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THE RED MEAT VALUE CHAIN IN TANZANIA

A report from the Southern Highlands
Food Systems Programme

R. Trevor Wilson



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PREFACE

Red meat is an extremely important component of the agrifood sector in Tanzania. It has many linkages along the chain, is a source of income for a large segment of the country's population, provides high value protein in the nation's diet, contributes to food security and was once — and could be again — a major earner of foreign exchange. In spite of these facts, the value chain has faced, and continues to face, a series of challenges that have had a negative impact on its performance. Production and productivity have stagnated or declined over many years. Opportunities in local, regional and international markets are largely under exploited or not exploited at all. In the current highly competitive and increasingly globalized agrifood sector quality-based differentiation is a fundamental factor in success. Branding (for example, of 'Kongwa Beef') will become essential to indicate the origin and quality of the product. Reliability of supply in terms of volume, price and quality throughout each year and over a period of years is also an important determinant of a successful red meat chain. As Tanzania continues to struggle in these matters it fails to gain and is, indeed, losing market share to its competitors.

In order to face up to these challenges, the Tanzania Ministry of Agriculture, Food Security and Cooperatives (MAFC) requested the collaboration of the Food and Agriculture Organization of the United Nations (FAO) in applying the value chain framework to analyse four commodity chains. Emphasis was placed on the Southern Highlands area with a primary target being provision of sets of strategic recommendations directed at promoting sustainable development and competitiveness.

The study is based on extensive consultation with stakeholders throughout the value chain: input suppliers, producers, processors, retailers, government officials and other support providers and has been developed as part of FAO's technical assistance programme for Tanzania. It demonstrates a continued commitment to MAFC's, and — in the particular case of red meat to the Ministry of Livestock and Fisheries Development (MLFD) approach — to supporting the agricultural sector.

It is envisaged that the recommendations — organized around public-private partnerships (PPP), institutional change, trade and market liberalization and knowledge-driven development — will provide a solid foundation from which Tanzania's red meat industry and the wider agricultural sector can grow strongly toward a rewarding future for all its stakeholders. It is also hoped that through this study a wider audience can benefit from the information and analysis provided.

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My thanks to those participants of the red meat value chain who agreed to meet and talk with me, sharing their views as well as their hopes and fears. Many of these 'key informants' are presented in Annex 3.

Many documents have been written on livestock and the red meat value chain, and this report draws deeply upon them, in particular on the strategic interventions of the Livestock Sector Development Programme.

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R. Trevor Wilson, 2013

In fond memory of David Kenneth Hitchcock

EXECUTIVE SUMMARY

The red meat value chain begins with the primary producers of cattle, sheep and goats and ends with consumers. It covers all stages from 'pasture to plate'. Producers overwhelmingly work in traditional systems and are either small-scale mixed farmers, agropastoralists with a few head of stock, or pastoralists with a greater number of animals and who depend more heavily on livestock for their livelihoods. There is very little 'modern' production. Livestock production is based on indigenous types of livestock finding their feed resources on natural rangelands; there are few 'improved' or 'exotic' animals and virtually no areas of highly-productive planted pastures. With only 12 percent of the country's cattle and 6 percent of its small ruminants finding home there, the Southern Highlands region is not a major livestock-producing area. There is strong internal (regional and national) demand for red meat, and the world market for red meat is also expanding rapidly. Tanzania should be well placed geographically and in terms of output to gain access to these markets but for many years has not had great success in doing so other than through the (often informal) transfers of live animals to neighbouring countries, intermittent shipments of live animals to the Comores, and exports of meat to countries farther afield, in particular the Arab Gulf states.

The value chain includes a multitude of participants at several levels. These include primary producers, agents (who buy, sell and move stock to and from primary and secondary markets), dealers, trekkers and transporters (animals are trekked to primary markets though the law requires their transport by truck or train to secondary markets), meat inspectors, butchers, processors and consumers. To these may be added suppliers of inputs, research and extension workers, exporters and importers, wage labourers and facilitators of various hues. In addition to these principal actors there are many other small operators who make a living from the red meat business. It is unusual to find fewer than three links between the producer and the plate, and there may be as many as ten transactions before the final product reaches the consumer.

Most players operate on low margins per animal or product, although the bigger the operation the bigger the margin. Producers, agents and butchers alike handle from very few to very many animals or products a year. Sales are supposed to take place by auction at market, but buyers and sellers tend to prefer one-on-one individual bargaining for an animal. Very little new technology is generated and the use of technology at all levels is limited. Few inputs are used at a producer level although, as animals move through the chain, there are — of necessity — some additional uses of inputs. Meat production has increased largely as a result of increases in livestock numbers and not because of greater output per animal. Animals are slaughtered at rural slaughter slabs (of which there are hundreds); rural or urban slaughterhouses (of which there are fewer than 100); and abattoirs (of which there are fewer than 10). Slaughter slabs and slaughterhouses are generally old, lack equipment and often slaughter well in excess of their design capacity under deplorable conditions of animal welfare and food hygiene. Abattoirs are designed to supply a more sophisticated and export market but are facing marketing difficulties, and generally operating at less (and sometimes much less) than their design capacity. Local demand is for undifferentiated 'warm' meat that is supplied to consumers via thousands of small butcher's outlets that are often unregistered, with local environmental conditions often compounding the problems of food safety. There is thus minimal value added towards the end of the chain. The sophisticated market for prime and

processed products (much of which is imported) is extremely small and there is very little processing of any kind internally and only limited processing for the external market.

Income depends largely on volume, as margins at all levels tend to be low. Butchers' incomes fluctuate throughout the year, being highest in the wet seasons, when supply and demand are high. Herders, slaughterers, skimmers, butchers' employees and general *factoti* are among the lowest paid of employees in Tanzania. Alongside differences in wealth the livestock sector is also notably divided across gender lines. Some 65 percent of male-headed households participate in livestock activities whereas only 51 percent of female-headed households participate.

A recent analysis of global food security placed Tanzania 99th out of 105 countries measured, with two of the six countries below it being contiguous (Burundi, Democratic Republic of Congo) and two being relatively near neighbours (Ethiopia, Chad). According to the World Bank, in 2012 Tanzania ranked 127 out of 183 countries in doing business, with the regional average being 137. Concurrently, the World Economic Forum found Tanzania to be one of 37 'factor-driven economies' and ranked it 120 (down from 113 the previous year) out of 142 countries. It cited the major reasons for this lowly position, in order of priority, as: access to finance, corruption, tax rates, inadequate infrastructure, inflation and inefficient government bureaucracy.

This does not bode well for encouraging external or internal investment in new or expanding businesses. Tanzania is widely regarded as a country with a heavy regulatory burden, but with regulations only lightly implemented. Traders in live animals or in meat, for both internal and external markets, are subject to an onerous regime of form-filling and permissions. Multiple — and often conflicting — legal instruments under the jurisdiction of multiple ministries and other official bodies impinge upon the livestock sector. In general, however, value chain participants are ignorant of the laws or choose to ignore them, and are safe from repercussions since the responsible authorities are not in a position (financially or materially) to enforce them. The National Livestock Policy of 2006 is designed to stimulate the development of the livestock industry in order to exploit available resources whilst at the same time showing due concern for the environment. The policy emphasizes the importance of competitive markets including commercialization of the livestock industry, value added products and sustainable livestock development and is said to be among many of Tanzania's initiatives to invite and open doors for private sector investments.

Weak vertical and horizontal linkages affect the whole chain. Actors and enterprises do not cooperate or coordinate (indeed the latter seems to be a totally alien concept). The capacity to influence domestic policy, as well as more mundane aspects — such as collective access to inputs and other service — is thus limited. In summary both vertical and horizontal integration remain marginal. The red meat value chain may be considered a form of 'market-type governance' with many producers, traders and local butchers. Relationships between stakeholders in the value chain are mainly determined by the price at which the product is sold. Coordination is required for the whole chain, and will need to encompass all actors, to generate communication and trust. The Southern Highlands Red Meat Value Chain is largely driven by market forces with respect to prices and their up- and down-stream effects on supply and operations throughout the chain. The major issues include lack of governance, poor supervision of lower-end associations, too many small players and small transactions, lack of market coordination, unclear and conflicting roles and mandates in

district councils, weak industry associations and inadequate or non-enforcement of operating procedures.

Livestock production and animal health extension services are poor with staff poorly trained and equipped. The ratio of service providers to service receivers is low. The transfer of extension services from the centre to local authorities in the name of devolution has had an even further negative effect on the provision of services.

The problems of the industry are widely known, as are the solutions. The quandary is to apply the latter to the former. If this can be done the Vision could be:

By 2025, a more efficient and sustainable red meat chain that helps boost employment, increase incomes, reduce poverty, improve food security and provide a better quality of life for all Tanzanians. In addition, the chain will provide an adequate supply of high quality animal protein to all Tanzanians and produce a surplus for export.

Strategic elements to improve the competitive status of the red meat value chain include:

- improving knowledge, skills and information throughout (and before) the chain (e.g. agriculture in schools, producer training, business training);
- promoting and strengthening groups and associations from primary producers through to retailers in order to encourage vertical and horizontal integration and provide the industry with a 'voice';
- improving existing and providing new physical infrastructure to support the growth of profitable agriculture and generate employment;
- developing, deploying and retaining equitable human resources especially in the livestock extension and animal health delivery services;
- promoting and adopting science and technology including research and development for high quality and nutritious food and other livestock products;
- strengthening and introducing an investment in livestock infrastructure including for farm level agroprocessing and physical market infrastructure;
- collecting, collating and disseminating transparent and widespread market information including volumes of trade and prices;
- introducing (or enforcing) grading and sales by live weight at markets;
- promoting fair and competitive farmgate prices;
- strengthening links between farmers and markets and higher up the chain for domestic, regional and global markets;
- promoting private sector investment and encouraging public-private partnerships (although great faith is placed on privatization and private sector investment it is not a panacea and lessons must be learned from the insolvency of Tanzania Pride and the inefficient operation of Sumbawanga Agricultural and Food Industries Limited (SAAFI));
- increasing the quantity and improving the quality of processed red meat products;
- ensuring that Tanzania's red meat products are produced (and can be verified as having been produced) to international standards of welfare, animal health and food safety;

- facilitating access to finance and credit including links to capital and short-term markets and introducing insurance for livestock;
- mitigating and adapting to the effects of climate change (research programmes to improve existing and develop new technologies);
- promoting measures to cushion livestock producers from the effects of drought and strengthen the Famine Early Warning System (FEWS);
- ensuring that land tenure arrangements for both traditional producers and those wishing to invest in large-scale livestock production are favourable to long-term investment; and
- implementing the National Strategy on Agriculture and HIV/AIDS to support increased red meat production.

Strategic areas that need to be addressed include:

- sustainable use of land, water and natural feed resources;
- public, private and public/private sector investments and financing;
- improvement of the productivity and efficiency of production, marketing and processing;
- improvement of animal health and control of livestock diseases (especially 'trade' diseases and the safeguarding of public health);
- rendering more effective the support services including research, extension, training and dissemination of information;
- general capacity building and empowerment all along the chain;
- chain governance, regulatory and institutional arrangements; and
- cross-cutting and cross-sectoral issues.

PROLOGUE - TUNA TOKA WAPI?

Ruminant livestock have long been a mainstay of Tanzania's economy and one of the key livelihoods of its people. In the 50+ years since Independence in 1961, as the human population has quadrupled, its cattle population has increased 9-fold, its goat population three-fold and its sheep population by a factor of 1.4.

A plethora of reports, workshops, projects and programmes have masqueraded as — or been a proxy for — development of the livestock red meat industries. The simple fact is, however, that the ordinary people of Tanzania still do not have enough meat to eat and even were there to be enough they would not be able to afford to buy it.

ACRONYMS

ADRI	Animal Diseases Research Institute
ASDS	Agricultural Sector Development Strategy
ARI	Agricultural Research Institute
BELA	Business Registration Agency (Ministry of Industry and Trade)
CAADP	Comprehensive African Agriculture Development Programme
CAHW	Community Animal Health Worker
CRDB	Cooperative Rural Development Bank
CAMARTEC	Centre for Agricultural Mechanisation and Rural Technology
CVL	Central Veterinary Laboratory
D by D	Development by Devolution
DRC	Democratic Republic of Congo
EBT	Exim Bank (Tanzania)
ECF	East Coast Fever
FBO	Faith Based Organization
FEWS	Famine Early Warning System
GDP	Gross Domestic Product
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
LIDA	Livestock Development Authority
LINKS	Livestock Market Information Network and Knowledge System
LITI	Livestock Training Institute
l.w.	Live weight
LSDS	Livestock Sector Development Strategy
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MFI	Microfinance Institution
MIFUGO	Ministry of Livestock and Fisheries Development (Kiswahili for Livestock)
MITM	Ministry of Industries, Trade and Marketing
MLFD	Ministry of Livestock and Fisheries Development
MWI	Ministry of Water and Irrigation
NARCO	National Ranching Company
NBC	National Bank of Commerce
NGO	Non-Governmental Organization
NLP	National Livestock Policy
NMB	National Microfinance Bank
NPS	National Panel Survey (carried out in 2008—2009)
NSGRP	National Strategy for Growth and Reduction of Poverty (also known as MKUKUTA from its Kiswahili acronym: Mkakati wa Kupunguza Umaskini na Kuongeza Kipato)
OIE	World Organization for Animal Health (Office International des Epizooties)
PMO-RALG	Prime Minister's Office Regional Administration and Local Government
RDS	Rural Development Strategy
SAAFI	Sumbawanga Agricultural and Food Industries Limited
SACCOS	Savings and Credit Cooperative Society
SHFS	Southern Highlands Food Systems

SIDO	Small Industries Development Organization
SME	Small and Medium Enterprises
SNV	Stichting Nederlandse Vrijwilligers (Netherlands Development Organization)
TALIMETA	Tanzania Livestock and Meat Traders' Association
TAZARA	Tanzania-Zambia Railway
TBS	Tanzania Bureau of Standards
TDB	Tanzania Dairy Board
TFDA	Tanzania Food and Drugs Authority
TIN	Tax Identification Number
TLMC	Tanganyika Livestock Marketing Company
TLRI	Tanzania Livestock Research Institute
TMB	Tanzania Meat Board
TPB	Tanzania Postal Bank
TPC	Tanzania Pride Meat Company
TPL	Tanganyika Packers Ltd
TRA	Tanzania Revenue Authority
TSZ	Tanzania (formerly Tanganyika) Shorthorn Zebu
TVC	Tanzania Veterinary Council
UAE	United Arab Emirates (includes Dubai)
URT	United Republic of Tanzania
UWAKAMA	Umoja wa Wafugaji Kanda ya Mashariki (Eastern Zone Livestock Producers)
ZARDEF	Zonal Agricultural Research and Development Fund
ZSC	Zonal Steering Committee

GLOSSARY

Borna	Originally used to describe a thorn enclosure used to pen in livestock, and now more broadly used both to describe any kind of enclosed space or district government offices.
Chipsi	Chips or 'French fries'
Kilimo kwanza	The 'Agriculture First' initiative that aims to ensure that the private sector is "properly anchored" and involved in the "development of agriculture." It stresses "the critical importance of the private sector participating actively in agricultural production, provision of agricultural inputs, crop marketing and in the agricultural value".
Mami	Liver
Mifugo	Livestock (used as shorthand for Ministry of Livestock and Fisheries Development)
Mnaada	Auction, or sale by auction
Nyarna choma	Roast meat (obtainable at traditional 'fast food' stalls in towns, villages and along roads).
Nyarna kawaida	'Usual' meat (as bought by the majority of Tanzanians), i.e. meat with bone or with the meat simply sliced off the carcass.
Safi	Clean
Supu	Soup (a favourite breakfast dish often made from the heads and feet of slaughtered animals)
Tamu	Sweet
Tunakwenda wapi?	Where are we going?
Tunatoka wapi?	Where are we coming from?
Utumbo	Stomach, rumen

1. INTRODUCTION

1.1 Background of the study and objectives

This study is the first to be formally published as part of the Tanzania Southern Highlands Food Systems Programme (SHFS). The programme was initiated in 2011 by the Ministry of Agriculture, Food Security and Cooperatives (MAFC) and the Ministry of Livestock and Fisheries Development (MLFD), with technical assistance from FAO. The latter funded this study under Technical Cooperation Programme facilities entitled URT 132 'Food Systems Development in Tanzania' and URT 133 'Advisory Services Capacity Development in Support of Food Security in the United Republic of Tanzania'.

Government and private-sector representatives recognized the need for thorough assessments of the country's main agrifood subsectors in order to design policies and strategies that would promote competitiveness and that would take into account economic, social, environmental and sustainability issues. SHFS aims to address this need by conducting a set of studies using the value chain approach. One of these studies is on the red meat value chain, which comprises animals of three species — cattle, goat and sheep — and their food products (other initial studies covered maize, rice and oilseed crops). The study's primary objective is to provide practical and actionable recommendations for a sustainable and inclusive competitiveness strategy. The secondary objective is to create a template for the analyses of additional chains.

The red meat value chain was chosen as one of the studies because of its importance in Tanzania's agrifood system, the rapidly changing nature of the markets in which it competes and the momentum offered by discussions within Tanzania on proposals for fundamental institutional changes.

The red meat subsector is a major component of the agrifood system in Tanzania. It is a direct source of income for a large segment of the rural population and has the potential — as it has been in the past — to be a significant source of foreign exchange. Livestock are seen as a principal way of alleviating rural poverty. Many services for the livestock sector, which elsewhere would be a private good, have long been a public good in Tanzania but production and productivity in the livestock beef chain have stagnated or even declined over a long period. Opportunities in local, regional and international markets are not well exploited whereas several neighbouring countries are expanding their share in these markets.

A high percentage of Tanzanian families own cattle, goats or sheep (often keeping all three species). These are major stakeholders in and potential beneficiaries of support to the red meat value chain. The cultural value attached to livestock — and the esteem in some parts of civil society deriving from owning large numbers of livestock — still prevail in Tanzania even as the country has changed dramatically in many other respects since Independence. It is thus particularly difficult for policy makers to evaluate the impact of measures, and to reach policy and strategy decisions that would urgently facilitate the changes needed in the red meat value chain to maximize social welfare for the population as a whole.

The red meat value chain has already been extensively studied in Tanzania (see for example the bibliography provided as Annex 1 to this report). It is thus legitimate to ask: Why do we need another

report? There are several reasons but a major one is that many studies were conducted some years ago and there have been many subsequent developments. These include the demand shock effect of the 2008 economic crisis, evolving — and invariably more challenging — production and processing standards, changing trade agreements that influence trade patterns, and increased consolidation in global meat processing and retailing that has changed the structure of the value chain. The current analysis thus provides an update on earlier studies to take into account the current state of affairs. Earlier studies also typically highlighted particular aspects of the chain rather than using a systems perspective. This study has brought the content of previous reports together in an overall value chain framework. Finally, and most importantly, the value chain approach epitomized in this document presents all the major issues in a clear, comprehensive and systematic way. As such it is an excellent platform for further dialogue between the public and private sectors on a vision for the red meat subsector and for the formulation and implementation of appropriate policies and strategies.

1.2 Methodology

The value chain approach is a systems analysis tool. It assesses how value in an end market is created by a sequential chain of activities conducted by participants who are supported by various business service providers (e.g. banks, transporters, extension agents, input providers) and who are influenced by the particular business environment in which they operate. Value chain analysis goes beyond behavioural assessments at the individual participant level by examining the nature of vertical linkages between suppliers and buyers (e.g. contracts between farmers and processors) as well as horizontal linkages between agribusinesses of the same type (e.g. farmer associations). These linkages are depicted in a value chain map (ideally with some indications on the numbers of agents, product flow values and volumes, and key points of leverage, but in many cases, as in Tanzania, such quantification is not possible).

Key points of leverage are links in the system at which many participants connect, through which high volumes of product flow (e.g. a large processor, a geographic cluster) or that affect the value chain as a whole (e.g. a policy). The end markets, participants and their linkages, service providers and operational environment are typically not static but are continuously evolving in various directions. Value chain development takes these dynamics into account by examining current trends and by focussing on the main growth and upgrading opportunities. End markets are the starting point in this approach and competitiveness in them is the primary performance indicator but other sustainability and performance indicators also need to be considered. Generating increased profits from a higher level of competitiveness but benefitting only a few, is an undesirable outcome if poverty reduction and food security are the objectives of the chain. Increasing competitiveness and profitability while irrevocably depleting natural resources is a self-defeating strategy. Value chain analysis examines the economic, social and environmental outcomes of various strategic options including impact on the poor (sales, jobs, food supply) and on the environment (soils, water, biodiversity) and examines the trade-offs that often need to be made among these objectives in seeking to develop sustainable and inclusive value chains.

Once the workings of the system (value chain) have been examined and understood in sufficient detail it becomes possible to assign priorities to the sets of interlinked constraints that need to be addressed and the opportunities that should be pursued in order to maximize the desired impact. The desired impact should be derived from a vision, the development of which is essential for the

design of an upgrading strategy. A strategy, by definition, needs a clearly specified and quantified goal. In value chain development 'strategy' refers, among other things, to the upgrading that needs to take place in the form of a policy change, introduction of a new technology, development of a new product, establishment of a new or different linkage or provision of a new service. The strategy is then translated into a detailed commodity development plan that specifies what should be done when and by whom. The value chain development process then moves from analysis and planning to implementation.

In its particular execution there are many varieties of value chain development. The one followed here combines elements of approaches used by FAO and the United States Agency for International Development (USAID). There are quantitative elements to the analysis (such as volumes, values and stakeholders in the value chain map, and assessments of profitability at various levels of the value chain) but the approach is predominantly a qualitative analysis of the structure of the system and how it changes over time. The aim is to identify those upgrading strategies that will be most likely to achieve the stated vision for the value chain.

This red meat value chain study systematically assesses the chain from farm to fork to derive practical recommendations that will maximize the desired impact. The objective for this study is to provide an analytical basis for the development of a vision and strategy for the red meat value chain but these ultimately have to be developed by the stakeholders themselves. Information for this study was gathered on a comprehensive set of issues through literature review, key informant meetings, discussions and interviews (see Annex 2 and 3), site visits and discussion workshops. The report is the outcome of a linear process comprising a launch stakeholder workshop that provided a first sketch of the value chain map and analysis of the strengths, weaknesses, opportunities and threats (SWOT) facing the value chain, a data collection and analysis stage, and a findings review workshop that discussed the preliminary conclusions and provided guidance for completing the report. The actual field study was conducted in September and October 2012 by the author of this report.

1.3 Brief overview of the value chain

Livestock production is a major agricultural activity in Tanzania. The sub-sector contributes to national food supply, converts rangeland resources into products suitable for human consumption, is a source of cash income, and an inflation-proof store of value. It contributes about 30 percent of Agricultural Gross Domestic Product (GDP) of which about 40 percent derives from beef production, 30 percent from milk and 30 percent from small ruminant and poultry production. Livestock production is predicated on a large resource base comprising different species, breeds and types and whose ownership and distribution differ from region to region. Commercial ranching, pastoralism and agropastoralism are the commonly distinguished systems in the rangeland areas. The first of these systems is very minor (2 percent of the national cattle stock) and practised mainly by the National Ranching Company (NARCO) with 15 ranches covering 623 000 hectares (ha) with a stated stocking capacity of 155 300 head. Pastoralism — in which the main roles of livestock are subsistence, a store of wealth and a source of cash income — is concentrated in the northern plains and is practised in traditional grazing areas where climate and soil conditions do not favour crop production. Agropastoralism comprises a range of combinations of crop cultivation with livestock keeping.

Livestock numbers are considered to have increased steadily for many years in line with human population growth. The country's livestock wealth in 2012 comprised 21.3 million cattle, 13.1 million goats and 3.6 million sheep, of which 99 percent were in the ownership of the traditional sector. These animals provide livelihood support to 1 745 776 (or 37 percent) of the 4 901 837 agricultural households in the country.

Livestock not only provides meat and milk but manure, hides and skins and draught power for cultivation and transport. It also fulfils social (and similar) roles. Most production is for the domestic market but there are some exports of live animals, meat and (more substantially) hides and skins.

Internal demand for red meat is estimated at about 450 000 tonnes a year and is growing in line with the human annual population growth rate of 2.9 percent (or possibly exceeding it, as a result of better living standards and aspirations for a better quality of life). Some 99.9 percent of demand is met from local production. Imports are almost exclusively 'choice' beef cuts from Kenya, which flow into the resident expatriate and tourist markets. Imports are estimated at 700 tonnes per year (the equivalent of 10 000 to 14 000 head of cattle). As indicated previously, local production is dominated by small-scale farmers who cannot benefit from economies of scale and often make 'emergency' sales to fulfil immediate cash needs. Small traders buy at the point of production and move animals on to a primary or secondary market. Much of the (limited) processing of red meat is also carried out by small — or at the best medium-sized - enterprises who have neither the technical nor financial capability to operate efficient and profitable businesses. Similarly, the final outlet (to the largely undiscerning consumer) is mostly through a small one-man butchery. As a consequence horizontal and vertical linkages in the value chain are weak and uncompetitive.

Animal feed derives almost entirely from natural unimproved rangeland and crop residues. Official estimates of the carrying capacity of the rangeland are 20 million animal units, but the 2012 livestock population equates to 16 million units so "there is ample potential for expansion of the livestock industry through better animal husbandry and addition of livestock" (see <http://www.tanzania.go.tz/livestock.html>, accessed on 25 September 2012). There is virtually no production of improved forages. Production of concentrate feed is limited to a small number of larger flour millers (mainly as a side-line and often on an 'on demand' basis) and some smaller processors. The base ingredients are by-products of the milling industry and are mainly maize bran and oil (sunflower) cakes fortified with imported vitamin pre-mixes.

Beyond the primary (and to a lesser extent the secondary) market most animals are slaughtered on rural slaughter slabs or at municipal abattoirs most of which are extremely unsanitary (see Box 1). These animals then go 'hot' — and with no further value added — to a multiplicity of (similarly unsanitary) small butchers' shops in the villages, town and cities of the country. A few public or private larger scale abattoirs take a small percentage of the marketed animals, the carcasses of which may or may not be processed into more specialized products. These abattoirs would appear to operate inefficiently and at less than full capacity (in contrast to municipal abattoirs which operate greatly in excess of it) and often have trouble with marketing (see Box 2).

Livestock research has a long and honourable (if somewhat chequered history) on the mainland. Mpwapwa Livestock Research Institute was established in the early 1920, during the era of the

British League of Nations Mandate of Tanganyika Territory, and following an earlier initiative by the German administration in 1905. Livestock research subsequently extended to at least six other stations throughout the country of which one — Uyole — is in the Southern Highlands. In spite of the importance of livestock, research has suffered from limited funding and a brain drain for many years and research and development has suffered as a result¹.

The Animal Diseases Research Institute (ADRI), formerly known as the Central Veterinary Laboratory (CVL), was established in 1961 in Dar es Salaam, in the grounds of what is now the Ministry of Livestock and Fisheries Development (MLFD). It was previously based in the CVL at Mpwapwa. A lack of finance and limited high-level personnel limit its effectiveness in serving the livestock industry. Animal health and nutrition inputs are available at many small private outlets throughout the highlands. Livestock production and veterinary research is also carried out at Sokoine University of Agriculture in Morogoro.

Box 1: Past it's 'use by' date — Morogoro Municipal Slaughterhouse



The slaughterhouse at Morogoro was built outside the town in 1953 with a design capacity of 15 slaughter cattle per day. Over the intervening 59 years, hundreds of thousands of cattle have been slaughtered there. In 2012, some 150 cattle per day were killed — at a cost of TSh 2 000 to the owner — in a facility that is now in the midst of a densely populated urban area. The physical structure is decrepit: the outside retainer walls crumbling, the internal floors cracked and pitted, the drainage for blood and grey water open to the air. Animals are slaughtered without benefit of stunning, and in full sight, sound and smell of their recently demised brothers and sisters. Hides are either air-dried or wet-salted in insalubrious conditions; intestinal contents and trimmings are simply dumped just outside the perimeter wall — to the delight of scavenging birds and other vermin. Not before time the Municipality is seeking to relocate and rebuild a facility more appropriate to the town and the twenty-first century. The present situation is a menace to animal welfare, the environment and human health.

Extension services are weak as are most other services due to limited funding. Devolution of such services from the central Ministry and its branches to local authorities (who are even more constrained for funds than the ministry and its specialized institutions) has been a disservice to the livestock subsector.

¹ A bill promulgated as Number 9 in the Gazette of the United Republic of Tanzania No 51 Vol 92 dated 23 December 2011 proposed an Act “to establish the Tanzania Livestock Research Institute; to provide for functions and powers of the Institute in relation to the conduct of research on livestock production and to provide for other related matters”.

Broad opportunities exist for enhancing this value chain from the producer to the consumer. Some development agencies, including especially Stichting Nederlandse Vrijwilligers (SNV, Netherlands Development Organization), are active in this regard in the Central Corridor and are developing or have developed models that could be multiplied throughout the Southern Highlands. Promoting and building the technical and financial capacity of existing or nascent civil society organizations such as the producer organization Umoja wa Wafugaji Kanda ya Mashariki (UWAKAMA the Eastern Zone Livestock Producers' Association) and its processing counterpart, the Tanzania Livestock and Meat Traders' Association (TALIM ETA), could yield huge dividends.

Box 2: Not so 'safi' — Sumbawanga Agricultural and Animal Food Industries (SAAFI)



SAAFI is a private limited company established in 2002. In 2004 it began building its export-standard abattoir; in 2007 the President officially opened the facility. The abattoir has a modern slaughtering/dressing chain, blast freezers, chillers, a cutting/boning line and a fleet of refrigerated trucks. A meat and bone meal plant is being constructed in order to maximize the value of condemned carcasses and inedible offals. Cattle for slaughter are bought from NARCO, from the company's own 700 ha ranch, or are bought locally (local producers are, however, reluctant to sell to SAAFI because of the low prices they offer). The design capacity is 150 cattle per day but throughput in September 2012 was only about 20 percent of that. If purchase is not a problem, the same cannot be said for marketing, which encounters difficulties. Export consignments have been sent by air to Oman (through direct selling), Egypt (through an agent) and by road to the nearby Democratic Republic of Congo (DRC). Repeat orders have not been secured from any of these places, since consignments are fraught with difficulty including 'excessive' corruption. The local market is supplied with '*nyama kawaida*', that is, bone-in meat with no attempt to supply or promote choice cuts. Mining companies in Shinyanga Region are supplied on a continuing basis with choice cut consignments. After five years of use the plant is already showing signs of severe wear with chipped and broken concrete and the galvanizing peeling off metal parts: this will preclude any future exports to discerning markets. If there was a business start-up plan for SAAFI, it does not appear to have been very robust and the prognosis for a profitable future is not very encouraging.

2. END-MARKETS

2.1 National market

More than 95 percent of meat from cattle, sheep and goats in Tanzania derives from local types of animals reared under extensive conditions in the pastoral system, or under very slightly more intensive circumstances in agropastoral and mixed farming systems. The National Ranching Company (see Box 3) dominates the so-called commercial production system but there are a small number of larger private commercial operations: these commercial activities make use of 'superior' cattle genetics, which are almost entirely of the Boran type.

Tanzania's demand for meat is expected to increase almost exponentially in the medium term, and will significantly outgrow that of other African countries. Total meat consumption is predicted to increase from 160 000 tonnes in 2010, to 290 000 tonnes in 2015 and to reach 500 000 tonnes by 2030. Tanzania's meat market demand is 53 percent for beef, 25 percent for poultry and 22 percent for goat and sheep meat. Annual meat production increased by 19 percent between 2005 and 2010 (from 378 500 tonnes to 449 673 tonnes), with most of the increase coming from the traditional sector. There was a concomitant increase in meat consumption (and other livestock products) but consumption levels in Tanzania remain well below world averages (see Table 1).

Table 1: Consumption of meat and other livestock products in Tanzania

Product	Tanzania		World 2005
	2005	2010	
Meat (Kg)	11	12	41.2 (Kg)
Milk (litres)	39	43	75.7 (Kg)
Eggs (number)	53	75	9.5 (Kg)

Source: MLFD, 2010; FAO, 2009

National demand for red meat is, in parallel with production, hugely dominated by the mass of poorer rural and urban households whose buying habits have been conditioned for generations by the supply of low quality beef, goat and mutton supplied as '*nyama kawaida*' (undifferentiated meat with or without bones). A growing mainly urban middle-income group is, however, beginning to be more discriminating in its purchasing habits and demanding better quality meat for which they are willing to pay a premium price.

The food service industry is also growing steadily and supplies Tanzanian institutional buyers (such as educational establishments, the military, hospitals and prisons that demand little more than '*nyama kawaida*'), hotels and specialized restaurant outlets (that are developing for the burgeoning tourist business and requirement much better quality meat in general and choice cuts in particular) and a growing number of supermarkets. As a result of the increased demand for quality meat, imports rose by 166 percent between 2008 and 2012.

Access to markets in rural areas is generally limited or difficult. The Tanzania National Panel Survey (NPS) of 2008–2009 showed that only 10 percent of rural farm households are market-oriented (i.e. sell more than 50 percent of their produce). Overall only 37 percent of agricultural production enters the market chain and for livestock this figure is as low as 8 percent. For those households that do

enter the market some 52 percent sell live animals, 4 percent meat and 21 percent other livestock products (mostly milk and eggs).

Just over 20 percent of total household food expenditure (or around 13 per cent of total household expenditure) is channelled into livestock products (whether purchased or own produced). Although food decreases as a proportion of total expenditure with rising wealth, red meat rises as both a proportion of total household expenditure and total food expenditure with increasing wealth. In rural households, food expenditure accounts for nearly two thirds of the total household expenditure. Urban households consume approximately twice the amount (in value) of meat, poultry and dairy as rural households, and four times as many eggs. Most urban livestock meat is purchased; rural households show a more equal division between the value of meat produced and that consumed.

The relationship between urban per capita consumption (in Tanzanian shillings) and increasing wealth is positive for nearly all products. Analysis of the patterns of animal product consumption shows a sector with much room for expansion. The disparities in consumption between rural and urban areas and between different income groups suggest that as average incomes in Tanzania increases, the demand for livestock products will expand. This offers good opportunities for livestock producers to increase production in order to serve a growing domestic market. Female-headed households, while somewhat disadvantaged in terms of access to livestock assets, appear to be in a relatively good position to benefit from such opportunities, as their participation in livestock output markets is equal to — or greater than that — of other households. Growth is also likely to be accompanied by a shift in the composition of the demand towards more meat and dairy products. Poultry will continue to be important but, if current consumption patterns are a guide, household preferences will increasingly shift towards other livestock products as incomes increase.

Livestock trade in 2010 has been estimated at about 857 208 cattle, 682 992 goats and 122 035 sheep with a total value of TSh 382.4 billion (around US\$ 250 million), an increase of 20 percent from 2009 (MLFD, 2010/2011).

Box 3: At home on the range? – The National Ranching Company (NARCO)



In the period immediately following the end of the Second World War, Great Britain was unable to provide enough food to feed its people, and there was a particular shortage of edible oils, such as margarine. It was therefore decided to grow oil seed crops in Britain's overseas Dominions and Trust Territories. The Overseas Food Corporation (more generally known as the Groundnut Scheme) was established by an Act of Parliament in 1946. In Tanzania it was proposed that groundnuts should be grown in Kongwa (in central Tanganyika), at Urambo (in the west) and at Nachingwea (in the south).

NARCO is, if you like, the great-great-grandchild of the notorious Groundnut Scheme, emanating as it does from the Tanganyika Agricultural Corporation, the National Development Corporation and the National Agricultural Corporation. When the soils and climate proved less than propitious for groundnut production at Kongwa (as indeed they did at Urambo and Nachingwea) operations turned to livestock. Tanganyika Shorthorn Zebu (TSZ) were the first cattle to be introduced, followed shortly by upgraded Boran. A holding ground at Ruvu (80 km from Dar es Salaam) was used as a fattening ranch for bought-in local steers in the early 1960s. The southern area of Nachingwea was converted to ranching in 1964 when 15 farms were linked as a single unit; West Kilimanjaro was established in 1964 by the amalgamation of several settler-owned ranches situated between Mounts Kilimanjaro and Meru. 'Kongwa Beef' was born in the 1960s (some Aberdeen Angus bulls were used to increase cattle growth rates and quality) and this is still the 'brand' that NARCO wishes to promote. Kongwa and West Kilimanjaro ranches became stud farms, and Boraii bulls were imported from Kenya to breed with — and thus upgrade — the local TSZ. Nachingwea ranch reverted to central government in 1966 and was subsequently used as a training camp for Mozambican and Zimbabwean freedom fighters. Meanwhile, NARCO continued to expand its operations and eventually had a total of 15 ranches covering 630 000 hectares. During the 1970s and 1980s, the Company encountered technical difficulties and financial shortfalls that resulted in reduced output of cattle and lowered profitability. A decision was made in 1992 to privatize some of the holdings. As a result, three ranches were sold and two others sublet but there was insufficient interest from the private sector to continue along this path. Problems on the remaining ranches continued throughout the 1990s in part because the privatization decision precluded the obtaining of loans and the hiring of high calibre staff. A new model of subletting was introduced in 2002 whereby half of each remaining ranch was retained as a 'core unit' with the other half being subdivided into smaller units suitable for investment by financially smaller entrepreneurs and families, or groups of families. Thus, 298 000 hectares were excised as 124 holdings of between 1 500 and 4000 hectares each. The remaining nucleus land (comprising 230 334 ha) is said to have a carrying capacity of 92 000 cattle but is stocked with only 26 000 head and a few goats and sheep (Kongwa Ranch has almost 10 000 cattle running on 38 000 ha).

NARCO continues to promote itself as a breeding operation and a supplier of superior quality cattle to smallholder and pastoral livestock producers. It also buys in local cattle that it keeps for three months in a feedlot before selling for slaughter. It claims that its own 'boran' cattle gain 1000 g per day in the feedlot (whereas local cattle gain 500-700 g). At sale, NARCO receives TSh 2500 per kg live weight for stock that yields a meat equivalent of 47-50 percent of the final live weight. The company has a 51 percent stake in the Tanganyika Meat Company (effectively the Dodoma Export Slaughterhouse), the other 49 percent being held by the Tanzania Investment Company. It is also seeking US\$ 9 million of private sector investment to complete the construction and equipment of an export slaughter facility in Ruvu with a capacity of 800 head of cattle and 400 head of small ruminants per day. This is currently stalled, however, because NARCO's own funds have proved insufficient for the task. 'Kongwa Beef' brand remains the company's flagship product, and is heavily promoted, especially at the Company's central Dar es Salaam retail outlet (in dire need of refurbishment in September 2012). Lamentably little 'Kongwa beef' now actually comes from the eponymous ranch.

The Consultant who compiled this report worked at Kongwa Ranch between 1960 and 1964 and was then, successively, Ranch Manager at Nachingwea, West Kilimanjaro and Missenyi.

2.2 Export markets

Commercial processing — for the domestic as well as the export market — started in 1949 when Tanganyika Packers Ltd (TPL) constructed the Kawe meat plant in Dar es Salaam. A smaller plant was established in Arusha some time later, but two other projected plants — at Mbeya and Shinyanga — failed to materialize fully. TPL was initially managed by the Liebig Extract of Meat Company (by then part of the British Vestey Group and later acquired by Brooke Bond) operating as a subsidiary company of the Tanganyika Livestock Marketing Company (TLMC). The Kawe plant had a capacity of 550 head per day (200 000 per annum) in two shifts. Some forequarters went into manufacturing but were mainly distributed to the domestic market as hot meat. Hinds were processed for export. Meat extract and corned beef were also major products destined for export². Upon nationalization in 1974, TPL became a subsidiary of the Livestock Development Authority (LIDA). Exports of meat and processed products ceased in 1976 when TPL lost its international sanitary certificate, the Kawe plant continued to supply the domestic market, however, until 1993 when it was officially closed. Following the dissolution of LIDA in 1986 the meat business was left unregulated until Parliament enacted the Meat Industry Act No 10 of 2006, which established the Annual Meat Council and the Tanzania Meat Board (TMB). Implementation of this act is often in concert or in conflict with other legal instruments (such as food quality and safety, animal health and disease and animal welfare) that are implemented by other ministries, institutions, boards, authorities and local government³.

Free movement of animals across national borders in East Africa long predates the colonial period (when, of course, there were no international boundaries). The pastoral system depends on periodic movement to take advantage of the availability of feed and water for its stock, and inevitably present-day international boundaries are traversed by many of these treks. Most, if not all of these treks are technically illegal, as the herders/owners of the animals do not have the required permits to move animals. The extent of this transboundary movement, by its very nature, is impossible to quantify but it is usually said to be ‘substantial’.

There are, of course, movements in both directions across such national boundaries although these are often not highlighted for political reasons. Although almost all movements are for livestock management reasons, there is certainly a commercial element in many of them, for animals can be sold in neighbouring countries at prices that are often considerably higher than in Tanzania. Most movements — and consequent ‘illegal’ sales — take place across the northern borders with Kenya and Uganda. There is much less movement across the borders to Rwanda, Burundi, DRC and Zambia, but many of the animals that cross them may emanate from the Southern Highlands.

There were no (official) exports of livestock and meat between 1976 and 2002. In the latter year exports of live animals began to regional markets (including Zanzibar!). These were followed two years later by chilled carcasses and meat to regional markets as well as to the Gulf States (see Table 2). The Tanzanian mainland officially exports live animals to Kenya, the Comoros, Burundi, Uganda and its offshore region of Zanzibar. Live exports are primarily of cattle, but also of goats and sheep.

² The author of this report used to buy TPL corned beef in supermarkets in the United Kingdom in the early 1970s: now he buys ‘Brazilian’ corned beef that has been processed in the UAE, with beef from...where? Tanzania!

³ For more details on regulations please see Section 4.1.1 (‘Legislation and regulations’).

Carcasses — as well as a limited number of cuts of beef, goat and sheep — are exported elsewhere, mainly to the Arab Gulf (Oman, Kuwait and Dubai), DRC and again to Zanzibar. In recent years the Dodoma abattoir has regularly exported goat and sheep carcasses to the Arabian Gulf and has a steady weekly export by air of 600 goats to Dubai and 200 goats and 10 sheep to Kuwait. In the Southern Highlands, SAAFI has intermittently exported carcasses and cuts to Egypt, the Gulf and DRC. It has a contract with ZamBeef (Zambia) — whose ‘vision’ is “to be the most accessible and affordable quality protein provider in the region” — for 5 tonnes per week and negotiations with the Angola army for a regular supply were under way in September 2012. In 2009/2010 exports of live cattle and meat generated more than TSh 3.3 billion, though this was only just above 20 percent of the TSh 14.7 billion earned from hides and skins (MLFD).

It is estimated that the world demand for beef will rise from 65.2 million tonnes (2012 figures) to 74.1 million tonnes in the medium term, and the demand for sheep meat from 26.6 million tonnes to 28.7 million tonnes over the same period⁴. Demand is projected to slow down subsequently but nonetheless to continue to increase. It is expected that much of the demand will be met by production in developing countries (which surpassed production in developed countries for the first time in 2007). More and more countries are seeking to close their supply gap through imports. The major beef exporters such as Brazil, Argentina and Australia face logistical challenges in supplying the new growth areas in Africa, the Middle East and Asia. Tanzania, however, is well placed — especially in view of the inefficiencies in the system at present — to supply part of this market at prices that are expected to rise substantially in the future. It could gain preferential access to some markets, rather more than niche, by marketing grass fed animals largely free from chemical and vitamin implants and from non-genetically modified organisms.

There are caveats, however, to increased market penetration. Animal welfare will increasingly become an issue. Although legislation is in place, for example, with respect to overt cruelty, the number of animals transported in one compartment and the distance of travel without offloading for feed and water is hardly policed — see Figure 1.

Figure 1: Animal transport on the Sumbawanga-Mbeya road showing multiple breaches of the Animal Welfare Act, September 2012.



⁴ See www.stats.oecd.org accessed on 24 September 2012.

Table 2: Exports of livestock and livestock products (2002-2008)

Year	Live animals				Meat			
	Species	Number	Value (TSh)	Destination	Type	Kg	Value (TSh)	Destination
2002	Cattle	382 140	114 600 000	Comoro				
	Goat		2 800 000	Comoro				
2003	Cattle	1 674 000 000e+10	5 859 000 001e+34	Comoro				
	Goat			Burundi				
	Sheep			Zanzibar Comoro Zanzibar				
2004	Cattle	3 003 000 000e+22	1 141 140 001e+63	Comoro	Beef	801 000	1 200 002 000e+12	Zanzibar Oman
	Cattle (heifers)			Burundi				
	Goat			Zanzibar Malawi				
	Sheep			Comoro Burundi Zanzibar Uganda Zanzibar				
2005	Cattle	3 685 000 000e+13	1 547 700 000e+63	Comoro	Beef	600	900 000	Zanzibar
	Goat			Zanzibar Kenya Comoro Kenya				
2006	Cattle	4 904 000 000e+27	2 206 350 000e+77	Comoro	Beef	163	2 445 009 000e+61	Oman
				Zanzibar	Goat	4 700.5		Oman
				Burundi		5 509.5		Dubai (UAE)
				Kenya		2 694		Kuwait
	Cattle (dairy)			Comoro		370		Muscat
	Cattle (heifers)			Malawi	Sheep	3 500		Zanzibar
Goat			Comoro		236		Dubai (UAE)	
Sheep			Burundi		19 137		Kuwait	
			Zanzibar		962		Oman	
2007	Cattle	2 734 000 000e+22	1 367 000 000e+60	Comoro	Beef	1 701	2 551 500e+71	Dubai (UAE)
				Zanzibar		9 000		Oman
				Burundi		36		UAE
	Cattle (dairy)			Comoro	Goat	6 650		Oman
	Cattle (heifers)			Malawi	Sheep	4 061		Dubai (UAE)
	Goat			Comoro		11 632		Kuwait
				Malawi		3 000		Oman
			Burundi		2 539.5		Dubai (UAE)	
			Burundi		72 789.5		Kuwait	
					1 263		Oman	
2008	Cattle	5 982 000 000e+11	3 109 600 007e+37	Comoro	Beef	934.5	2 338 751 000e+50	Oman
				Zanzibar		300		Comoro
	Cattle (dairy)			Comoro		5 000		DRC
	Goat			Comoro	Goat	6 292		Kuwait
				Burundi	Sheep	569		Oman
					14 285		Kuwait	
					2 363		Oman	

Source: MLFD Reports

Figure 2: Cracked and peeling concrete in an export slaughter facility after four years of use, September 2012



Much is discussed in Tanzania about establishing disease-free zones but in a country with porous internal and international boundaries these will be horrendously expensive to establish and not easy to maintain. Without fully guaranteed and documented disease-free certificates some markets will melt away. Meat hygiene is likely to be another issue. Markets currently accepting Tanzania meat may not do so in future and the most discerning markets will certainly not take meat and products from slaughter and packing facilities that are not scrupulously clean and guaranteed to be free from bacterial and other pathogenic contamination (Figure 2). Current export destinations are likely to continue to take Tanzania products for some time at least, but access to the European Union market is likely to remain a dream.

3. THE RED MEAT VALUE CHAIN

The value chain describes the range of activities required to move a commodity from the first point of production to the last point of consumption. This usually involves (an often complex) combination of physical change, inputs from various producer services, transfers of ownership and delivery. Commodity value chains are increasingly recognized as providing a solid framework for the analysis of the public and private sector stakeholders players within them, as well as the overall performance of particular markets.

The value chain is confounded by many technical and institutional impediments (from supply and use of inputs, via production and processing to marketing and retailing). The chain is fragmented, unorganized, uncontrolled (in spite of being over-regulated) and uncoordinated. It is dominated by large numbers of smallholder stock owners, an unknown but undoubtedly immense number of middlemen who operate across every link, and a similarly unknown number of small processors and butchers who put products on the market for the consumer but who mainly lack the technical and financial ability to run it efficiently and profitably. The horizontal and vertical linkages of the value chain are generally weak and uncompetitive and in need of support to strengthen them.

In Tanzania the 'red meat' value chain includes live animals, meat, processed meat products and by-products from cattle, sheep and goats that are sold both locally and in the export market. Primary processed meat and meat products are derived after animals are slaughtered and include carcasses, red offal (liver, lungs, tail, heart and kidneys), hides, skins and other by-products such as blood, bones, horns, hooves, hair, wool, glands, intestines, stomachs and gut contents.

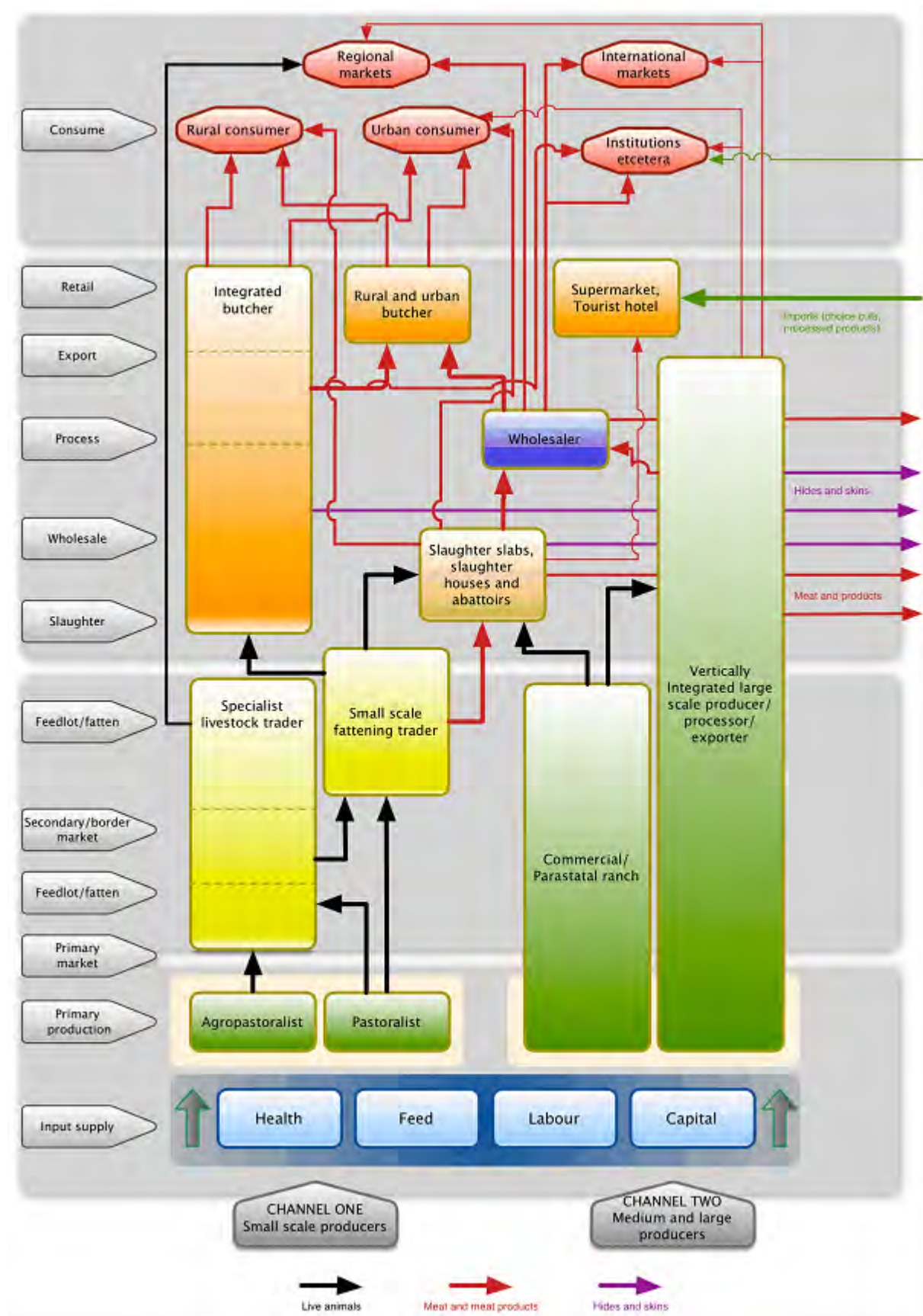
Actors in the value chain include primary producers, traders in animals, meat and by-products, processors, butchers and consumers. Most actors are not specialized and their functions relate to various segments of the value chain. Many primary producers, for example, engage in trading of animals and some upstream actors — such as butchers — trade in animals and meat, and undertake primary processing for production of higher value cuts, mince and sausages.

3.1 The value chain map

The value chain map (Figure 3) shows that the whole is suspended from the consumer. If the link to the rest of the chain were broken the whole would be susceptible to collapse. This situation is more or less true for all other links in the chain. Each link takes the product from its immediate predecessor and 'processes' it to an output that is used by the next link. Nominally, the value of product increases at each stage until it reaches the consumer.

It is possible to provide a succinct list of most of the participants in the chain (Table 3) but pivotal roles are played by the middle links of the chain through which all products must pass. Many participants in the chain (see Table 4) occupy more than one role. Some small-scale livestock producers but especially those of slightly larger scale also act as processors and retailers. Further up the chain some processors are also wholesalers and retailers and operate in both the domestic and export markets. Primary producers may sell cattle, goats or sheep directly through a market, to a trader or to a processor or may use a combination of all three outlets.

Figure 3: The Red Meat Value Chain in the Southern Highlands



A trader can sell to another trader, directly to a wholesale or retail butcher or to a processor or, again, may broaden his option by using a combination of these channels. Processors, especially the smaller enterprises, may buy animals directly from farmers or from traders and sell the products to wholesalers or retailers.

Table 3: List of supply and service participants in the Red Meat Value Chain

Core actors	Service suppliers
<ul style="list-style-type: none"> • Producers (Agropastoralists, Pastoralists, Dairy farmers, Commercial Ranchers) • Traders and agents • Slaughters and facilities • Wholesalers • Butchers (rural, urban, quality butcheries and supermarkets) • Meat product retailers (street vendors, shops, supermarkets) • Importers (live animals, meat and meat products) • Exporters (animals, meat and meat products, hides and skins) 	<ul style="list-style-type: none"> • Research • Training and Education Institutions • Extension service • Inputs (veterinary, feed) • Transport • Financial services • Meat inspectors and abattoir workers • Associations (producer, processor, trader, exporter) • Tanzania Meat Board

Table 4: Participants and functions in the Southern Highlands Red Meat Value Chain

Participant	Functions
Research	Livestock production and development research is carried out at the Uyole. Livestock Research Centre, which is located in the same facilities as the Uyole. Agricultural Research Institute (ARI) some 11 km from Mbeya. Professional staff includes 2 Ph.D., 7 M.Sc., O B.Sc., 10 Diplomas and 1 Certificate. In addition to limited applied research the centre has responsibilities in training and extension work. Collaboration with other agricultural research institutes takes place in socio-economic studies and in natural resources management (especially for the integrated management of crop/livestock/environment to sustain agricultural development). The Iringa Veterinary Investigation Centre is the reference laboratory for the Southern Highlands.
Feed manufacturers and suppliers	Energy Millers and Animal Feeds in Sumbawanga produce livestock feed primarily for dairy and poultry farmers and mainly for the on-demand Dar es Salaam market. Numerous small private retailers (as many as 500 have trading licences) sell small quantities of feed, feed additives and supplements.
Other input suppliers	MIFUGO and the municipalities provide limited extension and animal health services. Financial services are extremely limited and available only to a favoured few.
Producers	Most stock is kept by sedentary agropastoralists. Since the 1960s there have been incursions of pastoralists mainly from the area to the south of Lake Victoria. NARCO has a ranch at Macama, 45 km from Sumbawanga, and there are other smaller private ranches.
Traders	Primary buyers, primary brokers and secondary buyer-agents operate throughout the region. Trading takes place at the point of production and at primary and secondary markets. Some long-distance trade towards the Dar es Salaam market takes place by road transport but most is more local.
Slaughterers	Most slaughtering of goats and sheep is 'informal' and done at the point of production. Cattle are slaughtered at rural slabs (usually small and out-of-date slaughterhouses), at many of the larger villages and towns, and at some larger municipal facilities.
Processors	Small primary processing of 'nyama kawaida' cuts is carried out on a range of scales. Offal is processed by small-scale processors who deal in both red (edible) and green (inedible) varieties usually in proximity to the point of slaughter. SAAFI has a capacity to slaughter and process 150 cattle per day for the export and high end domestic market.
Retailers	Retailers are usually small-scale street vendors (often insalubrious one-person butcheries) and rather more hygienic urban butchers.

Every link in the chain relies on goods and services in order to enable it to fulfil its role(s). At the various stages, goods and services include land, labour, live animals, veterinary supplies, feed supplies, transport, energy, and finance. Also required are clearly defined and enunciated standards and a regulatory framework under — and applied by — law. Many of these requirements continue to be weak or non-existent in Tanzania.

3.2 Technology generation

Technology in livestock production includes inputs such as feed or veterinary medicine at the producer level, the machinery use in slaughtering and processing, and proper and hygienic presentation of products at the retail level. Technology has a key role in improving competitiveness and especially vis-à-vis near neighbours operating in the same environment and competing for the same market.

Red meat production in the Southern Highlands is based on traditional systems that use very little modern technology. Indigenous animals dominate the herds and flocks, but are considered to have limited production potential. Indigenous types include TSZ and Ankole cattle, Small East African goats, and undifferentiated African long fat-tailed sheep (Red Maasai sheep are also recognized in the north of the country). Animals derive their feed almost entirely from natural rangeland and some crop residues, which are usually in low supply and for much of the year have minimal nutritional value. Most herds receive little in the way of animal health interventions (only 29 percent of cattle are vaccinated regularly), protection from ticks (and the diseases they carry) or control of internal helminthic parasites. As a consequence, death rates are very high in calves, and may reach 70 percent in those infected by East Coast Fever (ECF). (The latter can be reduced to less than 30 percent with regular dipping). Reproductive rates in cattle reach only about 50 percent of their full potential (a cow first calves at 4 years of age and then produces a calf only once every 2 years), and overall growth rates are low and characterized by the gain-loss-gain annual cycle. Thus, overall output is greatly reduced; annual offtake for slaughter may reach 12 percent but is more likely to be 10 percent; and if an animal survives to the slaughter stage (a minimum of four years, and often six to eight years) the resultant meat is of very poor quality.

As can be inferred from the above, although many technological interventions are available, they are not generally used by producers (and are probably not even communicated to them by technical staff). Some are probably too sophisticated or too expensive for use at the present state of development of the regional herd. A vaccine against ECF, for example, has recently been put on the market but is too costly for general use: on the other hand, regular dipping or hand-spraying (acaricides are subsidized by the public sector) would greatly reduce the general incidence of tick-borne diseases (e.g. not only ECF but heart water, anaplasmosis and babesiosis).

The more widespread use of artificial insemination (AI) is often advocated as a means of improving the genetic make-up of indigenous stock but in the prevailing conditions of the Southern Highlands this technique only has limited application and is fraught with problems (such as accessing a supply of liquid nitrogen or indeed the cow while she is receptive to insemination). Treating fibrous feeds with urea or ammonia to improve their nutritional quality is a cheap, simple and very effective way of accelerating weight gain but has little application in the Southern Highlands. The low adoption of

available technologies is caused by poor extension services, difficulties in gaining access to technologies (cost/location) and the low level of knowledge among most livestock keepers.

Uyole Livestock Research Centre has the mandate for applied research for much of the Southern Highlands. It is committed to researching and facilitating the adoption of appropriate technologies in the region (and in conserving and characterizing the Iringa Red strain of the TSZ). Its impact is limited, however, by low staffing levels and limited budgets. Similarly the official extension services suffer from the same problems.

Adoption of known, improved (yet not overly ambitious) management and technological practices can, however, bring about spectacular increases in the output and quality of livestock products (Table 5). Among such are:

- strict implementation of the tick control regime recommended by the veterinary authority;
- vaccination against epidemic and endemic diseases, both ‘trade’ and ‘production’;
- matching the stocking rate to the carrying capacity and providing preferential access for target groups (e.g. pregnant animals and young stock);
- setting aside dry season pasture reserves and conserved fodders;
- regular (daily at least) access to water by livestock;
- use of mineral and vitamin supplements to target groups including breeding males;
- castration and early removal of inferior males and those unfit for service;
- sale of barren and unproductive females and of over-age draught animals; and
- sale of slaughter cattle when they are in good condition, early in the dry season, in order to avoid ‘emergency’ sales for immediate cash needs.

Table 5: Potential improvements in red meat production with the adoption of simple technologies

Production parameter	Current value	Intervention	Future value	Improvement (percent)
Cattle <i>Long intervals between watering are a major constraint to increased output</i>				
Reproductive rate (calving interval)	24 months	Strategic supplementation	18 months	33
Cow lifetime calf production	3	Strategic supplementation	4	33
Calf survival	30 percent	Vaccination/dipping against ECF, anthelmintic treatment	70 percent	233
Calf growth to 7 months	300 g/d	Mineral/molasses/multi-nutrient blocks, crop residue treatment	250 g/d	25
Older animal survival, per year	80 percent	Supplementation, dipping, anthelmintic treatment	90 percent	12
Offtake rate, per year	10 percent	Combinations of above	12 percent	20
Goats and sheep <i>Long intervals between watering are a major constraint to increased output</i>				
Reproductive rate (kids/lamb per year)	1.5/1.2	Strategic supplementation, anthelmintic treatment	1.6/1.3	6/8
Growth to 2 years	300 g/d	Mineral/molasses/multi-nutrient blocks, crop residue treatment	350 g/d	16
Adult survival, per year	80 percent	Mineral/molasses/multi-nutrient blocks, crop residue treatment	85 percent	6

Production parameter	Current value	Intervention	Future value	Improvement (percent)
Kid/lamb survival	50 percent	Anthelmintic treatment (including tapeworm), tender loving care	70 percent	40
Death from <i>Peste des Petites Ruminantes</i> / Rift Valley Fever	15 percent	Vaccination	2 percent	750
Offtake rate, per year	20 percent	Combination of above	25 percent	20

Source: Consultant's experience

Failure to use available, effective, cheap and simple technologies will inevitably result in an even greater loss of competitiveness, since the peers of Tanzania's livestock producers and processors in neighbouring countries, especially Kenya, are making widespread use of them.

3.3 Input supply and demand

The most important inputs for red meat production are perceived to be:

- animal health products including drugs and vaccines;
- nutritional supplements (conserved forages, concentrates, mineral and vitamins);
- fixed and mobile equipment and tools;
- pasture seeds;
- breeding animals (mostly males) and artificial insemination; and
- credit.

The limited access to input use and credit, livestock disease incidence as well as poor dissemination and uptake of knowledge on improved management are recognized constraints to the development of the Tanzania smallholder livestock sector. According to NPS the whole farming sector is characterized by extremely limited use of modern inputs. Only 6 percent of rural livestock keepers use hired labour for work on livestock activities and only 20 percent purchase fodder. The proportion purchasing fodder ranges from 13 percent for the poorest group of households to 37 percent for the more affluent rural households. This could be a reflection of greater purchasing power but also of differences in herd composition or rearing systems.

Access to extension services is apparently not quite so limited as access to credit but is nevertheless not very widespread. Just over one quarter of rural livestock producers made use of extension services and received advice on production practices or disease prevention and control. Access seems to be positively related to wealth but is also related to the number of animals kept by a household. This could be because households with more livestock have greater dependence on them for their livelihoods.

Public veterinary services are supposedly widely available but provision is clearly inadequate. Only 29 percent of households, according to NPS, used any form of vaccination and use of other veterinary inputs is limited. Actions in relation to livestock disease tend to be reactive rather than proactive. Access to animal health services and products is better in and near towns where private suppliers are common and can supply a wide range of local and international drugs and health supplements (Figure 4).

There is little use of purchased feeds — either roughage or concentrate — in the red meat chain (in contrast to dairy and poultry) except in the few households or organizations that have feedlots. Several flour millers produce animal feeds, in part because this is a practical and financially rewarding way of using maize bran (see Box 4). Almost all would be willing to formulate or use standard formulations for beef and small ruminant production. Once again feeds are more widely available in populated areas than in the remoter parts of the country where most livestock are found. This imbalance in location and availability of inputs — both health and nutritional — is a fundamental problem for the chain.

Figure 4: Private retail outlet supplying livestock drugs and feed supplements in Tunduma, September 2012



The import and distribution of most veterinary drugs and vaccines has been privatized but there are exceptions with some specified biologicals. The Government exempts all specialized livestock-related inputs from import and sales taxes, and acaricides are given a 40 percent subsidy on the retail price. These measures are intended to reduce the costs of livestock production. There are few distribution centres in rural areas, especially in the remoter pastoral areas, and producers are therefore often forced to travel long distances to towns to purchase inputs. Producers can obtain some inputs at rural markets and other informal distribution points but in so doing they risk buying counterfeit, diluted or poor quality products. Procuring inputs from informal channels can — especially when combined with drugs administered by untrained livestock keepers — make the cure worse than the disease.

There are many residues and by-products from crop production and processing that are useful as animal feed. These include crop stovers, which are usually extremely high in fibre (and though of very low nutritional value provide a simple way to improve the feed value). Maize bran is the major by-product of the flour milling industry and a potential major feed supplement for red meat production. However, much of it is simply wasted or used as a fertilized/soil improver. Other by-products of crop production include oilseed cakes and rice hulls. Mineral and vitamin supplements and pre-mixes are mostly imported. There are several larger scale producers of animal feeds (and possibly thousands of village entrepreneurs) producing feed of various categories for the dairy and poultry industries but there is little demand from meat producers.

The Government has a pasture seed farm at Langwila in Mbeya and a second one at Vikuge (in the Coastal Region but also serving the southern corridor). The two farms can produce up to 50 tonnes of

improved tropical pasture seeds annually for sale at cost and they also produce more than 300 000 bales of hay for livestock feed. The use of artificial insemination in dairy development areas for cross breeding and upgrading dairy herds has been used for a long time and is relatively widespread. It is now, however, Government policy to promote AI, mainly with Boran semen, in traditional beef production herds. Efforts to improve bulls, again especially with Boran, is promoted and supported by district councils through subsidized sale of bulls to individuals and producer groups.

Box 4: Let them eat cake — supplements and concentrate feed manufacture



There is, as yet, little demand for feed supplements or concentrate feeds from the red meat chain. There is, however, strong demand for dairy feeds and especially for poultry feeds. The market for the latter comprises layers mash, broiler starter, broiler grower and broiler finisher. A number of industrial-scale flour millers produce livestock feed, partially as a way to add value to the maize bran that is a by-product of the milling industry. Among these are Energy Millers and Animal Feeds (with facilities in Sumbawanga and Kibaha), Falcon Feeds, Farmers' Centre and Hill Animal. In addition to the large manufacturers there are many small-scale village millers producing animal feed as well as the 'home mixers'. One of the large millers has recently installed a fully automated 20-tonne batch mixer (with computer controlled mix proportions, and a capacity to produce pellets as well as meal). The main ingredient in Tanzanian stock feeds is maize bran (usually about 70 percent of the mix) followed by sunflower cake, whole (ground) soybeans, meat and bone meal, salt, lime and superlick. Deliveries are made in bulk or in 50-kg sacks. For small lots, a 50-kg bag of dairy-mix sells at TSh 15 000 (a 25-kg sack of maize flour costs TSh 22 000). There is no requirement to declare the ingredients, nor to display the proximate composition of the mix on the packet, but larger firms usually have analyses done by the Tanzania Bureau of Standards. If the demand rises the supply will be there.

The National Microfinance Bank (NMB) and the Cooperative Rural Development Bank (CRDB) are the main and largest providers of credit to agriculture in general in Tanzania. They have branches in most districts of the Southern Highlands. NMB has a range of products including loans for farmer groups and also Small and Medium Enterprise (SME) loans applicable to processors. Collateral requirements are, however, strict and livestock are not accepted as collateral. (N.B. NMB has not yet done any financing of livestock enterprises). Interest rates are based on Treasury Bills plus 1 or 2 percent and range from 19 percent for SMEs to 24 percent for microenterprises. Both banks provide funds to Savings and Credit Cooperative Societies (SACCOS) and Microfinance Institutions (MFI). Several other banks, including the Tanzania Postal Bank (TPB), National Bank of Commerce (NBC) and Exim Bank Tanzania (EBT) operate in the Southern Highlands (see Table 6) and could be sources of credit for livestock in the future. The Government is in the process of establishing an Agricultural Bank as proposed in the 'Kilimo Kwanza' (Agriculture First) initiative and has made a start with the Agriculture Window Unit in the Tanzania Investment Bank.

Table 6: Banks operating and providing loans in the Southern Highlands

Item	Bank				
	NMB	CRDB	TPB	NBC	EBT
Range of loan amount (TSh)	300—500 million per MFI/SACCOS	300—500 million per MFI/SACCOS	Average 1.1 million per MFI/SACCOS	5—250 million per MFI/SACCOS	500 million per MFI/SACCOS
Types of products	Whole range of financial products to individual clients: these include savings, loans, money transfer, payment services etc. Wholesale loans are extended to SACCOSs and MFIs.				
Profile of clients	NMB, NBC, EBT and CRDB are primarily indirect providers to rural areas through their links with MFIs and SACCOSs. TPB has a greater tendency to provide direct services to individual rural clients.				
Portfolio characteristics	CRDB volume of loans to agriculture (rural) comprises about 25 percent of total lending. NMB has extended significant lending in agriculture, whereas TPB, NBC and EBT have continued to lend to individual farmers as demand arises.				
Financing sources & capital structure	SACCOS and other MFIs are able to generate funds from the banks, NGOs and own members.				

Source: SIDO 2009

3.4 Production

Earlier sections of this report, as well as many other internal and external reports, have stressed that red meat production in Tanzania is overwhelmingly the domain of small-scale traditional producers. Estimates of up to 99 percent of red meat production deriving from the traditional sector are common and there can be little doubt that this situation will continue well into the future. The lack of any penetration of the red meat market, and particularly the beef market, is exemplified by the fact that after almost 50 years of operation the oft cited — and in some quarters much loved — NARCO has conspicuously failed to make any impact on the output of red meat through slaughter, or to change the genetic constitution of the national herd through the distribution of ‘improved’ bulls. The prognosis for future rapid change in production from the value chain is not very positive.

Livestock genetic resources

Cattle production depends almost entirely on the much maligned and denigrated indigenous breeds, mainly the TSZ (a classic thoracic humped Zebu) and the Ankole (a typical cervicothoracic humped Sanga). As early as the 1920s, however, there was lobbying within the veterinary services to support indigenous species. In statements well ahead of their time, colonial officers recognized that the main preoccupation of most livestock owners in the frequently harsh environments of Tanzania was (as it still is) to maintain and reinforce the inherent natural survival strategies of their animals. In this context they delivered remarks such as:

“Nature holds sway and elimination of the constitutionally unfit is the rule rather than fostering of the physically desirable”;

“Few people today except the natives themselves ‘in whose minds there is no dubiety’ appear to realize that in Tanganyika the actually convertible capital value of the livestock of the Territory if sold up tomorrow exceeds the sum of the values of the assets of all other industries combined”; and

“... the, as it were, hidden attributes of the Zebu, such as disease immunity and hardiness are of at least as great value as the revealed ones of physical form and what such form stands for, and that

because of this no justification exists for despising such animals because they fail to come up to European standards of excellency”.

However, such tenets did not prevent attempts at improvement. The Iringa Red subtype of the TSZ (see Figure 5) was an early target of genetic modification attempts when it was crossed with North Devon cattle. Subsequently, from 1935, in what should have been a structured programme, *Bos taurus* bulls — mainly Ayrshire from the United Kingdom — were used systematically to breed with local cows with the aim of producing a new breed adapted to the local environment but of higher output than the native stock. Some five years into the programme it was realized that upgrading to *Bos taurus* was failing to produce such an animal. The breeding plan was thus modified to introduce the blood of Red Sindhi and Sahiwal, imported from South Asia (now India and Pakistan) to replace at least partly the *B.taurus* genes. This resulted in an animal exhibiting Indo-African Zebu type morphology with traces of its taurine inheritance. Changes in research personnel were invariably accompanied by changes in the breeding scheme; these are “not well documented”. In spite of this, the resulting animal was accorded breed status as the ‘Mpwapwa’ in 1958 when it was said to comprise 35 percent Red Sindhi, 20 percent Sahiwal, 20 percent TSZ, 10 percent Boran, 5 percent Ankole and 10 percent *B.taurus* “mainly Ayrshire”! A breed improvement programme was instituted at the same time as breed status was declared with the intention of producing a dual-purpose animal for the semi-arid environment of central Tanzania, capable of producing 2 300 kg of milk in 305 days and a steer carcass of 230 kg in fewer than four years. In 1963 (when the author of this report was very familiar with developments at the Mpwapwa Research Station, though he did not work there) the animal was still very variable both in physical type (see Figure 5) and production traits.

Over the succeeding half-century there have been many further changes in the breeding plans of Mpwapwa cattle. In 1968, 10 years after the declaration of breed status, individual animals varied in genetic background, carrying from 3 to 88 percent Red Sindhi inheritance, 0–69 percent Sahiwal, 0–63 percent TSZ, 0–59 percent Boran and 0–34 percent Ayrshire. From 1968 to 1971 some Mpwapwa females were mated to Friesian, Ayrshire and Jersey bulls to produce a crossline whose females were backcrossed to Mpwapwa bulls. The number of animals has never exceeded 1 000 and most of these have been kept on the station of origin and another government stations with very few individuals having ‘escaped’ into the real world. The Mpwapwa has never, in fact, been a ‘breed’ though its credentials are enhanced by its being recorded by FAO as ‘endangered’.

The Fipa subtype of Sanga cattle is the preferred animal in Rukwa Province, with 91.6 percent of household preferring this type above all others. It can be classified as a medium-sized strain with considerable variation in body size and morphological features within and between districts. Most farmers perceived body size (91.7 percent), conformation (85 percent), colour (85 percent), disease resistance (87.5 percent), heat/drought tolerance (82.5 percent), draught power (87.5 percent), better carcass (84.2 percent) and fertility (70.8 percent) as its most important attributes. Mating practice was random among the majority (95.8 percent) of farmsteads owing to the absence of breeding bulls for each individual farmstead (43.3 percent), and also owing to grazing on communal rangelands (52.5 percent). Selection of breeding bulls was rarely rationally done. The age at first calving was 50 months \pm 1.3 months; the calving interval was 15.5 months \pm 0.6 months; longevity for bulls was 10.78 years \pm 0.59, for cows 14.56 years \pm 0.50, and for castrates 15.48 years \pm 0.55 years.

Figure 5: Native Iringa Red cow with half-bred Afrikander calf (left) at the Tanganyika Territory Government Stock Farm at Puku, Dar es Salaam; and Mpwapwa cattle (right) at Mpwapwa Research Station, central Tanzania five years after declaration of their breed status



Source: DVSAH 1926

Source: Trevor Wilson, 1963

Efforts at breed modification continue with the promotion of the use (though little actual application) of ‘improved’ Boran bulls from NARCO and a very limited number of private commercial ranches. The iconic (for Tanzanians) Mpwapwa is also occasionally suggested as an improver breed but very few animals are available and they are not popular with traditional farmers.

Goats are almost all of the generalized Small East African type. A few exotic goats, mainly Toggenburg but also some Saanen, have been introduced by development projects. A main condition of introduction of these animals is total confinement and zero grazing, supposedly in response to environmental concerns. There is thus as yet little to no evidence of this genetic group in local goat populations. Sheep are of the widespread East African long-fat-tail type.

Failure to improve the output of local livestock either by within-breed improvement or through genetic modification — in Kenya widespread use of Sahiwal cattle and Dorper sheep has totally transformed the livestock landscape in the south of the country — will inevitably result in even further reduction in Tanzania’s ability to compete in the world’s red meat chain.

Herd and flock demography

According to a sample survey carried out by the author of this report in 1998 the cattle herd demography was 27.2 percent male and 47.2 percent female (29.4 percent of which were cows and 17.8 percent of which were heifers), with the remainder of the animals older than ‘calves’. If half of the 25.6 percent ‘calves’ were male, the percentage of males and females in the herd would be 40 to 60. Among older males, 9.5 percent of the total herd were bulls, 7.1 percent were oxen (i.e. draught animals) and 10.6 percent were steers or castrates. Assuming that half the heifers are ‘breeding’ females the imputed calving rate of 0.67 young per breeding cow per year (25.6 percent /29.4 percent + 8.9 percent x 100) is rather high. In this sample of herds, breeding females were equivalent to 40 percent of the herd, and work oxen and other ‘non-reproductive’ males to 19 percent of the herd.

The goat population is made up of about 30 percent males and 70 percent females. The sheep population has greater differentials, with fewer than 20 percent males and over 80 percent females (Table 7). This information supports the hypothesis that there is early offtake of males for slaughter or sale (as even in the class under 1 year old there are more females than males). It also favours the premise that goats are reproductively more efficient than sheep, as there are fewer mature females and more young in the goat than in the sheep flock.

Individual animal output

In addition to the production of meat (and milk and hides and skins), livestock have many important non-physical and even non-financial outputs including their functions as draught animals and providers of manure, repositories of wealth and media of exchange. Livestock also have roles in customs, religious traditions and as dowry payments.

Table 7: Demography (percent) of goat and sheep flocks in Mbeya Region

Species	Male		Female	
	1 year +	< 1 year	1 year +	< 1 year
Goat	9.97	20.06	46.97	23.01
Sheep	8.03	11.80	56.12	24.05

TSZ cattle grow slowly and in a classic gain-loss-gain pattern according to the rhythm of the seasons and the passage of the years. Males reach a maximum of 300 kg live weight (though 240—270 kg is the common range) at five years of age. Females average 160—180 kg, so the average mature mass of all adult cattle is 210—240 kg. Local cattle produce little milk and meat but they are well adapted to the environment and long periods of under-nutrition in the dry season. The Ankole type has longer legs than the TSZ and is physically bigger at about 300 kg live weight. They probably have better milk and meat production characteristics but may be less resistant to some local stress factors. In traditional management systems, there are high mortality rates (5—10 percent in young and adult stock; and as much as 25 percent in calves), coupled with an annual calving rate of less than 50 percent potential. These factors limit herd growth and — more importantly — commercial offtake. The weights at which TSZ cattle are slaughtered can be imputed from those of 61 829 cattle trekked from northern Tanzania for slaughter at Athi River in Kenya in 1942 (Tanzania cattle were being exported to Kenya at least 70 years ago!): these averaged 215 kg, with a range of 205—220 kg depending on the district from which they had originated. Some 20 years later, 66 977 cattle slaughtered at the TPL export abattoir in Dar es Salaam averaged 237 kg live weight, and 22 476 slaughtered at Arusha weighed 250 kg. Dressing percentages are generally about 46 to 47 percent in carcasses of 100—110kg; a few better-fed animals can give a carcass yield of 50 percent.

Mature weights of male goats are in the range 28—35 kg and those of females range from 25 kg to 30 kg. These animals are good scavengers. They are also somewhat prolific breeders and produce enough milk for the twins (to which they often give birth) to grow at a reasonable rate and be ready for slaughter at 8—12 months of age. Local goats are tolerant of the harsh conditions and of some diseases and obtain their nutrients from a variety of grasses, herbs and shrubs. Most goats slaughtered for meat are young males that dress out at 43—45 percent and produce a carcass of 10—12 kg.

The fat-tailed sheep is stoutly built with a good spring of rib. In addition to the fat tail, when they are in good condition, there is a band of fat on the poll and fat pads on the sides of the muzzle. Local sheep are not as hardy as goats nor as prolific, and single births are the rule. Resistance to helminth parasites may be present in some types of sheep. Mature live weights are heavier than those of goats but growth rates are slow and carcass quality is not very good. Most males that are surplus to breeding needs are slaughtered before one year of age and with a dressing percentage of 40–45 percent provide a carcass of 10–12 kg.

Red meat output

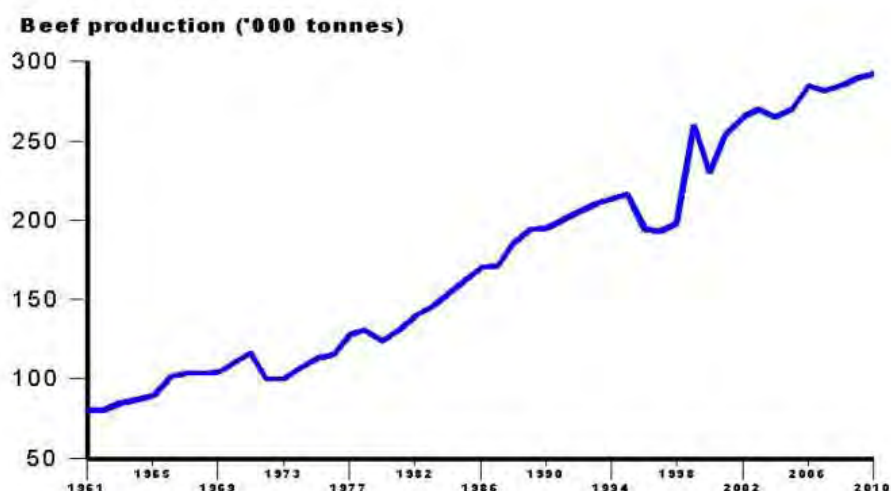
According to FAO's time series data, the cattle population of Tanzania increased over the 50-year period from 1961 to 2010 from 8.064 million to 19.246 million, or by a factor of 2.4. This is equivalent to a long-term annual growth rate of 1.75 percent per year. In the same period the number of animals slaughtered rose from 0.810 million to 2.700 million (Figure 6), or by a factor of 3.3 thus implying a higher annual percentage offtake rate, up from 10.04 percent in 1961 to 14.03 percent in 2010. Estimated meat production in 1961 was 80 000 tonnes implying a carcass weight of 98.7 kg, whereas in 2009 the meat production of 292 600 tonnes from 2 700 000 slaughtered animals implies a carcass weight of 108 kg.

Goat numbers are estimated to have increased from 4.452 million in 1961 to 12.9 million in 2010 — the equivalent of almost 3-fold with an annual growth rate of 2.15 percent over the 50-year period. The 1.027 million goats slaughtered in 1961, representing 23 percent offtake, produced 12 324 tonnes of meat thus implying a carcass weight of 12.9 kg. By 2010 the number of goats slaughtered had risen to 2.710 million, which resulted in 32 520 tonnes of meat at an implied carcass weight of 12 kg. The offtake rate of goats appears to have dropped to 21 percent in 2010, down from 23 percent in 1961.

The number of sheep in Tanzania was estimated at 2.986 million in 1961 with this figure having risen to 4.2 million in 2010, a factor of 1.4. Sheep thus have the lowest annual average rate of increase (in numbers of 0.68) of all three species of livestock that yield red meat. The 0.589 million sheep slaughtered in 1961 yielded 7 072 tonnes of meat implying an average carcass weight of 12 kg. Some 12 096 tonnes of meat were obtained from the 1.008 million sheep slaughtered in 2010 giving an estimated carcass weight of 12.0 kg. The calculated offtake rate for sheep in 1961 was 19.7 percent; this is supposed to have risen to 24 percent by 2010⁵.

⁵ FAO statistical data suffer from several interpretational problems but have the merit, at least, of being consistent and derived from a proven algorithm that takes account climatic conditions, disease status, security and other relevant factors. The absence of data from within Tanzania is underlined by the fact that for the whole 50-year series, the data provided are FAO estimates (for most countries some annual data derive from national data). The implied offtake of 14 percent for 2010 would appear to be optimistic in view of the situation on the ground.

Figure 6: Trends in annual beef production in Tanzania, 1961—2010



Profits from production

The control, prevention and cure of animal diseases is a major constraint to livestock profitability and growth, as well as possibly the single most important public policy element towards the subsector. The high level of reported disease could be linked to the low levels of vaccination. Poor nutrition is another major constraint to improved output that is perhaps coequal with health. These and other constraints need to be overcome if livestock production is to be financially and economically viable, and yield adequate returns to the land, labour and capital that is employed in its production. Whilst it will take time to improve the output of the red meat chain as a whole there are possibilities of improving parts of it.

In 2012, few feedlots or fattening farms were in operation. Despite this, significant growth and investment opportunities exist (especially to provide meat for the high quality end of the market and so compete with — and eventually replace — the 700 tonnes of quality meat that is imported annually). This is equivalent to the production of 10 000—14 000 animals. There are also substantial opportunities to increase the amount of beef but especially goat and sheep meat that is exported each year: meat exports from the two smaller species were estimated at 6 171 tonnes in 2011. The operation of a feedlot, ideally as part of an integrated ranching, feed production and feedlot process, would benefit from the whole value chain and better management of throughput and margins.

The assumptions for an operation that buys in cattle, however, are:

- capacity to fatten 5000 head per year;
- 415 cattle aged 2 to 4 years with an average live weight of 305 kg are bought per month;
- incoming animals are quarantined for 14—21 days, then fed for 90—120 days with an average gain of 0.6—1.0 kg per day;
- animals are sold at 350—450 kg for TSh 2200 /kg live weight or TSh 800 000—1 000 000 per head;
- mortality rate of 1 percent and 0.5 percent condemned at slaughter; and
- operating at 80 percent capacity by Year 3.

With these assumptions a gross margin of 14.3 percent would be achieved in Year 3: that would yield a substantial profit after amortizing capital costs (Table 8).

Table 8: Investment costs and projected returns (Year 3) for 5 000 head/year feedlot operation

Investment		Operating (Year 3)	
Item	Amount (US \$)	Item	Amount (US \$)
Capital works	950 000	Revenue	2 100 000
Initial cattle	750 000	Operating	1 800 000
Working capital	25 000	Gross margin (dollars)	300 000
Total	1 950 000	Gross margin (percent)	14.3

In spite of the conventional wisdom that traditional livestock production is not a highly lucrative business there are considerable margins to be made for a range of outputs. This is because the usual major input cost — the base feed supply that is free range grazing — is ‘free’ to the user (although it comes at a severe cost to the wider community and to the environment). Gross margins for a producer of 5-year old cattle can be as high as 75 percent, for 3-year old cattle in the region of 66 percent and for goats about 75 percent (see Table 9).

3.5 Processing

The incredible journey—from farmgate to consumer plate

Processing may be considered to start at the moment an animal leaves its point of production, either to be sold by the owner to an agent, or to begin the journey to market. From this point there are many pathways an animal can follow before ending up as meat (Figure 7).

Figure 7: Some examples of pathways followed from point of production to final consumption

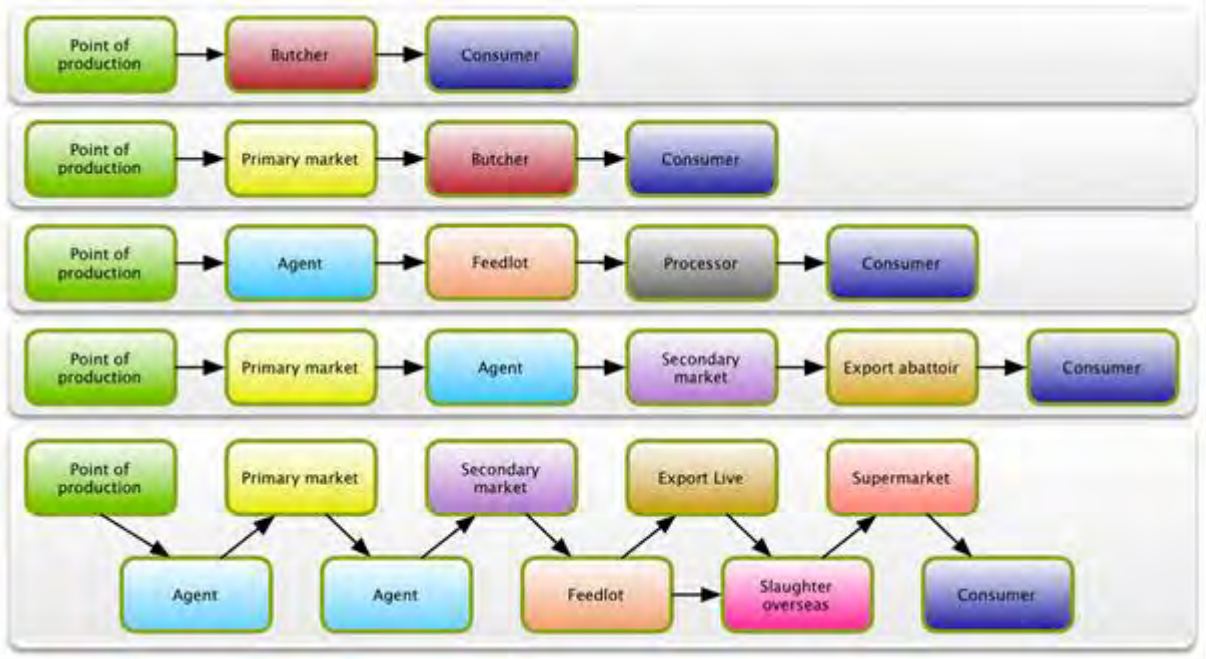


Table 9: Gross margin analyses⁶ for primary livestock production for 5-year old and 3-year old cattle, and for goats

Item	Activity		
	Cattle production (5 years, 300 Kg l.w.) (TSh)	Cattle production (3 years, 200 Kg l.w.) (TSh)	Goat production (TSh)
Costs			
Labour	20 000	12 000	4 000
Drugs/vaccination	50 000	30 000	3 500
Dipping	6 000	3 600	0
Trekking	20 000	12 000	2 000
Other	5 000	3 000	500
Total variable costs	101 000	60 600	10 000
Revenue	400 000	300 000	40 000
Gross margin	299 000	233 400	30 000

Source: corrected from ERB, 2009

Marketing

Livestock marketing infrastructure is, in some ways, relatively well developed. Animals are delivered to 300 or so primary markets (by their owners or small-scale agents), almost always trekking on the hoof⁷. From here they may go straight to a local butchery. Alternatively, they may be bought by other traders for further fattening, or to create lots of various sizes for moving onto secondary markets.

Around ten secondary markets are strategically located about the country, primarily in the main northern producing areas, and at Pugu on the outskirts of Dar es Salaam. The law states that cattle must be delivered to secondary markets by road (or rail). Indeed, although most cattle are delivered in this way, because road transport is perceived to be more expensive than trekking, many have been loaded only a few kilometres away from the market in order to satisfy these regulations. Many types of buyers encounter livestock at their secondary markets, including: private individuals, local and urban butchers, wholesalers, feedlot operators, large abattoirs, processors/manufacturers and exporters. Some nominal grading (visual and tactile) is carried out at secondary markets though results are not made use of along the chain.

Trade across borders — and particularly across the Kenyan/Tanzanian border — is substantial but generally not recorded. In an effort to retain at least some of the benefits and revenues from this trade, so-called ‘border markets’ are located at Loliondo and Longido in Arusha Region, at Mwanza in Mwanza Region and at Horohoro in Tanga Region. These markets do not operate as intended since there is no incentive (indeed only disincentives) for Kenya traders to operate there. Thus, the technically illegal and unrecorded movement of animals from Tanzania to Kenya continues.

Legally, animals can only move through the market chain after veterinary inspection, a health check and the issue of a movement permit (in some circumstances they also need a vaccination certificate). A number of veterinary checkpoints located at regional boundaries and at some natural barriers (such as bridges across major rivers) may make further inspections, issue permits or impound animals that are in breach of the regulations. Internal checks are not, however, necessarily more

⁶ Other gross margin calculations are possible: see the examples in Peham 2012 (listed in ‘Documents Consulted’).

⁷ There appears to be a certain fluidity about the overall number of markets and in some cases their level of classification: conflicting figures are provided even within MLFD.

effective than national boundary checks, and many animals arrive at markets after one or more ‘facilitation fees’ have smoothed the path of progress.

Trading, in the sense of a professional middleman buying and selling live animals at some point along the chain, is an important and — in the Tanzanian context — indispensable link in getting stock from the producer to the plate. Such traders are often accused of making excessive margins at the expense of other links but an analysis carried out in Manyara (see Table 10) shows that this is not in fact the case. The risks borne by traders are, of course, much less than those borne by owners at other points of the chain. (For example, many more animals die during rearing by their primary producer, and butchers lose profits if the carcass is condemned at slaughter).

The market chain is subject to onerous regulation at many points. Much regulation is not very productive, is not enforced or is even unenforceable. The regulation governing delivery to secondary markets is a case in point. Although trekking is ‘cheaper’ for traders, no account is taken of the weight lost during travel or the environmental cost of trekking, or indeed of losses further along the chain (for example, when weight loss has to be recovered in a feedlot or results in lower dressing percentages). Another requirement that is not implemented is the sale of animals by auction (*‘mnaada’*) at secondary markets. The authorities have tried to enforce this at times and have installed weighbridges (usually now broken and half buried in dust, see Figure 8). Neither sellers nor buyers support the sale of animals on a weight basis, preferring to continue with the tried and tested method of face-to-face bargaining for the animal itself (Figure 8).

Table 10: Gross margin analyses for cattle and goats traded from primary to secondary markets

Item	Activity	
	Cattle trading (TSh)	Goat trading (TSh)
Costs		
Purchase at primary market	400 000	40 000
Trekking	2 000	1 000
Feed	2 000	0
Health inspection	750	750
Movement permit	1 000	1 000
Final short transport	2 000	0
Total variable costs	407 750	42 750
Revenue		
Sale at secondary market	460 000	52 000
Gross margin	52 250	9 250

Source: corrected from ERB, 2009

Slaughtering

There are an estimated 1 000 slaughter slabs in the country with nominal daily throughputs of 1-10 cattle. Slaughter slabs are usually just a concrete platform but may have a simple roof. Rarely are there gantries or lifting aids, and killing and dressing are done on the floor. Even so, most slabs are in inappropriate locations (e.g. alongside a watercourse into which inedible offal and trash can be conveniently dumped, see Figure 9), or cracked beyond repair or overgrown by invading bush. True formal slaughter facilities in rural areas are, in fact, limited. Uncontrolled and unsupervised backyard slaughtering is therefore widespread (and can indeed be considered the norm for goats and sheep) and carries with it all the attendant health hazards.

Figure 8: A broken and unused weighbridge and face-to-face bargaining for sale of goats at Pugu secondary market, 2012



Figure 9: Dilapidated slaughter slab in the Usangu Plains, ideally situated to dispose of waste in the watercourse, 1998



About 75 slaughterhouses with nominal daily capacities of 10 to 50 cattle are to be found in municipalities and other urban areas. (N.B. as indicated in Box 1, ‘capacity’ in urban slaughterhouses is usually greatly exceeded as they struggle to keep up with the demand from rapid and uncontrolled urbanization.) Most urban slaughterhouses are very old, have dilapidated infrastructure, inoperative equipment, as well as unsanitary and unsafe by-products and waste disposal facilities. Dar es Salaam, at the end of the southern corridor, is a special case as several private slaughterhouses have been licensed to supply the city with meat (Box 5). Fees for slaughtering vary from as little as TSh 2 000 to over TSh 20 000.

In addition to the previous categories there is an uncertain number (generally put at five) of ‘abattoirs’ that are supposedly better organized than the other slaughterers and whose product is aimed at meat traders as well as niche and upper end consumer markets. In the past these abattoirs have been operational, non-operational, in receivership, being restructured, being constructed, searching for additional (public or private) financing or in the planning stage. None is publicly owned (though the public sector has shares in some) whereas others are entirely private. Unlike the slaughterhouses most of these facilities operate well under capacity and sometimes intermittently.

The only 'abattoir' in the Southern Highlands is the one built and operated by the Sumbawanga Agricultural and Food Industries Ltd (a private company). The Tanzania Meat Company Limited operates an abattoir in Dodoma; this is a public-private partnership with 51 percent owned by the Tanzania Investment Corporation and 49 percent by NARCO: this abattoir draws some of its input animals from the Southern Highlands. The Municipal Council owns Arusha Meat Company. Tanzania Pride Meat Company (TPC) is privately owned by Derlyn Investments Ltd and is an early attempt in Tanzania at vertical integration of the red meat chain. TPC opened a ranch (Glenshiels) near Morogoro in 2004, built a feedlot (Mtibwa), a hatchery and poultry rearing unit, a state-of-the-art abattoir and meat (including poultry) processing plant. It later added a feed mill and sausage making equipment. Fewer than six years after its incorporation the company entered receivership with total debts of US\$ 6.762 million.

In addition to the abattoirs listed previously, a further subdivision of such operations acts on a smaller scale (and has similar ambitions to supply a higher end or niche market). As for the larger enterprises, operational status fluctuates depending on the supply of suitable animals and the demand for the product. In a manner similar to the larger abattoirs, the ownership pattern of the smaller ones is of different types. Two of these operations are in the public sector and are owned and managed in-house by NARCO. (The first is Ruvu; the second is Kongwa — of the famous 'Kongwa Beef' — which now only slaughters a few cattle a week, with that meat mostly being despatched to Dodoma). Others are privately owned and may possibly be an addendum to a farming or ranching operation, or the situation may be reversed with the abattoir being the driver for the live animal production operation (Table 11).

Table 11: The main 'abattoirs' in Tanzania showing locations, capacities, target markets and status

Company/Operator	Location	Installed capacity (single shift/day)	Target market	Status (October 2012)
Large-scale operations				
Tanzania Meat Company	Dodoma Municipality	200 cattle 200 goats + sheep		
SAAFI	Sumbawanga Mun	150 cattle	Export + upper end local (mines)	Operational (but below capacity)
Arusha Meat Company	Sakwina, Arusha	300 cattle 400 goats + sheep	Wholesalers, upper end local market	Operational
Tanzania Pride Meat Company	Mvomero, Morogoro	200 cattle	??	In receivership
NARCO (+ Private)	Ruvu Ranch (NARCO)	800 cattle 400 goats + sheep	??	Partly constructed, additional funding being sought
Manyara Ranch	Monduli, Arusha	50 cattle 100 goats + sheep		Being constructed
Ilarmarak	Simanjiro, Manyara	40 cattle 40 goats + sheep		Planning stage
Smaller scale operations				
Malala Farm	Morogoro			Operational
Kisolama Farm (Selous Farming)	Iringa			Operational
NARCO Kongwa	Kongwa	10 cattle	Dodoma	Operational
NARCO Ruvu	Ruvu		Dar es Salaam	Operational

Source: adapted from ERB, 2009, and consultant's enquiries

Box 5: Let them go down to the slaughter! Private slaughterhouses in Dar es Salaam



Supplying Dar es Salaam's 4 million people with meat is a Herculean task. Most demand is for '*nyama kawaida*' (meat with bone) and quality is of little importance. To meet the demand the Municipality has licensed private slaughterhouses and these also have to be approved by the TFDA. Most of these establishments are in the suburbs but are located in high-density housing areas with which they are in close, even intimate, contact.

The technical skills of the workforce are not at a premium (although slaughterers and other workers have to be certified by the Ministry of Health) and the manager of one place visited was a 17-year old boy, the younger brother of the owner. A concrete block wall surrounds the property and there are minimal facilities inside. Cattle, the property of several owners for a day's kill, are delivered by lorry (goats and sheep arrive on foot) and unloaded into a corner area demarcated by old railway line posts, with metal or wooden rails tied on by coconut fibre rope: this '*boma*' is provided with an (empty) water trough. The owner is charged a slaughter fee of TSh 5 500, of which TSh 2 500 is paid to the meat inspector: the remaining TSh 3 000 is used by the manager to pay electricity, water, municipal taxes, registration costs, workers' wages, removal of waste, other sundries — what is left is profit!

In the dark of night, after ante-mortem inspection by a vet, animals are herded onto the killing floor — the crush through which they should be channelled has been reduced to two or three uprights — and after a sterling rodeo performance by several stalwart slaughterers the beast is wrestled to the ground and trussed with ropes. A slice (or more likely two or three) across the throat opening the jugular brings blessed relief to the animal (it needs to be noted that under the Animal Welfare Act, killing without stunning is allowed on religious grounds but cruelty is not. The impact of such cruelty on the adrenalin flow and the subsequent quality of the meat can well be imagined).

The carcass, after flaying, is examined by a certified meat inspector or vet, and meat and offals not considered fit for human consumption are dumped in a concrete tank, along with the animals condemned before slaughter as unfit, and covered with chemicals. The carcass is hacked to pieces before despatch to retail shops in the city. In the meantime, the blood, along with other waste, is channelled into a second concrete receptacle, the stomach contents are heaped up close by to await a buyer to take them away as fertilizer; the heads and feet are sold as separate items by the initial owner of the animals. Wet hides are collected by a commercial buyer and taken away for initial salting. The day finishes with the washing down of this abhorrent place.

Added value processing

The market for 'value added' and processed products such as sausages and salted beef ('bacon') makes up only a very small fraction of Tanzania's overall demand for red meat. Supermarkets, some specialist urban butchers, hotels and other food service areas (including mines and institutions) are the key outlets for processed products in the country. Imports of choice cuts and of value added products reached 700 tonnes in 2010⁸. The market is growing quite rapidly and is expected to grow

⁸ It is not clear whether this figure includes corned beef and other tinned products

further in the future as the target audience expands to include wealthier urban dwellers and an emerging middle class. Most imports are from Kenya but others arrive from as far away as Europe or New Zealand.

In response to demand there already exists a small processing industry in Tanzania owned almost entirely by the private sector (Table 12). The range of products that is manufactured is generally small as is the production capacity. Some manufacturers specialize in supplying a niche market within the overall niche market. Thus, for example, the Meat King Company in Arusha has the “the best Biltong and Boerewors in East Africa as stated by our customers” with these products being aimed especially at the South African community and South African tourists. A butchery and small manufacturer (similar to Meat King) that operates in Dar es Salaam is The Butcher Shop which buys meat from the Arusha abattoir as well as imports from Kenya and produces a range of high quality processed products from beef and mutton. Lamb Meat from Loibersoit is, as its name implies, a specialist supplier of meat from Dorper sheep that are grass-fed in the Southern Highlands. Other niche market suppliers (to complement the red meat chain) include those dealing in extra-large organic chickens, free-range rabbit meat and products, and pork products. Most of these are based in Dar es Salaam although there are nascent specialist businesses developing in other parts of the country (Figure 10). The processing industry can be expected to grow in the future.

Table 12: Manufacturers and retailers of ‘value added’ meat and meat products in Tanzania

Company	Location	Daily processing capacity (Kg)	Products	Target market	Status
Meat King Company	Arusha	238	Biltong, boerewors	Niche (South African community)	Operational
The Butcher Shop	Dar es Salaam	??	Biltong, sausages, barbeque items, choice cuts	Niche market (upper end Dar es Salaam)	Operational
Happy Sausages Ltd	Arusha	1 130	Sausages	Niche market	Operational
Tanzania Meat Products	Dar es Salaam			Retail trade	
Shoprite	Dar es Salaam (3), Arusha (1)			Retail trade	
Franconia	Dar es Salaam			Retail trade	
Bright Choice	Dar es Salaam		Imports from parent company in Nairobi	Retail, hotel	

Source: compiled by the consultant

Figure 10: A specialist one-man butchery in Morogoro supplying bespoke products to a niche market, September 2012



Hind view

The processing part of the red meat value chain is beset with problems, some cascading down from 'above' (in terms of laws, regulations, unwarranted and unproductive interference), some seeping up from 'below' (in terms of lack of organization, poor facilities, a non-discriminating customer base).

The main issues in terms of processing are:

- long and complicated market chains;
- lack of real competition among animal buyers;
- uncontrolled (often illegal) slaughter, especially of goats and sheep;
- slaughter facilities possibly numerically adequate but technically inadequate or too costly (in such cases, traders and butchers usually opt for lower cost or informal options);
- complicated and conflicting regulations that are not usually enforced;
- notional grading of live animals at secondary markets with no classification or grading system for carcasses;
- food safety mostly confirmed only through visual observation by a meat inspector and which often goes through 'on the nod';
- lack of facilities (or unused facilities) to examine bacteriological contamination and other food safety issues;
- untrained and unskilled staff throughout the links;
- lack of (or inadequate) equipment and tools throughout the links;
- 'abattoirs' have difficulty with markets and operate below capacity;
- potentially valuable by-products (blood, stomach contents, glands, etcetera) are not fully valorized and pose environmental hazards;

- little interest from the majority of domestic customers in quality or value added products;
- the range of products from the intermediate links in processing are limited in quality and quantity;
- further processing of diversified meat products is very limited in quantity and aimed only at a small market segment;
- not enough attention is paid to the treatment of hides and skins at slaughter to produce good quality leather;
- local horizons with regard to 'quality' considerations are probably lower than international ones; and
- a generalized laissez faire attitude at all levels of the chain from law makers to primary producers.

3.6 Wholesale and retail distribution

There is very little wholesale trade. Individual butchers control most of the retail trade and outside the main centres meat is sold from small outlets usually staffed by a single person. This operator may or may not be the owner. In the rural areas, as well as many smaller towns and villages, most premises (whose use has to be sanctioned by a plethora of authorities and regulations) are rudimentary, open to the air and flies, and constitute a real and present danger to human health and food safety (Figure 11). It is quite impossible to provide even an indication of the number of such establishments anywhere in the country. In Morogoro, for example, some 50 retail butchers are registered with the Municipality but one development organization has identified more than three times this number (and mapped them using the Global Positioning System). The products sold out of these establishments are usually limited to hot cuts of meat with bones or occasional meat only in response to individual requests; there is hardly any other differentiation into other products. As indicated in the earlier Section 3.5.4 (Value added), there are a small number of retail outlets selling to the expatriate community and higher income groups and which also serve (to some extent) the more exclusive restaurants and hotels in Dar es Salaam and Arusha as well as the safari camps.

Figure 11: Licensed retail butcheries, typical of those found in large villages and suburban areas



A small amount of frozen meat is sold in some of the lower end retail outlets but the freezing is mainly done in domestic chest freezers that are primarily employed to store meat not sold on the day of slaughter. Consumer preference is, however, for fresh hot meat; most outlets sell meat that is slashed or chopped direct from the hot carcass and limit their daily turnover to stocks that will sell on the day. Offal sells well on the local market. Stomach and intestines meet strong demand. Liver is the most prized of all carcass parts and commands the highest price per unit weight. The remainder of the fifth quarter — as in more sophisticated markets — adds to the value of the slaughtered animal as the head and feet are sold separately, often to specialist buyers who then have a lucrative business selling '*supu*'. The hide or skin constitutes a further source of income but, even after many years of intervention by the public services and international organizations, little attention is paid to flaying or the early stages of curing and much potential future value is lost at this stage. Blood and other fluids as well as stomach contents are regarded as waste but are rarely disposed of with any concern for the ambient environment.

Retail price controls were introduced in the 1970s, but in current day Tanzania — as with so many other controls, rules and regulations — they are only nominally in force. The promulgated prices seem to be considered 'the minimum price' by butchers; at the bottom end of the market, actual prices can be 50 percent (or more) higher. In general, however, it seems that meat (as well as livestock) prices have moved in line with inflation and have risen steeply — one might say almost exponentially — over the years. The existence of a highly-nucleated small butcher sector limits prices to some extent — although the lower-end retail butchery business seems to be reasonably profitable (Table 13) — and most attempts to manipulate the price are by larger retailers selling in the same market segment.

Prices are lowest in remote rural areas, and rise through the gamut of outlets as human population densities increase in urban areas. Similarly prices increase along the links from 'pure' butchers, through the economy type supermarkets, then to middle class supermarkets and finally to the elite butchers that provide services to the more discerning clientele (see Box 6). The street vendors and '*nyama choma*' sellers found everywhere from rural roads and main trunk routes to the centres of cities represent outliers in the price structure. It is extremely complicated to evaluate the real price of the meat element in this package since the meat is of the lowest quality, sold as unweighed beef or goat meat, combining that with the service element of cooking and offered as a 'take-away' item, with the addition of chips or even vegetables.

Table 13: Gross margin analyses of low-end retail butcher operations

Item	Activity	
	Cattle (TSh)	Goat (TSh)
Costs		
Ox/bull (300 Kg l.w.)	400 000	40 000
Cess	1 500	1 500
Slaughter fee	5 000	2 000
Meat inspection	2 000	2 500
Water	2 000	1 000
Rent	2 500	2 500
Total variable costs	413 000	49 500
Revenue		
Carcass (beef 150 Kg @ TSh 3 500/Kg), goat whole	525 000	52 000
Offals and feet	7 000	1 000
Head	6 000	2 000
Hide/skin	4 000	800
Total revenue	542 000	66 800
Gross margin	129 000	17 300

Source: corrected from ERB, 2009

3.7 Target group considerations

In a recent analysis of global food security, Tanzania was placed 99th out of 105 countries assessed, with two of the six countries below it being contiguous (Burundi, Democratic Republic of Congo) and two near neighbours (Ethiopia, Chad). FAO data indicates that 18 million Tanzanians were undernourished in 2012 (or 38.8 percent of the population), from 8 million (or 29.4 percent) in 1992. Market access among rural households is limited. Only 10 percent of farm specialized rural households are market oriented (i.e. sell more than 50 percent of their output) and of all rural households just 37 percent of total agricultural production is marketed (29 percent being crop sales and 8 percent originating from livestock). Even though the share of livestock in total agricultural sales is less than that of crops, livestock is a relatively more market-oriented activity as approximately half of all livestock production is sold. As a result, whereas the value of livestock sales contributes only 7 percent to total agricultural production, it contributes 25 percent of total agricultural sales and is thus an important source of cash income.

Alongside differences in wealth the livestock sector is notably divided across gender lines. Some 65 percent of male-headed households participate in livestock activities whereas only 51 percent of female-headed households do so. When herd structures are compared by the gender of the household head (a very imperfect indicator of gender control over assets) there are significant differences in both herd size and composition. Female-headed households own herds that are on average about two-thirds of the size of those owned by male-headed households. The difference is most marked in cattle ownership but is smaller for goats and sheep (and even further for poultry).

Female-headed households thus tend to have relatively more small animals than large ones. Women managing livestock earn less from them, manage considerably lower numbers of the main quadruped species, and are significantly less likely to use key inputs such as labour, fodder and vaccinations. The very different rates of inputs and services do not indicate discrimination in access *per se* as they may equally be driven by differences in herd structure (women being less likely to own cattle which cost more and are more input-intensive.) Despite these differences the share of

households with only female livestock managers is not completely disadvantaged in terms of market access (40 percent sell livestock). When considering the scale of production, female managers are significantly more commercially oriented, with 37 percent of their total livestock production being sold on the market (compared with only 30 percent sold by male managers). This highlights the fact that despite the obstacles faced by women in the livestock sector commercialization of production may not necessarily be affected.

Box 6: Poor men seek meat for their stomach, rich men stomach for their meat - the retail meat trade



Nyama choma, pata chipsi: Street vendors on the Sumbawanga Road
 One piece of roasted meat of around 150 g = TSh 2000
 (This may possibly be the most expensive meat in the country on a weight basis, and certainly the most profitable: it requires no movement permit, no cess, no slaughter fee, no inspection fee, and no medical examination for 'staff'!)



Nyama kawaida na utumbo: Village butcher in rural area
 Meat with bones = TSh 4000/kg
 Steki = TSh 5000/kg
 Mami = TSh 6000/kg
 Utumbo = TSh 3000/kg



Nyama ta mu: Suburban butcher near Dar es Salaam
 Meat with bones = TSh 6000/kg
 Steki = TSh 7000/kg
 Mami = TSh 7000/kg
 (Note refrigerator and upright freezer chest)



The super brand — 'Kongwa Beef' (but no longer from the mother ranch)
 Meat = TSh 6 000/kg lungs — TSh 5 000; pet food = TSh 2 500/kg
 Fillet/sirloin TSh 7 000 to 8 000/kg head; Goat meat 6 000/kg
 Liver (maini) = TSh 3 000/kg; stomach TSh 2 700
 Heart/tail = TSh 5 000/kg; beef fat = TSh 2 000/kg



The higher end: a quality supermarket in Dar es Salaam
 Mutton = TSh 11 500/kg
 Beef mince = TSh 11 000/kg
 Beef (other) = TSh 11 000/kg
 Steak = TSh 12 000/kg
 Fillet = TSh 15 000/kg
 Soup bones TSh 3 000/kg



The tops — butcher/processor in Dar es Salaam
 Ox liver = TSh 8 000/kg; lamb kidney = TSh 10 000/kg
 Beef tongue = TSh 12 000 kg; lamb rolled rib = TSh 22 500/kg
 Beef oxtail = TSh 14 500/kg; lamb shank = TSh 35 600/kg
 Beef T-bone = TSh 22 500/kg; Vrystater boerewors = TSh 17 000/kg
 Kenya rump = TSh 27 500/kg; lamb sausage = TSh 33 200/kg
 Beef sirloin = TSh 31500/kg; beef biltong = TSh 45000/kg

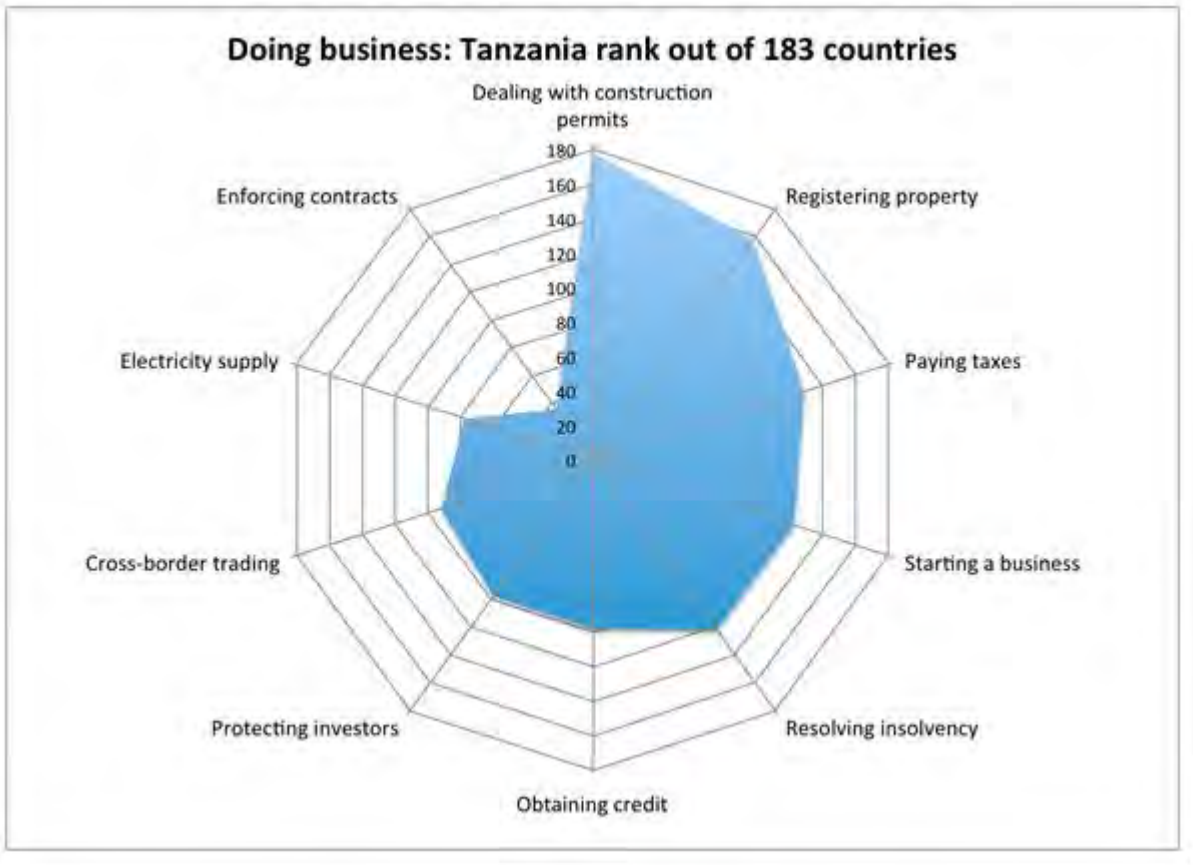
4. SYSTEMIC CONSTRAINTS AND UPGRADING OPPORTUNITIES

4.1 The Business Enabling Environment

Doing business

According to the World Bank, in 2012 Tanzania ranked 127 out of 183 countries in doing business, with the regional average being 137. Concurrently, the World Economic Forum found Tanzania to be one of 37 ‘factor-driven economies’ and ranked it 120 (down from 113 the previous year) out of 142 countries. It cited the major reasons for this lowly position, in order of priority, as: access to finance, corruption, tax rates, inadequate infrastructure, inflation and inefficient government bureaucracy. These facts do not bode well for encouraging external or internal investment in new or expanding businesses, and it remains to be seen whether, under existing (and probable future) conditions, the necessary investments will be made to take the chain to the next level.

Figure 12: Doing business in Tanzania



Source: adapted from World Bank data, 2012

Legislation and regulations

Tanzania is widely regarded as a country with a heavy regulatory burden that is only lightly implemented. Traders in live animals or in meat, for both internal and external markets, are subject to an onerous regime of form-filling and permissions (see Box 7). Multiple — and often conflicting — legal instruments under the jurisdiction of multiple ministries and other official bodies impinge upon the livestock sector. Several new pieces of legislation have been enacted since 2003 (see Table 14).

Table 14: Principle recent legal instruments that may affect red meat production

Legislation	Main provisions
Act No 16 of 2003: An Act to provide for the registration of veterinarians, or the enlistment of Paraprofessional and Paraprofessional Assistants, and for the establishment of the Veterinary Council and other matters incidental and connected thereto. ('The Veterinary Act')	Establishment of the Council Registration of veterinarians and veterinary specialists Enrolment of paraprofessionals and enlistment of paraprofessional assistants Registration of veterinary practice facilities General principles of veterinary practice and management of complaints
Act No 10 of 2006: An Act to make provisions for the restructuring of the meat industry, to establish a proper basis for its efficient management, to ensure provision of high quality meat products and for matters related therewith ('The Meat Industry Act')	Establishment of the Annual Council Establishment of the Tanzania Meat Board Provisions relating to registration Financial provisions Offences and penalties
Act No 13 of 2010: An Act to provide for the management and control of grazing-lands, animal feed resources and trade and to provide for other related matters ('Grazing Land and Animal Feed Resources Act')	Administration provisions Grazing land development and management Control, manufacture and composition of animal feed resources Container, packaging and labelling of animal feed resources Protection of grazing land General restrictions of forage seeds
Act No 17 of 2003: An Act to make provisions for control and prevention of animal diseases for monitoring production of animal products, for disposal of animal carcasses and for other related matters ('Animal Diseases Act')	Appointments and administration Measures for checking livestock diseases Measures for checking diseases of animals other than livestock Powers of inspectors Compensation Compulsory animal disease prevention measures General provisions on control of animal diseases Miscellaneous provisions
Act No 12 of 2010: An Act to provide for the establishment of the National Livestock Identification, Registration and Traceability System for purposes of controlling animal diseases and livestock theft and enhancing food safety assurance; to regulate movement of livestock, improve livestock products and production of animal genetic resources; to promote access to market and to provide for other related matters ('The Livestock Identification, Registration and Traceability Act')	National livestock identification, registration and traceability system Livestock registration and recording system Livestock traceability (Not enforced during the first three years of the Act coming into operation)
Act No 19 of 2008: An act to provide for the humane treatment of animals, establishment of the Animal Welfare Advisory Council, monitoring and mitigation of animal abuses, promoting awareness on the importance of animal welfare and to provide for other related matters ('Animal Welfare Act')	Establishment of Animal Welfare Advisory Council Keeping of animals (farm animals, companion animals, transport, care of injured animals, slaughter) Use for work and entertainment Surgical operations, biotechnology and experiments Control of aggressive animals and animal pound
Act No 18 of 2008: An Act to develop and regulate the production and preservation of hides, skins and leather and to promote trade in hides, skins and leather and to provide for related matters ('Hides, Skins and Leather Trade Act')	Establishment of Advisory Committees Registration of premises Licensing provisions Appointment of Inspectors

In addition to those listed in Table 14, other acts or regulations include (but are not limited to):

- The Food, Drugs and Cosmetics Act No 1 of 2003 (establishes the Tanzania Food and Drugs Authority or TFDA);
- The Tanzania Bureau of Standard's Code No TZS 109:1987;
- The Tanzania Bureau of Standard's Code No TZS 128: 1981(E) Meat and meat products;
- The Meat Slaughter Regulations;
- The Meat Hygiene Regulations of 1993;
- The Guidelines for Slaughter Facilities as provided by Tanzania Food and Drugs Authority (2007);
- The Meat Transport Regulations;
- Food Hygiene Regulations;
- Food Labelling Regulations;
- Food Import and Export Regulations.

Box 7: The sound and the fury — over regulation and under enforcement of livestock trade activities

The following permits and licenses are required for the following red meat trading activities:

Live animals

- Free Tax Identification Number (TIN) from the Tanzania Revenue Authority (TRA) to allow for taxation;
- Business licence from the Ministry of Industry and Trade's Business Registration Agency (BELA) (after obtaining income tax payment licence from TRA);
- Movement permit for each lot of animals traded from livestock markets issued by MLFD (after payment of market and movement permit fees).

Meat and meat products processing

- Business licence from BELA (after obtaining income tax payment licence from TRA);
- Premise inspection certificate from Tanzania Food and Drugs Authority (TFDA) for slaughterhouses, abattoirs, butchers, meat sale points and meat and meat product processing plants/areas;
- Attendant health check certificate for all operators and labourers.

Animal and/or meat and meat products export

- Free TIN from TRA for all businesses to allow for taxation;
- Business/export licence from BELA (after income tax payment to TRA);
- Export veterinary health certificate for each lot (issued by MLFD);
- Import permit (issued by the relevant authority in importing country).

Land rights and land markets

Land tenure in Tanzania is in the form of a right of occupancy and leasehold. There is no freehold system. The primary legislation governing land ownership is the Land Act No 4 of 1999 as well as the Village Act No 5 of 1999. Under the Land Act, there are several categories of land but the most relevant is general land. This is the land for which a right of occupancy or leasehold may be granted by the Commissioner for Lands (upon application and fulfilment of certain conditions). Village land is administered at grassroots level for which a Certificate of Title can be granted to the holder(s).

In theory rights to land, as indicated above, can be obtained by investors for varying periods. Anecdotal evidence suggests that it is easier said than done.

Government policy for the livestock sector

The National Livestock Policy (NLP) of 2006 is designed to stimulate the development of the livestock industry in order to exploit available resources, whilst showing due concern for conservation of the environment. The policy emphasizes the importance of competitive markets, including commercialization of the livestock industry, value added products and sustainable livestock development. The policy is said to be among many of Tanzania's initiatives to invite and open doors for private sector investments.

The policy is a far-reaching and ambitious document whose application has yet to bear fruit (or more aptly increase the productivity and efficiency of the livestock industry). In view of the importance of the livestock sector to the Tanzanian economy and to people's livelihoods, MLFD formulated a Livestock Sector Development Strategy (LSDS) in 2010 in order to render the NLP operational. The LSDS is described as an operations tool for the NLP that spells out the actionable interventions required to meet the livestock sector vision, mission and objectives in the short, medium and long terms.

The Livestock Sector Development Programme (LSDP) is designed to implement the NLP of 2006 and its LSDS of 2009 in the context of '*Kilimo Kwanza*', the Comprehensive Africa Agriculture Development Programme (CAADP), the National Strategy for Growth and Reduction of Poverty (NSGRP), the Rural Development Strategy (RDS), the Ruling Party Manifesto, Medium-Term Plan (5 Year MTP) and the Tanzania Development Vision 2025, Long-Term Plan (15-Year Plan). LSDP is also intended to transform the sector from its current status to one with potential for a progressive livestock sector that is economically, socially and environmentally sustainable. Further, LSDP seeks to enhance coordination of support for livestock development within a coherent and comprehensive national system taking into consideration the Decentralization by Devolution (D by D) approach.

Food safety and quality

Animal health is inextricably linked to food safety and consumer health. The meat production chain should aim to deliver safe food and high quality products to the consumer. Animal health management is therefore of paramount importance in both the early and later stages of the chain. Food safety issues and consumer health should start by focussing on husbandry practices, farm management and disease surveillance, and continue throughout the chain at slaughter through processing and at presentation to the consumer.

There appears to be adequate legislation to assure food safety and consumer health throughout the chain but at almost no point is there adequate surveillance and implementation.

Public infrastructure

It is usual to read that Tanzania is well endowed with public infrastructure including roads, rail, electricity, water, ports, telecommunications and markets. In general this is true. It is not, however, the whole truth. Most trunk roads are fully tarmaced and in good condition but they are narrow resulting in long journey times as traffic is held up by heavy haulage vehicles. A notable exception to

the 'good tarmac road' is the link from Tunduma to Sumbawanga (the new road is expected to be completed in 2012 and to reduce the journey time for a standard light car from more than six to less than three hours). Away from these main trunk roads the situation is different, with most roads in poor repair and often with bridges washed away or long waiting times for flash floods to subside. Poor rural (and some main) roads result in high to very high transport costs and longer journey times which are not only inimical to animal welfare but result in weight loss of the animals transported and the risk of condemnation at slaughter as a result of bruising (although this does not appear to be a factor considered at meat inspection).

The rail system (consisting of the Tanzania-Zambia Railway commonly known as TAZARA and Tanzania Railways) is not only extremely inefficient. Only TAZARA passes through the Southern Highlands, and the Central Line from Dar es Salaam to Kigoma operates, at best, only two days a week. Many transporters have therefore changed from rail to road to transport heavy items such as copper sheeting from Zambia, thus further lengthening the duration of journeys for other users. The electricity supply is patchy and often intermittent: Sumbawanga, for example, is connected to both the Tanzanian and Zambian grid *and* has a thermal generator but there are frequent periods in a single day when electricity is not available. Telecommunications have vastly improved but it is not only mobile phones that are needed: faster internet would greatly help businesses. Dar es Salaam, and the newly opened Songwe International Airport some 10 km from Mbeya, are the only airports that can land a large transport aircraft (the latter may be useful in the future to export meat from the Southern highlands). In Dar es Salaam, however, exporters frequently have problems obtaining cargo space (even if it is booked) as carriers shift to higher value cargo. There are theoretically sufficient market facilities but most are rudimentary or in disrepair and have poor management systems and communications.

4.2 Vertical and horizontal linkages and value chain governance

Integration

Extremely weak vertical and horizontal linkages affect the whole value chain. Actors and enterprises do not generally cooperate or coordinate (indeed the latter seems to be a totally alien concept). The capacity to influence domestic policy as well as more mundane aspects such as collective access to inputs and other services is thus limited. NARCO provides a minor exception to the generality of vertical integration as it not only breeds cattle but also produces pasture seeds, conserves grass as hay, fattens cattle in feedlot operations (the latter might rather be seen as 'reconditioning' as the feedlot animals are usually bought-in from traditional producers), slaughters and markets meat (Figure 13). There is further extremely limited vertical integration where agents act as butchers and may possibly undertake some very basic processing.

In summary both vertical and horizontal integration remain marginal. The red meat value chain might be considered a type of 'market-type governance' with many producers, traders and local butchers. Relationships between stakeholders in the value chain are primarily determined by the price at which the product is sold. Coordination is required for the whole chain and must encompass all actors if good communication and trust are to be generated.

Figure 13: Vertical integration at Kongwa Ranch — pasture seed production and slaughtering, October 2012



Governance

The Southern Highlands Red Meat Value Chain is largely driven by market forces with respect to prices and their up- and down-stream effects on supply and operations throughout the chain. The major issues include:

- *Lack of Governance* — The governance mechanism in the value chain is underdeveloped, actors operate in an uncoordinated and unorganized fashion, and if rules exist they are often ignored;
- *Poor supervision of lower-end associations* — TMB has the mandate to coordinate stakeholders but has neither the personnel nor other resources to do this;
- *Too many small players and small transactions* — The chain is characterized by too many small producers and processors that increase transaction and transport costs and reduce the ability of products to compete in the market such that some traders and large butchers exercise market power and can largely set prices to the detriment of marginalized suppliers;
- *Lack of market coordination* — No lead organization has a coordinating role in relation to markets, technology and information such that producers and processors have no incentives for improving neither their product nor the chain process to promote sustainable income earning opportunities;
- *Unclear and conflicting roles and mandates in district councils* — District Councils own many slaughtering facilities and are responsible for quality control as well as enforcing TFDA's regulatory role in licensing,
- *Industry associations* — Associations are weak at all levels of the chain;
- *Operating procedures* — Standard procedures are inadequately enforced, or not enforced at all, because of relaxed production and trade regulations; and
- *Integration* — There is little vertical integration of producers, mid chain actors (feedlots) and processors.

4.3 Support services

A service can be defined as a function performed/offered by a service provider and used by a customer to the benefit of the latter. The provision of a service may or may not be connected to a real material product. Numerous service providers are purported to operate in Tanzania's red meat value chain. These include government and private providers that engage in the supply of inputs, extension services, research and development, training, financial services, market information and

regulatory services. The role of the public sector has been elaborated in the NLP which states that the Government — in collaboration with other stakeholders — will provide core public services such as extension, information, research, training and livestock infrastructure. It will also formulate policies, provide a regulatory framework and protect the environment.

Public sector roles in the LSDP will be implemented by the Agricultural Sector Lead Ministries (ALM) including MLFD, the Ministry of Agriculture, Food Security and Cooperatives (MAFC), the Prime Minister's Office Regional-Administration and Local Government (PMO—RALG), the President's Office—Planning Commission, the Ministry of Water and Irrigation (MWI) and the Ministry of Industries, Trade and Marketing (MITM). Institutions and Commodity Boards under MLFD include NARCO, CVL, Tanzania Veterinary Council (TVC), AGRI, Tanzania Livestock Research Institute (TLRI), Tanzania Dairy Board (TDB), the Tanzania Meat Board (TMB), etc. Other services in related ministries also have important roles to play (for example, the TFDA, Tanzania Bureau of Standards (TBS), Small Industries Development Organization (SIDO), and the Centre for Agricultural Mechanisation and Rural Technology (CAMARTEC).

Tanzania Meat Board

TMB was established following the passing into law of the Meat Act 2006. The Annual Meat Council is the supreme organ and contains public and private stakeholder representatives of the meat chain. TMB acts as the Council's secretariat and executive arm. TMB's other responsibilities are extremely diverse and include: coordinating stakeholders, promoting compliance with national and international quality standards, collecting, processing and disseminating information, investment, developing and marketing products, and advising the Minister on issues relating to the development of the meat sector. A Registrar of TMB (effectively its Chief Executive) was not appointed until November 2010 and is still performing her duties in an Acting capacity. TMB is still in its infancy and is totally unequal to the tasks assigned to it since it has very limited human, financial and physical resources.

Value chain finance

Much of the red meat chain needs capital and recurrent financing, yet up to 2012 most actors have not been able to obtain finance. Many banks and other financial institutions provide some credit for agriculture (see Section 3.3 and Table 6) but none of this has been for livestock. TIB now lends to livestock groups and associations (rather than to individuals) through its new Agriculture Window.

NMB has a large agricultural portfolio but has not yet lent for livestock and has no plans to do so in the near future. Neither of these banks would accept livestock as collateral. MFIs and SACCOS are possible sources of credit and finance but have so far shown little activity in respect to livestock production. Livestock in-trust schemes operate in northern Tanzania but there are none in the Southern Highlands. Finance in — and credit for — the red meat chain seems to be constrained by high interest rates, high investment costs in some enterprises (especially export abattoirs) and long periods of return on initial investments. There is also a lack of awareness among stakeholders lower down the chain of the need for investment. Some major characteristics of finance in the chain are:

- large traders are either self-financing or have access through informal sources so that they can dominate the live animal market and squeeze out smaller operators who cannot pay immediately in cash;

- large finance institutions lack understanding of the financial requirements of livestock, and appear unwilling to learn;
- there are no favourable financial support packages, preferential interest rate programmes, or guarantee schemes that could ease access to finance;
- traditional livestock producers, feedlot operators, traders and small processors do not have the knowledge or skills to develop fundable business plans or loan applications and so far have received little support in this area;
- there is no concept of integrated value chain finance such as a combined loan schemes for interdependent feedlot operators, traders, slaughterers and butchers; and
- owners of public slaughter facilities — municipalities and other local government bodies — do not consider their facilities (buildings and equipment) as an asset to be nurtured but (to make a pun) as a cash cow (Figure 14).

Insurance

No insurance has ever been taken out on livestock in Tanzania. Insuring livestock (anywhere in the world) is not easy and, where available, is very expensive with the owner having to accept most of the risk⁹.

Figure 14: The Ilala Municipality slaughterhouse in Dar es Salaam: broken dressing shelf and main drainage system, October 2012



Extension and animal health services

Livestock extension has traditionally been part of the general agricultural service and financed entirely by the public sector. Historically, there has been too much direct government involvement in the management of extension, in spite of declining resources. Coordination with the private sector, Faith Based Organizations (FBO) and other Non-Governmental Organizations (NGO) was minimal for many years after Independence. Since the 1990s, however, some extension services have been provided by the private sector as farmer-led initiatives, and private agribusinesses have started to supplement public extension services (though this has hardly touched the livestock industry).

Extension workers are trained at one of six Livestock Training Institutes (LITI) located around Tanzania, LITIs provide training that results in the award of a Diploma in Animal Production, Diploma

⁹ The Consultant writing this report had two pedigree beef bulls die over a 15 year period that were insured with the insurance arm of the National Farmers Union (farmer-owned) but they found clauses in the policy which excused them from paying the claim.

in Animal Health or a Certificate in Animal Health and Production. LITI Morogoro, which is the relevant institute for the Southern Highlands, also provides a course leading to a Diploma in Range Management and Tsetse Control whereas LITI Temeke trains students for the Diploma in Veterinary Laboratory Technology.

The LITIs have limited numbers of teaching staff and staff houses, and insufficient student accommodation. At most institutes, the teaching facilities are old and obsolete, the infrastructure and equipment is in a poor state of repair and the farm units are in need of rehabilitation and retooling for the practical training of students. They do, however, have land suitable for expansion and are strategically located to meet livestock training requirements. The LSDP (see Section 4.1.4) included interventions aimed at developing human resources in the livestock sector. Emerging aspects, or aspects that are likely to — and should — emerge from the red meat chain such as commercial livestock production, private input supply and processing of livestock products have specific training needs that require re-designing of training curricula and the development of new ones.

As indicated in Section 3.3, only just over a quarter of producers have received extension or animal health advice. This is not surprising given that MLFD admits to a deficiency of 13 624 extension workers on the establishment (in addition to other challenges such as transport issues and lack of equipment). The situation has not been improved by the decentralization of extension from MLFD to local government who are perennially short of funds. There is clearly a need for massive training of field livestock extension staff using LITIs and retraining of the existing ones to equip them with new technologies (and motivate them to actually to get out into the field).

Both the public and private sectors provide veterinary services. In 2009, there were 114 students (including 12 women) studying veterinary medicine at the Veterinary Faculty of Sokoine University of Agriculture, with the aim of obtaining a Bachelor of Veterinary Medicine degree¹⁰. In reality, most fully qualified (degree level) veterinarians remain in the public sector whereas paraprofessionals (often known as Community Animal Health Workers or CAHWs) are mostly in the private sector. It is extremely rare to find a vet in rural areas (only just over 400 are registered with the TVC) except when a formal vaccination or other campaign is being carried out. Animal health services, such as they are, in the rural areas are thus provided by CAHWs with limited training and usually with limited resources and ranges of treatments. Both service providers are required to abide by the Veterinary Act (see Table 11), observe ethics as stipulated in the codes of conduct and comply with the guidelines set by the World Organization for Animal Health (Office International des Epizooties, OIE) regarding the delivery of veterinary services. Veterinary services in the country are still limited by inadequate veterinary infrastructure, inadequate technical support services, inadequate capacity to enforce ethics and standards, little adherence to standards and ethics by service providers (for example, in enforcing animal movement controls) and a still weak private sector.

¹⁰ The low proportion of female students contrasts with the situation in Europe where more than 70 percent of veterinary students are women. Tanzania is unusual in current veterinary education in Africa in awarding a Bachelors degree (most award a Doctor of Veterinary Medicine)

Research services

The objective of livestock research is to develop technologies that address the problems affecting the industry in order to increase livestock production and productivity and to augment the industry's contribution to the national economy and improved livelihoods. Various stakeholders currently undertake research. The lead institution for animal production is TLRI and for animal health AGRI. The Veterinary Faculty of the Sokoine University of Agriculture undertakes both production and health research. There is also limited research by some NGOs. To assist research centres to plan and implement research programmes relevant to the respective zones, the Client Oriented Research Management approach is employed, for which funding is provided by the zonal offices under the Zonal Steering Committees (ZSC) and through the Zonal Agricultural Research and Development Fund (ZARDEF). Such committees are made up of regional and district officials, researchers, extension officers and producers. Strategic research interventions for livestock improvement theoretically follow a commodity value chain approach.

Most research has been concentrated on-station and on some NARCO ranches. In recent years there has been increased interest and efforts in the phenotypic characterization of indigenous cattle such as Ufipa, Iringa Red, Ankole, Singida White, Tarime, Masai Black and Mbulu. Small ruminant research has tended to concentrate on breed improvement, nutrition and health management. Some of the past achievements in livestock research have been real, some chimaerical. Achievements are said to include the development of the dual-purpose Mpwapwa cattle breed, of the Malya (or Blended) goat and of Mpwapwa Rhodes grass. It is claimed that research on feeding and nutrition has yielded substantial results in terms of feeding strategies and have contributed to a reasonable growth in sheep and goat meat production.

The long tradition of livestock research has been jeopardized since Independence by reduced personnel and funding. In view of the importance of livestock to the economy and the numbers of livestock in the country, the Government's allocation of 0.024 percent of GDP in 2005 and of 0.089 percent of GDP in 2009 can be seen as paltry. External donors have provided limited and intermittent funding for research but have failed to view their commitments as long term. As for extension services, neither the fractionation of research through devolvement nor the presumed advantages of zonal priorities have assisted progress.

Market information

Linking farmers to markets is regarded as a milestone in promoting the growth of agriculture and reducing poverty. The World Bank views enhanced smallholder competitiveness and facilitation of market entry — as well as improved market access and the establishment of efficient value chains — as important factors in agricultural development. Pillar 2 of CAADP is entitled 'Market Access' and most African governments, including Tanzania's, have been developing policies and programmes to link farmers to domestic, regional and international markets. Improving the quantity as well as the reliability of agricultural data available to decision makers and stakeholders (including both public and private sector actors), is thus a precondition for formulating effective agricultural and rural sector investments, which could help farmers to gain access to market opportunities.

Data have been collected in Tanzania over many years but have seldom been put to good use and usually not to any use at all. A recent review of the status of livestock data conducted by MLFD states:

“A lot of livestock data are inadequate to varying degrees as they lack consistency through time and between sources; and are not complete as they possess a lot of gaps. In addition, most of the data are unreliable due to lack of culture of data collection and provision. There is general lack of responsibility of data verification for the purpose of ascertaining their adequacy at all levels. On the other hand, often livestock data are not readily accessible to users for a variety of reasons and available data are not always put to optimal use by data users as they are not made available in a timely manner, are not in the form required and are not disaggregated to appropriate levels.”

Information on livestock marketing has recently been collected through the Tanzania National Panel Survey (NPS) and the Livestock Market Information Network and Knowledge System (LINKS). NPS comprised a questionnaire survey of a limited number of households in the various regions of Tanzania including the Southern Highlands. The data included details on livestock ownership (including the species, and classes of animal within species) and market activities. LINKS has been operating within MITM since 2005 under its mandate to “facilitate the development of sustainable industry and trade sectors through creation of enabling environment and provision of improved services”.

LINKS collects, processes and disseminates data from 41 primary and 12 secondary markets in 18 of the 21 mainland regions. Primary markets are owned and managed by Local Government Authorities and, as indicated, their functioning is usually limited because of inadequate infrastructure and financing. Secondary (and border) markets are managed by the central Government, and are bigger than — and may have better facilities than — primary markets. Most markets operate on a weekly basis but some are held twice a week and Pugu (for Dar es Salaam) is open every day. A so-called ‘market-monitor’ who is a local government officer (with no direct reporting responsibilities to MITM) collects information on behalf of MITM every market day. This includes price information from buyers on concluded transactions for four types of animals (cattle, goats, sheep and donkeys). Details on breed (TSZ, Ankole, Boran, Exotic and other for cattle), age (immature, mature, mixed, young), gender (female, male, castrate) and grade (grade 1 to grade 4) are also gathered. Monitors are expected to collect price information from five buyers and obtain information on the total volume of exchanges from the market authorities. Monitors should send price and volume data to MITM every week when they are checked and validated. The ‘Weekly Summary Livestock Market Information Reports’, which provide average prices, total exchanges and details of breed, age, gender and grade from the various markets for all four species, are prepared and disseminated by MITM. A ‘Monthly Livestock Market Information Report’ presents a comparison with previous-month-price and volume levels. Weekly reports are disseminated through English and Swahili newspapers, through radio and TV programmes and via market boards in the Community Information Centres. Price and quantity data are also available through the LINKS website at www.lmlstz.net (although it is not easy to access this site). The LINKS data set provides useful information about market size as well as trends in prices and volume for live animals and thus, theoretically, on trends in business opportunities for livestock keepers.

Transport

Most livestock are reared far from markets and certainly very far from the major centres of consumption. Only one of the secondary markets (Pugu in Dar es Salaam) is located outside the Northern Region of the country. Southern Highlands livestock destined for slaughter outside the region are thus at a huge comparative disadvantage when it comes to marketing. Although the country is internally reputed to be well endowed with road and rail communications, this is rather an overstatement of the reality, and much of the Southern Highlands still remains isolated from the trunk road system. The TAZARA line, which passes through the Southern Highlands, operates only intermittently and does not have facilities or rolling stock for transporting livestock.

With the exception of the major export abattoirs there is little refrigerated lorry capacity for meat and there are no specialized cattle or small ruminant road transport vehicles. Most road transport of live animals is usually undertaken as back loads by vehicles that have travelled into the Southern Highlands with other commodities. Producers have to resort in the main to trekking their animals over long distances or adopting a variety of stratagems to get animals to market or slaughterhouse, most of which contravene the Animal Welfare Act (see Figure 15).

5 VISION AND STRATEGY FOR IMPROVED COMPETITIVENESS AND GROWTH

5.1 Vision

The problems of the industry are widely known, as are the solutions. The quandary is to apply the latter to the former. If this can be achieved the Vision could be:

By 2025, a more efficient and sustainable red meat chain that helps boost employment, increase incomes, reduce poverty, improve food security and provide a better quality of life for all Tanzanians. In addition, the chain will provide an adequate supply of high quality animal protein to all Tanzanians and produce a surplus for export.

5.2 Strategic issues synthesis

Existing policies, strategies and programmes

Based on the main policy, strategy and programme activities organized and put in place by the Government (Table 15) a series of Components and Subcomponents (Table 16) have been developed for implementation by the Livestock Sector Development Programme of 2011.

Table 15: Existing policies, strategies and programmes with relevance to the red meat value chain

Policy / Strategy / Programme	Launch year	Objectives / areas of intervention
Tanzania Development Vision 2025 (TDV) See: www.tanzania.go.tz/vision.htm	In progress	The Tanzania of 2025 should be a nation imbued with five main attributes: high quality livelihoods; peace, stability and unity; good governance; a well-educated and learning society; and a competitive economy capable of producing sustainable growth and shared benefits. Among others, the vision aims at developing a diversified and semi-industrialized economy with a substantial industrial sector, macroeconomic stability, a growth rate of 8% per annum or more, and an adequate level of physical infrastructure. It is also envisaged that fast growth will be pursued while effectively reversing current adverse trends in the loss and degradation of environmental resources (such as forests, fisheries, fresh water, climate, soils, biodiversity) and in the accumulation of hazardous substances.
National Strategy for Growth and Reduction of Poverty II (NSGRP II or MKUKUTA, from its Swahili acronym) See: www.tz.undp.org/docsmkukutall draft.pdf	2005	Builds on four key <u>fundamentals</u> : (i) efficient use and development of factors of production, including human capital/resources, (ii) strengthening and establishing well-functioning institutions and markets, (iii) provision of infrastructure, and (iv) ensuring good economic governance. Build also on four <u>strategic areas</u> : (i) Providing targeted subsidies to selected food crops, identifying and promoting modern farm technologies and providing support for increased utilization of improved technologies for crop and livestock production; (ii) identifying research activities and promoting food storage technologies/facilities and enhancing agro processing as well as environmentally friendly technologies and practices especially for rural areas; (iii) improving road network connectivity to facilitate flow of agricultural produce (outputs); and (iv) improving stock management and monitoring of food situation in the country.

Policy / Strategy / Programme	Launch year	Objectives / areas of intervention
'Kilimo Kwanza' (Agriculture First)		Aims to accelerate agricultural transformation through fostering the modernization and commercialization of agriculture, mainstreaming Government planning processes, allocating sufficient resources, mobilizing increased investments, and mobilizing the private sector.
Agricultural Sector Development Strategy (ASDS)	2001	Aims to create an enabling environment for improving agricultural productivity and profitability, improving farm incomes, thereby contributing to reducing rural poverty and ensuring household food security. It focuses on productive and gainful agriculture: subsistence agriculture must become profitable smallholder agriculture, and the spotlight must switch from public institutions to farmers and agribusinesses.
Agricultural Sector Development Program (ASDP)	??	Provides the government with a sector-wide framework for overseeing the institutional, expenditure and investment development of the agricultural sector. Aims at enabling farmers to have better access to — and use of— agricultural knowledge, technologies, and market infrastructure all of which contribute to increased productivity, profitability and income thereby enhancing food security. At a district level these interventions are implemented through District Agricultural Development Plans (DADPs) based on target communities and district development priorities. The ASDP, among others, promotes more control of resources by beneficiaries, pluralism in service provision, and resource transfer based on the evaluation of its efficiency.
Integrated Industrial Development Strategy (IIDS 2025)	??	Provides guidance in the implementation of the Sustainable Industrial Development Policy (SIDP) 2020 objectives under the newly prevailing economic environment and to realize the targets stipulated by TDV 2025. Aims to build up internationally competitive business environments and promote enterprises to make the industrial sector an engine of the economic growth. It particularly also promotes agricultural development-led industrialization to support successful implementation of <i>Kilimo Kwanza</i> and equitable growth of the regions.
Agricultural Marketing Strategy (AMS)	??	Contributes towards the attainment of TDV 2025, NSGRP, Kilimo Kwanza and the Millennium Development Goals (MDGs). AMS aims at promoting a competitive, efficient and equitable agricultural marketing system, including supporting the availability of international accredited laboratories and testing equipment for the introduction and monitoring of appropriate quality standards.
Integrated Hides, Skins and Leather Sector Development Strategy	2007	Aims at supporting the production, processing and marketing of quality hides and skins, processed leather, footwear and leather products.
Rural Micro, Small and Medium Enterprise Program (MUVI)	??	Supports agricultural and agro-industrial development in six target regions (the Coast, Tanga, Manyara, Mwanza, Iringa and Ruvuma). One important contribution of MUVI is the provision of information to poor rural entrepreneurs in value chain coordination.

Policy / Strategy / Programme	Launch year	Objectives / areas of intervention
The Southern Agriculture Growth Corridor of Tanzania (SAGCOT)	Not yet launched	Aims at attracting private investment into agriculture in ways that are socially and environmentally responsible. Addresses constraints related to uncertain policy environments, the development of private and public partnerships and availability of affordable and long-term finance. Investments are promoted along the trade routes that link Tanzania to Zambia (serving, within Tanzania, the Coast, Morogoro, Iringa, Rukwa and Mbeya regions). Focuses on discrete geographical areas ('clusters') within the corridor where there are opportunities to establish a critical mass of profitable small and large operators.

Source: 3ADI, 2011

Table 16: Components and subcomponents of the Livestock Sector Development Programme

Component	Subcomponents
Livestock Resource	Grazing land development; pasture development; animal feeds and feed additives; water for livestock
Livestock Production and Productivity	Meat production; milk production
Livestock Support Services Delivery and Empowerment	Livestock research; livestock training; livestock extension work
Animal Disease Control and Veterinary Public Health	Transboundary animal diseases; parasitic, vector and vector borne diseases; veterinary public health
Livestock and Livestock Products Marketing	Livestock marketing infrastructure; livestock marketing information; identification, traceability ecolabelling and animal welfare; processing and value addition
Legal and Institutional Framework	Regulatory framework of the livestock sector; Institutional Framework
Cross-cutting and Cross-sectoral Issues	Gender mainstreaming in the livestock industry; HIV/AIDS, malaria and tuberculosis; environmental conservation; finance and credit

Source: URT, 2011 (from Pica-Ciamarra et al, 2011)

Figure 15: Tanzanian cattle being trekked to market and improvised transport for slaughter cattle, October 2012



SWOT analysis

Strengths	Weakness
<ul style="list-style-type: none"> • Very large numbers of cattle and goats with some sheep • Near organic and primarily grass-fed production, suitable for niche markets • Large area of natural rangeland 	<ul style="list-style-type: none"> • Few producer, processor and butcher organizations • Supposedly low genetic potential of indigenous breeds • Livestock diseases common but access to veterinary services limited • Market access limited and difficult for primary producers • High transport costs over long distances; • Insufficient measures of biosecurity • Limited research results not extended to producers • Inadequate road services in remote areas.
Opportunities	Threats
<ul style="list-style-type: none"> • Organization of segments or of whole value chain into groups/associations to strengthen powers ('empowerment') • Enormous internal and external markets for red meat • Young population (promises more consumption in future) • Adding value to basic products through differentiation ('choice cuts') • Potential for dung and ruminant content in biogas production to complement or replace expensive sources of energy (opposite of contamination/pollution) • Valuable by-products of slaughtering process not efficiently collected and adequately treated 	<ul style="list-style-type: none"> • Endemic diseases common and poorly controlled ('trade' diseases) • Strong competition in export markets from regional producers as well as those farther afield (Brazil and Thailand) • Contamination/pollution from slaughterhouses, butchers and hides processing is rampant and poor waste disposal will come under increasing regulatory control (increased costs) • High interest rate and unstable macroeconomic environment (exchange rates and inflation) • Need to comply with export market regulations (> production costs) • Climate change may affect some aspects of production.

5.3 Value chain competitiveness strategy

Strategic elements to improve the ability of the value chain to compete include:

- improving knowledge, skills and information throughout — and before — the chain (e.g. agriculture in schools, producer training, business training etc.);
- promoting and strengthening groups and associations from primary producers through to retailers to encourage vertical and horizontal integration and to provide the industry with a 'voice';
- improving existing — and providing new — physical infrastructure to support the growth of profitable agriculture and to generate employment;
- developing, equitable deployment and retention of human resources especially in the livestock extension and animal health delivery services;
- promoting and adopting science and technology including research and development for high quality and nutritious food as well as other livestock products;
- strengthening and introducing investment in livestock infrastructure including for farm-level agroprocessing and physical market infrastructure;
- collecting, collating and disseminating transparent market information including volumes of trade and prices;

- introducing (or enforcing) grading and sales by live weight at markets;
- promoting fair and competitive farmgate prices;
- strengthening the links between farmers and markets and higher up the chain for domestic, regional and global markets;
- promoting private sector investment and encouragement of public-private partnerships (although great faith is placed on privatization and private sector investment it is not a panacea and lessons must be learned from the insolvency of Tanzania Pride and the inefficient operation of SAAFI);
- increasing the amount and improving the quality of processed red meat products;
- ensuring that Tanzania's red meat products are produced (and can be verified as having been produced) to international standards of welfare, animal health and food safety;
- facilitating access to finance and credit including links to capital and short term markets and introducing insurance for livestock;
- mitigating and adapting to the effects of climate change (research programmes to improve existing and develop new technologies);
- promoting measures to cushion livestock producers from the effects of drought and strengthening of the Famine Early Warning System (FEWS);
- ensuring that land tenure arrangements for both traditional producers and those wishing to invest in large-scale livestock production are favourable to long-term investment; and
- implementing the National Strategy on Agriculture and HIV/AIDS to support increased red meat production.

5.4 Proposed strategy components

The strategic objectives of the Red Meat Value Chain are to develop a competitive and efficient sector that will contribute to improve livelihoods for all Tanzania's people as well to the national economy. To achieve these objectives the strategy will:

- make a contribution to national food security through increased production, processing and marketing of cattle, goat and sheep products to meet national nutritional requirements;
- contribute to improved living standards of people engaged in ruminant livestock production through generation of increased income from sales of products;
- increase the quantity and quality of live animals and meat and meat products as raw materials for local industry and for export;
- promote integrated and sustainable use and management of natural resources related to ruminant livestock production in order to achieve a sustainable environment; and
- promote production of high quality and safe foods of animal origin in order to safeguard the health of consumers.

Strategic areas that need to be addressed include:

- sustainable use of land, water and natural feed resources;
- public, private and public/private sector investment and financing;
- improvement of the productivity and efficiency of production, marketing and processing;
- improvement of animal health, control of livestock diseases (especially 'trade' diseases) and the safeguarding of public health;

- rendering more effective the support services including through research, extension, training and dissemination of information;
- general capacity building and empowerment all along the chain;
- chain governance, regulatory and institutional arrangements; and
- cross-cutting and cross-sectoral issues.

Interventions should be designed as an integral part of the country's participatory processes and fit within the general framework of the current policies, strategies and programmes for livestock and rural development (see Table 16). Further consultations will be needed with a broad range of stakeholders before any progress can be made.

Sustainable use of land, water and natural feed resources

'Conventional wisdom' holds that there is ample land and feed resources in Tanzania to satisfy the needs of livestock. This truism ignores the fact that cattle numbers in 2010 were six times greater than they were in 1961; goat and pig numbers have also increased six-fold over the same period and poultry numbers five-fold (sheep have not increased to the same extent). These huge increases have been compounded by the additional pressure on livestock feed resources caused by the expanding human population (which was four times greater in 2010 than 1961). The expanded — and expanding human population — need more space to cultivate food and cash crops, and has caused a proliferation of urban areas. The declaration of large areas as national parks or game reserves has also, inevitably, lowered the availability of livestock feeding areas. The Government has partially recognised this situation through the enactment of key legislation (e.g. the Land Act No 4 of 1999, the Village Land Act No 5 of 1999, the Land Use Planning Act No 7 of 2007, the Grazing Land and Animal Feed Resources Act No 13 of 2010). It has also demarcated about 1.4 million hectares of land for grazing livestock in 266 villages of 15 regions in mainland Tanzania. Development and management plans are, however, required for sustainable resource ownership and use; these are important as they offer opportunities for investment in infrastructure and improvements in production and productivity.

There are challenges confronting the use of rangelands for sustainable production. These include the need to further develop a National Land Use Plan, which will entail demarcating land for grazing areas, providing title and ownership of grazing land for livestock producers, preparing grazing land management plans, improving pasture and water facilities for livestock, creating awareness in producers (and in institutions connected to the grazing resource) of the current situation, promoting investment in rangeland forage production, pasture seed production and conserving any surpluses for use in times of deficit. The fact remains, however, that in the 50 + years since Independence several factors have adversely affected feed resources and the latter are now greatly diminished in both quantity and quality (Figure 16).

Figure 16: Well-managed grazing with high value legumes in the 1960s (left); overgrazed and badly degraded land in 2012 (right)



Water is life for livestock as it is for people. Its absence forces producers to migrate in search of it; this can lead to conflict over resources. Water determines to a great extent the achievable level of production. Challenges in water supply include the need to: build the capacity of suppliers and users as well as harvesting techniques, promote investment in the construction of water infrastructure and form water users' associations.

Specifically there is a need to:

- revise and enact new legislation relating to feed resources;
- improve the capacity of Local Government Authorities (LGA) and sectoral ministries to undertake resource management planning;
- strengthen the capacity of LGAs to identify and allocate land for pastoral, smallholder urban and pen-urban livestock production;
- create awareness among stakeholders of the Land Act and Village Land Act of 1999 as well as the Land Use Act of 2007 and enable implementation of these acts; and
- provide lease or title deeds to producers for land which has been surveyed and allocated to them.

Public and private sector investment and financing

Investment — public, private and a combination of both — is required throughout the chain. Public investment in livestock has generally been low and sporadic and has lacked continuity. Private investors, with few (and not very encouraging) exceptions, have also been reluctant to invest in livestock. Financing for livestock and associated operations from the usual sources (banks and other financial institutions) has not been common in Tanzania; such institutions generally seem to have little knowledge of the industry and are therefore reluctant to invest in it. Successful investment needs thorough investigation of the business before any commitment is made. Capacity needs to be built in terms of the proper preparation of projects, investment in infrastructure and in marketing schemes. In spite of the fact that there is a huge external market for meat, Tanzania has had difficulty in gaining access to this. Investigations need to be made in depth and business plans and investment proposals prepared accordingly.

Specifically there is a need to:

- provide a conducive environment (taxes, regulations) for private sector investment;
- provide a guarantee facility so that commercial banks can extend loans to producers;
- use the Leasing Act of 2008 to promote investment through leasing (with a special emphasis on (i) enabling existing and new commercial cattle, goat and sheep farms and (ii) slaughtering and processing facilities to operate to capacity and in a competitive manner);
- secure funding through government borrowing from international sources (e.g. the African Development Bank, IFAD) to fund comprehensive activities in key priority areas (these should be both at a national and district level and in line with the decentralisation by devolution policy);
- support the establishment of a national investment bank to provide loans for investments in ruminant livestock production on affordable terms;
- promote and support the establishment of grassroots savings and credit associations for livestock stakeholders;
- facilitate linkages between and among primary producers, microfinance institutions and the national investment bank;
- promote the establishment of insurance schemes and the use of insured livestock as collateral;
- promote the investment in — and use of — appropriate machinery and equipment; and
- promote the investment in — and use of — improved breeds and husbandry practices.

Improved efficiency in production, marketing and processing

The production and productivity of livestock in the country can be improved *inter alia* by (i) improvement of the genetic potential of the existing stock¹¹, (ii) an increased number of improved stock, (iii) commercialization of the chain, (iv) increased processing capacities and (v) improvement of marketing efficiency. Cattle produce most of the meat and contribute 53 percent of Tanzania's total meat production; sheep and goats contribute about 22 percent; the remaining meat comes from poultry, pigs and non-conventional animals. Meat is mainly produced for the domestic market with only a very small proportion destined for export. The ability of sheep and goats to multiply and grow faster than cattle at relatively low cost makes them an attractive proposition for small-scale farmers.

Figure 17: Boran bulls used for breeding at Kongwa, in 1962 (left) and in 2012 (right)



¹¹ There has apparently been a considerable loss of genetic potential in the last 50 years, see Figure 17

The challenges which mitigate against increasing meat production and productivity include: a lack of available fast-growing meat animals, inadequate infrastructure, an inconsistent supply of quality feed resources, the lack of control of livestock diseases, inefficient marketing, poor provision of technical support services and the inadequacy of producer, processor and butcher organizations.

It is commonly held that livestock by-products (horns, blood, bones, hooves, heads, rumen contents and dung) are wasted. This is not entirely true — a visit to any slaughterhouse will reveal the extent of trade in some of these items (often by women who convert bones, feet and heads into '*supu*'). The financial value of these by-products is nonetheless not fully realized and other body parts could be used in the medicinal, pharmaceutical, animal feed and energy industries. Challenges facing the production, storage, processing and use of these by-products include identification and use of appropriate technologies, and awareness among producers and consumers on the use and value of such by-products.

Specifically there is a need to:

- promote a full inventory, characterization, evaluation and selection of cattle, goat and sheep types for increased productivity and conservation;
- encourage the private sector to establish quality ruminant breeding farms;
- develop guidelines and incentives to facilitate imports of superior germplasm;
- promote the application of modern techniques for genetic improvement;
- encourage the formation of breeders' societies for ruminant production;
- initiate national recording and selection schemes through breeders' societies for cattle, goats and sheep;
- promote the production of high quality animal feeds as well as the use of locally-available raw materials and feed additives by the private sector;
- promote compliance with animal welfare legislation;
- support livestock associations to establish and strengthen chain participants (producer groups, traders groups, processors groups) at village and district levels;
- promote the establishment of processor and consumer associations at district and national levels;
- support the training of groups and associations in organization and management skills;
- facilitate the development of marketing models of cattle, goat and sheep products for smallholder producer groups;
- support the private sector to invest in the manufacture of processing equipment and the production of packaging materials for various products;
- provide a favourable regulatory and administrative environment for private sector investment in the processing and marketing of main products and by-products;
- design and promote the establishment (and use) of standard abattoirs and slaughtering facilities for ruminant animals for rural areas and district centres;
- promote small-scale processing especially in rural areas where there are no large-scale processors to link farmers to markets;
- facilitate the establishment of contractual business linkages between producers/processor groups and buyers of livestock and livestock products; and
- support the training of producer groups and associations in group marketing, business skills and product handling (e.g. packaging, labelling).

Control of livestock disease and improvement of animal health

Surveillance is an important element in the control of animal diseases and includes both active and passive search and monitoring. It aims to map the animal disease situation for a specified period.

Surveillance provides the information needed for the application of mitigation measures to prevent the occurrence and spread of disease. The current surveillance system involves a link between the Directorate of Veterinary Services and the decentralized local government system via the zonal veterinary investigation centres (it is believed 70 to 80 percent of all local councils have a veterinary officer on their staff). Almost all surveillance at the district level, however, is passive and based on clinical diagnosis. The level of reporting to the central unit dealing with epidemiological surveillance is extremely low and apparently reducing: in 2007, for example, 172 disease surveillance reports were received (from 74 of Tanzania's 133 districts); in 2009 only 213 monthly reports were received. The challenge facing surveillance and laboratory diagnosis is to have a strong and sustainable system supported by laboratory diagnostic facilities as well as private sector participation in surveillance. It is in the national interest to develop effective surveillance and laboratory diagnosis.

Protection and promotion of animal health is a key factor in all animal production systems. Promotion requires the use of various inputs — including drugs, vaccines, pesticides, animal feeds and others — that influence the quality and safety of food of an animal origin. The inspection system is critical for farmers who have a right of access to high quality and safe animal feeds. Livestock inputs and their use, if left unregulated, can have a negative effect on the quality and safety of animal products and thus on human health. Legislation regulating many of these aspects is in place but the laboratory and inspectorate system is weak and unable to ensure compliance. Information on the quality and safety of animal products facilitates the marketing and consumption of the products. Animal welfare is a major concern in more developed countries, and as consumer affluence and awareness increases it is to be expected that more questions will be asked as to how animals have been raised, handled and slaughtered. (OIE now includes animal welfare in its Sanitary and Phytosanitary Measures in international trade). The challenge in welfare is to promote compliance at all levels in the livestock industry value chain.

Specifically there is a need to:

- prioritise the control of transboundary animal diseases (with the Government contributing its resources for control);
- establish mechanisms to jointly engage the ministry responsible for livestock and that responsible for health in the control of zoonotic diseases;
- establish mechanisms for the public and private sectors to share responsibility of controlling non transboundary infectious diseases;
- establish technical advisory committees to deal with outbreaks of diseases of major economic impact and public health concern,
- enhance the capacity of the laboratory system to carry out proper surveillance;
- ensure the availability of vaccines for major epizootic diseases;
- establish control systems for helminths and helminthosis;
- establish a disease early warning system and emergency preparedness unit to deal with diseases of major economic and public health importance;
- develop and enforce guidelines and codes of conduct for public, semi-private and private veterinary service practitioners and paravets;

- develop and enforce guidelines for veterinary information and disease outbreak reporting systems; these should include the obligations of private practitioners from village to national levels via Veterinary Investigation Centres (VICs) and DLDO District Livestock Development Officer (DLDO) offices throughout the country;
- put in place mandatory annual vaccination programmes for diseases of economic importance and those affecting human health;
- establish LGA by-laws to govern mandatory annual vaccinations and enable regulatory authorities responsible for the inspection of veterinary drugs to carry out regular inspections in all LGAs;
- implement a waiver on VAT and excise duty for veterinary products;
- build private sector capacity to import or manufacture appropriate drugs and vaccines;
- create and strengthen a pool of animal health workers by training staff at certificate, diploma and degree levels;
- enable LGAs to employ qualified animal health workers at district, division, ward and village levels;
- provide resources for in-service training and continuing professional development for existing animal health workers;
- enable law enforcers with legal instruments to carry out their duties more effectively and safeguard animal and public health;
- create awareness among stakeholders of the existence of laws and regulations governing animal health issues;
- establish mechanisms for enforcing existing laws and regulations at an LGA and central government level;
- strengthen extension services at all levels; and
- establish divisional livestock farmer training centres, and implement farmer field schools at every division or ward on a regular basis.

Support services (research, extension, training and dissemination of information)

Various institutions provide support services including the Government, parastatals, NGOs, CBOs and the private sector. Livestock research aims to develop technologies that address the problems affecting the livestock industry in order to improve production and productivity and to allow the livestock industry to contribute to the national economy and livelihoods. Strategic research interventions for the improvement of livestock follow a commodity value chain approach. Some perceived achievements include the creation of the Mpwapwa Breed, the production of beef strains of cattle (by crossing TSZ and Boran with twelve exotic beef breeds), the development of pastures as feed resources for grazing animals, and the development of a dual-purpose breed popularly known as the Blended or Malya goat. The sustainability of research has been a major bottleneck in the development of appropriate technologies for improving the livestock industry. Challenges in beef cattle and small ruminant research include improving research infrastructure, improving the skills and competence of human resources, increasing private sector participation and increasing the coordination among research collaborators.

Livestock extension services should support the transfer of knowledge and skills to farmers, and enable the sharing of information and experiences between stakeholders, so that production and productivity can be increased. Currently extension services are mainly (though nominally) provided

by the public sector, although there are some signs of increased private sector participation in delivery. The key challenges facing extension delivery include: increasing the number of extension staff; increasing the knowledge and skills among livestock stakeholders; linking research, training, extension and farmers; improving collaboration between service providers; and encouraging the participation of the private sector in delivery and delivery infrastructure.

Capacity building and empowerment all along the chain

Institutional and financial empowerment of all participants along the value chain comprises including and involving them in the planning and management of activities. This can be achieved in part through the formation of — and support for — groups, associations and networks including umbrella organisations.

Support should be provided along the chain to build relationships with a view to becoming a formal body. For producers, the example of Umoja wa Wafugaji Kanda ya Mashariki (the Eastern Zone Livestock Producers' Association or UWAKAMA,) could be drawn upon. For traders, the Tanzania Livestock and Meat Traders' Association (TALIMETA) could provide a model. Butchers would also benefit from assistance in forming associations. In all associations, the adequate representation of women and of minority groups should be assured. NGOs and FBOs can help establish and support the new bodies. Assistance for — and training in — technical matters should be promoted, and business and accounting skills provided; officers of associations should also receive assistance in management training, interpersonal skills and human relationships.

Technical and professional staff from the central ministry and its devolved services (provincial and district level) should have their limited skills improved through Continuing Professional Development (CPD). CPD can be defined in a number of ways, but the definition provided by the UK Royal College of Veterinary Surgeons (RCVS) probably best serves the needs of SHFS, defining it as: “the systematic maintenance, improvement and broadening of knowledge and skills and the development of personal qualities necessary for the execution of professional and technical duties throughout [a person's] working life”. There are many ways of contributing to CPD (courses of study, directed reading, attendance at seminars and workshops) but strong emphasis should be put on electronic media (E-learning) as this format significantly increases the range and accessibility of topics for CPD study (for example, through facilitated access to open and Creative Commons-licensed learning materials).

The Government and other bodies should also be assisted to provide value chain participants with information (on markets, disease, feed resources) via radio and television broadcasts.

Chain governance, regulatory and institutional arrangements

Governance of the value chain needs to be considerably improved. There needs to be transparency at all levels and more direct involvement from producers and processors. Essentially, governance should be a private sector matter, with the public sector providing support through regulatory activities. The regulatory environment is in need of thorough review and revision; it also needs to be redesigned to assist the red meat industry to operate more efficiently. Public institutions involved in the chain should be supported with adequate funding to perform their activities.

Cross-cutting and cross-sectoral issues

Cross-cutting and cross-sectoral issues include gender, health and trade. The Tanzania Meat Board should be the strategic element in these activities and oversee coordination between the various ministries and other institutions that impinge on the livestock sector.

EPILOGUE — TUNAKWENDA WAPI?

The problems are known.

The solutions are known.

If Tanzanians of every social and economic class are to have an adequate and affordable amount of quality meat for their dietary requirements, solutions need to be applied to the problems as quickly as possible. Otherwise this Epilogue will become an Epitaph.

ANNEXES

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Annex 2. Summary of items examined in this study

1. Meat production, meat markets and meat processing
 - Overview of production, and marketing of meat and processed products
 - Analysis of current meat production, domestic markets, exports and imports, cost structure (purchase price, sales price, wholesale and retail prices by meat grade), overall meat supply balance
 - Profit and loss accounts of meat by type of production
 - Review of regulatory framework including aspects of food safety, welfare, animal identification and traceability
 - Directions and effectiveness of measures of government support

2. Production structure
 - Dynamics of livestock population over time
 - Organizational structure of production, profit and loss account of production enterprises
 - Technology in livestock production
 - Production and productivity parameters
 - Livestock breeding situation (performance monitoring systems, station research, role of private sector and producers' associations)

3. Feed resources
 - Rangelands and pastures
 - Fodder and forage
 - Concentrates (including quality control and regulation systems for processed feed, import and export of processed feed, and associated quality and customs and tariffs)

4. Animal health and veterinary organization
 - Review of public and private veterinary services
 - Evaluation of situation on production; notifiable and trade diseases including transboundary diseases
 - Effectiveness of prevention and control measures;
 - Capacity of medical products industry and provision of vaccines and pharmaceuticals, manufacture of diagnostic preparations and disinfectants, constraints to imports of animal health products
 - Safety level of food and raw materials of animal origin (at all stages of lifecycle), and the level of food safety guarantee measures

5. Analysis of meat processing and consumer goods industry
 - Existing processing enterprises and overview of current situation
 - Dynamics of meat processing by type
 - Volume of consumption by type by season, in rural and urban areas and by ethnic group
 - Dynamics of import and export by type of meat and product
 - Analysis of meat prices and analysis of factors influencing changes in prices

- Identification of existing barriers (tax, customs, administrative) and shortcomings in development of consumer goods industry
- Determination of main factors influencing competitiveness; breakdown of costs and analysis of product quality, profit and loss account of processing enterprises
- Determination of main trends in sector development
- Analysis of distribution channels on internal and external markets

6. Market analysis

- International experience in meat production and processing, global trends, main factors affecting competitiveness, main trends in import and consumption of meat, determination of main factors influencing competitiveness of production and processing
- Potential markets and niche markets for meat and meat products
- Analysis of prevailing domestic quality and safety standards for meat and meat products, capacity of national producers and processors to comply with such standards, capacity of veterinary and public health services to oversee and enforce regulations

7. Value chain development options (policy. strategy. implementation)

- Analysis of the subsector strengths, weaknesses, opportunities and threats (SWOT)
- Recommendations for improvement of regulatory framework, tariff settings and national standards for meat and meat products
- Required policy support
- Development options for small-, medium- and large-scale livestock enterprises
- Options for development of organizational arrangements
- Recommendations for introduction of modern technology and upgrading of machinery and equipment
- Options for development of a domestic breeding programme
- Recommendations for the establishment of a sustainable feed base based on improved pasture management, preservation and quality systems, options for a compound feed industry
- Review of animal health and food safety measures, compliance with OIE standards, veterinary sanitary and disease prevention measures, diagnosis and treatment of diseases, development of system of livestock identification, establishment of veterinary inspection units and veterinary subsidiaries in local authorities, options for abattoir system and network (with infrastructure for meat cutting, hanging, storing, transport and marketing)
- Options for development of processing industry, viability of meat processing enterprises
- Options for development of the value chain along intermediary sections from production to processing and marketing;
- Identification of scientific, human resource and information support requirements

Annex 3. Stakeholders met

- FAO Resident Representative
- Nsanya E Ndanshau: National Programme Officer, FAO. Nsanya2002@gmail.com; 0784 359 703
- Edward Seigler: Consultant, FAO, Rome
- Jesus Bareiro: Consultant, FAO/SEA, Rome
- WCH Mleche: Director of Veterinary Services, Ministry of Livestock Development and Fisheries. dvs@mifugo.go.tz, wcmleche@gmail.com, 0784 358 549
- Gopray Nsengwa: Deputy Director of Veterinary Services, Ministry of Livestock Development and Fisheries. nsengwa@yahoo.com
- ES Swai: Senior Veterinary Officer, Ministry of Livestock Development and Fisheries. esswai@gmail.com
- Aaron PB Luziga: Assistant Director, Livestock and Marketing Information, Ministry of Livestock Development and Fisheries. Aaron7_lz@yahoo.co.uk
- Yakobo N Msanga: Assistant Director, Livestock Development, Ministry of Livestock Development and Fisheries. Ymsanga@rediff.com; 0754 678 347
- Brechard Bejumla: Ministry of Livestock Development and Fisheries
- Happiness Lyomo: Ministry of Livestock Development and Fisheries
- Suzana Kiango: Registrar, Tanzania Meat Board. Suzykiango@hotmail.com, 0713 412 756
- Martin E Kimanya: Manager, Food Registration Department, Tanzania Foods and Drugs Authority. Mekimanya@yahoo.co.uk, martin.kimanya@tfda.or.tz; 0744317 687
- Philipp Lehne: Chief Technical Advisor, UN Industrial Development Organization. P.Lehne@unido.org, 0768 736 677
- Monsiapile Kajimbwa: Portfolio Coordinator, SNV Morogoro. Mkajimbwa@snyworld.org, 0786 341 368
- Silvanus Mruma. Advisor (Private Sector Development), SNV, Morogoro. Smruma@snyworld.org, 0755 744 327
- Daniani Masatila: Manager, SAAFI, Sumbawanga

- Kennedy Machinga: Production Manager, SAAFI, Sumbawanga. Kennedymmachinga@gmail.com
- Saum Said: General Manager, Energy Milling Co Ltd. 0767 198 537
- Severina E S Mwaluanda: Acting Municipal Agriculture and Livestock Officer, Sumbawanga Municipal Council. Severinamwaluanda@yahoo.com, 07525 538 527
- Mr Mwazema; Livestock Officer, Sumbawanga Municipal Council
- Mr Danisiya: Livestock Officer, Sumbawanga Municipal Council
- Kevin S Mulunga: Livestock Officer, Sumbawanga Municipal Council
- Livestock Trader: Sumbawanga- Mbeya Road
- Yahya Malipula: Owner, Mshani Agro-Vet Service, Tunduma
- Ferdinand Mgaya: Programme Officer SHFS, Mbeya. Femgaya@gmail.com. 0767 500 537
- Amani Joseph Kilmile: Livestock Officer, Mbeya District Council. Ajkilemile@yahoo.com, 0782 474746
- Levitiler J Mulimbola: participant in training course. Mulimbolalevitiler@yahoo.com, 074 772 292
- Benedict N Matogo: Livestock Officer, Chunya District Council. Bbemack@yahoo.com, 0756 681 839
- Albert L Sangu: Livestock Field Officer, Mpande District Council. Albertsngu@yahoo.com
- Samson R Salingo: Livestock Officer, Sumbawanga Manispaa. Samsonsalinga@yahoo.com
- John M Mbogoma: General Manager, National Ranching Company Ltd. john.mbogoma@narco.go.tz, 0754 841 399
- Bwire Kafumu Mwijarubi: Production and Operations Manager, National Ranching Company Ltd. bwire.kafumu@narco.go.tz, 0767 926 846
- Immanuel B Mnzava: Marketing Manager, National Ranching Company Ltd. immanuel.mnzava@narco.go.tz, 0753 002 035

- Heslon E N Kashalankoro: Senior Ranch Manager, Kongwa Ranch, National Ranching Company Ltd. hkashalankoro@yahoo.com, kongwaranch@yahoo.com, 0754 306 417
- Leonard Basil: Livestock Field Officer I, in-charge Pugu Livestock Secondary Market
- Numerous Producers, Traders and Buyers at Pugu Livestock Secondary Market
- Numerous Butchers and Input Suppliers in Dar es Salaam suburbs
- Benjamin Mazigo: Manager, SME Lending and Leasing, Tanzania Investment Bank Ltd. bmazigotib.co.tz, 0784 543 066
- Joan Murusuri: Relationship Manager, Tanzania Investment Bank Ltd. jzmurusuri@tib.co.tz, 0784 505 444
- Adelitha Kibuga: Senior Officer, Agriculture Window Unit, Tanzania Investment Bank Ltd. akibuga@tib.co.tz, 0784 458 234
- Robert Pascal: Head Agribusiness, National Microfinance Bank. Robert.pascal@nmbtz.com. 0754 298 639
- Andrew K Karumuna: Barcode Executive, GS1 (TZ) National Limited. andrew@gs1tz.org, 0685 620 116
- Judith E Sanga: Office Manager, GS1 (TZ) National Limited. dajudy@gs1tz.org, 0779 62116
- Said M Sood: Managing Director, Energy Millers and Animal Feeds, Morogoro Road, Kibaha. 0783 888 888
- Enoch M Shija: Dar es Salaam Private Slaughterhouse, Yunus Yusuph Kimara Stop over. 06 52 316 007
- Yolande du Plessis: Managing Director, Butcher Shop Limited, Masaki, Dar es Salaam. yolande@butchershop.co.tz, 0754 680 660
- Leo B Akonaay: General Manager: Dodoma Meat Company Ltd, Dodoma. ctanzaniameat@yahoo.com, leo.akonaay8@gmail.com, 0767 255 222
- Nashon V Kalinga: Human Resources and Administration Officer, Dodoma Meat Company Ltd, Dodoma. ctanzaniameat@yahoo.com, nashonakalinga@yahoo.com, 0755 097 410
- David Phire: Meat Inspector, Dodoma Meat Company Ltd, Dodoma
- Shamel Andrew Moshi: Supervisor, Ilala Municipal Slaughterhouse

- Ahmed Abdallah: Meat Buyer and Butchery Manager, Mek Supermarket, Kinondoni
- Newton Mari: Pig Farmer, Ilala, Dar es Salaam. 0713 415 211