in order to facilitate access to financial products; the project will also support larger investments through a variety of financial mechanisms, utilizing the full scope of financing available in Tanzania. The project will not work directly on policies related to rural finance.
Access to land and land security	Aligned. The project will not work specifically on land or land tenure but will work on production intensification and access to natural resources (especially water). The guiding principles of IFAD's land policy suggest that IFAD should be aligned to national policy priorities, do no harm, focus on gender dimensions of land usage and empower rural people and their organizations on land tenure. The project will consider the extent to which land access and tenure security are issues of concern, in particular for the very poor, women and youth who may wish to get involved in dairy production but require accessing suitable grazing land or land for fodder production. The project could assess the extent to which target districts are already supporting: (i) district and village land-use planning and (ii) the registration of land and the issuing of CCROs, including where relevant, for communal grazing lands. In addition, where possible, synergies will be achieved with support being provided for land use planning and land registration by other development partners, including NGOs. USAID will be supporting land registration pilots in Iringa, possibly Njombe and parts of Mbeya while CARE and OXFAM have provided support for land registration, civic education and land use planning in Iringa and Mbeya. All three organizations have strong connections with our CPMT and have indicated their interests to collaborate with IFAD on land governance issues. Various efforts are underway to better map the support being provided for land governance, including under ILC's National Engagement Strategy for the country (Large Grant "Fostering Land Governance"), which could be instrumental to help strengthen synergies.
IFAD strategy on climate change	Aligned. Particularly with principle 3 – promote climate-smart approaches to rural development and principle 4 on risk and resilience. The climate change strategy suggests that climate change should be factored into the project design, explore new ways to work on emerging problems and mobilize resources to address these problems. The project is aligned with these three ways of working.
Knowledge management	Aligned. The Knowledge Management strategy suggests that projects should have baseline studies and should have dedicated frameworks for knowledge management in order to "learn systematically and collectively from its own projects and programmes, and from the experience of its partners, particularly poor rural people, in order to deliver high-quality services and to enable its partners to find innovative ways to overcome poverty, and to use the knowledge acquired to foster pro-poor policy reforms." The project is utilizing new guidance on best practice for logical frameworks and results hierarchies, and will have a dedicated M&E system as well as significant budget for knowledge management related to policy experience.
Scaling up	Consistent with best practice. While IFAD has an operational framework for scaling up and a commitment to scaling up, there is not as of yet a scaling up policy. However, the project is consistent with IFAD's vision of scaling up. The definition adopted by IFAD for scaling up is: "expanding, adapting and supporting successful policies, programmes and knowledge, so that they can leverage resources and partners to deliver larger results for a greater number of rural poor in a sustainable way". Scaling up results does not mean transforming small IFAD projects into larger projects. Instead, SHMDP interventions will focus on how successful local initiatives can sustainably leverage policy changes, additional resources and learning to bring the results to scale. The project intends to utilize the extensive set of lessons learned from the IFAD grant programme and aid projects lead by partner agencies (EADD, L-MIRA, ILRI) and NGOs (Heifer international) in order to ensure that the project interventions provide continuity while growing in scale.

Appendix 12B: SECAP Review Note

SECAP Review Note on:

United Republic of Tanzania

Southern Highlands Milkshed Development Project

I. Major landscape characteristics and Issues (Social, natural resources, and climate)

Socio- cultural context

Tanzania's economy is dominated by agriculture; tourism and services. Agricultural production is predominantly rainfed and contributes to about one quarter of Tanzania' GDP. The dominant crops grown in the country are coffee, sisal, tea, cotton, pyrethrum, cashew nuts, tobacco, cloves, maize, wheat, rice, cassava, bananas and vegetables. Livestock production comprises cattle, sheep and goats. Smallholder farmers dominate the agricultural and livestock market outputs.

On the basis of altitude, rainfall and temperature patterns, dependable growing season, soil structure, fertility and water retention, Tanzania has been divided into seven agro-ecological zones: coastal areas, arid lands, semi-arid lands, plateau, northern highlands, southern and western highlands and alluvial plains (SoE, 2014[1]).

Because of the favourable unimodal rainfall regime (600-2600mm falling between November and April) and moderate temperature (10.6-26.5^{o}C), the Southern Highlands are considered as Tanzania's food basket with a surplus of maize and rice production from the agricultural districts of Iringa, Mbeya, Rukwa and Ruvuma.

Livelihood diversification: Smallholder farmers in the Southern Highlands are engaged in several value chains (coffee, tea, maize, bananas, beans, potatoes, yams, dairy, etc.) according to specific agro-ecological zones. The southern highlands rely on three main livelihood zones (FAO & UDS, 2010). The first area covers parts of Mbeya where the communities' livelihoods are based on coffee, banana, tea, beans, maize crops as well as cattle products with passable roads and close access to market. The second zone includes most part of the southern highlands (i.e. Njombe and Songwe regions) and inhabitants rely on wood products, pyrethrum, tobacco, maize, dairy products and Irish potatoes, yet the fair access to market is challenged by some impassable roads during the rainy season. The third zone comprises rural parts of Iringa and Ruvuma regions where livelihoods depend mainly on maize, tobacco, banana, cotton, cashew, pulses, sugar cane, and rice production with little access to market due to bad roads in remote areas.

The dairy sector is one of the critical sectors in Tanzania, with high potential for improving food security, incomes and welfare. Livestock keeping entails economic, social, cultural and environmental dimensions. In most East African countries, cattle's keeping is increasing due to its associated benefits (Gillah and al., 2012). Smallholder farmers identify the dairy farming benefits as follows: increased income, employment generation, food and nutrition, organic waste recycling and amelioration of social status. Njombe et al (2011) estimated 4.9 million households in rural and peri-urban areas of Tanzania, 36% of households are livestock keepers, and 35% keep livestock and do crop farming as well, so that 71% of households engage in some form of livestock husbandry. Dairy cattle are concentrated in the cool highland regions of Kilimanjaro and Arusha, Southern Highlands (Mbeya and Iringa), as well as Tanga and Kagera. The distribution of the traditional dairy herd is mostly amongst small scale farmers, 80% who own less than 100 head of indigenous cattle (SAGCOT,[2] 2013). About 70% of milk produced comes from traditional dairy cattle while only 30% is

[1] United Republic of Tanzania, Vice-President's Office, 2014, State of the Environment (SoE) Report
[2] Southern Agriculture Growth Corridor of Tanzania (SAGCOT) is an agricultural partnership designed to improve agricultural productivity, food security and livelihoods in Tanzania. It was initiated at the World Economic Forum Africa summit in May 2010.

delivered by cross-bred dairy cattle. Most households own 1 to 3 cows and when milk exceeds family consumption, the surplus is sold in the neighbourhood. A cow yield between 7 to 12 litres of milk yields per milking (Ulicky & al., 2013).

Over the last two decades, total milk production has increased at the rate of about 2.8% per annum largely due to increases in cattle population rather than increases in productivity. Milk demand projections to the year 2020 based on current consumption levels, urbanization levels of 5% per annum, a population growth of 2.3% per annum, an overall income elasticity for dairy products of 0.8 and a modest real GDP growth of 1% per annum) indicate that demand of dairy products could increase by 60% or a per capital consumption of 100 litres /annum (Katjiuongua and Nelgen, 2014).

The project targeted districts (Ruvuma, Njombe, Mbeya, Iringa, and Songwe) are subdivided into urban and rural zones, with distinct farm land sizes, access to markets and agricultural and grazing patterns. The urban areas have a high population density (approx. 150 inh. /km^2), with concomitant small urban/peri-urban farm lands where zero grazing with improved dairy cow breeds is practised as a complementary source of income, while in the more remote rural areas (approx. 30-40 inh./km^2), population density is low and farm lands are larger and traditional dairy cattle are extensively grazed. Due to their proximity to markets and commercial centres the urban and peri-urban populations tend to be more economically empowered than rural inhabitants. Rural communities are hampered by lack of investment in transport infrastructures, storage facilities and electrification, with low access to service providers (e.g. input suppliers and extension services) and adequate water supply.

Natural resources and NRM

Tanzania has a unique ecosystem due to a higher number of endemic plants and animal species. The southern corridor (stretching from the Indian Ocean to the Zambian border) has a rich wildlife and diversified flora. In particular, the land cover in the Southern Highlands is heterogonous, including protected areas, mosaic of forests, woodland, scrublands, grassland, cropland (SAGCOT, 2013). Protected areas and biodiversity hotspots are under tremendous pressure from growing populations and the expansions of their agricultural and grazing lands.

The southern area encompasses large water bodies, including lakes, rivers and streams. Water sources fluctuate as a result of both spatial and temporal variations in rainfall, drought and human activities in catchment areas. The hydrological regimes of the region's rivers, lakes and aquifers are disrupted because of population growth, mismanagement of water catchments through unplanned development activities and are exacerbated by increased variability in rainfall patterns and climate change shocks and stresses (Kangalawe and al., 2011). Hence, during the long dry season, water sources dry up, with many streams becoming ephemeral. There is a growing urgency to better manage water supplies to meet the rising competition in potable water human and animal consumption, and for agriculture and hydropower uses.

Due the pre-dominance of moderately fertile clay soils and volcanic soils, most farmers in the Southern Highlands practice low input rainfed agriculture relying on local unimproved landraces, using little if any chemical fertilizers, pesticides and herbicides. Yet, the soils lack improved soil fertility management practices, which are critical for maximizing efficiency of nutrient, water use and increasing agricultural productivity. As a consequence yields are low (typical maize yields are 1.2 to 2 tons) despite adequate rainfall, and the area is subjected to heavy soil erosion due to the extensive crop and livestock systems (SAGCOT, 2013; FAOSTAT, 2012). The soil erosion is triggered by agricultural expansion and removal of vegetation through the expansion of cropped areas, inefficient farming practices, over grazing and deforestation for domestic energy supplies. If not addressed in a sustainable manner these practices will lead to wide spread degradation of the natural resource base, pollution of water bodies, and loss of biodiversity. This will also prevent economic growth and aggravate poverty and food insecurity.

Grazing patterns and land tenure security

The area covers one third of Tanzania mainland, it extends north and south of the central rail, road and power 'backbone' that runs from Dar es Salaam to the northern areas of Zambia and Malawi.

The SHDMP design mission explored the current land tenure settings in the project area as well as the potential constraints, opportunities and impacts of the programme. It has been observed that the situation of tenure security and natural resource management is highly heterogeneous and varies from district to district.

In some districts, especially in peri-urban areas, the villages are often gazetted and the interviewees described a context of stability and abundance of land allocated for grazing by village councils. In other areas, district authorities reported a scarcity of land available, villages are not gazetted, and there are localised episodes of conflict over land. In these areas, weak land governance, including development planning, the expansion of urban and national parks borders, exacerbated by climate changes all lead to increased competition for land between the different land users. Concretely, a plot of land that is considered "free" or "unused" will be the subject of contention between livestock keepers who have traditionally used it for grazing, farmers that want to expand their crops and in some case pastoralists that have increasingly moved southwards over the past few decades as a consequence of evictions in the northern districts of Tanzania.

Currently, dairy farmers in the project development area own small plots of land (usually from 0.5 acre to 5 acres) that they have inherited from their family or purchased from their neighbours, but they rarely have certificates (Customary Certificates of Occupancy -CCROs) for their land. However, the lack of a certificate does not seem to be a constraint for smallholders, especially in terms of access to project resources, farmers' organizations or financial services.

To be considered for membership of dairy farmers' organizations only requires that the applicant owns a cow and has submitted a successful request of membership to the assembly. Membership ensures access to financial support and loans from the organizations communal funds that have been collected mainly through membership fees. The members are also mobilizing the producers group itself as a guarantee to access collective bank loans. In fact, it seems that banks are more likely to issue loans to groups than individuals as the members will guarantee the payment of the loan.

On the one side, these financial strategies mobilized by the groups seem to adequately respond to smallholders' needs in term of access to financial services. On the other side, the value of CCROs and associated tenure security is often neglected by farmers since the certificate cannot be used as a collateral without being part of a larger business plan.

Moreover, the lack of implementation of land-use plans and other mechanisms for land governance and natural resource management brings in the issue of the availability of lands for grazing and pasture production. On this topic, it has been observed that households' grazing patterns are diversified and depends on multiple aspects. These include:

Land availability. In the areas with abundance of land (i.e. Ruvuma rural areas), the dairy producers are more likely to have small conservation plots where they grow small volume of pasture at the borders of their crops. In peri-urban areas (i.e. in Njombe and Mbeya) some better off dairy producers have allocated less than 1/5 of their land for pasture while poor farmers rely on pasture cut and carried from rural areas and "free" pasture along the roadside and crop plots. In fact, where land is scarcer, particularly in urban and peri-urban areas, smallholders tend to cut forage/grass where it is available, often on land considered "unused" or "communal" or in designated communal grazing lands. However, people reported that even where a communal grazing land is formally or informally designated, these lands lack adequate facilities (i.e. watering points) and have an insufficient capacity to satisfy the needs of the smallholders.

Seasonality. The availability of pasture for both grazing and forage conservation is highly dependent on the quality of the rainfall season, and leads to strong fluctuations in milk production throughout the year. In the rainy season there is an abundance of grazing compared to the dry season when dairy farmers complement their scarce stock of pasture with maize residues, beans, sunflower cake and other fodders.

Type of breed. Improved breeds of dairy cattle are usually kept in cattle sheds and fed through cut and carry systems. On the other hand, "indigenous breeds", which are considered more robust and mobile, are more likely to be fed though grazing, often on the borders of the roads, crop plots or big

plantations. It has been observed that dairy farmers also own “indigenous cows” and practice simultaneously different grazing patterns depending of the breed of their animals.

19. **Human resources and time**. The choice between grazing and zero grazing also depends on the labour resources that smallholder households can allocate to the dairy production. While some people consider that the practice of tethering allows them to undertake other activities, others have estimated that cutting the pasture on their plots is more time-effective. However, individual plots or “free” land are often located more than 4 km from the cowshed, a distance that farmers cover twice per day. Thus, regardless the grazing pattern, the activities of pasture production and water collection are the most intensive and time consuming labours associated with dairy production. These activities employs alternatively all the members of the family, especially women, youth and children. In many cases, smallholders employ young people to collect the forage, especially during dry season and when it is not cut on their own plots.

Climate

The country’s climatic conditions are complex, with wide variations across the country tempered by a strong seasonality that is becoming exacerbated by the impacts of climate change. The five regions selected in Southern Highlands (Mbeya, Iringa, Njombe, Ruvuma, and Songwe) present heterogeneous climatic conditions as well as agro-ecological zones, influenced by physiology and altitudes (low to highlands).

In the Southern Highlands, rainfall is already highly erratic and will grow more unpredictable as the start and end of seasons become less reliable. Moreover, the areas will experience longer and more frequent drought periods as well as floods events (Mbungu, 2015). The unimodal model in the Southern Highlands will see a reduction in annual rainfall (Mbululo & Nyihirani, 2012) coupled with significant increase in spatial and temporal variability of rainfall with long term implication on the agricultural sector (Mbuyu, 2015). Temperatures will increase in the range of 1.5°C to 3°C for the lower emission scenario and 3°C to 5°C for the higher emission scenario (SEI, 2011). The changing climate has resulted in general decline in both agro-diversity and productivity and reduced water flows and availability with severe effects on the country capacity to generate electricity through hydropower. Over the last century, 70% of natural disasters in Tanzania, were hydro-meteorological – droughts and/or floods (Mbungu, 2015). As a consequence, drought periods, have resulted in severe damage to livestock’s water points, crops and rural infrastructures and increased conflicts amongst multiple water users.

Livestock are particularly vulnerable to rising temperatures (heat stresses), increased humidity and more unpredictable rainfall patterns associated with global warming. Drier conditions mean reduction in the quantity and quality of vegetative production from both pasture and rangeland, associated with decreases in water availability. As a consequence of changing climate, livestock experience diverse problems including loss of body weight due to inadequate feeding and water intake, both of which lead to decreased milk production and an increase susceptibility to disease (Kangalawe et al. 2011). At the same time, prices can vary seasonally from Tsh 297/ltr in wet season, to Tsh 575/ltr in dry season, a 94% price differential reported by TechnoServe in 2012. Increased farm gate prices also lead to decline in local consumption, as buyers could not afford the cost.

Thus, it is important to recognize these variations so as to have a better understanding of subsequent impacts and thus provide adequate adaptation and mitigation responses for building smallholder farmers ‘resilience.

Key Issues

The dairy industry is a critical sector in the economic development of the rural Tanzania, yet it is highly vulnerable to the vagaries of climate and makes significant contributions to anthropogenic green gas emissions (Gerber & al. 2013). Indeed, climate change and associated increased variability affect the quality and availability of seasonal grazing and water sources, which together impact on animal nutrition and consequently lactation levels of both traditional and improved cattle breeds. These issues are compounded by increased carbon dioxide levels that reduce protein contents of available feed and forage (Kintish, 2014). In addition, increased incidence of new pests and diseases such as

Rift Valley Fever (RVF) ticks, snails and other pests have been observed in correlation to temperatures increases. At the same time, dairy farming systems contribute to the degradation of the natural resources base, leading to a loss of biodiversity when grazing on the rangelands and communal lands is poorly managed and increased production of greenhouse gases. Solid and wastewater released at farm and processing facilities levels pollute soil, surface water and groundwater systems whereas mismanagement of manure disposal and rapid expansion of livestock numbers in extensive and intensive systems increase the amount of greenhouse gases emitted in the atmosphere.

Dairy cattle rely upon the agro-ecosystem to provide their basic dietary requirements through extensive grazing of grass and shrubs or indirectly through zero grazing. The nutritional quality of these pasture grasses, forages, shrubs and crop residues, and availability of water, have a direct correlation on the quality and quantity of both milk and beef yields. The feed quality of rangeland pasture is a function of the plant species present and their growth stages. Younger plants are more nutritious than older plants and the overall nutritional values are a function of climate and soil factors. Rangeland productivity therefore varies with agro-ecological zones, range management, sowing and choice of pasture seed for enrichment. In addition, water is crucial in animal nutrition. Indeed, water intake regulates animal feed ratio. Limitations in availability of clean, fresh, and high-quality water can limit milk production quicker than a deficiency in any other nutrients (Lukuyu & al., 2007). While the Southern Highlands have abundant water bodies, this resource is subjected to seasonal fluctuation, especially during the dry season, which might lead to water scarcity. In addition, the long distances walked to water sources are energy intensive and drastically affect milk and meat production. While analysing factors and constraints to increased milk production, Techno Serve (2012) noted that most Tanzanian farmers do not plan ahead. The bulk of the dairy herd nutrition therefore relies on the natural resource base and its seasonal fluctuations in productivity. Consequently, milk supply to processors can drop by as much as 50% due to decline in grazing and water quality and quantity in the dry season.

To address the environmental impacts associated with dairy farming systems and strengthen the resilience of smallholder agro-pastoral farmers, SHMDP will identify and promote adaptation and mitigation responses relevant to each specific agro-ecological zone. The project will adopt a climate-smart dairy intensification approach that consists of (i) supporting and coaching farmers on the zero-grazing model to increase animal productivity through improved breeding, better animal feed (development and selection of diversified forage and fodder varieties with the support of regional research institutions) and on-farm water accessibility; (ii) enhancing resource use efficiency along the dairy value chain (small-scale choppers, chilling facilities, etc.) with an emphasis on the substitution of fossil fuel and firewood with green energy sources such as biogas and solar energy sources to power dairy machinery, chillers/coolers, water heaters and small scale choppers; and (iii) reducing other outputs concomitant to dairy production and processing (e.g. manure management, recycling of solid waste and wastewater, etc.)

Water management. Limited availability and accessibility of potable and hot water remain a major challenge that is compromising milk quality and hygiene at farm level as well as collections points. According to the FAO-AQUASTAT, the total annual renewable water resources for all sectors of the economy and per inhabitant is2020 m^3, slightly above the United Nations minimum fresh water requirement of 1700 m^3 per capita per year (Mbungu, 2015). Yet, current rainfall and discharge variability coupled with increased fresh water demand from various sectors are major challenges in Tanzania. Water is a valuable resource for livestock development as well as for the expansion in irrigation systems due to population growth (Mbuyu, 2015).

Inadequate water infrastructure (see attachment 1) at farm and grazing land areas are source of conflicts amongst different land users (MLFD[3], 2011). Inadequate access to clean water affects livestock productivity, especially during the dry season. The lack of water resources at the farm level is worse during the dry season and in zero-grazing units, yet, with higher temperatures water requirements of livestock increase.

[3] United Republic of Tanzania, Ministry of Livestock and Fisheries Development, 2011

Waste management and energy use efficiency. To date, a lot of manure nutrients are lost through the vaporisation process that occurs when manure is left exposed to the sun and thus contributes to GHG emissions. Sustainable energy alternatives coupled with waste management practices and technologies will contribute to reduction of operational cost and women and children burden associated with water and firewood collections. . In addition, the adoption of climate smart practices and technologies will decrease water and soil pollution (from caustic water and solid waste). (see attachment 2)

II. POTENTIAL PROJECT'S SOCIAL, ENVIRONMENTAL, AND CLIMATE CHANGE IMPACTS AND RISKS

Key potential impacts

It is generally agreed that poor feeding practices (including water) are the main constraint to increased milk productivity in Tanzania. The major swings in seasonal milk production are well documented and mirrors seasonal rainfall patterns. Farmers rely on locally produced pasture, forage and crop residues to feed their animals, all of which (except for the largest specialized dairy farms) are produced under rainfed low input conditions While cross-breed can be highly productive and increase household incomes, they are, however, less adapted to local conditions (Lukuyu & al, 2007). Animal reproduction potential and lactation levels are affected by heat stress, high incidence of diseases (e.g. Ataxia-Telangiectasia (AT)) and parasites (e.g. Tick-Born Disease (TDB)) and limited access to quality feeds and water. For increasing milk yields and animal health in zero grazing units, the project interventions will be concentrated on small improvements in herd management (e.g. simple shelters) troughs for feed and water, and unlimited access to quality feeds and water. . Whereas in the more extensive systems where traditional cattle breeds dominate, these animals may cause environmental and land degradation through the pollution of water and streams and pressures on seasonal grazing thus reducing the quantity and quality of feed and consequently reproductive potential and lactation levels. The project interventions will support the modernization of traditional extensive system into intensive system when possible; improve water access and forage and fodder quality in grazing lands.

Land degradation. The extensive grazing management practices for traditional dairy cattle rely upon natural pastures/rangelands, which are already under pressure through over-grazing. The uptake of improved pastures, through enrichment with improved grass species and legumes is limited; the challenge is to increase availability of quality pastures for use in dairying throughout the year. In the past wetlands have been seen as a traditional buffer to the dry season crop and livestock production. In more recent times, herd and population growth have led to an expansion into wetlands in which unregulated use, and human influence are causing soil erosion, land degradation and a loss of the unique rich biodiversity that the Tanzania was known for. In addition, daily movement of cattle herds to and from water sources have huge environmental consequences, their trails leaving scars across the fragile dry rangelands.

Depending on the biodegradability and solubility of dairy outputs, the environment might be affected by high ground water nitrate concentration due to inadequate manure and fertilizer management, and wastewater discharges from slaughterhouses and dairy processing plants (Cheserek, 2013). Dairy processing wastewaters contain substantial quantities of organic matter (e.g. protein, lactose, and fat), nitrogen and phosphorus. If excessive concentrations of these enter waterways, oxygen depletion and plant growth in the waterways may reach nuisance proportions. In addition, cleaning of plant results in caustic wastewater (FAO, 1996).

In addition, few of the milk collection points and dairy processing units have adequate water heating facilities to clean and sterilize milk handling and holding equipment. Where water is heated fire wood or charcoal is used. Unclean water increases the risks of contamination and spoilage, reducing the profitability of the value chain.

Climate change and adaptation

Changing patterns of precipitation due to climate change will have a significant impact not only on farmer's staple agricultural crops, the residues of which are used to feed livestock, but also on the

productivity of managed pasture and availability of natural vegetation. In general, locations receiving less precipitation produce less biomass.

Feeding practices: With changing climate and increased grazing pressures, the availability of wild plants is decreasing and thus, farmers must adopt a better pasture management plan and cultivate appropriate forage varieties. Yet, dairy cattle in rural areas are poorly fed due to poor feeding practices, availability of nutritious forage, water availability and accessibility. Ruminants are mainly dependent on fodder (elephant grass, Guatemala grass, *bracharia* spp, Rhodes grass, desmodium), poor valorisation of crop residues, trees, bushes, and the availability of cheap and qualitative crop by-products (sunflower cake, maize bran, rice polish, etc.).

The expected higher frequency of torrential rains and the longer and more frequent drought have a major impact on river, springs flows and variability (SEI, 2011). Prolonged droughts in the past have dried up rivers, led people to the verge of starvation and caused severe power shortage resulting in serious social and economic losses (Mbuyu, 2015). According to the Stockholm Environment Institute (2011), whereas drought affects more people, the floods are the most economically disastrous with the destruction of rural infrastructures, including roads and agricultural and livestock facilities.

The aim of SHMDP is to improve the productivity of the existing dairy herd under the management of smallholder producers, rather than to substantially expand the number of animals. If successful, however, the higher productivity and associated profits would logically lead to some expansion in the number of animals, thus increasing greenhouse gas emissions. Barriers to entry and higher risk levels associated with dairy production will serve to limit the extent of this expansion. Nevertheless, emission modelling efforts should include a rational increase in the herd size in areas targeted by the project. The likelihood of additional emissions being caused by the SHMDP through the conversion of bush to managed pasture land is low, but should be monitored through technical programme of the advisory service providers.

III. ENVIRONMENTAL AND SOCIAL CATEGORY (B)

Environmental degradation, pollution risks associated with the intensification of the dairy production and lack of appropriate waste management are important issues to be considered. Hence, the project will adopt a climate smart dairy production intensification approach that involves enhancing animal feeding practices, improving energy use efficiency along the dairy value chain as well as manure and waste management. Improving pasture productivity and quality, by enhancing the composition of forage varieties, conservation and better pasture management coupled with low carbon source of energy for chopping and milling forage systems, cooling and dairy processing plant are important means to improve food security, adapt to climate change and reduces both direct and indirect GHG emissions

The Environmental and Social category is B, considering that the potential negative impacts of SHMDP are: (i) increasing pressure on natural resources, (ii) subsequent increased land degradation and loss of biodiversity, (iii) increase pollution of surface and groundwater; (iv) increased risk of contamination. In order to reduce the impacts associated with the intensification of dairy production, SHMDP will ensure that climate smart practices and technologies (e.g. solar energy, biogas technologies, water supply and storage, and waste management) will be widely promoted along with improved management of natural resources and dairy cattle herds which will contribute to mitigating and adapting to environmental risks.

IV. CLIMATE RISK CATEGORY (MODERATE)

Dairy farming is perceived as both contributor to and victim of climate change; on the one hand, the sector may contribute to greenhouse gas emissions (associated with land management, dairy cows themselves, processing and transportation); while on the other hand, dairy farming is highly vulnerable to climate change and variability, mainly through increased temperatures and alterations in rainfall patterns. These factors influence feed and water availability, as well as animal health and breeding, and consequently milk production and quality. The climate risk classification is moderate. The project outputs and outcomes will be impacted by climate variability and change. However,

adaptation and mitigation measures will be integrated along the whole dairy value chain so as to build community resilience.

V. RECOMMENDED FEATURES OF PROJECT DESIGN AND IMPLEMENTATION

Overall, a special focus will be given to the management of natural resources (e.g. water, forage and fodder, agro-forestry and intercropping techniques) and to labour saving and energy efficient technologies along the dairy value chain. In particular, the project will build synergies with the two IFAD-funded Agriculture for Research for Development grants; the first grant recipient ILRI will assess incentive-based interventions for reducing the impact of livestock in East Africa, and the second grant recipient CIAT will focus its research on climate smart dairy systems in East Africa through improved forages and feeding strategies. These researches will fill gaps and facilitate implementation of good practices and the promotion of adequate technologies for each agro-ecological zone.

Mitigation measures

Mitigation related activities will include pasture land management, promotion of agroforestry for increasing soil carbon sequestration and reducing soil erosion as well as manure and wastewater and solid waste management to decrease water and soil pollution. Hence, climate risk management will be integrated along the dairy value chain so as to contribute to SAGCOT Framework for Agricultural Green Growth and Agriculture Climate Resilience Plan (2014-2019). A climate-smart livestock approach acknowledges the environmental impacts of the livestock sector and encourages intrinsic adaptation and mitigation potential. Indeed livestock is an important provider of human nutrients as well as manure for crop production and soil fertility restoration. Therefore, dairy livestock is essential for restoring soil nutrient through the use of organic manure that reduces or eliminates the need of chemical fertilizers, which are expensive and contribute to GHG emissions. To mitigate the negative impact of the livestock development sector, there are affordable and efficient treatments of manure. The level of nutrients can be increased through composting manure and crop residuals. However, it requires good management practices so as to reduce loss of nutrients into the atmosphere through evaporation or erosion during rainy season. Cow sheds and houses must have concrete floors to facilitate the collection of manure and urine commonly used as organic fertilizer and/or feed for a biogas digester.

For example, applying manure in the root zone below the ground surface enable reduction of evaporation as well as vaporization process, thus allowing a persistent release of required nutrients during the entire period of the crop growth. Through L-FFS, the project will propose training modules on the best options to handle and use manure and bio-slurry produced by bio-digesters so as to enhance soil fertility and restoration.

Promotion of biogas systems

Livestock waste is more than a potential source of nutrients for soil fertility improvement; the urine, dung, waste feed and bedding can be used as a feedstock for the generation of biogas – methane that can be used for cooking and lighting smallholder households in rural areas, especially in areas off grid. There are several types of biogas systems: (i) float-drum type (Indian digester); (ii) fixed dome type (Chinese digester) and (iii) tubular rigid and flexible plastic types. The choice of a specific model depends on the use, initial investment capital, volumes of animal dungs and site size for installing such system. The float-drum and tubular plastic types are easily installed at lower cost and with less labour but present a shorter life-span. The fixed domes require a higher initial investment capital, demands a high level and technical capacity for construction and labour , but if well-made have a bigger capacity and longer life span Although often cheaper and easier to install the float drum and tubular biogas systems are more sensitive to low night temperature than concrete dome systems**.** The project will facilite access to biogas systems (fixed domes and plastic tubular) along with good manure and bio-slurry management in synergy with existing initiatives in the region (e.g. SNV Tanzania Domestic Biogas Programme or SIMGAS financial scheme),

Multi-benefit approaches

Adaptation measures will encompass, for instance: promotion of a diversified range of flood and drought tolerant forage varieties; sensitization campaign for good water and soil management such as rooftop rainwater harvesting facilities and equipment; and use of organic fertilizer and efficient use of available grazing and cropping land. The project will advocate and facilitate support to access finance for climate resilient facilities and technologies along the dairy value chain.

While promoting the zero grazing model, the project must acknowledge the sensitivity of improved dairy cattle to heat stress and increased humidity and therefore promote covered cowshed models which are well ventilated and water access and availability on both farm and grazing lands. .

Thus other technologies (rainwater harvesting facilities, wells, boreholes, ,etc…) would be promoted and financial support will be provided at household level, milk collection points, MCCs and processing units so as to ensure enough water for livestock as well as for hygiene and sanitation purpose (see Attachment 4 and further details in Appendix 13 on dairy infrastructures and water).

The better integration of livestock and crop production associated with adoption of renewable energy at farm and processing level will be conducive to livelihood diversification and increased incomes.

Incentives for good practices

SHMDP will embody both adaptation and mitigation measures and encourage locally based solutions and easy and affordable technologies and facilities.

The design mission identified important linkages between the land tenure arrangements and the availability of pasture. In a context characterized by limited land access and weak land governance, the intensification of dairy production and the consequent demand for pasture and other natural inputs, are likely to pose constraints to the implementation of project activities and have the potential to further increase the pressure on land and natural resources.

Identifying and securing communal grazing lands and ensuring land availability for the very poor, women and youth and for community fodder production in more arable highland areas, is an important issue that should be addressed to ensure the sustainability of the initiative. Moreover, village land-use planning, the registration of land and the issuing of Certificate of Customary Right of Occupancy (CCROs), including for communal grazing lands, can provide an enabling environment for farmers to invest in more intensive commercial production and improve their ability to access credit and other financial services. This is particularly important as production and dairy cattle numbers increase so will competition for the land. In selected villages, the project will directly support district and village authorities to elaborate Village Land Use Plan (VLUP). The VLUP will be particularly helpful to provide an enabling environment for the implementation of two pilots: i) identify, secure and improved communal grazing lands and; ii) communal cowsheds for youth (see Attachment 2 to Annex 4).

In order to ensure the sustainability of the investment, the programme could address land tenure security and climate change resilience through cross-cutting activities aimed to strengthen, where relevant, land governance, tenure security and efficient natural resource management. In particular, the following interventions will be considered as part of the targeting strategy:

In identifying districts that are ready to engage with the SHMDP, the project could assess the extent to which the District has or is supporting: (i) district and village land-use planning that includes the identification of suitable grazing land or land for fodder production; and (ii) the registration of land and the issuing of CCROs, including where relevant, for communal grazing lands.

In identifying target groups, the project could consider the extent to which access to land and tenure security are issues of concern, in particular for the very poor, women and youth who may wish to get involved in dairy production and the extent to which these can be accommodated in village land- use plans.

Where possible, the project will build synergies with initiatives on land use planning and land registration supported by other development partners, including NGOs. On this topic, USAID will be supporting land registration pilots in Iringa, possibly Njombe and parts of Mbeya while CARE and

OXFAM have provided support for land registration, civic education and land use planning in Iringa and Mbeya. All three organizations have strong connections with the IFAD country office and have indicated their interests to collaborate with IFAD on land governance issues. Various efforts are underway to better map the support being provided for land governance, including under ILC's National Engagement Strategy for the country (Large Grant "Fostering Land Governance"), which could be instrumental to help strengthen synergies.

As part of the targeting strategy, the project should integrate land tenure issues in the Gender Action Learning System (GALS) both at household and cooperative levels. This will promote not only equitable access to land but also inclusive decision-making on the use of individual and communal land.

Participatory processes

The Livestock Farmers Field Schools will provide opportunities for testing new technologies through demonstrations plots and as a platform for knowledge sharing amongst dairy farmers. The L-FFS modules will include a participatory resource mapping exercise so as to have a better understanding of location, availability and social dynamics associated with natural resources (water bodies and water supply systems, grazing land, forage, fodder, etc.). This will be a starting point for providing modules that are tailored to the existing conditions and to the household's skills and responsibilities.

VI. MONITORING AND EVALUATION

Climate risk management is a cross cutting issue as climate risks are observed at each dairy value chain node. In addition, if the intensification of dairy production is not well managed, it could lead to environmental degradation such as loss of biodiversity and scarcity of natural resources. Therefore, the project must continuously assess the constraints that affect the dairy production intensification and tackle them accordingly in project implementation. At baseline stage and throughout project implementation, the M&E team in collaboration with L-FFS groups and district staff, must ensure that all activities are :

- Identifying factors that guarantee a resilient household and on that basis fine-tune project climate-smart approach and priority investments and interventions (to be developed at baseline)
- facilitating adaptation through synergies with existing or planned initiatives
- combining mitigation (reductions in greenhouse gas emissions), adaptation and biodiversity conservation, especially in the rangelands
- Participatory screening processes for assessing local knowledge, practices, available resources and distribution of responsibilities and available services according to each agro-ecological zones as well as impact of weather patterns.
- delivering additional development benefits, and/or
- exploiting potentially beneficial changes in climatic or environmental conditions
- developing localized solutions (e.g. drought or flood tolerant forage varieties, etc.) and using available materials and technologies
- exploiting opportunities for climate change financing and/or carbon markets
- ensuring that project activities are not leading to maladaptation
- cost-effectiveness of the proposed measures/activities/ promoted technologies

VII. INSTITUTIONAL ANALYSIS

Institutional framework

This project will significantly contribute to both the **Tanzania Agriculture Climate Resilience Plan** (2014-2019) the **Intended Nationally Determined Contributions** (INDCs) and the **Renewable Energy Strategy** (2014). In alignment with these policies and strategies, the SHMDP will adopt and

promote when necessary: (i) agricultural, water and land management, focusing especially on catchment and water management best practices; (ii) accelerating the uptake of climate–smart agricultural practices and incentives at district level; (iii) reducing impacts of climate related shocks and enhance measures to diversify livelihoods and community resilience; (iv) strengthening knowledge and institution capacity to tackle climate change; (v) enhancing the use of renewable energy potential by promoting energy efficiency and behaviour; and (vii) promoting waste and water reuse and recycling technologies, to name a few.

Within component 3 on policy support, the SHMDP must encourage the integration of climate and environmental considerations within the Livestock Sector Master and particularly in the support to develop a sub-sector Dairy Master Plan. Under the Sub-component 2.3: Development and dissemination of climate smart technical and institutional innovations, the project will strengthen collaboration between research centres (Universities and Tanzania Livestock Research Institute (TALIRI) under the Ministry of Agriculture, Livestock and Fisheries), the extension services, and the private sector, in order to enable technical innovations to be developed and disseminated at producers' level, and to enhance the participation of beneficiaries in research priority setting and testing of technologies on farm or communal lands..

Capacity building

The L-FFS framework under component 2 will provide opportunities to enhance communities resilience skills and knowledge through modules focused on promoting integrated crop and livestock techniques, improving manure management and composting techniques at household level, water and soil conservation techniques, conservation and diversification of animal feed (e.g. forage, fodder, agro-forestry and crop residues, etc.) as well as identification of labour-saving and energy efficient technologies along the dairy value chain. The L-FFS will encourage localized knowledge and technical sharing processes in which farmers will communicate and exchange know-how and tips to flourish crop and livestock productions. In addition, the district and extension staff will also benefit from training on climate risk management and improved dairy handling and practices.

VIII. FURTHER INFORMATION REQUIRED TO COMPLETE SCREENING, IF ANY

Ex-ACT Green Gases emissions Analysis (FAO tool) to be undertaken at project start-up and before implementation. Additional thematic areas to be explored through research and implementation process: :

- Benefits of both crop production and cattle production
- Sustainable strategies to manage land use given competition between diverse land uses and increased value of land (especially when water access will be provided)
- Sustainable strategies and infrastructures to manage water use to facilitate crop and animal production
- Assess appropriate solid and waste water management strategies and infrastructures at different levels of processing units
- Climate and agricultural calendar for each agro-ecological zone under project area and their associated farming and grazing systems.

Attachment 1: Annual average temperatures and precipitations in SHMDP targeted areas

Regions	Annual average low and high temperatures	Average annual precipitation
Mbeya	11.8-23.4 °C	955 mm
Iringa	13.5-24.7°C	661 mm
Njombe	10.6-22.1 °C	1140 mm
Ruvuma	15.7-26.5 °C	1157 mm
Songwe	18.3-22.8 °C	1577 mm

Source: Tanzania Meteorological Agency

Attachment 2: Table on Potential water management challenges and solutions along the dairy value chain

Stage of the dairy value chain	Bottleneck in the dairy value chain	Potential solutions / technologies	Practices/uses
At farm level	Insufficient access to water resources/ long distances to water points/ No access to national water network. Unsustainable energy sources for heating water	Water tanks and/or cisterns linked to rooftop gutters so as to capture rainwater Water heating facilities	Livestock watering Hygiene Domestic use
MCCs/ collections centres	Insufficient access to water resources/ insufficient access to national water network/ lack of water quality Unsustainable energy sources for heating water	Water tanks/ cisterns Calculation of rooftop runoff water Installation/ Construction of Ferro-cement water tanks and rooftop rainwater harvesting equipment coupled with filters such as sand bed filter, popup filter or stabilization tank. Water heating facilities	Cleaning equipment/ Hygiene
Processing plant level	Insufficient access to water sources/ national water network High consumer of water for processing cheese, sour milk and yoghurt	Water tanks Calculation of rooftop runoff water Installation/ Construction of Ferro-cement water tanks and rooftop rainwater harvesting equipment coupled with filters such as sand bed filter, popup filter or stabilization tank Water heating and sterilization facilities	Processing milk into dairy products Purification of water Cleaning and sanitation

Attachment 3: Potential energy use efficiency solutions along the dairy value chain

Stage of the dairy value chain	Bottleneck in the dairy value chain	Potential solutions / technologies	Practices/uses
At farm level	No access to electrical grids Firewood collections for domestic purposes which increase women workload and prevent the development of income generating activities Limited access to technology Insufficient capital Lack of information	Small size float drum biogas system or tubular plastic biogas system	Heating water for milking/ cleaning bucket milking equipment Cooking at household level
MCCs/ collections centres	No or low access to electrical grid Large volume of animal dungs, in the presence of a cowshed Low access to credits No heating system for cleaning milking storage and chilling equipment Insufficient use of milk processing equipment Lack of information	Medium or large float drum biogas system or tubular plastic biogas system Fixed-dome biogas system	Water heating for cleaning and sterilize milk storage and chilling equipment Small scale milk processing equipment
Processing plant level	Low or disturbed access to electrical grid Limited access to adequate technology Low access to credit Lack of information	Fixed-dome biogas system Large scale float-drum biogas system or tubular plastic biogas system	Water heating and sterilization equipment Medium to large scale milk processing equipment

Attachment 4: Training on environmental aspects for dairy development for MCC operators and others

Promotion of reliable and low cost renewable energy sources along the dairy value chain (both at processors and household levels)

Objectives are:

- to ensure the sustainable use of natural resources and to increase the share of renewable and recycled resources at the input side of the value chain,
- to maximize material and energy efficiency at each stage of the process, and
- to reduce negative environmental impacts as outputs at all points of the chain (waste management)

Solar water heaters in processing plants for cleaning equipment and facilities; simple water heaters can be easily manufactured locally; this will conduct to the reduction of firewood and concomitantly deforestation decrease.

Milk cooling facilities powered by biogas are potential solutions for collections points located in remote areas, far from electricity grid.

Moreover, biogas can coupled with a generator for better use of energy sources.

Charcoal evaporative cooling systems are easy to manufacture locally and provide a solution for the evening milk.

Solar and biogas energy sources could also be used for pasteurization, packaging, transport and refrigeration.

Improving waste management at dairy processing unit:

- *Milk handling:* Wastewater is mainly produced during cleaning operations. Especially when different types of product are produced in a specific production unit, clean-up operations between product changes are necessary. In developing countries, the main problem is pollution through spoilage of milk.
- *Cheese production:* Waste results mainly from the production of whey, wash water, curd particles etc. Cottage cheese curd for example is more fragile than rennet curd which is used for other types of cheese. Thus the whey and wash water from cottage cheese may contain appreciably more fine curd particles than that from other cheeses. The amount of fine particles in the wash water increases if mechanical washing processes are used. The main suspended solids mentioned in the literature are coagulated milk and fine particles of cheese curd.
- The dairy industry typically handles large volume of milk, and the major waste material from the processing is water. The water removed from milk can contain considerable amount of organic milk products and minerals. Hence the kind of waste of significant environmental concern arising from the operations of dairy processing is wastewater.
- Dairy processing wastewaters contain substantial quantities of organic matter, nitrogen and phosphorus. If excessive concentrations of these enter waterways, oxygen depletion and plant growth in the waterways may reach nuisance proportions. In addition, cleaning of plant results in caustic wastewater

The following recommended techniques can be used to prevent the contamination of the wastewater stream:

- Avoid milk, product, and by-product losses (e.g. from spills, leaks, excessive changeovers, and shut downs) through the adoption of good manufacturing procedures and facility maintenance;
- Separate and collect product waste, including rinse waters and by-products, to facilitate recycling or further processing for subsequent use, sale, or disposal (e.g. whey and casein);
- Install grids to reduce or avoid the introduction of solid materials into the wastewater drainage system;
- Process and foul drains should be separate in process areas and should discharge directly to a treatment plant and/or municipal sewerage system;
- Pipes and tanks should be self-draining, with appropriate procedures for product discharge prior to, or integral with, cleaning procedures;

- Subject to sanitary requirements, recycle process water, including condensate from evaporation processes, for preheating and heat-recovery systems for heating and cooling processes, to minimize water and energy consumption;

Adopt best-practice methods for facility cleaning, which may involve manual or automated Clean In Place (CIP) systems, using approved chemicals and/or detergents with minimal environmental impact and compatibility with subsequent wastewater treatment processes.

Appendix 13: Rural infrastructure systems for dairy development

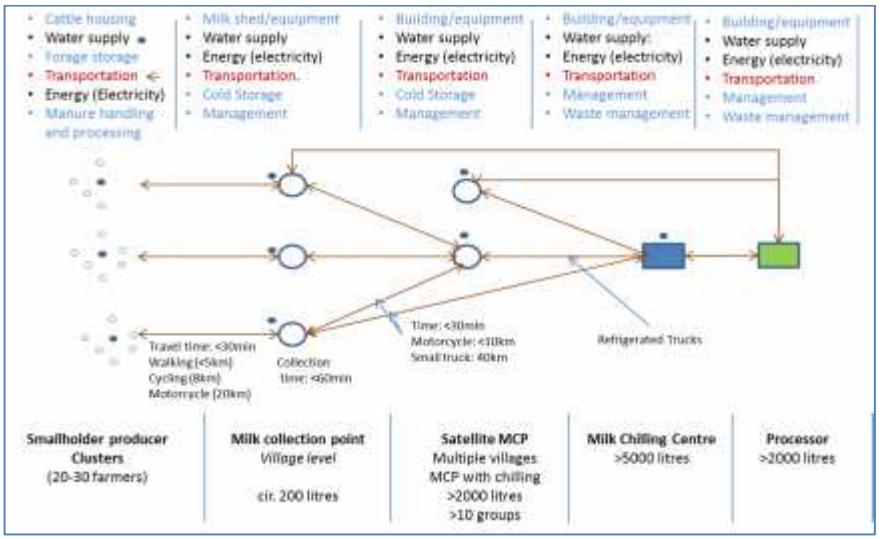
Introduction

1. There is no consistent definition of infrastructure across sectors. In this Appendix infrastructure refers to the physical links and nodes of networks organised in interrelated systems designed to give a service that addresses economic and social needs. They are built, operated, maintained and decommissioned. The infrastructure systems rely on non-physical services for its functionality. Rural infrastructure facilitates the inbound and outbound supply chains for goods and services in rural areas.

2. Rural infrastructure covers all aspects of social and economic life. Infrastructure is in the following sectors: water supply and sanitation, transport energy (mainly a responsibility of the public sector) and post-harvest storage and processing facilities (mainly a responsibility of the private sector). Some examples of rural infrastructure services are listed in Attachment 1.

3. The infrastructure that is of importance in a dairy value chain includes animal housing, water supply, energy, transportation, storage and processing facilities (see Figure 1). The requirements will differ across the chain, but absence of the necessary infrastructure at any level will make the value chain inefficient.

Figure 1. Simplified infrastructure system for milk collection



Benefits of investing in rural infrastructure in the SHMDP

4. Benefits include the following:

5. ***Potential to reduce post-harvest losses of milk[1]:*** A three country study in East Africa, undertaken by FAO (2003), shows that post-harvest milk losses in Kenya, Uganda and Tanzania add up to about US$56 million a year.

6. In Tanzania, the study found that cumulative losses are about 59 million litres each year (valued at US$14 million). Overall about 16% of milk production is lost in the dry season and 25% during the wet season.

7. In Kenya, the loses reach about 95 million litres (valued at US$ 22 million). In Uganda the losses are estimated to be about 27% (US$23 million), with about over half lost due to spoilage of spillage at the farm level or during transporting and marketing. A study in Kenya (2010)[2] indicated a

[1] http://www.fao.org/ag/ags/post-harvest-management/milk-dairy/milk-and-dairy-products-post-harvest-losses-and-food-safety-in-sub-saharan-africa-and-the-near-east-pfl/en/
[2] Ministry of Livestock Development, 2010; Rural Infrastructure Study. Smallholder Dairy Commercialisation Programme, Kenya.

reduction in post-harvest and processing milk and dairy products losses, still reported losses as high as 18%. The main cause of the losses was identified as poor rural infrastructure.

8. In all these cases, the main cause of the losses is due to milk and dairy products failing to reach the market on time. Whilst this study is somewhat outdated, it does seem possible that in Tanzania the situation may have improved since the study was undertaken. Rural infrastructure and the sector are still to be developed.

9. ***Potential to extend dairy value chain and its benefits to remote rural areas*****:** Currently, in Tanzania, the milk collection radius from milk chilling centre is about 40km, which is about 2hrs milking to chilling time. As the milk collection centres are mostly in urban areas, intensive milk production has been confined to urban and peri-urban areas only. Surplus milk (after home consumption and local sales) produced further than 40km from urban centres is lost due to poor infrastructure to bring it to areas of high demand. Investing in infrastructure will help communities make money from the milk as well as increase milk supply to urban areas.

10. ***Reduce the labour required in fetching water for dairy cows*****:** Water is a key component in the nutrition of dairy cows and a key determinant of productivity. In Mbinga, one farmer indicated that he stays with his two sisters who are responsible for ensuring that his two dairy cows have water all the time. The sisters make seven trips a day to fetch water from a tap 800m away to water the cows. In addition, they make three more trips to fetch water for the family. The farmer is planning to build his herd to at least five production cows. It is clear that the farmer will need to invest in bringing water to the homestead or invest in a water bowser services.

11. ***Increased quality of milk, to enhance incomes and reduce health threats:*** The improvement of transportation and energy services leads to improved quality of milk.

Status of rural infrastructure in Tanzania

12. The main development corridors in Tanzania are along the main transport corridors of: (i) from Dar es Salaam to Dodoma and Northwest to Mwanza, and connecting to Uganda and Kenya in the North; (ii) from Dar es Salaam to Mbeya and onwards to Zambia; (iii) from Dar es Salaam to areas around Kilimanjaro; and (iv) from Mwanza to Kigoma. Infrastructure along these routes is well developed, with the rest of the country largely sparsely populated and under developed infrastructure.

13. The main infrastructure services in rural areas supported by government are roads, water supply, energy and telecommunications. It is widely recognized that rural infrastructure is perhaps the biggest hurdle of all for the development of rural areas in Tanzania. In general, main road are good, but in the rural areas, the roads become narrow, turn to mud or disappear altogether and there is low coverage of the electricity grid or water supply networks. This leads to high post-harvest losses of surplus production due to lack of transport links and refrigeration of produce and inability to timeously ship to markets. The Tanzania Central Bank governor[3] is quoted indicating that rural infrastructure has always been a problem, such that when productivity has improved, produce from smallholder farmers is thrown away.

14. ***Rural roads*****:** The road network in Tanzania currently comprises 86,472 km of roads in the formal inventory of which 12,786 km are categorised as trunk roads, 21,105 km as regional roads and the remaining 52,581 km as district, urban and feeder roads (local roads). The trunk and regional roads are under the responsibility of the Tanzania National Roads Agenc which is a semiautonomous agency under the Ministry of Works. The district, urban and feeder roads are the responsibility of local government authorities (LGAs) who are under the oversight of the Prime Minister's Office Regional Administration and Local Government (AfDB 2013). The trunk and regional roads carry the bulk of the traffic in the country but the local roads play an important economic and social role in rural areas by efficiently linking producers to markets.

15. The development of local roads is urgently needed in rural areas where poor access to rural towns and villages prevents rural populations from participating in and benefiting from a range of government programs designed to benefit rural populations and poverty groups (AfDB 2013)

16. ***The traffic level on the unpaved road network*****:** about a third of the network carry an annual average daily traffic (AADT) of less than 50 vehicles and the rest less than 100 vehicles. During the rainy season, the unpaved roads are mostly impassable due to poor drainage, broken or missing

[3] Pilling, D. 2016; Tanzania's farming blighted by lack of modern infrastructure. Financial Times http://www.ft.com/cms/s/0/0280eb8e-41ca-11e6-9b66-0712b3873ae1.html#axzz4HtJ7u6Ec. Accessed 20/08/16

structures, slippery surfaces. However, the country has made great strides in reforming the road sector, with the establishment of the Road Fund to finance road maintenance, including for local roads.

17. ***Water supply:*** About 51% of the rural population are estimated to have access to water supply by June 2014 from boreholes and water points. The sustainability of rural water supply schemes remain a major problem[4] due to lack of maintenance.

18. ***Electricity:*** Tanzania's power sector is characterized by exceptionally low power consumption, limited electrification and poor reliability of supply. About 36% of households in Tanzania have access to electricity (EWURA 2016). The government plans to increase access to electricity to 30% by 2015/16, 50% by 2020 and 75% by 2035. In this pursuit, the government has strengthened the Rural Energy Agency and has an operational Rural Energy Fund to facilitate implementation of projects, and by 2014 the connectivity in rural areas of the mainland was reported at 17% in 2014[5] (REA 2014). Grid connection priority is given to settlements which are generally within 10km of the main grid and having at least 500 inhabitants. Off-grid electrification is recommended for settlements that are too far from the main grid. Off-grid technologies under consideration are solar (as distributed technology), small hydro plants and small biomass fueled plants.

Infrastructure and technology investments

Farm level infrastructure and technology

19. ***Housing requirements for breeding cows:*** In cases where intensive dairy farming using improved breeds of cows is practiced, the farmer will require to build a cow shed that protects the cows from the elements. The cowshed is constructed from locally available material, and consists of the following key parts: feeding and resting area that are covered and a calf pen. The resting area and the calf pen should be well drained, ventilated and bedded. The floor of the animal housing should be easy to clean (e.g. concrete floor).

20. ***Water requirements*****:** Water is very important for dairy animals and lack of it will significantly affect production. Adequate, good quality water must be provided at all times. The quantity of water required depends on the following factors: target production, dry matter content of the feed, stage of lactation and the ambient temperature. The higher these factors, the more the water is required.

21. Water can be obtained from feed and/or drinking. Lactating cows need larger proportions of water relative to body weight than most livestock species since 87% of milk is water. Cows will drink more water if it is availed at all times. Dairy cows suffer from a limited intake of water more quickly and severely than from a deficiency of any other dietary nutrient[6]. Lack of water has a big effect on feed intake (especially if the feed is low in moisture) and thus on milk yield.

22. The Kenyan Dairy farmer training manual recommends providing a minimum of 60l/day for improved breeds, and encourages provision of more water for increased milk yield. This recommendation can be taken to be low for yield targets of milk above 10litres per day. The Botswana Dairy farming handbook recommends that "water should always be available". It is estimated that in the Southern Highlands of Tanzania, a lactating cow feeding on feed with mostly dry hay (85%), will need at least 75litres per day of water.

23. Dry cows may require about 50-60 l/day and calves and heifers about 40l/day[7]. With a herd composition of 3 lactating cows, 1 dry cows and 2 calves or heifers, a dairy farmer will need to have supply minimum of about 360l/day for the animals for optimal production. An additional 10% of this amount is required as potable water for hygiene purposes such as preparation before milking, cleaning the milking area and utensils.

24. In addition to this water required by the animals, the farmer will need to have access to about 25-30litres per person in the household. Hence, the water requirements for a dairy farming household can be significant, requiring specific investments to facilitate access to water, to ensure optimal production and reduce the burden on women to fetch the water.

[4] The water sector report 2014, Ministry of Water.
[5] REA Annual Report for the Financial Year ended 30th June 2014
[6] Dairy farmer's training manual, Kenya Ministry of Livestock Development, 2012
[7] Verbal communication with dairy production specialist, Alban Bellinguez

25. The piped network systems supplying water to villages are designed for livestock water supply as well. The water supply engineer for Mbinga, indicated that the designs of village water supply systems provide for 25l/d/person for human domestic use and 25l/d/animal for livestock. This water allowance will not be adequate for a zero grazed dairy cow.

26. Water may also be required, in highly intensive dairy systems, for forage production for irrigation of pastures and production of nutritious forage. It is not envisaged that the smallholder farmer with up to 5 cows will invest in irrigated pastures.

Milk collection and transportation infrastructure and technology

27. ***Milk and dairy products cooling*****:** Since milk is highly perishable it is recommended that it should be cooled as soon as possible after milking, to drop the temperature to around 4oC. Cooling milk slows down the growth and activity of bacteria and hence prevents spoilage. This will require chilling facilities that use electricity. In most areas, electricity is not available or is very unreliable.

28. Smallholder farmers having difficulty in selling milk from the evening milking because of lack of cooling facilities to be able to deliver the milk to a chilling centre the following morning. The evening milk is normally used for own consumption and processed to be sold to the local market as fermented milk. However, some farmers preserve the night milk by boiling, then mix with the morning milk to sell to the market.

29. In the absence of electricity, milk can be cooled through: (i) Keeping the milk can under a shade; (ii) Dipping the containers milk in a cold water bath, flowing stream of cooling tank; (iii) Using a charcoal cooler, but in all the cases the milk should be delivered to a chilling facility with 1-2hrs of milking.

30. Milking cooling is absolutely essential along the dairy value chain. Once milk is processed, it needs to be chilled to post processing avoid losses. Milk collection and distribution centres should be located where electricity is available, and provision is made for a back-up generator. Alternatively, distributed energy generation should be considered whenever feasible.

31. In Europe, there are milk chilling tanks starting from as small as 50litres, costing around €1,600. There is a need to study the effectiveness of these small chilling tanks and determine the best size to be used at an MCP. In addition, these small chilling tanks can be used from solar energy, thus giving an opportunity to better preserve the milk.

32. A recent FAO study (2016), has described nine options for assisting different scenarios of sites for milk collection centres. The nine milk cooling and storage options are: Option 1: direct expansion refrigerated milk-cooling tank; Option 2: direct expansion milk cooling tank with precooling using mains or well water; Option 3: bulk milk cooling tank with precooling using mains or well water followed by instant cooling using ice water from an ice builder unit; Option 4: integrated ice bank milk cooling tank; Option 5: integrated ice bank milk cooling tank with precooling using mains or well water; Option 6: precooling of milk using precooled mains water from an integrated ice bank milk cooling tank; Option 7: ice bank milk cooling tank with precooling using mains or well water followed by instant cooling using ice water from an integrated ice bank; Option 8: instant milk cooling using a PHE and an ice bank tank; and Option 9: containerized MCC. Each of these options can be run from electricity from the grid or from distributed technologies.

33. ***Transport services*****:** Milk is mainly produced by small-scale farmers scattered in rural areas or around cities and towns, milk collection involves significant transaction costs. Collectors have to visit many farms and from each of them they collect a small volume of milk. This entail relatively high operational costs for milk collection centres or industrial buyers and it negatively affects the quality of the milk due to the time spent between the milk harvest and the reception of the milk in a cooling tank.

34. In Tanzania, the high transaction costs, and lack of chilling facilities in rural areas, have limited the collection of milk to a radius of about 40km from a chilling centre. The milk is brought to a collection point by foot, bicycle of motorcycle. The collection point has no chilling facilities, hence the milk has to be transferred to a chilling centre within an hour of receipt. Since the chilling facilities are located where there is electricity, mostly urban areas, the 40km radius restrict milk production to urban and peri-urban areas. Smallholder milk producers in the rural hinterland do not effectively participate in marketing milk beyond their local areas.

35. Investing in rural transport services will facilitate the quick movement of milk from smallholder producers, with no access to chilling facilities, to a chilling facility in an urban area.

36. Investments in transport service should consider all forms of rural transport including: non-motorised traffic (bicycles, animal drawn carts) and pedestrian traffic. This will identify tracks and paths that may need to be improved to facilitate access to milk producing and consumption areas.

37. ***Infrastructure gap*:** The Sothern Highlands presents an infrastructure gap that may limit the development of the dairy value chain. The main infrastructure gaps are in the availability of water and electricity in the rural areas of the Southern Highlands, that has limited the expansion of milk production to beyond peri-urban areas. A summary of the infrastructure available in key milk producing villages in Mbinga illustrates the current situation (see Table 1). Water supply systems have been installed in 52% of the districts. Electricity installations are implemented by the Rural Electrification Agency, prioritising villages within 10km of an existing grid line.

Table 1. Qualitative indication of status of rural infrastructure in Mbinga Rural[8]

District	Village	Availability of potable water	All weather access roads	Availability of electricity
Minga Rural	Mbuji	No	Yes, but difficulty access in rain season	No, but work in progress
	Mikalanga	Yes	Yes, but difficulty access in rain season	No, but work in progress
	Mukumbi	No	Yes, but difficulty access in rain season	No, but work in progress
Mbinga Urban	Kihungu	Yes	Yes	No
	Likafara	No	Yes	Yes
	Miyangayanga	Partly, needs rehabilitation	Yes	Yes
	Tanga	Partly, needs rehabilitation	Yes	Yes

Proposed approach

38. Milk is a highly perishable product and requires cooling within 2 - 3 hours after milking the cow[9]. SHMDP investments in infrastructure should aim at improving (i) transport service in the wet season, to allow all season access to and from milk collection points and centres; and (ii) water supply to milk collection points, centres and availability of energy for cooling and other operations.

39. One criteria for the selection of placement of satellite MCPs and MCCs is the availability of water, electricity and all weather access throughout the year. In cases where there is substantial production or potential for increased production, the project will assess the available infrastructure and determine the feasibility to upgrade. To facilitate the siting of the MCPs and MCCs a condition assessment survey of key infrastructure (roads, electricity and water supply) ill will be carried out.

40. All infrastructure development should be preceded by feasibility studies that clearly identify the costs and benefits of the proposed infrastructure, including a baseline survey of key indicators.

41. ***Improved access roads to milk collection points and centres*:** Selected roads will be surveyed to determine if the investment should be for basic access or full upgrade. Basic access investments will be done for roads that are not passable during the wet season due to spot areas that may require improvement, such as no or broken culverts (in some cases, no or broken small bridges), parts of the carriageway that have poor quality soil that causes the road to be slippery or muddy. Full upgrade investments will be done where the road already has high traffic volumes or is anticipated to have heavy trucks using it. Full upgrade will entail rehabilitating the road to a full engineering

[8] Source: Verbal communication with the district water supply engineers and officials from the district engineer's office (July 2016)

[9] Warm fresh milk should preferably be cooled immediately after milking to preserve quality and prevent spoilage. Cooling to 10 oC within 2 hours of milking and 4 oC within 3 – 4 hours is essential (FAO and WHO, 2011)

designed gravel road with average carriage way width of 4.5m and 0.5m shoulders either side and gravel thickness between 120mm-150mm. Since the exact locations are still to be defined, a provision has been made to improve 10km of access roads in each targeted village at an average cost of US$20,000 per km[10]. The number of roads per district will depend on the general condition of roads in the district and the number of MCP/MCC sites.

42. To ensure sustainability of the investments, the local government authorities should have made an undertaking to maintain the road and adequately participate in the selection, design and construction of the roads.

43. ***Improved access to water for production, milk collection points and centres:*** The programme should work closely with district authorities to have government invest in water supply to target villages. Initially, priority for selection should be given to villages that already have a reliable water source within about 500m of the farm. In cases where there are high priority villages with no water source, the programme will invest in a borehole or other source as identified for the area.

44. The location of MCPs and MCCs will prioritise location of sites where water supply is already available. Clusters located in rural areas, are unlikely to have water supply systems, hence the project will invest in identifying the most suitable source of water for the site. Whenever feasible, borehole water will be preferable to surface water. Assuming that 60% of the villages, where MCPs and MCCs will be located will not have any water supply, the project will invest in borehole within 500m of the MCP or MCC. The project will also serve the community. A provision of $20,000[11] per borehole has been budgeted for. In cases where the groundwater is not available or of poor quality, the project will work with the district council to assist the community to have water supply.

45. For sustainability of the investments, each village assisted with a water supply source will form a COWOS and undertake to maintain the infrastructure.

46. ***Electricity supply:*** Availability of electricity will be selection criteria for sites for MCPs/MCCs. The project will work closely with the community, district council and Rural Electrification Agency (REA) to prioritise villages and small towns with high potential of milk production. In addition, the project will work with the REA to develop/pilot cooling facilities powered from solar. The work done by FAO (2016) shows promise. Provision has been made to part finance the installation of solar powered chillers in selected locations.

[10] With a range of $12,000-$35,000 per km as determined from discussions with district road engineers and MIVARF engineer.
[11] We have assumed a borehole depth of 80-150m, 6” diameter (complete with gravel packing), casing, solar pump and tank. The cost may vary with location distance from an urban centre. Cost estimates were given by the Zonal irrigation engineer in Mbeya.

Attachment 1: Examples of rural infrastructure by sector and function

Sector	Function	Primary physical components	Responsible sector (public/private)
Water	Water storage	Dams	Public sector
		Tanks	Public
	Water abstraction and delivery	Pumping stations	Public
		Main and distribution pipelines	Public
		Weirs	Public
		Main and distribution canals	Public
		Control and monitoring points	Public
Sanitation	Production	Animal housing	Private
	Wastewater collection	Toilets	Public/Private
		Sewer pipelines	Public
		Storm water drains	Public
	Treatment and disposal	Septic tanks and soakaways	Public/Private
		Influent storage	Public
		Wastewater treatment facilities	Public/private
Transport	Road	Roads	Public
		Drainage crossings (bridges, culverts)	Public
	Waterway transport	Landings	Public/Private
Energy	Generation	Small and mini-hydro power plants	Public/private
		Distributed power plants (solar, biogas etc)	Public/private
		Back-up generators	Private
	Transmission and distribution	Power lines	Public
		Transformers	Public
		DC converters	Public/private
Post-harvest	Storage	Silos	Public/private
		Warehouses	Private
		Chilling facilities	Private
		Granaries	Private
	Processing	Abattoirs	Private
		Pack houses	Private
		Processing facilities	Processing
	Marketing	Marketing stalls	Private

Appendix 14: Strategy for facilitating specialized financial services to the dairy value chain

The Southern Highlands Milkshed Development Project (SHMDP) aims at contributing to the creation of an inclusive modern, competitive Tanzanian dairy sector, which delivers affordable, available and accessible safe dairy products to all Tanzanians and other consumers in the region. In addition, the SHMDP is also expected to improve livelihoods in rural areas, increase incomes of smallholder dairy farmers and other actors involved in the dairy value chain and enhance nutrition for members of smallholder dairy farming families. Hence, a majority of interventions in the project aim at addressing the issues/bottlenecks that hinder development of the dairy sector in Tanzania.

However, the interventions proposed in two of the major components of SHMDP viz., Component 1 (*Building efficient dairy value chains from producer to consumer***)** and Component 2 *(Increasing on-farm productivity),* would also result in a higher demand for financial services by different stakeholders/actors in the dairy value chain. This would be from the point of view of providing technical assistance/inputs, as also enhancing access to financial services such as savings, credit, insurance, etc. Some of the areas, which would require an intervention/support from the project, are the following:

- ***Technical assistance*** including inputs for (i) financial literacy/awareness creation about the financial services; (ii) preparation of business/enterprise development plans; (iii) potential mapping; (iv) preparation of banking plans; (v) product development; (v) facilitation for financial linkage; and (vi) review & monitoring of linkage efforts.
- ***Provision of financial services*** for funding various investments such as (i) purchase of cans, equipment, vehicles and construction/renovation of civil structures for creation of milk collection/chilling infrastructure (SMCCs and CMCCs); (ii) operating milk kiosks, dairy bars, restaurants and other outlets; (iii) purchase of animals by dairy farmers; (iv) construction of community cowsheds; (v) establishment of new AI Centers in the private sector (including liquid nitrogen distribution outlets); (vi) purchase of equipment, vehicle, dairy animals, etc., by the para-veterinarians for establishing their clinics/milk production units and acquisition of motorcycles by the public and private service providers (extensionists).

The project would strive to ensure that the above mentioned inputs / services are made available to the stakeholders/target groups of the project. It is in this context that a ***Strategy for facilitating specialized financial services to the dairy value chain*** (hereinafter referred to as the *strategy*) has been prepared. The strategy not only aims at addressing various constraints, which the actors/stakeholders in the project are likely to face, but also lays down a roadmap for ensuring a linkage between financial service providers and project target groups.

Before going into the details of the activities / interventions proposed in this strategy, an attempt has been made in the following section to capture some information about the financial sector in the country, which also has a bearing on this strategy.

Composition

The financial sector in Tanzania, especially with reference to the provision of savings and credit services, comprises a variety of institutions, both the formal and informal. Salient features of various financial institutions are given in the table below:

Sr. No.	Type	Remarks
A.	**Formal Sector**	
1.	Banks	
a	Commercial Banks	Licensed and supervised/regulated by Bank of Tanzania, the central bank
b	Cooperative/Community Banks	
c	Microfinance Banks	
2.	Development Finance Institutions	Licensed and supervised/regulated by Bank of Tanzania

3.	Savings and Credit Cooperative Societies (SACCOS)	Registered and supervised/regulated by the Registrar of Cooperatives/Tanzania Cooperative Development Commission
4.	Micro Finance Institutions (MFIs)	Registered under various statutes/regulations. Not subjected to effective supervision/ regulation
B.	**Informal Financial Intermediaries**	
1.	VICOBAs	No effective supervision/regulation
2.	Village Savings & Credit Associations (VSLAs)	
3.	Other Groups (Solidarity Groups, Church Groups, etc.)	

Outreach

As on 31 December 2015, there were 709 branches of 57 banks/licensed financial institutions in the Mainland Tanzania. It is interesting to note that 70% (497) of the branches are in 7 regions (out of 25), viz., Dar es salaam (37%), Arusha (7%), Mwanza (7%), Mbeya (6%), Morogoro (4%), Kilimanjaro (5%) and Dodoma (4%), and most of these are in the urban areas. Five regions in the Mainland have less than 10 branches each. In addition, banks also engage *agents* to expand their outreach and as on 31 December 2014, there were 1652 bank agents in the country. The total number of SACCOS in the country stood at 4 118 as on 30 April 2016, with a membership of close to 0.45 million.

As regards to the five regions in the Southern Highlands, it has 11% share of the number of branches in the Mainland Tanzania. Similarly, there are 562 SACCOS in Southern Highlands with a membership of 143 747. In addition, a few major un-licensed MFIs are operating in this zone. Details of the formal financial institutions present in the Southern Highlands are given in the following table:

Sr. No.	Type of Institution	Region			
		Iringa	**Mbeya/Songwe**	**Njombe**	**Ruvuma**
1	**Commercial Banks$**				
a.	Number	7	16	3	4
b.	Branches	11	41	8	10
2	**Microfinance Banks#**				
a.	Number	1	1	1	1
b.	Branches	1	1	1	1
3	**Community Banks@**		--		
a.	Number	1	--	1	1
b.	Branches**	1		1	1
3	SACCOS	149	140	187	86
4	**Unlicensed MFIs £**				
a.	Number	2	2	2	1
b.	Branches/Hubs	6	9	3	1

$: Includes major banks like CRDB, NMB, NBC, Postal, EXIM, Access, Akiba, TIB, Equity, CBA, etc.
#: FINCA Bank (Vision Fund Tanzania has plans to open branches in Iringa, Mbeya and Njombe)
@: MuCoBa Bank Plc., Njombe Community Bank and Mbinga Community Bank
**: Besides, all the three community banks also have *Service Centers* at major towns
£: BRAC Tanzania and CRDB Micro Finance Services Co. Ltd., both of which propose to set up around 06 branches and 10 Mini Service Centers (in addition to the present 04 Hubs), respectively, in the Southern Highlands,

Rural financial services

It is observed that Tanzania does not have effective rural finance architecture in terms of outreach, financial resources or the product offerings. There is hardly any financial institution's outlet below the district level (except SACCOS) and in many of the districts the financial services infrastructure is very poor. As a result, the financial services in rural areas are available in a very limited way from the formal sector. While the SACCOS provide most of the financial services, a few community/cooperative/microfinance banks and MFIs have also made forays in the rural areas. In addition, IFIs (VICOBAs, VSLAs, etc.) are also popular among the rural populace, but they have their own limitations in terms of providing a wide range of financial services to the rural poor.

As per the findings of the *Finscope Survey of 2013* (conducted by FSDT), less than 5% of the farmers in the country have access to the formal financial services. On the positive side, many of the banks are taking a close look at the potentials available in the agricultural sector and have plans to tap the same. Some of the banks, such as the NMB, have launched new initiatives for extending a variety of financial services for the agricultural sector. As a result, the share of agriculture, fisheries & forestry in the total loan portfolio of the banks, which stood at 8.98% as on 31 December 2014, increased to 11.10% as on 31 December 2015, thereby registering a growth of nearly 24%. SHMDP will build upon and leverage this renewed interest of the banks/MFIs in financing agricultural activities.

Rural finance initiatives under MIVARF

The Government of Tanzania (GoT), through the Prime Minister's Office (PMO), is implementing the Marketing Infrastructure, Value Addition and Rural Finance Support Programme (MIVARF), which is jointly funded by African Development Bank (AfDB), IFAD and the GoT. The Rural Finance Component (RFC) of MIVARF is supporting a variety of initiatives aimed at enhancing the access to financial services by the rural households (which were hitherto excluded from the formal financial system) and helping the policy makers in creating a suitable institutional framework for the orderly growth and supervision/regulation of the rural financial institutions/MFIs. Activities/initiatives of RFC of MIVARF can be summarised under the following broad categories:

Enhancing the access to financial services by the rural households – financial support to 10 community/cooperative/microfinance banks and 03 MFIs for undertaking suitable measures to bring at least 500,000 (being revised upwards) additional/incremental rural households in their ambit. The support covers various activities like infrastructure development (including expansion of physical outreach), adoption of appropriate technology (both software and hardware), increasing mobility of the staff (vehicles), training & capacity building of staff/other stakeholders and improving business operations (product development, etc.).

Support for the development of a suitable policy and institutional framework to the government, supervisory/regulatory and academic institutions/agencies, such as the Ministry of Finance (MoF), Tanzania Cooperative Development Commission, Cooperative Audit and Supervision Corporation, Bank of Tanzania, National Economic Empowerment Council, Moshi Cooperative University, etc., in creating a conducive environment for the orderly growth and supervision/regulation of the rural financial institutions/ MFIs in the country.

Creating synergies with other components of MIVARF viz., Value Addition (VA) and Producer Empowerment for Market Linkages (PEML) by engaging with financial partners (and non-partners too). The objective is to link VA and PEML groups with the financial intermediaries, with a view to enabling their members to access financial services and facilitating financing against Warehouse Receipts (WR) by the financial institutions.

Guarantee and innovations support – MIVARF is in a very advanced stage of rolling out two important facilities viz., the Covered Guarantee Scheme (CGS) and the Rural Innovation Fund (RIF). While the CGS would provide a mechanism to hedge the risks arising out of the agricultural lending to the banks, RIF would support various actors/ stakeholders (including individual entrepreneurs, financial intermediaries, commercial entities, technology solution providers, mobile network operators, academic/research institutions, etc.), for trying/validating innovations aimed at improving the access to and the delivery of financial services in rural areas, with a special focus on agricultural activities.

SHMDP will leverage the initiatives implemented and facilities created by MIVARF and will take suitable measures to ensure the same.

Following are some of the hypothesis/assumptions, which form the basis of this strategy:

- SHMDP is primarily a dairy sector development project and the institutional finance needs are incidental to the initiatives proposed to be undertaken in other components of the project;
- Most of the dairy farmers in the project are not used to taking loans for the purchase of dairy animals, taking up the activity on commercial lines and repaying the debt with interest;

- A substantial part of the individual/institutional investment would be met out of the project resources;
- A reasonable number of financial service providers/intermediaries are operating in the project area and no need is felt for creating new/ additional financial institutions;
- Most of the financial service providers do not offer suitable products for meeting the requirement of dairy farmers or other individual/institutional investors in the dairy value chain;
- Lending to agriculture is perceived to be a risky venture by most of the financial service providers, especially in the absence of suitable risk mitigation mechanisms (guarantees, insurance, etc.);
- A few financial service providers also face the challenges of capital, liquidity, technical expertise (staff competence and attitudes), etc.; and
- Provision of technical inputs on financial services is a highly skilled task and requires experienced and competent service providers.

The Strategy

As indicated earlier, the strategy will focus on two broad areas viz., the technical assistance and provision of financial services and would seek to address both demand side (prospective borrowers/beneficiaries) and supply side (financial service providers) issues. Various activities/interventions proposed under the strategy are listed in the table below:

Sr. No.	Area of intervention	Task/Activity	Target Group	Proposed Duration
A.	***Demand Side Interventions***			
1	Sensitisation/ awareness creation	Cluster-wise/district-wise programs/workshops on financial literacy and the principles of *development through credit*	i. Traditional/existing dairy farmers ii. Members of FOs iii. New dairy farmers (under the *Pilot* project)	01 Day
2	Training & capacity building	Cluster-wise/district-wise programs on enterprise development, preparation of business plans, linkage with financial institutions, etc.	i. Leaders of the FOs investing in milk collection/chilling infrastructure ii. Entrepreneurs setting up milk kiosks, dairy bars, restaurants and other outlets iii. Leaders of the existing dairy/ milk processing cooperatives desirous of expanding/ strengthening their operations iv. Veterinary doctors/ Para-veterinarians/ extensionists	03 to 05 Days
B.	***Supply Side interventions***			
1	Sensitisation/ awareness creation	Region-wise/district-wise programs/workshops on the potential for financing various activities under different components of the project	Staff of financial services providers	01 Day
2	Training/skill development	i. Region-wise/district-wise programs/workshops on the issues of governance, resource mobilisation, business operations, supervision/regulation, audit, etc.	Stakeholders of SACCOS willing to participate in the project	03 to 05 Days
		ii. Region-wise/district-wise programs/workshops on the financing of different segments of dairy sector value chain, including through new	Staff of financial services providers (separately for the banks/MFIs and SACCOS)	03 Days

		products and services, as also the risk mitigating options in agricultural lending, like guarantees, insurance, etc.		
3	Consultancies	i. For developing products and services for financing investments under various segments of dairy value chain, especially the credit products	--	03 to 04 Weeks
		ii. Potential mapping, preparation of a potential linked banking plan and formulation of templates for the model project profiles/ business plans	--	08 to 10 Weeks
4	Financial Linkage			
		i. Regional/district level meets for facilitating financing of enterprise/ business development plans of the project beneficiaries	Financial service providers and the project beneficiaries	01 or 02 Days
		ii. Follow-up meets/visits for financing agreed enterprise/ business development plans	Financial service providers and the officials of ZPIU	Half a day
		iii. Region-wise half-yearly meetings to review and monitor the progress in regard to financial linkage	Financial service providers and the officials of ZPIU	01 Day

Phasing of interventions

The proposed interventions will have to be initiated and implemented at different points of time during the currency of the project. Most of the interventions pertaining to the financial services inputs should be initiated after the project implementation has stabilized, preferably during the second year. However, the ZPMU will use its discretion to take a call on the timing of various activities, depending on the progress made in the implementation of other important activities under the project. As regards the activities/interventions proposed for the beneficiaries/stakeholders in the project, these should be provided after the FOs/groups of dairy farmers (proposed under the *Pilot* in component 2) have been formed, sensitised and start functioning as a coherent unit. This should be followed up with sensitising the staff of the financial services providers in the project area, about the potential for financing various activities under different components of the project.

Once the demand for enhanced financial services within the project is established, the process of recruiting consultants should be initiated for developing financial products and for undertaking the exercise of potential mapping, preparation banking plan and formulating/designing templates for the model project profiles/business plans. After the consultants have submitted the deliverables, the ZPMU should engage with the financial service providers on a regular basis, through the mechanisms indicated above, with a view to ensuring access to desired financial services by the stakeholders in the project.

Engagement with financial institutions

Although, the project is open to a partnership with any financial institution operating in the project area, it would shortlist a few of them, which are willing to participate in the project activities and have a fairly strong presence in the in Southern Highlands, for securing their active involvement in the project activities. In this regard, besides the active/profitable SACCOS in the project area, SHMDP would engage with the following financial institutions:

- Mbinga Community Bank, Mbinga
- Njombe Community Bank, Njombe
- MuCoBa Bank PLC, Mufindi
- CRDB Microfinance Services Co. Ltd./CRDB Bank
- NMB Bank
- Akiba Commercial Bank
- Access Bank
- EXIM Bank

In this context, the ZPMU will engage with the top management of the shortlisted institutions (CEOs/Agri-business Heads), both individually and on a collective basis. The individual meetings, which would be more of introductory in nature, would be held as soon after project is officially launched (and even before the commencement of project activities). During the course of these meetings, besides apprising the top management of the details of the project activities, especially from the financial services perspective, banks may also be requested to nominate a Nodal/Focal Officer for engaging/communicating with the project. Once the project finally takes off, the ZPMU would hold a joint meeting of the financial institutions and share with them the plans for future engagements (as indicated in table above). This will set the basis of a regular interaction between the project and the financial institutions.

Technical Service Providers

As indicated earlier, provision of technical inputs on financial services is a highly skilled task and requires experienced and competent service providers. While the project will involve government departments (Cooperative, Livestock, etc.) at the district level for the formation and sensitisation of FOs, capacity building inputs on financial services aspects would be provided with the help of service providers, who have the expertise and experience in this field. Details of a few entities, which are involved in the similar activities in Tanzania, are indicated in the following table:

Sr. No.	Name	Contact Details
1.	CRDB Micro Finance Services Ltd.	Mikocheni Industrial Area, P.O. Box 268 Dar es salaam. Gen Line: +255-22-2126241/2923000/1, Fax: +255-22-2126523/2923002 Email: microfinance@crdbmicrofinance.com microfinance@crdbbank.com Website: www.crdbmicrofinance.co.tz
2.	BRAC Tanzania Ltd.	Plot 2329 Block H, P.O. Box No. 105213, Mbezi Beach, Dar Es Salaam Tel:+255 22 264 7280 Email Address: bractanzania@gmail.com
3.	Private Agricultural Sector Support Trust (PASS)	Patel Building, 3rd Floor, Kisutu Street, P.O Box 9490 Dar Es Salaam Tel: +255 22 2110 394. Mob: +255 22 2110 395. Fax +255 22 2110 392 Email: pass@pass.ac.tz Website: www.pass.ac.tz
4.	Litenga Holding Ltd.	3rd Floor, Msasani Towers, Off Kimweri Road (Opposite CCBRT Hospital), Plot No. 503/01, Block G, P O Box 105124, Dar es Salaam, Tanzania Tel: +255 22 2923333, Fax: +255 22 2923332, E-mail: info@litengaholding.com Web: www.litengaholding.com

Implementation arrangements

The strategy also underscores the importance of continuous and active involvement of all the actors/stakeholders in the project, as also making available the desired technical expertise for their training, capacity building and skill development, for the successful implementation of the activities proposed. While the responsibility of implementing/coordinating most of the activities would primarily rest with the project management unit (particularly the *Agri-business Specialists*), some of the tasks will have to be accomplished with the help of independent consultants/subject matter specialists. Similarly, the emphasis will also be on the adoption of a consultative/collaborative approach and to leverage the local expertise available for implementing a few activities, which may require technical inputs not available in the project management unit.

Outputs and outcomes

The implementation of this sub-component is expected to result in the delivery of **outputs** such as (i) customised financial products and services for dairy value chain developed; (ii) staff of the financial institutions in the project area trained in dairy value chain financing; (iii) potential for flow of credit for various activities under the dairy value chain in the project area assessed; (iv) templates for individual business plans/model project profiles for different activities prepared; and (v) bankable plans formulated.

Similarly, the main **outcomes** from the implementation of this component would be (i) a financially literate and aware target group; (ii) a potential for private investments in dairy value chain created; and (iii) a rural financial services delivery mechanism, which is responsive to the needs of the dairy value chain in the project area, in place.

Challenges

The implementation of different activities/interventions proposed under this sub-component could face a few challenges/constraints. Some of these are listed below:

Sr. No.	Challenge/Constraint	Suggestions
1	Most of the dairy farmers in the project area are accustomed to receiving dairy animals free of cost under various projects/programs and could be averse to the idea of taking loans from the financial institutions for the undertaking dairy farming activities. This could adversely affect the implementation of banking plans.	The ZPMU and the service providers involved in the formation and sensitisation/training & capacity building of FOs/farmers will have to make special efforts to alter the mindset of the targeted group, both through theoretical inputs and the exposure visits to a few successful enterprises.
2	Even if a few actors/stakeholders in the project are willing to borrow from the financial institutions, they may feel constrained/discouraged from doing so, due to the unavailability of suitable products and services from these financial institutions.	It is in this context that the intervention for developing suitable financial products and services has been suggested. This should result in making available products which are not only developed on the accepted/prudent banking practices, but are also transparent, customer friendly and responsive to the needs of the targeted beneficiaries.
3	Reluctance of financial institutions to lend for dairy value chain due to lack of (i) outreach, (ii) suitable products, (iii) expertise/trained staff, (iv) resource crunch and (v) collaterals	While the project may not be able to take of the issues outreach, liquidity, etc., it can ensure provision of inputs for developing suitable products/services and the expertise at the level of financial institutions. Similarly, the project can address the issue pertaining to lack of collaterals by sensitising the prospective beneficiaries about the importance of obtaining

		land certificates, in particular the Certificates of Customary Rights of Occupancy (CCROs) and the general land titles. Simultaneously, it can facilitate linking financial institutions to other risk mitigating mechanisms like guarantees, insurance, etc.
4	Interventions suggested earlier may result in raising the aspirations of all the stakeholders, both on demand and supply side. However, lack of availability of adequate number of good quality dairy animals, as also the collection/chilling and animal healthcare infrastructure, could adversely impact the outcomes the proposed interventions.	In this context, it would be necessary that suitable arrangements/tie-ups are made with private suppliers/other projects, to ensure timely and adequate supply of dairy animals and priority would have to be accorded to those beneficiaries, who avail loans from financial institutions. Similarly, the project will ensure simultaneous creation of the required infrastructure to back the financing of private investments.

Attachment 1: Illustrative list of the financial products likely to be developed/introduced

Dairy farming

- *01 animal (cow) unit* – This product would aim at the existing dairy farmers, who already own 2-3 milch cattle
- *1+1 animal (cows) unit* – For the smallholders (on an individual and group basis) being introduced to the dairy farming for the first time. In this case, the second animal would be provided after 06 months, so as to ensure that there is no break in the income stream, even when the first animal goes into a dry period
- *10+1 animal unit* – This would meet the requirements of the entrepreneurs or veterinary science graduates, who wish to take up dairy farming on a commercial basis and would include 10 cows and a bull
- *Construction of individual / community cowsheds*

Milk collection infrastructure

- *Construction of Milk Collection Points* – For financing Farmers' Organisations (FOs) and would cover items like construction/ renovation of shed, cans, equipment, etc.
- *Construction of Milk Chilling Centers* – For financing Milk Processing Companies and FOs, thereby covering the cost of construction/ renovation of civil structures, purchase of cans, equipment, milk chilling infrastructure, vehicles, etc.

Milk processing/vending

- *Small Milk Processing Unit (for yogurt)* – For small dairy cooperatives engaged in primary processing of milk (especially for yogurt), thereby financing construction/renovation of civil structures, purchase of cans, equipment, vehicles, etc.
- *Setting-up Milk Kiosks/Dairy Bars* – For small/micro entrepreneurs, who wish to seek self-employment, thereby financing purchase of cans/utensils, equipment, rent for premises for 3 to 6 months (to be capitalised), etc.

Animal health care/AI facilities

- *Establishment of Veterinary Clinics/AI Centers* – For veterinarians, para-veterinarians and extensionists, covering the cost of office/ medical equipment, medicines/liquid nitrogen (requirement for one operating cycle to be capitalised), rent for premises for 3 to 6 months (to be capitalised), vehicles, etc.
- *Purchase of Vehicles* - For veterinarians, para-veterinarians and extensionists for purchase of motor-cycles/cars.

(The above products will be composite in nature, i.e. it will address the issues of both, the investment credit and working capital requirements of at least one operating cycle).

Appendix 15: Contents of the Project Life File and reference material

Policy related

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