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Investing in rural people

United Republic of Tanzania

Southern Highlands Milkshed Development Project

Detailed design report

Volume 1 – Main report

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Currency equivalents

Currency Unit	=	Tanzanian Shilling (TZS)
US$1.0	=	2,169 TZS

Weights and measures

1 kilogram	=	1000 g
1 000 kg	=	2.204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

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

Map of the project area

Executive Summary[1]

A. Rationale

1. **Economic context**. Tanzania has experienced high economic growth, averaging between 6-7% per year over the past decade, based on sound macroeconomic policies. The country has a long coastline and borders with eight countries, so it has the potential of becoming a regional commercial hub. 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.

2. **Poverty, and demography**. The share of people living in poverty has declined from 33% in 2007 to 28% in 2012. Rural areas contain about 84% of the poor, or about 12 million people. Life expectancy at birth is 60 years; the male literacy rate is 75% and female is 60%. Women face challenges in working and access to decision-making at all levels. Tanzania's youth almost doubled from 4.4 million in 1990 to 8.1 million in 2010, and will swell to 11 million by 2020.

3. **Agriculture, climate and land**. The agricultural sector contributes about one quarter of GDP and provides employment to three quarters of all Tanzanian workers, while fulfilling 90% of the country's food need. About 80% of production comes from smallholder farmers, with little use of modern technologies and inputs, and is highly vulnerable to weather shocks. Agricultural production gains have been derived principally from expansion of the area cultivated rather than yield increases, which has been a driver of deforestation and land degradation. Agriculture is a sector where significant productivity achievements can be made, while making production climate resilient. The country imports significant volumes of cereals and pulses, which could be produced nationally.

4. **Livestock**. Tanzania has a cattle population of 21-25 million heads, more than 95% of which is of indigenous breeds, while 5% are crossbred and exotic dairy cattle. The livestock sector contributes 7.4% to the country's GDP; growing at only 2.2% p.a. performing well below its potential. Livestock plays an important role in the rural economy: about one-third of rural households – 2.8 million – keep cattle, and rely on them for a major part of their income. There are three main production systems: pastoral/agro-pastoral, crop-livestock and intensive dairy and beef production.

5. **Dairy**. The dairy sector currently makes up 2% of GDP. Total milk off-take is about 2.1 billion litres a year, 70% of which comes from the traditional herd and the remaining 30% from the 780,000 cattle in the improved dairy herd. Productivity is generally low, the result of the intrinsic low productivity of the traditional breed and poor management. Most dairy cattle are kept by smallholder farmers in the northern and southern highlands and Tanga region, which are the most important areas for dairy production.

6. About one-third of all milk is consumed on-farm or sold at the farm gate; and of the remaining two thirds, is sold through the informal sector as raw or fermented milk. Reportedly, only 10% of marketed milk is processed, though this is likely an under-estimate. The milk value chain downstream of the farmer is complex, diverse and involves a variety of different actors: cooperatives, traders/transporters, collection centres, processors, agents and retailers. Traders/transporters play a key role, buying from farmers, and selling either to processors, retailers or consumers. There are about 180 milk collection centres in the country, of which 55 have milk chilling facilities. Many are owned and operated by smallholder co-operatives, some by processors, and others by NGOs and by large producers. Some are also involved in basic processing and sell to the local market. Currently, there are reported to be about 83 milk processing units, most of which are small, processing less than

[1] The second design mission, which conducted its work in Tanzania between July 25 and 12 August 2016, comprised Salimu Mwinjaka and Ellyukaga Mwakipesile (MALF), Marie Chanoine, Christian Hakiba, Mwatima Juma, Sizya Lugeye, Elisa Mandelli, Jacqueline Machangu-Motcho, Mawira Chitima, and Louise McDonald (IFAD); Alban Bellinguez, Barbara Jordan-Vincente, and Muli Musinga (FAO TCIA); and Ravi Malik (MIVARF). Francisco Pichon is the Country Director, Antonio Rota is the Lead Advisor, and Edward Heinemann is the Policy Advisor.

1 000 litres/day. The total volume processed has increased steadily over the last decade and today amounts to 167,000 litres/day (36% of operational capacity).

7. Overall, the challenges facing the dairy industry combine to create a vicious circle of under-performance and weak competitiveness. Limited livestock multiplication and AI services result in lack of stock of improved dairy animals, limiting both milk production potential and the numbers of market-oriented dairy farmers; weak support to smallholder farmers leads to low use of productivity-enhancing technologies, resulting in low milk yields and profitability, and seasonal fluctuation of milk supply; low numbers of dairy farmers lead to low production density, which leads to limited and diffuse supplies of surplus milk, which result in high collection costs and low investments in milk collection and marketing activities, which lead to weak local industries and underutilisation of installed plant capacities; leading to high operating costs in processing and loss of price competitiveness against imports; and higher consumer prices constrain effective demand.

8. The policy and strategic context for the livestock sector is set by the 2006 National Livestock Policy, the 2010 Livestock Sector Development Strategy and most recently the 2015 Tanzania Livestock Modernisation Initiative. 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 Ministry of Agriculture, Livestock and Fisheries (MALF) is responsible for policy formulation, local-level capacity building and technical backstopping of service delivery, and monitoring and evaluation; while the Local Government Authorities (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.

9. The Tanzania Dairy Board (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. Due to its limited human and financial capacity the TDB has till now been unable to fulfil its mandate. One of its roles is that of secretariat to the Dairy Development Forum (DDF) – a non-statutory platform that brings together industry stakeholders to explore a coordinated approach to development of the Tanzanian dairy industry. Smallholder dairy producers are represented by the Tanzania Milk Producers Association (TAMPRODA); while the processors are represented by the Tanzania Milk Processors Association (TAMPA).

10. There is however, growing momentum for change. The Agricultural Council of Tanzania, the Tanzania Chamber of Commerce and Agriculture and the Tanzania Private Sector Foundation have started to address the business environment in general. The new President Dr. John Pombe Magufuli has also expressed interest in tackling the business environment issue. 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 the proposed project. In addition, 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.

11. **Project rationale**. The 2015 Country Programme Evaluation carried out by IFAD's Independent Office of Evaluation made a specific recommendation to support dairy value chain development. The proposed Southern Highlands Milkshed Development Project (SHMDP) responds to that recommendation and to a separate request by Government to support it, and to assist those smallholder farmers interested in dairy farming as a business.

12. Demand for milk products is growing with rising incomes, population growth, urbanization and changes in diets. In Tanzania consumption of milk is still relatively low, at 45 litres per capita p.a.; but it has been projected to rise to 100 litres p.a. by 2020. Demand is also increasing within the Southern Highlands, and there are also limited exports to neighbouring countries. There are thus markets –

zonal, national and potential export – for increased volumes of competitively priced, quality dairy products from the Southern Highlands.

13. Smallholder dairy farming in the area is increasing, and production and processing are growing. The picture is one of a vibrant dairy sector, offering good opportunities for economic growth, improved livelihoods for smallholder dairy producing families, and employment along the value chain. It can have important nutritional benefits – particularly if the quality and safety of dairy products are improved. The project can contribute to delivering these potential benefits.

14. While public support continues to be necessary to build the dairy value chain, there is now also a major opportunity to modernise the sector, based on a more private sector-driven, commercial approach. Critical to exploiting this are both a shared vision as to the respective roles of the public and private sectors, and a more enabling environment to attract investors to dairy production, service provision, processing and marketing. The project can play an important role in these areas and in doing so, support Government's emerging policy priorities.

15. A key lesson from past and current project initiatives in the dairy sector is that if farmers are to produce more, they must be able to sell their produce at a fair price. The project will therefore support the modernisation of the entire value chain, and to focus on smallholder dairy farmers, service providers and processors and traders/transporters; as well as the policy and regulatory environment under which they all operate. In doing so, the project will link up to a number of relevant initiatives of the Government and its development partners. 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.

B. Intervention Area and Target Group

16. **Project area**. The project will be implemented in the milkshed areas of the Southern Highlands in the regions of Mbeya, Iringa, Njombe, Ruvuma and Songwe. The five regions, have a total population of 5.73 million, of which 4.07 million (71%) are rural. The total herd comprises about 1.3 million indigenous animals, and 120 000 improved/ crossbreed dairy cattle, which are kept by some 60,000 smallholder households. The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) passes through the project area.

17. 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. 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.

18. **Target groups.** These include smallholder farmers who are either actively producing milk for the market, looking to access milk marketing opportunities or looking to start dairy farming. It also includes entrepreneurs – particularly women and youth – and other groups such as traders, processors, milk shops and farmer organizations (FOs). The project direct target group comprises about 67,575 smallholders, with women representing 30% of the target group and youth 20%:

- 30,000 poor, mixed-farming households with small-scale semi-intensive dairy production, owning 1-3 dairy cows;
- 4,000 poor, mixed-farming households with medium-scale intensive dairy production, owning 3-7 dairy cows;

- 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;
- 11,000 very poor households without dairy cattle, including 10,000 very poor agropastoralists with small traditional herds, 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 or access to financial services, but with potential access to communal land; and
- 12,175 other rural non-producers (transporters, processors, traders, seed producers, input suppliers and school children).

19. Other indirect beneficiaries will include active SACCOS and financial institutions operating in the project area with whom the project will develop partnership agreements and collaboration to support project activities. Overall, women will represent 30% of the target group and youth 20%.

20. The **targeting strategy** comprise of: (i) *geographic targeting*, based on the identification of priority districts; (ii) *self-targeting*, with activities geared towards the needs of poor producer households that are engaged in dairy activities; (iii) *direct targeting* of very poor and/or marginalised households, including youth; (iv) *empowerment and capacity building measures* to ensure the target group is able to access the proposed activities; and (v) *enabling environment and policy dimensions* so as to ensure a conducive environment for the project to be implemented and sustainability of its results.

21. A **gender and youth strategy** will be entrenched in the project's three components and cut across the different target groups. Its objectives are to (i) promote the inclusion of both women and men smallholder farmers in the dairy value chain and ensure equitable access to benefits deriving from it; (ii) support men and women's joint decision making and promote women's inclusion in relevant organizations; and (iii) promote the involvement of young men and women in the dairy value chain.

22. 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. In response, SHMDP will adopt a **climate smart strategy** to ensure that all project interventions are environmentally sustainable and tailored to the specific dairy value chain climate risks in the heterogeneous project targeted zones. Such climate smart strategy will include: (i) supporting the zero-grazing model; (ii) enhancing resource-use efficiency (e.g. biogas/solar energy sources to power 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).

C. Approach

23. SHMDP will take as its starting point the value chain for milk and milk products; and it will focus particularly on supporting the inclusion of smallholders for the production, marketing and processing of milk. However, within each selected district the value chain is shaped not by administrative boundaries, but rather by areas of economic opportunity: geographical clusters of economic activity (dairy production, transportation, processing), within/across each district, and radiating from a source of demand or a point of aggregation for milk collection, chilling, distribution and processing. It is in these clusters that the project will focus its efforts. Clusters will be characterised by a geographic concentration of interconnected producers, businesses, suppliers, and associated institutions in the dairy value chain; and by either the reality of, or the opportunity for, direct and indirect synergies among them, resulting in profitable market linkages.

24. SHMDP 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.

D. Project Goal and Development Objective

25. The overall goal is 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. Its realization will depend on achievement of the project development objective: 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.

Outcomes and Components

26. The outcomes, which will lead to the achievement of the project development objective, comprise:

- 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.

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

Component 1: Building efficient dairy value chains from producer to consumer

28. The outcome of this component is development of an increasingly modern, efficient and diversified value chain linking targeted smallholder dairy farmers in the Southern Highlands to urban and rural consumers in the project area and other regions in Tanzania and beyond. The idea is to take up the increased milk production from targeted farmers expected to arise from investments in improved production and productivity, and convert it into nutritious and hygienic milk and milk products to consumers, and to ensure that producers are rewarded for their efforts. The 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 link the players in the value chain to sources of investment and working capital to finance their operations. It is organized around three sub-components:

29. ***Capacity building of farmer organizations (FOs)*** aimed at improving the participation of dairy farmers in various forms of business-oriented FOs and strengthening FO capacities for improved service delivery to farmers in milk collection and marketing, input supply and proximate animal health services. Interventions under this sub-component will focus on 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. Where FOs exist and are strong, they are the preferred mechanism for farmers to engage with the market, the preferred model for processors to engage with farmers, and generally present the best option for increased production and delivery of quality milk from smallholder farmers to the market.

30. ***Investment in climate-smart quality milk collection and handling systems*** geared at expanding and improving capacity utilisation of the infrastructure available in the project area for

quality milk collection and handling; enhancing the quality milk handling system by supporting improved capacity of milk transporters; and strengthening the system for enforcement of milk quality standards by relevant government authorities. 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 system meets current and potential demand, has high exposure to climate variability, and identify gaps that need to be addressed. This study will identify the appropriate type, size and location of climate-smart infrastructure required; and suitable financial and management models to provide a basis for possible shared responsibilities between FOs, private sector and the project in Public-Private-Producer-Partnership (4Ps) modality arrangements.

31. ***Support for improved processing and distribution of affordable milk and milk products*** aimed at increased value addition and processing of milk into a diversified range of quality milk products; support for improved trade and distribution of quality milk and dairy products by both formal and informal traders; leveraging private sector co-investment and bank financing for enterprises in all segments of the dairy value chain; and initiatives for expansion of the domestic and regional market for milk and milk products, including campaigns for increased consumption of milk for improved health and nutrition. The sub-component 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.

Component 2: Increasing on-farm productivity

32. The outcome of this component is increased on-farm production and productivity of smallholder dairy farmers based on increasingly commercialised and intensive, sustainable and resilient production systems. The project will pursue a twofold strategy first by improving the productivity of existing smallholder dairy production systems; and 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. This will be achieved through three sub-components:

33. ***Sustainable access of women and men smallholder farmers to services, inputs, and assets.*** 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 (improved animal feeding will also be included in the FFS extension package and innovation agenda); (iii) improving the animal health status of the dairy herd; (iv) improving access to water for production and hygiene purposes; and (v) supporting targeted asset building mechanisms for very poor households. The implementation of this sub-component will be closely linked to the implementation of sub-component 1.1. Capacity building of FOs which 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.

34. ***Capacity building of service providers, extension workers and smallholder farmers*** aimed at transforming their production systems into more sustainable productive and market oriented production systems. 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. 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 part-financing motorcycles and extension kits under cost-share arrangements to ensure the durability of the equipment. 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. Finally, the sub-component will assist dairy farmers to engage in hands-on field-based learning, to acquire and develop their knowledge, attitudes, and behaviour for increased milk productivity and quality, through the establishment of Livestock Farmers Field Schools (L-FFS) around similar production activities, and anchored on

existing interest groups/aggregation points such as village interest groups, dairy cooperatives and hubs.

35. ***Dissemination of climate-smart technical and institutional innovations.*** 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. The sub-component will promote the following set of activities: (i) supporting development of climate-smart 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.). In the scope of this sub-component, the project will strengthen collaboration between existing initiatives (e.g. SNV-Tanzania Domestic Biogas Programme), research centres (universities, ILRI 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.

Component 3: Supporting an enabling policy and institutional environment for dairy development

36. 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. 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. This will be achieved through two sub-components:

37. ***Support to evidence-based and inclusive policy dialogue.*** The project will strengthen stakeholder dialogue at all levels. Dairy sector actors will be invited to become members of ***multi-stakeholder dairy platforms*** (MDPs), which are to shape the future 'clusters' and contribute to the fine-tuning of the project activities at district level. MDPs will also help 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 would also be 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. The project will also support ***policy reviews and studies*** that could inform policy processes. A number of study topics have been predefined, 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. Under this sub-component, the 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.

38. ***Strengthening institutional capacity for dairy training.*** 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. The project will work with the Livestock Training Agency (LITA), supported by Sokoine University of Agriculture and the Director of Training in MALF to strengthen capacities of extensionists in the field of dairy production by (i) developing tailored short-term training modules for key service providers and actors in the dairy value chain in the Southern Highlands; (ii) financing government staff, and part-financing selected non-government staff, to enable them to participate in the training modules developed; and (iii) developing a pool of specialist trainers, potentially drawn from LITA and the regions/districts themselves, after training them at appropriate institutions.

39. Interventions proposed under components 1 and 2 are expected to result in a higher demand for **specialized financial services** by the various actors in the dairy value chain. Hence, the SHMDP will support initiatives aimed at enhancing access to financial services by the value chain actors, both from the demand side (prospective borrowers/clients) and supply side (financial service providers). Support from the project will be in the form of technical assistance and facilitating linkages for provision of financial services. Focus will be on financial literacy/awareness creation about the financial services, preparation of business development plans, potential mapping, preparation of banking plans, capacity building of the financial service providers, facilitating linkages for provision of financial services and creating an institutional mechanism for reviewing and monitoring the progress in this regard on a regular basis. Besides engaging with the financial institutions in the project area, SHMDP will also leverage the opportunities created through the implementation of other development projects in the country. In this context, the project will undertake suitable initiatives to ensure that the benefits of the *Credit Guarantee Mechanism and the Rural Innovation Fund*, currently being set-up through the implementation of the IFAD-funded Marketing Infrastructure, Value Addition and Rural Support Programme (MIVARF), also accrue to all the value chain stakeholders in SHMDP.

40. **RBA collaboration.** The following activities requiring specialized skills and analytical tools will be implemented in partnership with FAO: (i) Training of national L-FFS Master Trainers; (ii) technical assistance in the formulation of a National Dairy Master Plan and use of the EXTRAPOLATE (Ex-Ante Ex-Ante Tool for Ranking Policy Alternatives) policy formulation toolkit developed by FAO in the scope of the Livestock Pro-poor Policy Initiative; and (iii) collaboration in milk cooling technologies at milk collection points and milk chilling centres with FAO Nutrition Division***.***

E. Implementation Arrangements

41. The project implementation period will be 7 years. A Project Steering Committee (PSC) chaired by Permanent Secretary of MALF, with public, private and producer representation, will be responsible for overseeing project implementation. The Project Coordinator will act as the secretariat of the PSC. The PSC will meet twice a year to provide strategic direction to project implementation and monitor progress. The project will be executed by MALF. The Division of Policy and Planning in MALF will be responsible for overall coordination, in close collaboration with the Department of Livestock Development.

42. Day-to-day project management will be the responsibility of an autonomous Zonal Project Management Unit (ZPMU). Government will recruit from the market those staff with expertise which is not readily found in MALF. The ZPMU will consist of the following contracted staff: Project Coordinator; Dairy Agribusiness Specialists; supported by 10 Dairy Agribusiness Advisers (5) and Group Development Advisers (5) contracted as service providers; Dairy Production Officer; Extension & Producers' Organisations Officer, also responsible for the implementation of the gender strategy; Planning, M&E, Knowledge Management Specialist; Finance Manager; an Accountant; and a Procurement Specialist. Short-term specialist expertise will be contracted according to need.

43. 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 to define performance-based MoUs based on district AWPB and determine backstopping

arrangements according to the needs and priorities of the clusters. 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.

44. 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 will be responsible for approving the district-level dairy AWPB and monitoring the progress of implementation.

45. 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.

46. A start-up package will include a series of launch workshops to be conducted to ensure buy in of stakeholders. At the national level, participants will include key government policy- and decision-makers, representatives of research institutes and other technical experts, key NGOs, relevant private-sector bodies, financial institutions, donor bodies and representatives of civil society. The district-level launch workshops will bring together the District Council and technical departments, NGOs, development partner-funded projects, value chain stakeholders and representatives of farmer groups /organizations. At village level sensitization workshops will also be conducted. Gender balance will be sought among participants at all levels.

F. Costs and Financing

47. Total project investment and incremental recurrent costs, including physical and price contingencies, are estimated at US$41.28 million. Price contingencies make up 4% of 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. Total baseline costs are US$39.23 million, while price contingencies account for US$1.5 million.

48. The SHMDP is to be financed by the Government, IFAD, Heifer International and the beneficiaries. IFAD will finance approximately 77% of the project costs (US$32.12 million) through a loan on highly concessionary terms over a seven-year period, and Heifer International will cofinance 12% of total costs (US$5 million). The Government will finance taxes and duties and the National Social Security Fund contribution for all staff employed by the project (US$3.59 million, representing 8.7% of total costs), and the beneficiaries will contribute (US$0.568 million, representing 1.4%). The Government will also provide office space and may second some government staff to the ZPMU.

G. Benefits and Impact

49. The main project benefits will go to rural communities in the project area. The target groups (described in para. 18) comprise 67,575 beneficiary households. Women will represent 30% of the target group and youth 20%. Project benefits are expected to include increased incomes and

livelihoods for smallholder dairy-producing families and employment along the value chain, improved food security and nutrition, and reduced vulnerability in rural areas. Benefits would derive from: (i) improved on-farm productivity of smallholder dairy producers; (ii) reduced milk losses and improved milk processing for value addition; (iii) increased adoption of dairy industry technologies and increased capacity among processors; (iv) increased quantities of hygienic and safe dairy products; (v) enhanced milk quality, food security and nutrition status both at farmer household level and at the national level; (vi) increased economic activity in rural areas through higher profitability and viability of milk collection centers and dairy processing plants; (vii) employment opportunities to traders, transporters and milk bars; and (viii) incremental tax revenues as a result of increased volume of taxable income.

50. In order to assess the impact of the project, a financial and economic analysis was carried out. Three financial models for dairy farming were developed: Financial increases are expected to range from a low of 566,339 Tanzanian shillings (TSh) for the mixed-farms with extensive cattle production model to a high of TSh 3.5 million for the mixed-farms with medium-scale intensive dairy production model. The financial models also present positive returns to labour and show positive returns but high sensitivity to increases in production costs and drops in prices/revenues.

51. A cost-benefit analysis was carried out for a 15-year period using economic prices. On the basis of the benefit and cost streams, the base-case economic rate of return (EIRR) is estimated at 16.6%. The base-case net present value (NPV) of the project's net benefit stream, discounted at 10%, is US$12.62 million. 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 a 10% increase in costs, and a reduction of NPV by 50%. A one-year delay in project benefits reduces EIRR to 13%, but will have a significant impact on NPV. A two-year delay will make the NPV negative and reduce the EIRR to 10%.

H. Sustainability

52. **Social, environmental and climate assessment.** The project will contribute to improving the livelihoods of targeted dairy farmers and to strengthening the resilience of their production systems, through the promotion of dairy farming as a profitable business. To build ownership and sustain investment in the dairy value chain, the project implementation approach is focused on grassroots institution building as well as participatory and bottom-up approaches with emphasis on community development.

53. On the basis of the SECAP Review Note the climatic risks for this project are medium. To minimise these risks, three lines of actions will be undertaken: (i) the project area will be determined taking into account those districts where the risks of climate change and shocks are not excessive; (ii) support to a range of climate adaptation approaches, e.g. the promotion of feeding strategies for the dry season, use of drought tolerant pasture species, use of heat tolerant dairy breeds, and water harvesting techniques; and (iii) climate change mitigation, by reducing carbon emissions per unit of milk delivered to the consumer. This would be achieved through improving the productivity of the existing herd–reducing livestock mortality rates, and improving manure management. While increased transportation of milk would likely lead to a limited increase in emission levels, where possible the project would promote processing technologies based on renewable energy; and by improving the efficiency of the value chain, this would lead to reduced levels of waste of milk.

54. **Scaling up strategy.** SHMDP will strengthen the dairy value chain and the linkages between smallholder producers and their organizations as well as processors or traders. It will promote the development of a scalable model for integrating financial and non-financial services to small dairy farmers into the commercial relationship between them and processors; and it will support efforts to reduce the cost of doing business in the dairy processing industry, thus creating incentives for further investment in the sector as a whole based on commercial value chain relationships and services that are market-driven and sustainable.

55. The potential for long-term sustainability of the project outcomes beyond the implementation period is further enhanced by the larger context within which the project will operate. Central to the opportunity for sustainability is the fact that demand for milk in the Southern Highlands, in Tanzania as

a whole, and the larger region is increasing. In response, there is dynamism is the dairy sector: smallholder dairy farming is increasing, milk production is increasing, and the processing sector is also developing. The project is thus supporting a sector that offers substantial opportunities for inclusive rural growth and transformation.

Logical Framework[2]

Narrative summary	Key performance indicators	Baseline	Target	Source	Frequency	Responsibility	Assumptions
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 and nutrition, and brings benefits to the economy as a whole	▪ % increase in economic value of Tanzanian dairy sector[3] ▪ % reduction in child malnutrition (stunting) in project area ▪ No. estimated additional jobs created	2.6% Iringa: 41.6% Njombe: 49.4% Ruvuma: 44.4% Mbeya: 37.7% -	4.2%[4] by end of project 10% reduction in stunting prevalence 11,400[5]	Survey LSIPT MALF sector reports/Agriculture Sector Review Survey/Ministry of Health	Baseline, MTR and end of project	MALF	Growth in the sector improves livelihoods. Sector actors apply new technologies and standards / quality. Demand for quality milk and milk products increases. Policy and regulatory environment are enabling for the VC for expansion in production and processing as well as for trade.
Project Development Objective: 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	▪ % increase in total milk consumption per capita ▪ Increase in household dietary diversity score ▪ At least 70% of HHs participating in the SHMDP report increased incomes from dairy enterprises ▪ Volume of CO_2 sequestered/ avoided per litre of milk produced	45 litres / cap. p.a 5.7 0 77 kg of CO_2 per litre of milk[6]	≥60 litres / cap. p.a. 8.0 ≥70% of HHs targeted by project TBD under the IFAD-supported grant to ILRI on 'Greening livestock	Survey/Ministry of Health Survey / Project End Report	Baseline and end of project Baseline, MTR and end of project Baseline and end of project	ZPMU DPIU ZPMU and districts	Policy framework is developed for a conducive environment for development of the sector Increased incomes from HHs in the dairy VC attracts new entrants (especially youth/ women) into the sector. Economic clusters and new technologies reduce costs for actors in the dairy VC.

[2] It is noted that the 3rd PDO indicator % of HHs in the Southern Highlands reporting increased incomes from dairy enterprises will also contribute to monitoring the performance of component 1.2 and 1.3, while the 4th PDO indicator, Volume of CO_2 sequestered/avoided per litre of milk produced will also contribute to the performance of component 2.2 and 2.3.
[3] Refers to the economic value of the Tanzanian dairy sector (as a percentage of the total) at the end of project
[4] Based on Livestock Sector Investment Policy toolkit – FAO/WB
[5] Including job opportunities created for non-producer rural woman, farm assistants, youth engaged in production systems, and pitot group of very poor youth
[6] This figure is derived from a preliminary GHG Assessment conducted using FAO's EX-Ante Carbon Balance Tool (EX-ACT) and the Global Livestock Environmental Assessment Model (GLEAM). The results will be further ascertained through analyses that will be undertaken within the IFAD-supported ILRI grant on Greening livestock: Incentives based interventions for reducing the climate impact of livestock in East Africa (see further details in Project Life file).

Narrative summary	Key performance indicators	Baseline	Target	Source	Frequency	Responsibility	Assumptions
Outcome 1: 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	▪ Annual volume of milk sold to processing enterprises by targeted farmers	50,000 MT	180,000 MT	M&E reports, Records from processors	Baseline, MTR and end of project	ZPMU, DPIU, Processors	Aggregation represents an important dimension of the development of the VC. Farmers have adequate incentives to increase supply to processors. Policy/ regulatory framework provides incentives for investment in the VC. Demand for processed products increases as projected.
	▪ % of targeted farmers (M/F) in forward contract arrangements with buyers	20%	70%	M&E reports, Records from processors	Baseline, MTR and end of project	ZPMU, DPIU, Processors	
Outputs: 1.1 Organizational development of farmer organizations and cooperatives strengthened	▪ No. bankable enterprise development plans developed by farmer organizations	-	75	Project M&E Reports	Semi-annual	ZPMU and DPIU	Strong and organized farmer groups facilitate accessibility of finance from banks/MFIs. Availability and recruitment of good service providers for capacity building of farmer organizations. Regulations on milk standards updated and enforced. There is a willingness of farmers and private sector to invest in expansion of facilities.
1.2 Expanded climate–smart quality milk collection and handling infrastructure	▪ Number MCPs, satellite MCCs and full MCCs operating in project area using Good management practices, SOPs and climate-smart technologies	42 MCPs 0 SMCC 6 FMCCs	180 MCPs 60 SMCC 25 FMCC	Project M&E Reports	Semi-annual	ZPMU and DPIU	
1.3 Improved processing and distribution of affordable milk and milk products	▪ Annual volume of processed milk sold in distribution outlets - milk kiosks, retail outlets, milk parlors, meeting safety standards	70,000MT	240,000MT	Project M&E Reports	Semi-annual	ZPMU and DPIU	
Outcome 2: Increased on-farm production and productivity of smallholder dairy farmers, based on increasingly commercialised and intensive, sustainable and resilient production systems	▪ Average volume of milk produced by smallholder dairy farmers (M/F) in the project area	260 M ltrs	440 M ltrs	Survey and model	Baseline, MTR and end of project	ZPMU and DPIU	Market is able to absorb the increased production.
Outputs: 2.1 Enhanced and sustainable access of women and men farmers to livestock production services, water inputs and improved livestock	▪ % of HHS (M/F) accessing production inputs (AI, veterinary drugs and feeds) (RIMS)	AI: 20% Feed: 80% Fodder: 50% Health: 50%	AI: 40% Feed: 100% Fodder: 80% Health: 90%	Project M&E Reports	Semi-annual	ZPMU and DPIU	Liquid nitrogen and quality semen are available in the country and project area. Farmers remain resilient In the event of major animal health crisis (disease outbreak). Districts maintain or increase their extension budget.
2.2 Enhanced capacities of women and men smallholder farmers to transform their production systems into more sustainable productive and market oriented production systems	▪ Number of farmers and farm assistants (M/F) graduating after having completed a FFS curriculum (M/F)	0	15,000	Project M&E Reports	Semi-annual	ZPMU and DPIU	

Narrative summary	Key performance indicators	Baseline	Target	Source	Frequency	Responsibility	Assumptions
2.3 Climate-smart technical and institutional innovations developed and disseminated	▪ Numbers of farmers (M/F) adopting practices and technologies that enhance household resilience to climate shocks and stresses.	0	15,000	Survey	Baseline, MTR and end of project	ZPMU and DPIU	LITA- Madaba has capacity and willingness to effectively train farmer groups.
Outcome 3: An enabling policy and institutional environment that attracts and incentivises productive private investment along the dairy value chain	▪ % increase in value chain stakeholder satisfaction with dairy policy and institutional framework	To be determined at baseline	60%	Survey	Baseline, and End of project	MALF, DDP, ZPMU	TAMPA/TAMPRODA adequately represent processors and smallholder producers.
Outputs: 3.1 Strengthening stakeholder dialogue that pushes for reforms at all levels	▪ No. policy issues identified at district and zonal platforms for action at these and national (DDF) levels	-	16[7]	Project M&E Reports	Semi-annual	ZPMU and DPIU	TDB develops minimum capacity to prioritise its capacity develop requirements. L-MIRA with support of concerned national and local stakeholders is able to drive reforms in the dairy inputs/ processing sectors .
3.2 Strengthening TDB to carry out its mandated functions	▪ Conducting of DDF ▪ Guidelines for compliance with standards developed	<1p.a. -	2 p.a. 3	Project M&E Reports	Semi-annual	ZPMU and DPIU	
3.3 Strengthening capacity of Government and non-government staff and service providers in dairy sector to effectively deliver on their mandates	▪ No. Extension staff trained ▪ No. Trainers trained	0 0	300 30	Project M&E Reports	Semi-annual	ZPMU and DPIU	LITA has capacity to implement activities.

[7] Assuming one per district plus ne at zonal level

I. Strategic context and rationale

A. Country and rural development context

1. **Country context**. The United Republic of Tanzania was formed in 1964 by the unification of mainland Tanganyika and the isles of Zanzibar. The country has a total land area of 884,000 km^2, and a human population of 47 million in 2012. 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 0.521, 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. Administratively, the country is divided into 31 regions (26 on the mainland and 5 on Zanzibar), which are sub-divided into around 170 Local Government Authorities (LGAs - comprising municipal, district and town councils).

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 liberalisation. 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 country imports food stuffs and livestock products, because of low agricultural productivity, the lack of primary processing and weak internal markets. 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. 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.

3. **Poverty, human development, and demography**. The National Household Budget Survey shows that overall, the percentage of people living in poverty declined from 33% in 2007 to 28% in 2012. However, about 84% of the poor reside in the rural areas , and in 2012 33% of the rural population lived below the poverty line, compared to 22% for the urban areas. 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. Life expectancy at birth is 60 years; male literacy rate is 75% and female is 60%. Around 1.6 million people are living with HIV in Tanzania, representing 6% of the population.

4. **Women and youth**. Women of reproductive age (15-49 years old) represent 24.5% 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 (15–24years) in Tanzania represents roughly 18% of the total population and this share remained stable between 1990 and 2010. In absolute numbers, there is a youth bulge phenomenon, with the size of Tanzania's youth having 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, so creating jobs in rural areas is imperative.

5. **Food and 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 needs. The country has 95.5 million hectares (ha) of land, of which 44 million ha are classified as arable, but with only 23% under cultivation. About 80% of production comes from subsistence farmers relying on the hand hoe and rain-fed production, with limited areas under medium and large-scale farming. To date, agricultural production gains have been derived principally from expansion of the area cultivated rather than yield increases, and this expansion process has been the driver of deforestation and land degradation. Smallholder agriculture is labour intensive with little application of modern technologies and inputs, and it is highly vulnerable to weather shocks. Agriculture is a sector

where significant productivity achievements can be made, while making production climate resilient. The country imports significant volumes of cereals and pulses, which could be produced nationally.

6. **Livestock**. Tanzania has the second largest population of cattle in Africa (after Ethiopia), estimated at between 21 and 25 million heads[1], 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 the remainder. The livestock sector contributes to 7.4% of the country's GDP. However, the growth rate of the sector is low (2.2% p.a.), and that growth reflects mainly increased livestock numbers, rather than increased productivity; and red meat and dairy imports are substantial. The livestock sector is recognised to be performing well below its potential.

7. Livestock plays an important role in the rural economy: About one-third of rural households – 2.8 million – keep cattle (70% of whom have less than 10 head of cattle), who rely on them as a 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), and landscape as well as socio-cultural and economic factors. There are three main production systems: pastoral/agro-pastoral, crop-livestock and intensive dairy and beef production. The pastoralist system is mostly located in the northern and eastern parts of Tanzania. 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.

8. **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 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. However, it is important to note that typically the traditional animals are not kept primarily for milk sales, whereas the improved animals are kept principally for this purpose. Productivity is generally low, the result of the intrinsic low productivity of the traditional breed and poor management – 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.

9. 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 fermented milk, through the informal sector. Reportedly, only about 10% of marketed milk (61 million litres p.a.) is processed, but this appears to be under-estimated as the definition of processing considers only the medium- and small-scale formal processing sector, and excludes for example, less formal micro-processing (for fermented milk or yoghurt) or milk sold direct from the cooling centre.

10. The distinction between raw and processed milk and the informal and formal markets is not hard and fast, and there are different degrees of processing and formality along the value chain. Milk passes through a variety of marketing channels: it may be sold either individually or through cooperatives, to traders/transporters, at collection centres, sometimes through a cooling centre, or direct to the processor. The traders/transporters, equipped with bicycles or motorbikes, play a major role in the system: most frequently they buy from farmers and sell raw milk to retailers or direct to consumers; but they may also sell the milk to processors, or may even buy from processors for resale. Most traders operate without quality checks, and adulteration is common.

11. Milk collection centres (or collection points – MCPs) are a key part of linking smallholder dairy farmers to processing units. In 2015, there were reportedly around 183 MCPs in the country, about 55 of which have milk chilling facilities (26 of these are in Tanga Region), typically with a bulking and cooling capacity of between 50 litres and 500 litres. Four main models of ownership and operation can

[1] The former according to the most recent (2007) survey by the National Bureau of Statistics; the latter according to the 2015 Livestock Modernization Initiative.

be distinguished: (i) the processor-smallholder model; (ii) the NGO-facilitated model; (iii) the smallholder co-operative model; and (iv) the processor- "largeholder" model. The Southern Highlands milkshed area has different models of MCP. The largest processors (particularly ASAS Dairies, based in Iringa) are vertically integrated with their own network of cooling centres and MCPs, which they consider a requirement to guarantee a good quality and hygiene of milk as well as stable supply. Some cooperative-owned MCPs are also involved in basic processing and sell to the local market.

12. Following privatization of the parastatal Tanzania Dairies Ltd. in 1995 a private sector-own processing industry has emerged. Currently, there are reported to be about 83 milk processing units (almost certainly an under-estimate), making pasteurised milk, fermented milk (*mtindi*) and yoghurt, and – to a lesser extent – ghee, cheese, butter and long-life milk. The degree and quality of packaging vary.

13. Most are located in areas with high populations of improved dairy cattle – and ***not*** in the traditional cattle areas. These source their milk from traders, cooperatives and cooling centres, as well as directly from large-scale commercial dairy producers. The majority of the processing units are small, processing less than 1 000 litres/day. Total installed capacity is estimated at 640 000 litres per day (or 459,000 litres per day for the 73 operational plants). The total volume processed amounts to only 167,000 litres per day (26% utilisation of the total capacity, or 36% of the operational capacity), though the volume has increased steadily from 60,000 litres in 2005. In the Southern Highlands, ASAS Dairies[2] is the largest processor, with a capacity of 50,000 litres/day; it is followed by Njombe Milk Factory[3] with 6,000 litres/day, and a limited number of smaller processors with between 500 and 2,000 litres/day.

Box 1: Regulatory bodies affecting the formal dairy processing industry

- **Tanzania Food and Drug Authority** - under the Ministry of Health and Social Welfare responsible for regulating the quality and safety of food, drugs, cosmetics and medical devices
- **Tanzania Bureau of Standards** under the Ministry of Industry and Trade who is mandated to undertake measures for quality control of products of all descriptions and promote standardization in industry and commerce
- **Tanzania Business Registrations Licensing Agency** – for business registration and Licensing
- **National Environment Management Council** – oversees environmental monitoring especially to registered dairy processing plants
- **Occupational Safety and Health Authority** – workers health and safety
- **Local Government authorities (LGA)** – local levies and taxes
- **Ministry of Industry and Trade** - issues operating licenses to milk processing industries and trade licenses to traders (Weight and Measures)
- **Ministry of Land** - offers land occupancy permits for pasture and ranching grounds to large farmers

14. Particular problems faced by the processors include: (i) an unstable supply of milk, which fluctuates considerably between the rainy and dry seasons, resulting in under-utilisation of the processing capacity; (ii) inadequate outreach to potential supplier farmers; (iii) irregular power supplies, poor equipment and limited access to capital to replace it; (iv) high operating and transaction costs, resulting from multiple, inconsistent and overlapping regulations and taxes (see Box 1); and (v) competition from imported dairy products, both from the world market and from neighbouring countries, in particular Kenya, which enter the country without import duty.

15. 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 issues linked to the affordability of dairy products, to the fact that in parts of the country there is not a strong culture of milk consumption, and there is only a limited school feeding campaign.

[2] ASAS Dairies: http://www.asasgrouptz.com/dairies.html
[3] Financed by the Italian NGO CEFA, Italian Development Cooperation and the private Italian dairy company Granarolo: http://www.cefaonlus.it/uk/where/milk-production-and-marketing-in-njombe.asp

16. In terms of the range of dairy products consumed, raw milk is by far the most regularly consumed dairy product (with almost 80% of households consuming it regularly), with *mtindi* a distant second. A total of about 70 million litres p.a. reaches consumers in the form of processed milk and dairy products. Of this, imports of milk, liquid milk equivalent (LME) and other dairy products make up 10-12 million litres of this.[4] For liquid milk the principal sources are regional (Kenya and South Africa), while for dried milk Ireland, Malaysia (presumably re-exported) and the Netherlands are the main sources. FAO data show that liquid milk (including UHT) and milk powder are the most important products, with smaller quantities of cheese, butter, whey powder, ice cream and evaporated milk. There are over 55 importers of milk and dairy products.

17. The challenges facing the dairy industry combine to create underperformance and weak competitiveness:

- Limited livestock multiplication and artificial insemination (AI) services result in a lack of stock of improved dairy animals, limiting milk production potential and the number of farmers adopting dairying as a commercial undertaking;
- Weak support to smallholder farmers leads to low use of productivity-enhancing technologies, which results in low milk yields and profitability;
- Milk production fluctuates seasonally, as the availability of grazing, forage and water is highly dependent on the quality of the rainy season;
- Livestock is vulnerable to the rising temperatures and unpredictable rainfall patterns associated with global warming;
- Low numbers of progressive farmers lead to low production density and levels of surplus milk;
- Limited/diffuse supplies of surplus milk lead to high collection costs and low investment in milk collection and marketing;
- Low milk collection and marketing lead to weak local industries and underutilization of installed plant capacities;
- Underutilization of plant capacities leads to high operating costs in processing and loss of price competitiveness against imports; and
- Higher consumer prices decrease effective demand.

18. **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 (PDB), under the "Big Results Now!", have started to address the business environment in general. 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. In addition, the World Bank is about to start implementing a 3-year 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.

19. The proposed Southern Highlands Milkshed Development Project (SHDMP) can make an important contribution to establishing an enabling policy environment that: (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. Experiences from Kenya and Uganda show the critical importance of a strong dairy board or equivalent, in bringing

[4] Data on total quantities of domestically processed and imported milk and dairy products vary hugely by source. The figure for total consumption of 70 million litres p.a quoted here represents 60 million litres, which is the total domestic processing capacity (166,000 litres /day x 350 days); plus imports of 10-12 million litres of milk and liquid milk equivalent (FAO data).

stakeholders together and promoting the sector based on a shared vision and understanding, and agreement as to the appropriate and complementary roles of the public and private sectors.

Land management and climate variability

20. Land management and climate resilience are cross-cutting issues, critical for the development of the dairy industry in Tanzania. The dairy sector is highly vulnerable to climate variability and makes significant contributions to anthropogenic green gas emissions. 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. At the same time, dairy farming systems contribute to the degradation of the natural resources base and loss of biodiversity when grazing on the rangelands and communal lands is poorly managed. 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.

21. In a context characterized by reduced land access and weak land governance, the development of dairy production and the consequent demand for pasture and other natural inputs, are likely to further increase the pressure on land and natural resources, particularly for the very poor, women and youth which are likely to have a harder time identifying and securing communal grazing lands (see SECAP review note in Appendix 12). Tenure arrangements and natural resource management in the Southern Highlands are highly heterogeneous and varies from district to district. While some districts are experiencing scarcity of land as well as cases of conflicts among different land users (crop producers, livestock keepers, pastoralists), others are characterized by social stability and abundance of land allocated for grazing by village councils. Households' grazing and feeding patterns are also diverse and depend on seasonality, type of breed, land availability and on the time and human resources allocated to dairy production. Where there is abundance of land, dairy producers are more likely to have small plots where they cut fresh pasture and prepare storage for the dry season. In areas with land scarcity, smallholders tend to cut forage/grass where it is available, often on land considered "unused" or "communal" or in designated communal grazing lands.

Policy and institutional context

22. The guiding normative framework for articulating national 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.

23. **MKUKUTA II** (National Strategy for Growth and Reduction of Poverty Phase II known by its Kiswahili acronym) 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. It also focuses on scaling up the role and participation of the private sector in priority areas of growth and poverty reduction, such as agriculture.

24. **Big Results Now!** (BRN). Using BRN as a planning methodology, the Government has committed to deliver concrete development results in "Key Result Areas", of which one is agriculture – and under the agricultural agenda the dairy sector is recognised as a priority. Under the BRN, a PDB coordinates the ministries to deliver results for the objectives set under the Government's development policy agenda. In January 2014 the PDB identified the biggest bottlenecks for agriculture businesses to be property registration, power connection and business licensing.

25. **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.

26. **Decentralization by Devolution** (DbyD). Since 1998, under the D by D policy, LGAs in the country's 170 or more districts are responsible for delivering all public services at the local and village level – even if in practice they have very limited resources and operational capacities; and they are answerable to locally elected officials. Under the policy, central government retains four major functions: policy formulation and guidelines, capacity development of LGAs, technical backstopping, and policy monitoring and evaluation. The budgeting process for providing funds to districts is a lengthy one, through the Prime Minister's Office - Regional Administration and Local Government. Local elections are held every five years and were last held in December 2014.

27. **Tanzania Agriculture Climate Resilience Plan**, 2014–2019. In line with the National Climate Change Strategy, the priority areas for adapting to the effects of climate change under the Plan are: agricultural water and land management; accelerating uptake of climate-smart agriculture; reducing impacts of climate-related shocks and promoting measures to diversify livelihoods and respond to those shocks; strengthening knowledge and systems to target climate action; and mainstreaming gender into climate change initiatives for agriculture. The approach also aims to reduce the environmental impacts of agricultural activities that can drive climate vulnerability.

Livestock and dairy policy[5]

28. The **National Livestock Policy** (NLP) of 2006, with its broad objective "to commercialize the industry and stimulate its development while conserving the environment", sought to open new avenues for accelerating the growth and contribution of the livestock industry to poverty reduction and the national economy, by making more optimal use of available land, animal and human resources. The 2010 **Livestock Sector Development Strategy** (LSDS) spelt out the interventions required to meet the objectives of the Policy. The **Livestock Sector Development Programme** (LSDP - 2011/2011–2015/2016) was in turn designed to implement the NLP and LSDS, while also contributing to a series of national policies.

29. **Tanzania Livestock Modernisation Initiative** (TLMI). Launched in 2015, the TLMI too aims to implement the NLP in the context of other key national policies and strategies. The objective of TLMI is to transform the traditional livestock sub-sector (meat, dairy and poultry) into a modern engine for rural development and poverty alleviation, improved national health and nutritional standards.

30. **A Livestock Sector Master Plan**, currently under development, is expected to offer specific guidance as to how these outcomes can be most effectively achieved; while a foresight analysis currently being conducted with the support of ILRI, is expected to provide an indication of overall investment requirements for the dairy sector.

31. In 2012 *the Tanzania Milk Processors Association* (TAMPA) presented a policy brief to the Parliamentary Committee for Livestock, Agriculture and Water, which put forward solid recommendations for policy reforms. Committee members agreed that there are too many regulations and a lack of inter-ministerial coordination, and gave support to a review of policies. As a result of this, in 2013 the Ministry of Finance granted the dairy industry zero VAT rated status, making it a more attractive investment opportunity; but one year later the VAT exemption was reversed, and to date,

[5] See Appendix 1B – Attachment 1 for an analysis of the dairy policy and institutional framework.

there has been little movement to resolve the policy and institutional mandate overlaps and related costs.

32. The establishment of the *Dairy Development Forum* (DDF) as a platform for dialogue among stakeholders in the dairy sector may offer an important opportunity for addressing these and other issues affecting the sector. A new World Bank-implemented, Bill and Melinda Gates Foundation (BMGF)-funded *Livestock Micro-Reforms for Agribusiness* (L-MIRA) Project, also represents an important vehicle for bringing about regulatory reform in the dairy (and poultry) sector. It will intervene in two broad areas: improving farmers' access to quality inputs and services, and removing regulatory compliance complexity for off-takers and processors.

Livestock and dairy institutions

33. **Ministry of Agriculture, Livestock and Fisheries** (MALF). Under the policy of DbyD, the Ministry retains the core functions of policy formulation, local-level capacity building and technical backstopping of service delivery, and monitoring and evaluation. Under the Executive Agencies Act, functions of specific departments may be passed on to semi-autonomous agencies where it is deemed that those functions will be better and more efficiently carried out by such agencies. The Minister retains the power to make regulations on advice by the Board. They become enforceable in law once gazetted as government notices.

34. There is restricted capacity within MALF for building specialised skills relevant for the dairy sector. None of the six livestock training institutes of MALF offer specialized courses in dairy science and technology or dairy production, while Sokoine University of Agriculture offers only limited training in dairy technology at undergraduate level.

35. **Local government authorities.** Under DbyD, the LGAs at the district level are responsible for implementing most government policies and regulations, as well as for providing support services to the smallholder dairy sector, prioritised and financed through approved District Agricultural Development Programmes (DADPs). The regional secretariats' provide oversight, monitoring and evaluation.

36. **The Tanzania Dairy Board** (TDB). The dairy industry is regulated under the Dairy Industry Act of 2004. TDB was established under the Act 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. It is headed by a Registrar and CEO, who is appointed by the Board, which in turn reports to the Annual Council (AC). The Board and the AC have the role of advising the MALF on matters related to the dairy industry including formulation of regulations for the industry. Both the Board and the AC 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 human and financial capacity the TDB has till now been unable to fulfil its mandate.

37. **The Dairy Development Forum** (DDF). The DDF is a non-statutory platform that provides space and function beyond what is intended for the TDB's Annual council. Launched in 2013 with support from the Irish Aid-funded, ILRI-implemented project MoreMilkiT, the DDF 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. Its objectives are to: (i) promote a more inclusive orientation in public and private investments in the dairy sector; (ii) promote professionalization and best practices in the dairy sector; (iii) act as a platform for sharing information and knowledge, addressing systemic bottlenecks and co-creating solutions in the dairy sector; and (iv) facilitate the mentoring of milk-shed (or regional) dairy innovation platforms.

38. **Tanzania Milk Producers Association** (TAMPRODA). The association, based in Morogoro, was established in 2002 and registered in 2004, initially with support from the Dutch government. TAMPRODA membership is open to individual milk producers, farmer/livestock keepers' organizations, NGOs and institutions directly involved in milk production; and its role is to lobby for the interest of its members and offer business services to its members.

39. **Tanzania Milk Processors Association** (TAMPA). TAMPA was established in 2001 and registered in 2003. Most of the processors are members, and the current membership stands at around 90. The objectives of TAMPA are to build the capacity of the processing industry and that of its members to procure and process milk efficiently; assist its members acquire skills and knowledge in milk processing and marketing; promote the consumption of processed milk in the country; and lobby for the welfare of its members by engaging government, NGOs other private sector organisations.

40. Other relevant associations representing the interests of the private sector include: the **Agricultural Council of Tanzania**, with its key functions being policy lobbying and advocacy and capacity building for its 97 members; the **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; the **Tanzania National Business Council** (TNBC) established under Presidential Circular in 2001 as a forum for public and private sector dialogue; and the **Tanzania Private Sector Foundation**, a private sector platform through which the business community can express its concerns to the TNBC.

B. Rationale

41. The Country Programme Evaluation (CPE) carried out in 2014-2015 by IFAD's Independent Office of Evaluation made a specific recommendation to support the livestock sector, with focus on the development of the dairy value chain, since the sub-sector has historically received limited attention and investment by IFAD. In response, in March 2015 the then-Ministry of Livestock and Fisheries Development requested IFAD to support the development of the national livestock industry, with specific focus on the dairy sector. The proposed Southern Highlands Milkshed Development Project (SHMDP) responds to this request by supporting the development of the dairy value chain, focusing specifically on those smallholder farmers interested in dairy farming as a business. While such an approach would exclude the large numbers of pastoralists, IFAD is planning to work with the Government to develop a new project for 2017, focused specifically on pastoralists as the target group (Drylands Development Project), as indicated in the RB-COSOP 2016-2021.

42. The case for IFAD support to the dairy sector in Tanzania is based on a number of factors. First, across the developing world, demand for milk and milk products is growing with rising incomes, population growth, urbanization and changes in diets. In Tanzania consumption of milk is still relatively low, at 45 litres per capita p.a. Not only is this figure significantly lower than the figures for other countries in the region (Kenya 110 litres p.a., Rwanda 59 litres p.a. and Uganda 50 litres p.a.), but also the fact that urban areas consume twice the national average, both suggest that there is substantial unmet consumer demand. Indeed, projections suggest that demand in Tanzania could rise to 100 litres p.a. by 2020. As consumer demand becomes more segmented, the market for improved and diversified (i.e. processed) milk products of assured quality and safety is also expected to grow. Demand is also increasing within the area of Southern Highlands – particularly in the growing towns and district centres, and there are also limited (if as yet unquantified) exports from the Southern Highlands to parts of Malawi, Zambia and the Democratic Republic of Congo (DRC). Overall, it seems clear that there is a market – zonal, national and potential export – for increased volumes of competitively priced, quality dairy products from the Southern Highlands.

43. Second, it is evident that the dairy sector is a dynamic one: smallholder dairy farming is spreading, production is growing, and there is almost certainly considerably more processing going on than is recognised in published figures. Much, though not all, of this processing is at a small-scale, some of it artisanal rather than industrial; the picture is one of a vibrant sector, offering good opportunities for inclusive growth. This is a positive environment, and a development project which addresses the emerging climate and environmental issues along the value chain can build on and support this dynamism in a sustainable manner. There are substantial opportunities for increasing smallholder production and productivity, through improved management practices, technologies and services, and genetics – if producers have financial incentives to invest and are able to access effective services from the public and private sectors.

44. Third, the dairy sector currently contributes only 2% of GDP. Yet a number of studies suggest that it can be an important driver of economic growth in Tanzania. It can also be a source of improved livelihoods for smallholder dairy producers and their families, and of employment – particularly for youth – along the dairy value chain. It can have an important nutritional impact among producers and consumers in the rural and urban areas alike – particularly if linked to efforts to improve the quality and safety of milk and dairy products. These potential benefits are recognised in key Government policy and strategy documents, including the overall Agriculture Sector Development Programme II (ASDP2), and the 2015-launched TLMI. The project will support these policies and deliver results for their objectives.

45. Fourth, the dairy sector has already received considerable development support over the years. While not all of the initiatives have been successful or sustainable, they have laid the ground work for this project. There are substantial (if still insufficient) numbers of smallholder farmers milking improved/crossbreed animals in the Southern Highlands, a dairy 'culture' around production and consumption is developing, and private sector interest in the dairy sector is growing. While public support continues to be necessary, there is a major opportunity to modernise the sector, based on a more private sector-driven, commercial approach.

46. Fifth, critical to achieving this are both a shared vision as to the respective roles of the public and private sectors, and a more enabling environment to attract investors – small-scale and large-scale alike, to dairy production, service provision, processing and marketing. The project can play an important role in both of these areas. This would be consistent with the emerging policy priorities of Government as expressed in the BRN and SAGCOT initiatives; it would also respond to the GOT's new recognition of the importance of the dairy sector – as reflected in the TLMI, with the new political commitment to resolving these issues.

47. Sixth, a key lesson from past and current project initiatives in the dairy sector is that focusing on production – the supply 'push' – alone is insufficient, in the absence of efforts to expand market opportunities – the demand 'pull'. If farmers are to produce more, they must be able to sell their produce, and at a fair price. Project support therefore needs to support the modernisation of the entire value chain, and to focus on smallholder dairy farmers, service providers and processors and traders/transporters; as well as the policy and regulatory environment under which they all operate. Within the value chain the project does not need to choose between supporting either the formal or the informal processing sectors, it should rather enable ***all*** players in the value chain to expand the volumes they produce, 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.

48. Seventh, there is a number of major initiatives under way and growing momentum for policy reform in the dairy sector. Four are of particular relevance to this project: (i) the preparation of a Livestock Sector Master Plan and the road map/investment plan for dairy; (ii) the BMGF-financed L-MIRA project being implemented by the World Bank, focused on supporting regulatory reform for dairy input suppliers and processors; (iii) the East African Dairy Development Programme (EADD – also BMGF-financed) being implemented by the NGO Heifer International, 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 (iv) the IFAD-supported Market Infrastructure Value Addition and Rural Finance Project (MIVARF), which supports financial service delivery to the agricultural and rural sector through a range of institutional and policy reform activities. The project should both support and draw on all of these initiatives.

49. Finally, it is evident that the Southern Highlands is a heterogeneous area, in terms of predominant dairy farming systems (both zero and extensive grazing), climatic conditions, human and dairy cattle populations, infrastructure, and currently ongoing projects; as well as the constraints to, and opportunities for, development of the dairy sector. Some regions have invested in milk collection and processing but have paid inadequate attention to production, others have invested in production but less in milk collection and processing and others still have invested in processing but less in milk production and milk collection. Some districts are able to build on substantial private investment, or on

ongoing or past development activities; while others may have little dairy activity going on. A one-size-fits-all approach under the project would thus be impractical. Instead, it is proposed to define the final project area in terms of geographical 'clusters' within selected districts in the five regions where there are real opportunities to build on; and then to develop and adopt an integrated implementation approach that is tailored to the specific and local economic, social and environmental context in the different districts, and that is based on local-level planning, involving all key local stakeholders.

II. Project description

A. Project area and target group

Project area

50. **Overview of project area**. 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.

51. 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),[6] 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[7].

52. 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 households. 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.

53. 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.

54. 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

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

milk from its 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.

55. There are 562 active Savings and Credit Cooperative Societies (SACCOS) in the Southern Highlands with a membership of about 143 747. The following financial institutions are also operating in the project area: CRDB, NMB, NBC, Postal, EXIM, Access, Akiba, TIB, Equity, CBA, Mbinga Community Bank, Njombe Community Bank, and MuCoBa Bank PLC. FINCA Bank (Vision Fund Tanzania) has plans to open branches in Iringa, Mbeya and Njombe. In addition, a few major un-licensed MFIs are operating in the five regions targeted by the project. These include BRAC Tanzania and CRDB Micro Finance Services Co. Ltd., both of which propose to set up around six branches and ten mini-service centers, respectively, in the Southern Highlands. Details of the formal financial institutions present in the project area are provided in Appendix 14: Strategy for facilitating specialized financial services to the dairy value chain.

56. Tanzania has a complex climate, with wide variations across the country and strong seasonality. The five regions selected in the Southern Highlands present heterogeneous climatic conditions as well as agro-ecological zones, influenced by physiology and altitudes (low to highlands). Rainfall in the highlands is already highly variable, and is growing more unpredictable. Over the long term, the Southern Highlands will likely experience rainfall decreases coupled with significant increase in spatial and temporal variability of rainfall resulting in disastrous impact on the agricultural sector. For instance, drought periods, have resulted in severe damage to livestock's water points, crops and rural infrastructures and increased conflicts amongst multiple water users. The project outputs and outcomes will be impacted by climate variability and change. Adaptation and mitigation measures will be thus integrated along the whole dairy value chain based on the identification of the associated climate risks so as to build community resilience.

57. **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.

58. 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[8] (Table 1).

[8] Mbarali and Songwe districts are also being analyzed for inclusion.

Table 1. 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 FOs	# 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

59. 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

60. 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[9],** 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[10], 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**:**
  - 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.

61. 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.

62. 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

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

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 and gender strategy

63. 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.

64. ***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. 57-58, 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 (FOs), 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[11]. Within each defined project district, as a second step, the ZPMU will conduct a rapid assessment (para. 59) to define the clusters and project activities tailored to their specific circumstances.

65. ***Self-targeting.*** Activities and implementation mechanisms are 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.

66. ***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. The pilot will be reviewed at mid-term, and if successful, scaled up.

67. ***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.
- 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.

[11] See Attachment 2 in Appendix 4. Land tenure measures: enabling communal grazing land and youth group managed cowsheds through Village Land-Use Planning.

- 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.

68. ***Enabling environment and policy dimensions.*** The 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.

69. **The gender and youth strategy** will be entrenched in the project's three components and cut across the different target groups. First, it will 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, preventing men from taking control of all income generated and decision making. Second, it will promote the involvement of young men and women in the services revolving around the dairy value chain, in particular AI, veterinary and para-veterinary services, transportation, distribution and labour employed in processing centres. Third, it will 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.

70. 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.).

B. Development objective and impact indicators

71. The overall **goal** is 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.

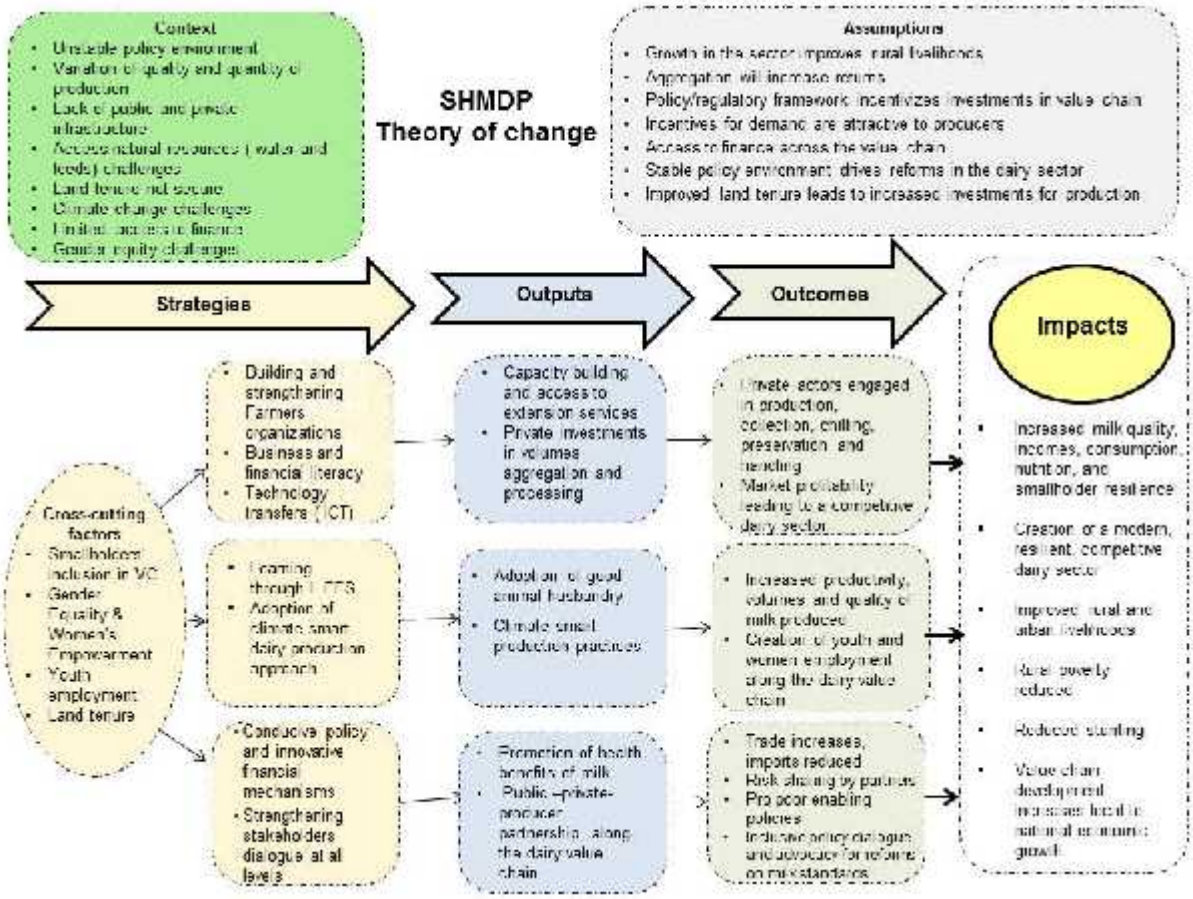
72. The project **development objective** will be to increase market opportunities and diversify sources of income from the quality, nutritious dairy products of smallholder dairy farmers participating in the value chain, thus enhancing consumption, nutrition and the climate resilience of rural livelihoods.

73. 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 producers, 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.

74. 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.



C. Outcomes/components

75. To achieve the objective and outcomes described above, the project will carry out activities that have been organized under three main components (which are described in greater detail in Appendix 4):

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

76. **Component 1: Building efficient dairy value chains from producer to consumer (US$ 20.7 million)**

77. The outcome of this component is development of 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. 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

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

78. 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. Information provided by MALF shows that out of the approximately 55,468 smallholder dairy farmers in the five regions covered by SHMDP, only 25-30% are organized 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 are registered as companies. In total, there are 172 smallholder dairy FOs in the targeted area. While these exist in different forms, a general characterization is that the majority are weak, not commercially-oriented and rarely receive supervisory oversight by the government. Where these exist and are strong, they play a key role in establishment and management of MCPs 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. These FOs are the preferred mechanism for farmers to engage with the market, the preferred model for processors to engage with farmers, and generally present the best option for increased production and delivery of quality milk from smallholder farmers to the market.

79. 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:

80. ***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 FOs in the targeted area, which express interest in working with the project to ascertain their operational and organizational capacity, and to identify and competitively select the FOs to be supported under the project. For each selected district, it is anticipated that the project will work with up to four FOs[12] who demonstrate the highest potential for expanded membership and sustainable service delivery to smallholder dairy farmers. New entrants into dairy farming and newly formed farmer groups will be encouraged to join existing dairy FOs to build on economies of scale. 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.

81. ***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 short and medium term goals, clearly identifying various sources of financing (equity/debt) and other gaps that could be supported by the project. Once prepared, each EDP will be validated by the FO membership through a general assembly before presentation to financial institutions for appraisal and financing. At the same time, the FO could 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.

82. ***Capacity building of FOs in line with their EDPs*:** For FOs who successfully develop bankable EDPs[13], the project will provide targeted capacity building support tailor-made to meet capacity gaps identified in the EDP. While it is expected that these will vary according to the stage of the FO and the short and medium goals set in the EDPs, it is anticipated that these will cover the following areas: (i) organizational development; (ii) capacity building in financial and business management; (iii) technical training and capacity building in areas related to milk handling and

[12] It is expected that the project will target secondary FOs bringing together 10 or more grassroots primary producer organizations with an average membership of 400 farmers. Most of the existing 172 FOs are grassroots groups of 20-30 farmers.

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

preservation, milk processing, and establishment and management of input supply and dairy services delivery units; (iv) rapid review and adoption of modern information communication technology (ICT) for FOs; and (v) linkages to financial institutions for financing of FO enterprise development plans, building on mechanisms already established under the MIVARF project.

83. ***Capacity building of district's cooperative departments:*** To improve the effectiveness of the oversight and support roles performed by district's cooperative departments in targeted districts as a resource towards improved performance of 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 working with the project.

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

84. Milk is a highly perishable product and requires cooling within 2 - 3 hours after milking. MCPs and MCCs offer to milk producers a place to collect and chill their milk to maintain quality. For these facilities to effectively perform their function, they need to have minimum required work 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 to allow milk produced by farmers to reach the facilities in good condition. To support the upgrading, expansion and improved capacity utilization of milk collection and handling infrastructure in targeted districts, the project will support the following activities:

85. ***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.

86. ***Investment*** **in milk collection infrastructure:** Based on appropriate business partnership models identified under the infrastructure study, SHMDP will support the establishment and upgrading of at least 180 farmer-led MCPs; construction/upgrading of up 60 satellite MCCs (of up to 2,000 litre/day capacity) and the construction/refurbishment of up to 15 centrally located MCCs (of 5,000 litre/day capacity). 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.

87. ***MCC road and water access infrastructure improvement*****:** To support all weather accessibility of feeder roads connecting MCPs/MCCs to milk production clusters and market outlets, the project will support feeder road improvements of sections deemed impassable during rainy seasons. While investments will be demand-driven and responsive to the needs of each cluster, it is anticipated that the project will support up to 10kms of road improvements in each targeted district. 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.

88. Provisions are also made for support to MCCs and processing facilities without reliable/adequate supply of portable water to sink boreholes or extend piped water connection to their premises. Besides collaboration with other programmes, the project will help catalyze partnerships in provision of alternative energy sources for powering milk chilling, basic equipment for milk testing and lighting. 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.

89. ***Support to milk collectors/transporters*:** Milk collectors, usually young men, perform a critical service in the transportation of milk from individual farmers to MCPs, MCCs, and in a number of cases, to the markets/processors. To improve quality handling of milk at this segment of the value chain, the project will support better organization and training of transporters in hygiene and appropriate handling of milk. In addition, the project will support transporters to access financing for upgrading of transportation means (motor cycles, tri-cycles and even small light trucks). The project plans to pilot the use of refrigerated tanks on 3-wheeled motorcycles.

90. ***Capacity building support to milk inspectors:*** The project will support the capacity building of milk inspectors in all targeted districts for effective training in 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.

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

91. 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 subsector 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 milk products in the project area and other parts of Tanzania and the region. In addition, the sub-component will 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. The sub-component will also 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. To grow the market for milk and milk products, the project will also support initiatives aimed market expansion. The following are the main activities to be undertaken under the sub-component:

92. ***Market studies:*** The project will support four targeted studies on dairy processing in the project area; milk trade and distribution models; dairy market segmentation and growth potential; and 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.

93. ***Milk processing and value addition*:** Based on the results of the processing study, 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. 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. Training will be conducted both on-site, at training institutions within Tanzania (including the newly established dairy training unit at Sokoine University) and also in neighboring countries with significantly advanced dairy industry; and through study tours and exchange visits to both locally and in the East Africa region.

94. ***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; (iii) conduct business trainings on how to establish and operate retail businesses selling dairy products in the development poles; and (iv) 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.

95. ***Support for development and offering of financial products suited to dairy*****:** An assessment of financial service providers in the Southern Highlands 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:

96. 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.

97. 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.

98. 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.).

99. ***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: introduction of pilot "school milk feeding program" in two primary schools in each targeted district to test sustainable integration of milk in parent-financed school milk feeding for children in primary schools (see Appendix 4 for details); targeted marketing campaigns aimed at increasing the consumption of milk in the targeted project area and the country as a whole; and support to private sector-driven efforts for increasing product diversification and penetration in market segments not well covered.

100. ***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 Specialist (DAS) who will be supported by a team of ten 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 (see draft TORs in Attachment 1, Appendix 5). These advisors will comprise the core of the value chain support team. At district level, implementation will be done by the established DPIU led by the District Livestock Officer. On need basis, private service provider will be contracted to provide focused support (e.g. training).

101. The district-level multi-stakeholder dairy platform, with support from TDB, will be central in identification of potential partners in in the business of milk transport with assistance of DPIU (District Livestock Extension officer) with the milk inspector (MI) will be responsible for creation of database of identified milk transporters in each district. DPIU will be responsible for organizing training with

support from zonal dairy agribusiness specialist and TDB. The focus training will result in development of business plans qualifying for access to credit.

Component 2: Increasing on-farm productivity (US$ 11.4 million)

102. The outcome of this component is increased on-farm production and productivity of smallholder dairy farmers based on increasingly commercialised and 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

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

103. 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 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.

104. ***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.

105. 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; (ii) supporting if necessary, and recommended by an audit, the refurbishing of the liquid nitrogen plant in Iringa; (iii) supporting the creation of five regional AI cooperatives or associations, managed by inseminators, where liquid nitrogen and semen will be stored and distributed; and (iv) supporting partnership between inseminators and regional cooperatives of inseminators with FOs, to enable access to AI through FOs and MCCs.

106. The project will also 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.

107. 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.

108. ***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 appropriate to the agro-ecological conditions of each target district; (ii) support to private producers at household and community level for the intensified 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 explore business opportunities related to climate-smart technologies and practices for intensified pasture and seeds production that will involve the rural poor along the value chain, especially women and youth, and facilitate suitable linkages between the financial institutions and the private producers/marketing companies for the production and distribution of feed and forage.

109. ***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 transboundary animal diseases (TADs) and zoonotic diseases fall under the responsibility of the Veterinary Authority, while the other diseases fall under the responsibility of private veterinary services. The project will therefore follow a twofold approach in the animal health domain: (i) support to the public veterinary services for the surveillance and control of TADs including vaccination and (ii) support to private veterinarians and para-veterinarians to enhance their capacities and outreach.

110. The project will support a set of activities aimed at improving the disease surveillance mechanisms: (i) public awareness campaigns aimed at improving participation of farmers, extension workers, private vets and para-veterinarians in disease reporting; (ii) consultation workshops organized to improve and formalize coordination and collaboration between various public and private stakeholders; (iii) reinforcement of reporting means at district level; and (iv) support to the Regional Veterinary Investigation Centre and the Zonal Veterinary Centre of Iringa in Iringa to improve their investigation and coordination capacities.

111. 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 Contagious Bovine Pleuro-Pneumonia (CBPP) will be considered as the first priority since it is ranked so in the national disease prioritization framework. The project will also support both private and public veterinary services for the control of East Coast fever (ECF) by supporting district and communities to: (i) establish the logistics for the vaccination campaigns 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) promote awareness creation and information dissemination among cattle keepers for effective prevention of vectors and control of ECF. ECF prevention will also be part of the FFS package.

112. 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 sources 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; and (iv) supporting creation of local professional organizations of veterinarians and paravets. The project will facilitate linkages with financial institutions for the private veterinarians and para-veterinarians to obtain loans for setting up their business enterprises.

113. ***Supporting access to water for production and hygiene:*** In some villages, where milk production is 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 sited to serve a radius of 500m within the village and will be powered by solar energy to the extent possible. 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. The district guidelines for development of community water system will be followed at all times.

114. ***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 include the following initiatives: (i) 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 partial restocking. (ii) A pilot programme targeting 150 youths operating in collective cowsheds will be implemented for 15 groups of ten youth. And (iii) a pass-on-the-gift programme will be implemented for 1,000 targeted very poor and vulnerable households without dairy cattle. In addition to the animals, the targeted households will benefit from a whole package of activities including training, extension services, group facilitation, etc.

115. As part of the direct targeting and empowerment strategy of the project, SHMDP will provide support for **financial literacy and leadership training for women farmers** to strengthen their capacity to build the assets required for dairy production. Training will also aim at enabling women to better manage changes in power dynamics that might occur in the household as a result of the value chain becoming more commercial; overcome the numeracy and self-confidence gap; and provide them with the necessary skills to gain access to financial services. 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.

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

116. ***Supporting existing network of public and private extensionists:*** In order to compensate the existing deficit in extensionists, the project will support 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 extensionists based on a cost-shared arrangement in order to ensure the durability of the equipment.

117. ***Establishing 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.

118. L-FFSs will be created around similar production activities, and when 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 is not only technical but also managerial and financial. A pilot of the L-FFS in this 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) identifying innovative, gender-equitable solutions in livelihoods planning and dairy value chain development. The 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, Appendix 4.

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

119. ***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. Research centres will be also 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.

120. ***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. Research would be conducted preferably on farm or on station, in collaboration with district extension workers, and in conjunction with L-FFSs. 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.

121. ***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. In coordination with component 3, 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, Extrapolate) to test policy options.

122. ***Organizing regional exchanges with neighbouring countries for promotion of technical and organisational innovations:*** The project will organize exchange visits for the 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 use of GALS in the context of L-FFS.

123. ***Implementation arrangements:*** ZPMU specialists in dairy production will be responsible in ensuring a close linkage of this component to component 1 especial in the use of developed MCCs and MCPs as hub for access to inputs necessary for improvement in productivity. A hub could ideally offer services such as veterinary care, AI, extension, and sell inputs such as feeds and forage seeds to its members. The component will also make use of Dairy Development Platform for assessing progress and challenges of dairy development for each district and creation of farmers/groups/ associations data base. DPIU will have direct responsibility on implementation through 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 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 value chain development **(US$ 2.6 million)**

124. 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

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

125. ***Strengthening stakeholder dialogue at all levels:*** The Dairy Development Forum (DDF), in operation since 2012, 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 generated has remained at national level (with the exception of Tanga Region). The same will be true of L-MIRA, which has also been designed with a national focus. Arguably, 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. As an early activity, the ZPMU will conduct a short study intended to draw out the lessons from the Tanga Region stakeholder platform, and use these to inform the implementation in the Southern Highlands.

126. Implementation of this activity will build upon the formed clusters inviting members to become members of a district-specific multi-stakeholder dairy platform (MDP). MDPs are likely to vary in size and may go across two or more clusters. Membership will be open to all economic actors with a legitimate interest in the sector: they may be expected to number around 30 or so per economic cluster. The members will select the chairs of the MDPs. The first task of the platform (under the guidance of the DAS) will be to fine-tune the project activities to be conducted at this level.

127. The project will then provide support to convene, facilitate and support as necessary regular MDPs in each of the participating project districts (which may go beyond district boundaries). From PY2 onwards, these are expected to be held in all project districts four 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 and help resolve local-specific policy constraints; (ii) assist to better prioritise and target public sector support, through and beyond the project; (iii) help identify win-win opportunities for greater collaboration; (iv) support establishment of commercial relations between farmers and other private sector operators; and (v) provide lessons and experience that could enrich the national level dialogue.

128. On the basis of the MDPs, a zonal platform would also be established and supported. This will be made up in large part of members of the district level platforms, plus those players (such as e.g. the Regional Livestock Advisors or ASAS Dairies) whose involvement in the sector goes beyond the district level. Membership would be open to all those with a legitimate interest in the sector; it would meet twice per year, though this could be increased if members consider it useful to do so. The zonal platform would have similar scope as those at district level; though focusing on issues that go beyond district boundaries. The zonal platform would also help make the bridge from the district to the national level DDF, and 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.

129. ***Conducting policy studies, analysis and follow-up:*** Effective policy dialogue needs to be informed by analysis. The project will thus support conducting policy reviews and studies that inform these policy processes. Study topics, which should all be confirmed by the Project Steering Committee, could include for example: (i) a review of the organization of extension service delivery, and approaches for recognising or certifying private extension suppliers; and (ii) 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 on a sustainable basis, etc.

130. In addition, the need for relevant, policy-focused studies would emerge in the course of project implementation. The need for them would originate from three main sources: (i) discussions 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) gaps identified by stakeholders in the other ongoing policy-related initiatives in the sector – particularly L-MIRA. They would thus be based on the concrete issues that men and women smallholder producers and others face in the dairy value chain. A key role for all such studies would be to build on the TLMI and the Livestock Sector Master

Plan (LSMP), and 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 in this. The findings of all studies and analysis could be presented to the national DDF, as well as to the inter-ministerial Agricultural Sector Consultative Group.

131. ***Supporting the Tanzania Dairy Board:*** The TDB currently lacks the capacity to fully respond to its mandate, relative to both the promotion and the regulation of the sector; though it is beyond the scope of the SHMDP to provide a comprehensive package of capacity-building support to TDB. Nevertheless, the TDB does have a crucial role to play in convening stakeholders from across the dairy sector; promoting policy dialogue amongst them, and advocating for policy reform on behalf of its members; and 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.

132. 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 TDB 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. The specific requirements relative to each activity will be determined through the annual work planning and budgeting process.

133. 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 (transporters, MCCs, processors, etc.), and certification for training courses and their participants. 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 do not 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 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

134. The project will work with the Livestock Training Agency (LITA), 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: animal feeding and forage production; genetics and reproduction; and animal health and milk safety and quality.

135. 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.

136. 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).

137. 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 in the project area; dairy technologists already operating in formal or informal processing facilities in the region will be considered in 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.

138. ***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 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.

139. Interventions proposed under components 1 and 2 are expected to result in a higher demand for **specialized financial services** by the various actors in the dairy value chain. Hence, the SHMDP will provide necessary support for such activities, both on demand and supply side, that will facilitate improved access to financial services. Support from the project will be in the form of technical assistance and facilitating linkages for provision of financial services. Focus will be on financial literacy/awareness creation about the financial services, preparation of business/enterprise development plans, potential mapping, preparation of banking plans, capacity building of the financial service providers (including training of staff and developing specialized products for meeting the aspirations of different value chain actors), facilitating linkages for provision of financial services and creating an institutional mechanism for reviewing and monitoring the progress in this regard on a regular basis. Besides engaging with the financial institutions in the project area on an individual, as well as on a collective basis, SHMDP will also leverage the opportunities created through the implementation of other development projects in the country. In this context and more particularly, the project will undertake suitable initiatives to ensure that the benefits of the *Credit Guarantee Mechanism and the Rural Innovation Fund*, currently being set-up through the implementation of the IFAD-funded Marketing Infrastructure, Value Addition and Rural Support Programme (MIVARF), also accrue to all the stakeholders in SHMDP. See strategy for facilitating specialized financial services to the dairy value chain in Appendix 14.

D. Lessons learned and adherence to IFAD policies

140. **Past results, impact and performance.** Based on the 2015 Country Programme Evaluation and other assessments, IFAD's support to Tanzania's agricultural and rural development has contributed to improved performance and impacts on IFAD's target groups. Some of the main finding have included the following: (i) 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; (ii) farmer empowerment (including women) by strengthening farmer groups, water user associations, and savings and credit associations, has enhanced IFAD target groups' capacities and ability to contribute to participatory planning and implementation of agricultural development plans; (iii) through support for ASDPI, the introduction of a programmatic, sector-wide approach has resulted in alignment and

harmonization of key sectoral policies, institutional arrangements and development partner investments, and supported the Government's decentralization strategy; (iv) while it took time for the Government and development partners to agree on the ASDP content and financing mechanisms, eventually this resulted in a programme that addressed sectoral needs and national priorities and had realistic objectives; and (v) results for enhancing smallholder access to rural markets and financial services have been below targets, as projects have been hampered by wide geographical dispersion of investments and assumptions on the role of an inclusive private sector.

141. **Lessons learned.** The main lessons learned from IFAD's support to the agricultural sector in Tanzania 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: (i) securing sustained political and leadership commitment by the agricultural sector lead ministries, local government authorities, development partners, and private sector for a sector-wide approach; (ii) ensuring that adequate fiscal and human resources are effectively mobilized, channelled and managed; (iii) accommodating different funding modalities beyond the basket fund, while securing coherence and alignment; (iv) expanding the role of and provide appropriate support to an inclusive private sector; (v) supporting farmer empowerment, for instance by scaling up the Farmer Field School (FFS) approach; and (vi) achieving effective coordination in the sector through appropriate institutional arrangements, which can be enhanced through IFAD's implementation support.

142. In Zanzibar, key impacts have been achieved through the introduction of FFS promoting integrated crop and livestock technologies and improved support services provided by community CAHWs. These interventions demonstrate cost-effectiveness and good sustainability prospects, with demonstrated spill-over effects to nearby farmers and their communities.

143. 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 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.

144. IFAD support to stand-alone projects has presented opportunities for more refined targeting at design and implementation, but has also incurred 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.

145. With respect to non-lending, and as proposed under the new RB-COSOP, there is need for IFAD to expand its non-lending support in areas 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.

146. 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).

147. In addition to these IFAD-specific lessons learned, a recent review of successes and failures of a range of dairy value chain development interventions in Tanzania[14] identified the following lessons, a number of which are of direct relevance to the design of the SHDMP:

- ***Breed improvement.*** Animal breeding and selection serves to improve and/or maintain genetically superior animals for higher production. A review of the Dutch-financed Smallholder Dairy Support Programme highlighted the value of a flexible approach. The project's initial breeding strategy focused 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 new approach resulted in improved milk production and sales. A close sanitary monitoring of bulls remains necessary however to avoid spreading of diseases.
- ***Product diversification.*** 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. 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.
- ***Collective marketing.*** A variety of projects 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.
- ***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 quarterly to address problems related to market access, improving dairy production, and overcoming the strong seasonal fluctuations in milk supply. Among other achievements, it 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.
- ***Financial services.*** Projects that provide grants and loans or credit services send a wrong signal to the clients, and the approach is ultimately unsustainable. Financing requirements of value chain actors can be addressed through project-facilitated financial instruments offered by market actors after verification of scope and type of financial services requirements of various the value chain actors. 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.
- ***Limited intervention logic.*** Many dairy projects have 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. This is exemplified by the unclear systems of collection, marketing and distribution of the milk produced within some of the major dairy projects. Project designs should include value chain interventions, which take a broader systems approach to achieve sectoral growth.
- ***Dispersed heifer calf pass-on.*** While Heifer International and its partners have helped to increase the number of dairy cows in the country, countrywide distribution has created setbacks. 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] Ogutu, C, L. Kurwijila and A. Omore (2014)

- ***Poverty targeting.*** In addition, Heifer International – and other projects – have targeted poor farmers with the pass-on scheme. Given 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, some recipients have been unable to realise the milk production potential of the dairy cows they have been given. 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.
- ***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.
- ***Insufficiently inclusive design.*** Although dairy farming is largely a private and commercial activity, many dairy projects have not consulted the private sector during the design stage. The full range of value chain players 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.

148. Beyond Tanzania, some of the key lessons from the ongoing IFAD-supported Smallholder Dairy Commercialisation Project in Kenya have been 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, and ensuring that 30% of leadership positions went to women; (ii) training sessions arranged at convenient times for women; (iii) introduction of gender-friendly and labour-saving technologies; (iv) use of gender-sensitive participatory appraisal methodologies in the planning, implementation and monitoring processes; and (v) sensitisation and capacity building on gender.
- Low quality of technical support to Dairy Groups affected the achievement of 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.
- The subsidies for Artificial Insemination (AI) and animal health services offered by some counties posed a challenge to SDCP-supported private service providers' business development. Through cooperation with the counties, SDCP sought to 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 developed 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 was slow and results were limited. Setting up the system was time-consuming, while new and emerging technologies rendered the SMS platform inadequate.
- The school milk programme supported by SDCP did not yield expected development results: 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. While it had evident nutritional value, the programme did not target those most in need, i.e. children 18-23 months old; and in order to address under-nutrition, a more comprehensive approach to increase dietary diversity is required.

149. 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 atus 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.

Adherence to IFAD policies

150. The project is in line with IFAD Strategic Framework 2016-2025. The project activities, implementation arrangements and M&E system have been designed in compliance with IFAD Targeting Policy, IFAD policy on gender equality and women's empowerment and in line with the approaches outlined in the Framework for Gender Mainstreaming in PMD Operations. The project is designed to be consistent with IFAD's Private Sector Development and Partnership Strategy, its Rural Finance Policy and the associated Decision Tools for Rural Finance. Finally, the project will be aligned with both IFAD's Climate Change Strategy and its Environment and Natural Resource Management Policy. The project is considered Category B as far as its Environmental and Social classification is concerned.

III. Project implementation

A. Approach

151. 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. In support of the FYDP II, the project will be the first for MALF 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 smallholder dairy sector and in doing so the public and private sector's mandates, roles and responsibilities will be both capacitated and strengthened.

152. SHMDP will take as its starting point the value chain for milk and milk products; and it will focus particularly on supporting the inclusion of smallholders for the production, marketing and processing of milk. 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.

153. The implications of the project design for the implementation arrangements to be established 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 will be 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 build on, other initiatives in the dairy sector; particularly EADD, focused on the development of integrated dairy hubs; and L-MIRA,

focused on supporting regulatory reform. The SHMDP implementation approach will need to be sufficiently flexible to ensure complementarity and build synergies between the initiatives.

- 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.
- The relatively limited project implementation period (7 years) demands that project activities start up as quickly as possible.

B. Organisational framework

154. **Project oversight.** 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 FOs 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.

155. **Project execution.** 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.

156. **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.

157. 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 a Procurement Specialist. Draft TORs for ZPMU staff are presented in Appendix 5 (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.

158. 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.

159. At an operational level, it will: (i) Take overall responsibility for the planning, management and supervision of all three project components and the activities under them; (ii) assist District Development Teams to prepare AWPBs for the project, consolidate these and submit the project AWPB to MALF and IFAD for review and approval; (iii) conduct project-level procurement of good and services, and support district-level procurement as appropriate; (iv) 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; (v) manage relationships with, and backstop implementation by, the districts and with other partners e.g. research and training institutions, and service providers; (vi) develop and implement a communication and knowledge management strategy to manage relations with the public, project partners, non-state actors and farmers; (vii) establish arrangements for actively collaborating with other relevant development initiatives in the dairy sector; and (viii) 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.

160. **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.

161. DPIU broad responsibilities will include: (i) Leading the cluster development approach at district level (described below and Appendix 5) and organisation of the district Multi-stakeholder Dairy Platforms (MDP); (ii) 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; (iii) 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; (iv) in collaboration with ZPMU, building capacity in dairy technologies by providing training to district, village extension officers and farmers; (v) procuring project services and facilities in liaison with ZPMU, contracting out dairy studies and other activities as per LGA guidelines; (vi) 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 (vii) 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.

162. **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.

163. 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.

164. **Contracted service providers.** 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.

165. 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.

166. 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.

167. **Implementation start-up.** At the ZPMU level a Project Implementation Manual (PIM) for the whole project will be prepared, however at the district level short user-friendly guidelines will be prepared for each component. There will also be guidelines for programme staff procedures and financial management. Prior to the launch workshops, the ZPMU teams will revise the logframe

around outcomes which will then be discussed with the various actors in the value chain as well as project partners to ensure buy in from all stakeholders.

168. 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.

169. **The cluster approach**. In summary, the project will apply a business approach for establishing viable economic clusters as the the basis for defining the effective project and tailoring project activities to the specific local circumstances of the cluster. Clusters will be characterised by a geographic concentration of interconnected producers, businesses, suppliers, and associated institutions in the dairy value chain; and by either the reality of, or the opportunity for, direct and indirect synergies among them, resulting in market linkages. Clusters will be also the foundation of organising sector actors at the local level and these clusters will then join into MDPs. It is in these clusters that the project will focus its efforts.

170. In the case of the Southern Highlands, clusters will extend to those smallholder dairy farmers who are geographically located sufficiently close to the point of demand / aggregation to make their participation economically viable for them and other value chain actors. A cluster approach will also be used to identify potential locations for MCPs or MCCs as well as learning and discussion groups / forums / L-FFS, etc. In addition, clusters may provide the basis for the creation of a Federation representing a number of FOs and the formation of MDPs.

171. The project will bring the various value chain actors and government together to discuss common issues in the MDPs (see component 3). The intention is that the platforms will help create trust between the different actors, and result in them developing an action plan together to tackle the issues and strengthen the value chain.

172. The key steps of an MDP action plan will comprise: (i) rapid mapping in all key dairy production locations. to identify and map the main actors in the local value chain, including their demands, contributions and expectations; (ii) identifying the clusters and MDPs; (iii) a MDP validation workshop, with value chain actors (buyers, processors, traders and businesses as well as representatives of producer groups) to confirm the scale and scope of the immediate market opportunity; (iv) confirming the interest of buyers/traders interested to buy increasing volumes at prices likely to incentivize for producers to increase production and meet demand; (v) reviewing the project's instruments, modalities and resources as a basis for stimulating growth in the local value chain, and providing an input into the district-level AWPB; and (vi) developing and implementing a joint action plan, commencing with immediate local market opportunities or bottlenecks.

173. The ZPMU will contract a service provider with a proven track record working in the dairy sector, who will provide training and capacity building to the DPIU to ensure clarity on the role they will play in the cluster approach and the establishment of the MDPs (see draft TORs in Attachment 1, Appendix 5). Subsequently, the cluster development process at the district level would be led by the DPIU for sustainability. For a detailed discussion see Attachment 2 in Appendix 5: Using clusters in the implementation approach for Multi-stakeholder Diary Platforms.

C. Partnerships and collaboration with other initiatives

174. **RBA collaboration.** The following activities requiring specialized skills and tools will be implemented in partnership with FAO:

- *Training of five national L-FFS Master Trainers (MTs)*: Services provided by FAO will include a residential expertise in Tanzania for the first three 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. FAO will be responsible for: (i) organizing and conducting the training of the national MTs; (ii) assisting the CTC for L-FFS in the organization and planning of the L-FFS activities; and (iii) providing guidance and support the preparation of the training manuals and materials for the L-FFS.
- *Technical assictance in the formulation of a National Dairy Master Plan:* The EXTRAPOLATE (Ex-Ante Ex-Ante Tool for Ranking Policy Alternatives) policy formulation toolkit, developed by FAO in the scope of the Livestock Pro-poor Policy Initiative, will be used to facilitate the stakeholder consultation process and discussions on policy options to be included in the DMP. This consultation process will be facilitated by FAO using the EXTRAPOLATE toolkit.
- *Collaboration in milk cooling technologies* at MCPs/MCCs is being also explored with FAO Nutrition Division.

175. **Collaboration with other initiatives.** Synergies will be established with the following projects aiming at strengthening the national policy framework and institutional capacity for dairy sector development:

- The US$ 45 million BMGF-funded, Heifer International (HPI) implemented, EADD2 covering Iringa, Mbeya and Njombe Regions in Tanzania (as well as in Uganda and Kenya) in collaboration with ILRI, Technoserve, the World Agroforestry Centre and ABS Global. SHMDP draws on the lessons of the EADD “hub” model, and as EADD2 is due to be completed in 2018, so there will be little opportunity for direct collaboration; however, the 12 dairy hubs with which EADD is currently working will receive further support as necessary under SHDMP to ensure sustainability.
- The BMGF-financed, World Bank-implemented Livestock - Micro Reforms for African Agribusiness (L-MIRA), will aim to improve the policy and regulatory environment for dairy farmers and processors. The project will also seek to remove the regulatory compliance complexity for processors, through rationalisation of laws and regulations, and implementation support for more effective regulation especially with respect to inspection activities. Public private dialogue will support to accelerate the reforms. L-MIRA is of major relevance to the SHMDP – particularly, though not exclusively, component 3, which will support L-MIRA’s agenda, both by conducting a studies on complementary regulatory and trade issues related to the dairy value chain, and by bringing the L-MIRA-supported process of national-level policy dialogue to the zonal and district levels. Further opportunities for collaboration will be defined during implementation.
- Three IFAD grants: (i) “East Africa Livestock for Livelihoods (EA- L4L)” to HPI to support dairy development activities in selected areas in Rwanda and Tanzania (specifically Zanzibar) – this may provide relevant lessons on the dairy “hub” development model; (ii) “Greening livestock: incentive-based climate-smart agriculture interventions for reducing the climate impact of livestock in East Africa”, to be implemented by ILRI; and (iii) a grant to CIAT will focus on supporting climate smart dairy systems in East Africa through improved forages and feeding strategies. The synergy with this project will enhance SHMDP’s capacity to ensure climate resilience of dairy development activities.
- BMGF is funding two further public-private partnership initiatives on dairy development, focused on: (i) AI delivery in East Africa as a pathway towards increasing the number of crossbred females owned by smallholders, through the Public-Private Partnership for Artificial Insemination Delivery Programme (PAID), implemented by the Land O’ Lake International

Development Fund and ABS Global; and (ii) a National Dairy Records Processing and Dairy Farmer Education and Feedback Centre – aimed at training farmers to better manage their crossbred animals, and to encourage/support them to record performance to help them close the yield gap with their best performing neighbours. SHMDP will work closely with PAID for AI services

176. The ZPMU will be expected to meet regularly with the managers of these projects, in order to explore and concretize the collaboration between them and through engagement in a variety of dairy value chain forums.

D. Planning, M&E, learning and knowledge management

Planning

177. Planning will be guided by the project's logframe, and in particular the project development objective and three key outcomes. From PY2 onwards, the activities defined in the annual work plan and budget (AWPB) will also 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 and risk analysis for each result. The AWPB will include plans for training and technical assistance, M&E and procurement for the year in question, wherever warranted.

178. 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 the MDP, and it will be approved by the district council and will form part of the DADP. This will help to build ownership at the district level, and the taking on of responsibility for implementation, monitoring and evaluation by district organs.

179. 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.

180. 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 and evaluation

181. The M&E function within the project will serve three distinct functions. The first will be one of ***management and planning***: to provide timely information that enables the managers of the project to plan as well as confirm whether implementation and financial performance are on target, the project's objectives are being achieved and the project's strategic approach is valid; and to take corrective actions as necessary. The second will be an ***accountability*** function: to 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.

182. The M&E system will be derived from the project logframe and should link with appropriate national systems. 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. The indicators used to measure progress, results and impact will include: (i) the indicators defined in the logframe; (ii) those identified by the ZPMU and project implementing partners as critical for management, accountability and learning; as well as (iii)

those of relevance to the project that contribute to IFAD's Results and Impact Measurement System (RIMS), which measures and reports the results and impact achieved by IFAD-financed projects[15].

183. In addition, the M&E system will collect and analyse information about a number of key dimensions 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 (including climate risk and greenhouse gas emissions).

184. 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.

185. A baseline study will be carried out upon start-up in order to inform overall project planning, ensure benchmarks and realistic targets are set, and determine climate risk and environment-related benchmarks. With regard to the indicator on reduction of GHG emissions along the dairy value chain, the study should collaborate with ILRI and Sokoine University - National Carbon Monitoring Centre to establish appropriate methodologies to measure and monitor the project development objectives and other outcome indicators related to environmental and climate risks management as needed and ensure these are incorporated in the project M&E system.

186. 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, activities and components; and the overall targets, as necessary. The midterm review will also be the deciding point to assess whether or not the project implementation period should be extended beyond the initial 7 years depending on progress in relation to dairy cattle production cycle. Any suggested changes will be assessed and endorsed by IFAD.

187. Field visits and joint implementation review missions will also be carried out on a regular basis by project staff, IFAD 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.

188. M&E data will be captured, analysed and presented through a web-based M&E system, capable of producing reliable and easily accessible information. This will allow for real-time inputting of data – including from e.g. mobile phones or tablets; their automatic aggregation; timely decision making by managers; and open access to, and sharing of, results among all project stakeholders at all levels.

189. Upon project effectiveness, an M&E consultant will be recruited to establish the M&E System; prepare the M&E manual; and provide ongoing support for the set-up and implementation of the project's M&E system – including training and capacity development specifically on aspects relevant to the project M&E and in line with the AWPB training plan and the capacity development plan of the M&E manual. In doing so, he/she will work closely with the Planning, M&E and KM (PMK) Specialist.

190. 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 actors in the dairy value chain will be encouraged to monitor and record their own performance, as part of the management of their businesses.

191. Parallel with the continuous data flows, thematic studies and evaluations will be carried out by external experts. 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

[15] IFAD is currently revising RIMS and SHMDP will align with the updated version of the system.

contracted out to consultancy firms, policy research institutions or universities, according to approved TORs and following competitive selection procedures.

Learning and knowledge management

192. 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.

193. Case studies ('snapshot studies' under the three components listed in Attachment 3, Appendix 6) 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.

194. 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.

E. Financial management, procurement and governance

195. **Fiduciary risk.** Overall the country's inherent risk is considered "high" based on the country's recent Corruption Perception Index (CPI) and its score for the Rural Sector Performance (RSP). Additionally, the Project Fiduciary risk is assessed to be "medium", in view of the experience and lessons learnt with ongoing projects in the portfolio and the financial management arrangements proposed below for the project.

196. **Financial management.** MALF will hold the overall fiduciary responsibility of the programme. The ZPMU, to be established in accordance with Government and IFAD requirements, will be assigned with the day-to-day coordination, financial management and procurement responsibilities for the project. In particular, the financial management and procurement functions will be supported by a Finance Manager, an Accountant and a Procurement Specialist to be recruited among the ZPMU staff. At the district, these responsibilities will be delegated to the existing district's finance department and procurement management unit respectively. The ZPMU will have its own dedicated computerized accounting system for its accounting, financial reporting and budget control. Districts' accounting and budget control will be supported with the EPICOR accounting system currently in use in all districts. Districts' accounting system will be configured for recording SHMDP funds related to the monitoring of project activities.

197. The project's overall financial management arrangement and processes, including reporting will be in accordance with the guidelines and procedures stipulated in the PIM, which is to be developed at project start-up and as a condition precedent to the first disbursement of the IFAD financing.

198. **Disbursement and funds flow**. Disbursements from IFAD will largely follow the standard methods as spelt out in the Loan disbursement handbook and will be clearly stipulated in the Letter to the Borrower. In particular disbursement of loan proceeds will be made through a designated account to be

opened by the ZPMU and MALF at the *Central* level in the Bank of Tanzania. Other bank accounts to be operated by the project will be an Operations Account in Tsh to be opened at the *Zonal* level in a commercial bank and a Counterpart Account in Tsh to be opened at the *Zonal* level in a commercial bank. Signatories to these accounts will be specified by the Government and approved by IFAD and will follow, at a minimum, a dual authorization system.

199. 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. Project funds will be ring-fenced into that account and will be transferred quarterly and on the basis of an approved work plan and budget. Transfers will be made only for activities related to the monitoring and follow-up of the project by the district personnel. This disbursement modality is proposed to avoid project disbursement lags associated with the untimely justification of large advances made to districts. Replenishments to these accounts will only be based on a full and satisfactory accountability of 70% of the previous advance and 100% for the earlier ones. Districts will not be able to carry forward funds from one budget year to the next. Controls proposed below will ensure accountability and traceability of funds, including expenditure attribution and control. The reporting on expenditures at the *District* level will follow the same Statement of Expenditures (SOEs) procedures used by the project.

200. All other implementing partners such as DPP-MALF, TDB and LITA will receive funds from the project in a dedicated bank account opened for the project and in accordance with a signed MOU and related work plan.

201. **Procurement.** 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 will be responsible for the procurement of goods, works and services at the national, zonal and district level. At *District* level, the procurement of selected investments will be delegated to the DPIU which will be responsible for all procurement actions at the district. However, no funds transfer will be made to the districts for the said investments as payments will be done at the ZPMU level for procurement actions initiated and completed by the DPIU. 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.

202. **Internal audit.** SHMDP will be included in the audit plan of both MALF and the districts. Where required, SHMDP will consider providing funds to cater for the internal audit services provided by the said entities.

203. **External audit**. External audits will be performed by the Comptroller and Auditor General (CAG). Draft TORs for the annual external audit of the Programme will be provided. The external audit report will need to provide opinions on: (i) the project's financial statements; (ii) the operation of the designated account; and (iii) the statement of expenditures.

204. **Risks and mitigation measures.** Based on the country's high inherent risk and the financial arrangements proposed above, a number of fiduciary risks need to be mitigated, in order to provide assurance that the project will have sufficiently strong financial management systems and controls in place to properly manage, control and report project finances. These risks relate mainly to: inadequate financial management; capacity weaknesses of MALF, ZPMU and district staff; non-compliance with regulations and procedures, including on procurement; weaknesses in internal audit capacity and quality; quality and timeliness of external audits; internal control issues; poor budget planning and execution; weak contract management; and inefficiencies of the EPICOR system, including the lack of traceability of funds, accountability and expenditure attribution and control in the use of the DDA.

205. Mitigation actions associated with the above risks have been identified as follows: (i) procurement of a dedicated and off-the-shelf accounting software for the project; (ii) continuous capacity building and technical assistance to MALF, ZPMU and districts staff; (iii) recruitment of a Finance Manager for ZPMU in accordance with approved TORs; (iv) strengthening of internal audit function; (v) strict follow-up on external audits; (vi) development of a PIM with detailed financial

management and procurement guidelines; (vii) configuration of accounting system for budget planning and monitoring; (viii) clear accountability and reporting measures for funds transfer to districts; and (ix) configuration and codification of EPICOR system for capturing SHMDP transactions at the district level[16].

F. Supervision

206. IFAD financed activities of SHMDP will be directly supervised by IFAD. IFAD will undertake twice yearly supervision and implementation support missions to assess project implementation status, in collaboration with Government and partners. In addition, IFAD will be responsible for: (i) reviewing withdrawal applications for IFAD proceeds; (ii) reviewing and approving on a no-objection basis all procurement under the project financed by IFAD funds; (iii) monitoring compliance with the Financing Agreement, recommending remedies for any substantial non-compliance; and (iv) carrying out all other functions needed to administer the financing and supervise the project.

207. Two areas can be highlighted as requiring particular efforts from IFAD. The first will be to provide strong and frequent support to the members of ZPMU to effectively and efficiently managing the project for development results; maintaining a pro-private sector, whole value chain project approach; and guiding and supporting the implementation of the individual components, particularly at district level. The second, to support the efforts of the project and other partners to improve the policy and regulatory environment for dairy production and processing. This will not just be a function of the project supervision process, but will be a key area for IFAD's policy engagement under the RB-COSOP 2016-2021.

G. Risk identification and mitigation

208. Table 2 identifies the risks with the greatest likelihood of occurring and the highest potential impact on the achievement of the project outcomes.

Table 2. Risks and mitigation measures

Risk	Level of risk	Mitigation measures
Policy and regulatory framework: The dairy industry in Tanzania has been long constrained by a hostile policy and regulatory environment. Attention has been drawn to multiplicity, complexity and overlapping of regulations governing the industry which make both the cost of doing business, and the cost of the final product to the consumer, excessively high. Key issues include: (i) the regulatory framework, which imposes multiple, inconsistent and overlapping regulations, and results in high compliance costs; (ii) multiple and fragmented institutional responsibilities for that regulation; and (iii) heavy taxation of the sector, with multiple entry points for that taxation, which undermines viability and competitiveness relative to duty-free milk imports.	High	The project design will build on the progress made to date on these issues under the DDF; it will be closely coordinated with, and will complement the efforts of, L-MIRA, the World Bank-implemented proje for policy and regulatory reform in the dairy value chain; and it will promote policy dialogue and reform at the zonal and district levels.
Infrastructure: Poor road infrastructure can reduce the geographical area around collection and cooling points where it is viable to market raw milk; lack of water storage infrastructure may result in lower milk yields, particularly in the dry season; and lack of/unreliable electricity can undermine operations of MCCs/processors. Project investments in infrastructure are vulnerable to elite capture.	Medium	SHMDP will support the rapid analysis of the infrastructure and transportation system for milk collection and chilling within the context of emerging production clusters. 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 gaps. This analysis will 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. 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, 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

[16] 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. See Attachment 4 in Appendix 7 for additional details.

Risk	Level of risk	Mitigation measures
		project.
Climate change: The effect of climate change may have a significant impact on natural resources, in particular pasture and forage/crop production, and water accessibility, affecting seasonal available grazing, and thereby reduce nutrition and consequently lactation levels of traditional and improved breed cattle.	Medium	The approach will be two-fold: first, to define the project area in terms of those districts where the risks of climate change and shocks are not excessive; and second, to design, and ensure that the project supports, relevant climate adaptation approaches, such as the promotion of feeding strategies for the dry season, use of drought tolerant pasture species, use of heat tolerant dairy breeds (jersey), and promotion of water harvesting facilities.
Disease: The risk of disease outbreak, both for endemic diseases such as FMD, ECF or CBPP, or for emerging or re-emerging diseases such as RVF is constant: they could cause major losses for dairy producers and the dairy industry if surveillance mechanisms and contingency and prophylactic plans are not effectively and efficiently funded and implemented by national veterinary authorities.	Low	The project will support the strengthening of efficient veterinary services for smallholder dairy farmers, and in particular the surveillance and diseases control mechanisms in the project area. It will also promote national policy dialogue on disease control issues and strengthen the capacity of smallholder dairy farmers to participate in them. However, the risk goes beyond the scope of this project, in particular as it relates to the emergence or re-emergence of animal diseases.
Roles of public and private sectors: The implications of government's political commitment to improving the business climate are not fully appreciated at all levels of government, and there are diverse views as to what should be the responsibilities of government, and the role of the private sector, in the development of the dairy sector. Public investment in areas open to the private sector will undermine private investment and the private sector-led development of the sector.	Medium	The project builds on the need for policy changes in order to establish an enabling framework for business to grow in the dairy sector and the Government of Tanzania has shown willingness to undertake the required policy reforms. Clear signals of commitment have been provided through projects (e.g. the BMGF funded and WB implemented project Livestock Micro-reforms in Agribusiness Project: L-MIRA) and initiatives (e.g. The Southern Agricultural Growth Corridor of Tanzania: SAGCOT, and the Tanzania Livestock Modernisation Initiative). Improved dialogue among stakeholders at district, zonal and national levels will further contribute to a shared understanding among government and the private sector, including farmers. So too will the policy dialogue promoted under L-MIRA, which SHDMP will work closely with. Project-supported studies under component 3 will also tackle these issues.
Management and implementation capacity: While the project has an explicit value chain focus, it is uncertain that there are adequate skills available in Tanzania's public sector to ensure that it is effectively managed for delivery of the expected results. Equally important, there is both inadequate capacity and limited incentive mechanisms to drive improved performance in the public sector, and the risk of continued weaknesses, particularly at district level and below, is evident – so undermining the scope for improved farm-level productivity.	High	Recruitment of ZPMU staff will use competitive process to seek skills from the market where government lacks these. The implementation of the SHMDP will be structured around performance-based MoUs with LGAs and other government agencies, partnership agreement with key partners (HPI, FAO etc) 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. As part of the support delivered, service providers will 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 availability of project resources to districts will be partially conditional on overall implementation performance, and reporting of such performance. 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 thresholds.
Pre-requisite assessments: There are a lot of studies to be conducted at project start up (under sub-components 1.1, 1.2 1.3, 2.1 and a baseline study) by suitably qualified and experienced consultants. There is also the ZPMU team to be recruited. These are all critical for project implementation to start up, and for project effectiveness to be a real starting point for the project.	High	While it may not be possible for these activities to be financed prior to project effectiveness, IFAD will need to ensure that all the key preparatory steps are carried out, so that work can start as soon as the project is effective. A gantt chart is being prepared to identify what can be done, when and by who, prior to effectiveness.

IV. Project costs, financing, benefits and sustainability

A. Project costs

209. The total project investment and incremental recurrent costs, including physical and price contingencies, are estimated at US$ 41.28 million (TZS 104 billion). Price contingencies make up 4% of project costs and physical contingencies represents 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. A summary of the project costs by component is presented in Table 3 below.

Table 3. Project costs 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

B. Project financing

210. The project is to be financed by the Government of Tanzania, IFAD, Heifer International, and the beneficiaries. IFAD will finance approximately 77% of the project costs (US$32.12 million) through a loan on highly concessionary terms over a seven-year period, and a Development Partner, Heifer International, will cofinance 12% of total costs (US$5 million). The Government will finance taxes and duties and the NSSF contribution for all staff employed by the project (US$3.59 million, representing 8.7% of total costs), and the beneficiaries will contribute (US$0.568 million, representing 1.4%[17]). The Government will also provide office space and may second some government staff to the ZPMU. 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

[17] When participating farmers have fully repaid their commercial loans to financial service providers, their contribution to the project will be much greater, representing about 24% of total costs.

C. Summary benefits and economic analysis

211. **Project benefits.** The main project benefits will go to rural communities in the areas of project intervention. It is evident that there will be substantial benefits accruing to the households with members targeted by project activities, as indicated in the returns to the financial models detailed in Appendix 10. In assessing the number of project beneficiaries, it is estimated that there will be some 67,575 beneficiary households: (i) 44,000 smallholders with dairy cattle 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; and (vi) 12,175 other rural non-producers beneficiaries in the dairy industry (transporters, processors, traders, seed producers, input suppliers and school children).

212. The core target group of 44,000 dairy smallholders covers three different socio-economic categories: (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.

213. 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.

214. The expected benefits would go beyond the PDO and intermediate results indicated in the results framework.

215. **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.

216. 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).

217. 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.

218. **Financial analysis.** In order to assess the impact of the project, a financial and economic analysis was carried out. The financial analysis aims at: (i) examining 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 farming; (ii) assessing the financial and operational suitability of the MCPs, MCCs, milk traders and dairy processing plants; and (iii) setting a basis for the economic analysis. Several models were developed for each of these activities to demonstrate the financial viability of potential investments from the point of view both of poverty alleviation and business potential.

219. Three dairy farming models were developed under the financial analysis: (i) mixed farms based on an 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 based on a semi-intensive dairy production model; and (iii) mixed farms based on a 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. 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. These financial models also present an interesting return to labour.

220. In addition, five value chain models have been developed including three milk collection centres, a dairy processor and milk trader/transporter. The models show positive returns but high sensitivity to increases in production costs and drop in prices/revenues.

Table 5. 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

221. **Economic analysis.** An economic cost-benefit analysis was carried out for a 15 year-period of analysis to account for the phasing and gestation period of the proposed interventions. Price of inputs and labour were converted from financial to economic values using specific conversion factors. A 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.

222. **Summary.** Given the above benefit and cost streams, the base case economic internal rate of return (EIRR) is estimated at 16%. 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 below.

Table 6. Project 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

223. **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 7.

Table 7. Sensitivity analysis

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)

D. Sustainability

Social, environmental and climate assessment

224. The project will contribute to improving the livelihoods of targeted dairy farmers and to strengthening the resilience of their production systems, through the promotion of dairy farming as a profitable business. To build ownership and sustain investment in the dairy value chain, the project implementation approach is focused on farmers grassroots institution building as well as participatory and bottom-up approaches with emphasis on local level development.

225. The SECAP category is B, considering that the project will aim to improve the productivity of dairy animals rather than to increase their numbers. Thus, the project will foster zero-grazing model relying on increased production and use of fodder, rather than extensive grazing that results in a greater risk of biophysical degradation and potential loss of biodiversity. It will also promote the use of renewable energies (e.g. solar energy and biogas technologies) wherever possible along the dairy the value chain.

226. On the basis of a three-fold approach, the project activities will be tailored to the various agro-ecological zones and associated climate risks along the dairy value chain. First, the project area has been determined taking into account – on the basis of the information available – those districts where the risks of climate change and shocks are not significant. Second, the project will support a range of relevant climate smart livestock practices and technologies such as the promotion of feeding strategies for the dry season, use of drought tolerant pasture species, use of heat tolerant dairy breeds (jersey), and the promotion of water harvesting facilities.

227. Third, the project will also give attention to climate change mitigation, by focusing on reducing carbon emissions per unit of milk produced and delivered to the consumer. This would be achieved above all by promoting measures that would improve the productivity of traditional and improved dairy breeds and reducing pollution from manure and solid waste disposal. Sustainable livestock intensification implies a more efficient and sustainable use of natural resources (water, feeds, soil, biodiversity, etc.) while reducing environmental impact and building smallholder resilience to economic and climatic shocks and stresses. Looking at the post-production nodes of the value chain, while increased transportation of milk would likely lead to a limited increase in the level of emissions, wherever possible the project would promote processing technologies based on renewable energy; and by improving the resource use and labour efficiency along the value chain. Hence, the project would lead to reduced levels of waste of milk and enhanced economic benefit.

Scaling up strategy

228. SHMDP will strengthen the dairy value chain and, in particular, the linkages between smallholder dairy producers and their organizations on one hand, and processors or traders on the other. It will promote the development of a scalable model for integrating financial and non-financial services to small dairy farmers into the commercial relationship between them and processors; and it will support efforts to reduce the cost of doing business in the dairy processing industry, thus creating incentives for further investment in the sector as a whole based on commercial value chain relationships and services that are market-driven and sustainable.

229. The potential for long-term sustainability of the project outcomes of the project beyond the implementation period is high. Central to the opportunity for sustainability is the fact that demand for milk in the Southern Highlands, in Tanzania as a whole, and the larger region is increasing. In response, there is dynamism is the dairy sector: smallholder dairy farming is spreading, milk production is increasing, and the processing sector is also developing. The project is supporting a sector that offers substantial opportunities for inclusive growth.

230. More specifically, the prospect of sustainability is built on three main elements of the project approach. The first is the focus on building a private sector-led dairy value chain, where the links are formed by win-win commercial relations established between the different players involved, in which risk and returns from the value addition is fairly shared. Such relations can be continued beyond and in the absence of project support, and as the different players gain more experience in those relations, so they can be further developed and matured.

231. Second, for smallholder dairy farmers to be able to negotiate those commercial relations and defend their interests, coming together as groups is critical. Aggregation of supply is the first purpose of groups, to improve market access; but collective sales of milk, as well as collective purchases of inputs and services, can change the terms of trade for producers and make milk production intrinsically more profitable. The history of group (and in particular cooperatives) in Tanzania is a mixed one, but there are important success stories that show that where there is an economic purpose to group formation, they can be sustainable. These lessons will be built on by the project.

232. Third, the project will support ongoing efforts to create a more enabling policy environment for private sector investment in the sector. Reducing the current policy and regulatory bottlenecks in the sector can increase the viability of the dairy processing sector; increase its competitiveness relative to both the informal, raw milk sub-sector and to imports of milk and dairy products; create employment; and bring more quality milk to consumers. Achieving success in this area will be central to achieving sustainability; however, the issue of Tanzania’s poor investment climate is one that is of concern to the political leadership, and thus there are important opportunities for IFAD, Government and other partners to work together on this.