Food and Agriculture Organization of the United Nations

THE WHITE MEAT VALUE CHAIN IN TANZANIA

A report from the Southern Highlands Food Systems Programme

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This background paper is made available without further edits to the version presented by its authors.

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R. Trevor Wilson, 2013

In fond memory of David Kenneth Hitchcock

EXECUTIVE SUMMARY

The white meat value chain begins with the primary producers of pigs and poultry, and ends with consumers. It covers all stages in the chain 'from farm to fork'. Producers overwhelmingly work in traditional systems keeping a few pigs or poultry, and the animals are an integral — though often minor component — of their whole production system. There is very little 'modern' production. Output is based on locally adapted or indigenous pigs and poultry that are often left to find their own sustenance by scavenging for food wherever they can find it. There are a few 'improved' or 'exotic' animals, especially in pig production, although modern hybrids are used in the poultry sector for the limited production of broilers and commercial layers. The Southern Highlands regions are not major livestock producers, but nevertheless have higher numbers and densities of pigs and poultry than other parts of the country. There is strong — and growing — regional and national demand for white meat, and the world market for white meat is also expanding rapidly. Tanzania could be well placed geographically (and in terms of output) to gain access to these markets but has so far failed to capitalize on its natural comparative advantage. To date there have been virtually no exports of live animals or meat, nor of products from pigs and poultry.

The value chain includes a multitude of participants at several levels. These include primary producers such as agents (who buy, sell and move stock to and from primary and secondary markets), dealers, meat inspectors, traditional small-scale retailers, processors, supermarkets, fast food outlets 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 participants there are many other small operators who make a living from the white meat business.

There are sometimes as few as two links between the producer and the plate though there may be up to ten transactions before the final product reaches the consumer. Most participants operate on low margins per animal (or animal-product), though bigger operations tend to have bigger margins. Producers, agents and retailers may handle from very few or very many animals (or products) in a year. Live animals are almost all sold through individual bargaining during one-on-one meetings: sellers and buyers know local prices, and deals are usually concluded quickly and amicably. Very little new technology is generated and the use of technology at all levels is limited.

Few inputs (except in the specialist broiler segment) are used at a producer level although there are more inputs in some of the vertically integrated poultry enterprises. Meat production has increased largely as a result of increases in livestock numbers and not due to a greater output per animal. Pigs may be slaughtered at urban or rural slaughter slabs (some of which are at least partly supervised, and with basic meat inspection) but most pigs are slaughtered 'informally' at the producer or small-retailer level. The majority of indigenous poultry is slaughtered by the consumer, though there are some formal markets for broilers in Dar es Salaam and other large towns. Slaughter slabs, where they exist, are generally old, lack equipment, and often kill under deplorable conditions of animal welfare and food hygiene. The local demand is for undifferentiated 'warm' meat that is supplied to consumers either directly through the producer or through small retail outlets (in the case of pigs) that are usually unregistered and with poor environmental and food safety conditions. Alternatively (in the case of indigenous poultry), animals may be killed at home. There is thus minimal value added towards the end of the chain. The sophisticated market for prime and processed products (some of which are imported) is extremely small and there is very little processing of any kind internally other than for the small and mainly urban broiler segment.

Income depends largely on volume, as margins at all levels tend to be low. Producers, slaughterers, skinners, retailers' employees and general *factoti* are among the lowest paid 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. Women and children play a greater role in producing pigs and poultry than ruminants.

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. These facts do 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 wilfully to ignore them, and tend to be safe from sanction 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, 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. (The exception to this is the broiler segment, which is usually intimately coupled to layer enterprises that produce day-old chicks for sale either to outgrowers or independent small-scale growers, and rear broilers for their own slaughtering, processing and wholesaling/retailing.) 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 services, is thus limited. In summary both vertical and horizontal integration remain marginal.

The white meat value chain may be considered a '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 white 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 white 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 for all Tanzanians and produce a surplus for export.

Strategic elements to improve the competitive status of the white 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 white meat products;
- ensuring that Tanzania's white 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 white 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.

ACRONYMS

ADRI	Animal Diseases Research Institute
ASDS	Agricultural Sector Development Strategy
AEF	African Enterprise Fund (International Finance Corporation)
AGOA	African Growth and Opportunity Act (United States of America)
ALM	Agricultural Sector Lead Ministries
ASF	African Swine Fever
BELA	Business Registration Agency (Ministry of Industry and Trade)
CAADP	Comprehensive African Agriculture Development Programme
CAHW	Community Animal Health Worker
CAMARTEC	Centre for Agricultural Mechanisation and Rural Technology
CRDB	Cooperative Rural Development Bank
CPD	Continuing Professional Development
CVL	Central Veterinary Laboratory
D by D	Development by Devolution
DVS	Directorate of Veterinary Services
EAC	East African Community
EBA	Everything But Arms
EBT	Exim Bank (Tanzania)
FBO	Faith Based Organization
FEWS	Famine Early Warning System
FMD	Foot-and-Mouth Disease
GDP	Gross Domestic Product
HPAI	Highly Pathogenic Avian Influenza
LINKS	Livestock Market Information Network and Knowledge System
LITI	Livestock Training Institute
LSDS	Livestock Sector Development Strategy
MAE	Mazimbu Agro Enterprises
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MEI	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
MTP	Medium-Term Plan
MWI	Ministry of Water and Irrigation
NARCO	National Ranching Company
NBC	National Bank of Commerce
NEEC	National Economic Empowerment Council
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
RIU	Research into Use
SAAFI	Sumbawanga Agricultural and Food Industries Limited
SACCOS	Savings and Credit Cooperative Society

SADC	Southern African Development Community
SHFS	Southern Highlands Food Systems
SIDO	Small Industries Development Organization
SME	Small and Medium Enterprises
SUA	Sokoine University of Agriculture
SVD	Swine Vesicular Disease
TAFMA	Tanzania Animal Feed Manufacturing Association
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
TIC	Tanzania Investment Centre
TIN	Tax Identification Number
TLRI	Tanzania Livestock Research Institute
TMB	Tanzania Meat Board
TPB	Tanzania Postal Bank
TPBA	Tanzania Poultry Breeders Association
TRA	Tanzania Revenue Authority
TVC	Tanzania Veterinary Council
URT	United Republic of Tanzania
UWAKAMA	Umoja wa Wafugaji Kanda ya Mashariki (Eastern Zone Livestock Producers' Association)
ZARDEF	Zonal Agricultural Research and Development Fund
ZSC	Zonal Steering Committee

GLOSSARY OF KISWAHILI WORDS AND PHRASES

Chipsi	Chips or 'French fries'
Dagaa	Small dried fish
HalaI	'Lawful' meat (i.e. slaughtered according to Islamic law and tradition)
Kitimoto	Roast pork
Kuku	Chicken
Mdondo	Newcastle Disease
Mifugo	Livestock (used as shorthand for the Ministry of Livestock and Fisheries Development)
Mishkaki	Kebab or skewered meat
Ndizi choma	Roast banana
Nyama choma	Roast meat (obtainable throughout the country at traditional 'fast food' stalls in towns and villages and along roads)
Nyama kawaida	'Usual' meat (as bought by the majority of Tanzanians), i.e. meat with bone, or with the meat simply sliced off the carcass.
Ondoa umaskini	Lift out of poverty
Pata chipsi!	Get your chips here!
Pumba	Maize bran
Supu	Soup (a favourite breakfast dish often made from the heads and feet of slaughtered animals)
Vijana	Young unmarried men (singular = kijana)
Wasichana	Young unmarried women (singular = msichana)

1. INTRODUCTION

1.1 Background of the study and objectives

White meat production 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 to be a significant source of foreign exchange. Livestock has been seen as a key way of alleviating rural poverty, and many services for the livestock sector that elsewhere would be a private good, have long been a public good in Tanzania. However, production and productivity in the pig and poultry industries have stagnated or even declined over a long period. Opportunities in local, regional and international markets are not well exploited, although several neighbouring countries are now expanding their share in these markets.

A considerable percentage of Tanzanian families own pigs and many more own poultry (often keeping the two species together). These are major stakeholders in the white meat value chain, and potential beneficiaries of support to it. The cultural value attached to livestock — and the esteem in some parts of civil society deriving from owning large numbers of animals — still prevail in Tanzania, even though the country has changed dramatically in many ways since Independence. It is thus particularly difficult for policy makers to agree strategy decisions (or evaluate the impact of interventions) that will facilitate the changes that are so urgently needed to improve the white meat value chain and maximize the benefits of that chain for the population as a whole.

The white meat value chain has already been quite extensively studied in Tanzania (see, for example, the bibliography provided in Annex 1 of this report). It is thus legitimate to ask: why is another report needed? The major reason is that previous studies were conducted years ago, do not detail more recent developments, and are thus out of date. Excluded from previous reports are: the demand shock effect of the 2008 economic crisis, evolving and invariably more challenging production and processing standards, changing trade agreements that have influenced trade patterns, and the increasing consolidation of global meat processing and retailing which is serving to change the structure of the value chain. This 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 white 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 key participants. The latter are supported by various business service providers (such as banks, transporters, extension agents, input providers) and are influenced by the particular business environment in which they operate. Value chain analysis goes beyond behavioural assessment of the individual participant level to examine: (a) the nature of vertical linkages between suppliers and buyers (e.g. contracts between farmers and processors) and (b) the nature of horizontal linkages between agribusinesses of the same type (e.g. farmer associations). These linkages are depicted in a value chain map, which ideally has some indications of the numbers of agents, product flow values and volumes, and key points of leverage. In many countries, such as in Tanzania, such quantification is not, however, 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. 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 (though other sustainability and performance indicators also need to be considered). Generating increased profits (as a result of 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 also a self-defeating strategy. Value chain analysis examines the economic, social and environmental outcomes of various strategic options including impact on the poor (in terms of sales, jobs, food supply) and on the environment (in terms of soils, water, biodiversity) and examines the trade-offs that can be made between these objectives to seek and 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 others, 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 used 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). The approach is, nonetheless, 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 study systematically assesses the chain from farm to fork to derive practical recommendations that will maximize the desired impact. Its objective is to provide an analytical basis for the development of a vision and strategy for the white meat value chain, though these ultimately have to be developed by stakeholders themselves.

Information for this study was gathered on a comprehensive set of issues through literature reviews, meetings with key informants, discussions, interviews (Annex 1, 2 & 3), site visits and 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, as well as an 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 January and February 2013 by the author of this report.

1.3 Brief overview of the value chain

Livestock production is a major activity in Tanzania: it contributes to national food supply, converts many feed resources to products for human consumption, provides income and is an inflation-proof

store of value. It contributes about 30 percent of Agricultural Gross Domestic Product (GDP) of which about 40 percent comes from beef, 30 percent from milk and 30 percent from small ruminants, pigs and poultry.

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: it accounts for only 2 percent of the national cattle stock, and is practised primarily by the National Ranching Company (NARCO), which has 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 and mixed smallholder farming comprise a range of combinations of crop cultivation with livestock keeping.

Urban and pen-urban agriculture contributes an increasing proportion to total livestock output. White meat — for the purposes of this study pig and poultry meat[1] — derives almost entirely from smallholder, mixed and urban/pen-urban production systems (there being little large-scale or commercial production for either species).

Livestock numbers are believed to have increased steadily for many years, echoing human population growth. The country's livestock wealth in 2012 comprises 21.3 million cattle, 13.1 million goats, 3.6 million sheep, 1.6 million pigs and 45.5 million poultry (domestic fowl, ducks and turkeys combined). 99 percent of all animals owned are in the traditional sector, and contribute to the livelihoods of 1 745 776 (or 37 percent) of the 4 901 837 agricultural households in the country.

Production of pig and poultry meat is effectively entirely for the domestic market.

National demand for white meat is about 60 000 tonnes a year and is growing in line with human population growth of about 2.9 percent *per annum* (though possibly also exceeding that, as a result of better living standards and aspirations for a better quality of life). Almost all the demand is met by local production. Imports are exclusively 'upmarket' processed and value-added products mainly from Kenya and aimed at the resident expatriate and tourist markets. Pig product imports amount to about 250 tonnes *per annum*. Poultry meat imports rose from 6 tonnes in 1997 to around 500 tonnes in 2005. As indicated, local white meat production is dominated by small-scale farmers, who cannot benefit from economies of scale and often make 'emergency' sales to satisfy their immediate needs. Small traders buy at the production point and move animals to consumers in a generally truncated chain. Marketing is characterized by a large number of traders dealing in small amounts of produce that is usually highly perishable. There is virtually no further processing of pig meat (other than chopping an animal up into family size pieces). There is some local processing of poultry into value-added and specialized products (e.g. breasts, wings, gizzards, drumsticks) by some local partially-integrated poultry enterprises but these increasingly face problems that have a negative impact on efficiency and profitability. (Problems include poor quality feeds, disease, unqualified labour, old machinery, excessive utility costs — coupled with unreliability of supply — and lack of access to operating capital.) With the exception of a very few commercial poultry enterprises, horizontal and vertical linkages in the value chain are weak and uncompetitive.

Pig feed comes entirely from local resources, with maize bran ('*pumba*') the main 'concentrate' feed. This is complemented in rural areas by scavenging (by free ranging animals) and cut and carried

[1] Rabbit meat can legitimately be considered 'white meat'. However, rabbit numbers in Tanzania are so small, and the market for it so specialized, that the species has not been considered in this report.

green material (for confined stock), and in urban areas by hotel waste and rejected food ('swill'). Traditional village poultry production is predicated on scavenging for feed with only a small amount of supplement being fed in by a few progressive farmers. Production of poultry concentrate feed is carried out by some outgrowers for their own use, by the few larger integrated producers (again mainly for their own use) and by a very small number of specialist millers. It is also a side-line for some larger wheat flour and maize meal millers (often on an 'on demand' basis) and some smaller processors. The base ingredients of all poultry feeds are whole ground white maize, by-products of the milling industry, oil (sunflower) cakes, fishmeal (ground '*dagaa*'), and imported soybean meal fortified with imported vitamin pre-mixes.

Pigs are mostly slaughtered under primitive conditions at the site of production, on crude and usually unregulated and uninspected rural slabs or, in Dar es Salaam, at registered slabs (even in the city, however, there is a great deal of unregulated slaughter). There are a few specialist retail outlets for pork, but most retail trade is carried out on an *ad hoc* basis. Poultry from the traditional scavenging sector are invariably killed at home. Some of the larger integrated poultry enterprises have electric stunning equipment; 'halal' slaughter is carried out by a registered person of the Islamic faith, and using mechanical defeatherers and cutting equipment. Apparently, without exception, the integrated producers are operating at less than — and often considerably less than — installed capacity.

Since Independence there has been no direct Government research on pig production. Sokoine University of Agriculture (SUA) in Morogoro has undertaken research into feeding and pig diseases and has experimental and demonstration units. The Tanzania Veterinary Laboratory Agency (TVLA) — a semi-autonomous unit of the Veterinary Department of the Ministry of Livestock and Fisheries Development (MLFD) — produces a Newcastle Disease vaccine but there has been little other formal research on poultry diseases, nutrition and production. In spite of livestock's importance, research has suffered from limited funding and a brain drain for many years, and research and development has suffered as a result.[2] Extension services are weak as are most other services due to limited funding, and there is little formal knowledge of pig and poultry production. 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. Pig and poultry health and nutrition inputs are available at many small private outlets throughout the highlands and indeed over most of the country.

Broad opportunities exist for enhancing the pig and poultry value chains from the producer to the consumer. This is particularly so for pigs where the value chain has no public participation whatsoever thus leaving the way clear for the private sector to intervene. Models need to be developed for both industries that can be applied and multiplicated throughout the Southern Highlands. Promoting and building the technical and financial capacity of civil society organizations as models for pigs and poultry could yield huge dividends as has been proved by one poultry producer group (see Box 1). In this regard, the Eastern Zone Livestock Producers' Association (known locally as Umoja wa Wafugaji Kanda ya Mashariki or UWAKAMA) and its processing counterpart the Tanzania Livestock and Meat Traders' Association (TALIM ETA) might serve as models.

[2] Bill Number 9 in the official Gazette No 51, Vol 92 of 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." The Act refers to pig and poultry production only under Section 18 (1): "Research on livestock carried out by the institute shall focus on the following areas: ... (b) meat - beef, cattle, sheep goats, poultry and pigs; ... (d) animal genetic resources of cattle, sheep, goats, chicken, ducks, pigeons, and other livestock species". (Note there is no express mention of pigs in the latter clause).

2. END-MARKETS

2.1 The national market

More than 95 percent of meat from pigs and poultry in Tanzania derives from local types of animals reared under small-scale low-input systems in rural, urban and pen-urban areas[3]. 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 (2010 figure) to 290 000 tonnes in 2015 and to reach 500 000 tonnes by 2030. Some 53% of Tanzania's market demand is 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); most of the increase emanated from the traditional sector. There was a concomitant increase in the consumption of meat and other livestock products, but consumption levels in Tanzania still remain well below world averages (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 white meat, in parallel with production, is dominated by the mass of poorer households whose buying habits have been conditioned for generations by the supply of low quality[4] meat 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 it is willing to pay a premium price.

The food service industry is also growing steadily and supplying Tanzania's institutional buyers. The latter include educational and military establishments as well as prisons and hospitals (whose demands are for little more than '*nyama kawaida*'). It also supplies the hotels and specialized restaurants that are developing for the burgeoning tourist business (whose requirements are for much better quality meat in general and for choice cuts in particular) and a growing number of supermarkets. As a result of the increased demand for quality meat, imports of various types of chicken products rose from tonnes in 1997 to around 500 tonnes in 2005.

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 (as a whole) 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. 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

[3] There are no truly indigenous domestic pigs in Tanzania: see Section 3.4 for a full description.
[4] When considered by western — but not necessarily African — consumers.

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.

Box 1: Putting all their eggs in one basket — Mkombozi Poultry Producers' Group

Madoi Njou used to keep a few indigenous fowl in his house compound. Three or four hens got themselves mated to a village cock, laid a few eggs, brooded them, hatched some and managed to keep some alive, which then grew to lay eggs or be eaten as a welcome protein change in the family diet. Every year by July his flock had grown to a dozen or so birds. Then — disaster! The cold weather of August brings with it the dreaded '*mdondo*' (the viral Newcastle Disease), 80—90 percent of his flock is wiped out and he has to start again. In 2002, the Australian NGO (KYEEMA) arrived and advised Madoi to protect his fowl with the then new I-2 thermostable vaccine produced at the Tanzania Veterinary Laboratories Agency in Dar es Salaam (earlier Newcastle Disease vaccines required a cold chain which made their use problematic). Spectacular success! KEEMA also trained a Village Animal Health Worker (VAHW) to administer the simple vaccine. The latter is first given by the ocular route to chicks when they are two-days old, and then regularly administered at three-monthly intervals. A vaccine against Gumboro disease, another major enemy of domestic fowl, is also given before chicks are one-week old.

In a relatively short time Madoi's flock had increased from less than 20 to more than 200, thanks to KEEMA's vaccination programme, improved housing, protection against village dogs and cats, and a little better feeding. Other villagers see the benefits and want more of the same.

The Mkombozi Poultry Producers agency, formed in January 2013, has 6 men and 4 women members. One of the latter is also the VAHW. The I-2 vaccine is sold by the PILA to regional veterinary offices and Veterinary Investigation Centres at TSh 10 per dose; they sell it on to district veterinary offices at TSh 12, who in turn sell it to the VAHW for TSh 15; The VAHW performs the vaccination for TSh 50 per bird which includes provision of her services and the vaccine. The vaccine is also marketed in retail shops and can be bought there, though the cost of buying it privately is more than buying through the public service.

The Mkombozi Poultry Producers benefit from economies of scale in terms of purchasing and marketing. The market in the local town 10 km away takes place every Monday. In the days before the group was formed individual producers took their surplus eggs and live birds (should they have any!) to the market on foot or by bicycle. Now they are producing more than 1 000 eggs a week for sale (at TSh 250 each) and somewhere between 20 and 30 live birds (which at 4—6 months old are worth TSh 10 000 for cocks and TSh 7 000 for pullets). These are farm gate not market prices since it is now worthwhile for small and medium-scale traders to collect the 30+ trays of eggs and a whole basket of live birds from the village. In the old days they could only scrape enough money together to buy small quantities of supplementary feed but now they purchase 50-kg bags at unit prices much below those paid for the smaller quantities.

Madoi is an ardent prognosticator of the values of health care, housing and nutrition for his birds as a way out of poverty ('*ondoa urnaskini*'), as a way of improving the nutritional status of his family and contributing to his children's school fees. He and the fellow members of his group preach the virtues of joint action far and wide.

The relationship between urban per capita consumption (in Tanzania 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 increase 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.

FAO estimates that the amount of domestic fowl meat produced increased from 4 902 tonnes in 1961 to 55 500 tonnes in 2011. Duck meat in the same period decreased from 1 400 tonnes to 1 320 tonnes. Output of pig meat, on the other hand, rose from 2 600 tonnes in i961 to 14 120 tonnes in 20h.

2.2 Export markets

Over the three decades between 1980 and 2009, the combined global production of red meat (cattle, buffalo, sheep, goat, camel together with minor species), and white meat (pig, poultry, chicken, turkey, duck, goose together with minor species) rose more than two-fold (FAO STAT data, 2011). The smaller increase was in red meat, which rose only 43 percent. At the end of 2009, the world was producing 33 per cent more cattle and buffalo meat, three-fifths more sheep and camel meat, and three times more goat meat. In comparison, by the end of 2009, 2.5 times more pig meat was being produced than in 1980, four times more poultry meat, ten times more goose meat, six times more duck meat, four times more chicken and three times more turkey.

Pig meat is the most important meat in the world. More meat is produced from pigs than from all other ruminant species combined. The rapid increase in production between 1980 and 2009 took place mostly in China, Japan and Southeast Asia. The rapid human population growth in China — coupled with Asian dietary preferences — has been largely responsible for the increase in pig output. The rapid increase in China has been made possible in part by the switch from rearing traditional native breeds (which tend to be very fat but not very prolific) to 'European' breeds (which have a much greater body mass, more rapid growth rates and considerably higher prolificacy).

In 1980, production of all red meat was more than two and a half times that of all poultry meat. During the reference period this situation was dramatically reversed. Chicken meat production overtook that of beef (including veal) and buffalo meat as the 20th century closed and the 21st opened. By 2009, production of white meat exceeded that of red meat by about 10 million tonnes per year. More than 85 percent of all the poultry meat produced is chicken: turkey contributes about 6 percent, duck about 4 percent, goose under 3 percent and minor species (including guinea fowl, pigeon and Japanese quail) contributing the remaining 3 to 4 percent. Although greatest in quantitative terms (in both 1980 and 2009), the growth in chicken meat production was slower (but nonetheless impressive at 10 percent *per annum*) than that of ducks (which showed 20 percent annual growth) and goose (which showed a spectacular 30 percent annual growth). Turkey meat had the slowest growth in production at just over 7 percent per year.

The global output of meat was projected to grow to 283 million tonnes in 2010, an increase of 60 million tonnes (27 percent) over the 1998—2000 period. Nearly three-quarters of these gains were expected to be in developing countries. An average annual growth of 2.2 percent in the global meat sector is thought to be possible in view of technical innovations and restructuring, particularly in the poultry and pig meat sectors. This is slower than the 3 percent average annual gains between 1992 and 2000. Meat output in developing countries is projected to grow at 3 percent annually (compared with just 1.2 percent in developed countries). These trends continue the shift in world animal

production from developed to developing countries (which have characterized livestock development from the mid-1980s onwards) and also reflect changing patterns in demand. By 2010 nearly 80 percent of ruminant animals (and slightly less than 70 percent of pigs and poultry) were being reared in developing countries. Developing countries' share of global animal production was projected to increase to 59 percent by 2010 (a substantial increase from 54 percent in 2000 and 46 percent in 1992).

The poultry sector will continue to be dynamic and is expected to grow at an annual rate of 3 percent, generating over 40 percent of the 60 million tonne increase in global meat production projected for 2010. Pig meat will account for approximately 38 percent and beef for 17 percent of the remaining output gain.

There are no recorded exports for pig or poultry meat from Tanzania. From the foregoing analysis, however, the potential is enormous. There are caveats, however, to export 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.

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. (Current slaughter facilities at the main urban poultry market in Dar es Salaam — inspected and certified by the Tanzania Food and Drugs Authority (TFDA), the Ministry of Health and the Ilala Municipality — provide an indication of the problems to be overcome — see Figure 2). 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 maintained scrupulously clean and guaranteed free from bacterial and other pathogenic contamination (Figure 2). Current export destinations can be expected to continue to take Tanzania products, at least for some time, but the dream of access to the European Union market is not likely to materialize.

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

Figure 2: The poultry slaughterhouse at Kisutu market, central Dar es Salaam, 2013 — food hygiene and safety

3. THE WHITE 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. The chain usually involves (an often complex) combination of physical changes, inputs from various producer services, transfers of ownership and deliveries. Commodity value chains are increasingly recognized as providing a solid framework for the analysis of the public and private sector stakeholders 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, uncoordinated, and uncontrolled (in spite of being over-regulated). It is dominated by large numbers of smallholder pig and poultry owners, an unknown but undoubtedly immense number of middlemen who operate across every link, and a similarly unknown number of individual sellers and small processors (who, for example, may cut pig or chicken carcasses into smaller pieces). The latter supply restaurants, cafes and street vendors, or put their products on the market in other ways, but mainly lack the technical and financial ability to work efficiently and profitably. The horizontal and vertical linkages of the value chain are generally weak and uncompetitive and in need of support and strengthening.

In Tanzania the 'white meat' value chain includes live pigs and poultry, raw (fresh) pig and poultry meat, processed meat products and by-products from pigs and poultry that are sold uniquely to the domestic market. Primary processed meat and meat products are derived after animals are slaughtered and include whole and part carcasses, offals (liver, lungs, heart and kidneys of pigs; gizzards and liver of poultry) and other by-products such as feathers, heads and feet. Secondary processed products derive mainly (if not solely) from the small commercial poultry sector where there is some vertical integration. Participants include primary producers; traders in animals, meat and by-products; processors, butchers and consumers. Most participants are not specialized and their functions relate to various segments of the value chain. Many primary producers, for example, trade animals, and some upstream participants — such as butchers — trade animals and meat as well as undertaking primary processing in order to produce higher value cuts.

3.1 The value chain maps

The value chain maps (Figure 3) show that the whole is suspended from the consumer. If the link to the rest of the chain were to be 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 the product increases at each stage until it reaches the consumer. Although it is possible to provide a succinct list of most of the participants in the chain (see Table 2), pivotal roles are played by the middle links of the chain through which all products must pass. Many participants in the chain (see Table 3) occupy more than one role. Some small-scale livestock producers (but especially those working on a slightly larger scale) also act as processors and retailers. Further up the chain some processors are also wholesalers and retailers, operating in both the domestic and export markets. Primary producers may sell cattle, goats or sheep in several key ways: directly through a market, to a trader, or to a processor (they may also use a combination of all outlets). A trader may similarly sell to another trader, directly to a wholesaler or retail butcher, or to a processor (or again, may broaden his options by using a combination of all channels). Processors, especially the smaller enterprises, may buy animals directly from farmers or from traders, and sell the products to wholesalers or retailers.

Every link in the value chain relies on goods and services in order 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), machinery for slaughtering and processing, and proper/hygienic presentation of products (at the retail level). Technology has a key role in improving competitiveness, and especially vis-à-vis Tanzania's near neighbours, which are operating in — and competing for — the same market.

Table 2: List of supply and service participants in the White Meat Value Chain

Core participants	Service suppliers
• Producers (traditional primary producers (pigs and poultry), semi-commercial and commercial producers (pigs), integrated enterprises (hatcheries > day-old-chicks > growers > slaughterers > processors) (poultry), outgrowers (broilers) • Traders and agents (pigs and poultry) • Slaughterers (pigs and poultry) • Wholesalers (pigs and poultry) • Butchers/point of sale (rural, urban, quality butcheries and supermarkets) (pigs and poultry) • Meat product retailers (street vendors, shops, supermarkets) (pigs and poultry) • Cafés and retailers ('kitimoto' for pigs, poultry) • Importers (live pigs/birds, eggs, meat and meat products)	• Research • Training and Education • Institutions • Extension service • Inputs (Veterinary, • Feed) • Transport • Financial services • Slaughterers • Meat inspectors • Associations (producer, trader, processor) • Tanzania Meat Board

Figure 3a: The Pig/Pork Value Chain in the Southern Highlands

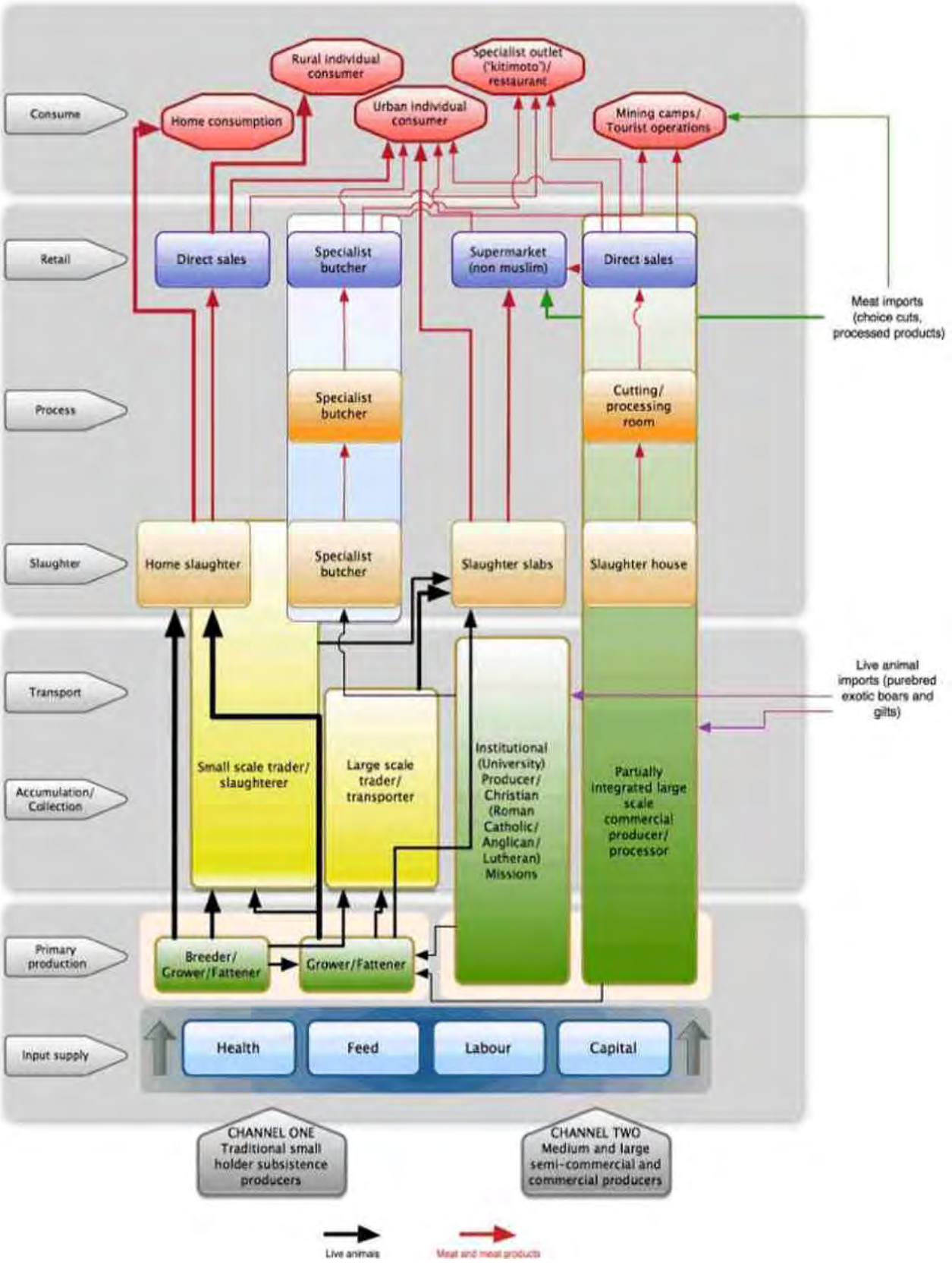


Figure 3b: The Indigenous Domestic Fowl Value Chain in the Southern Highlands

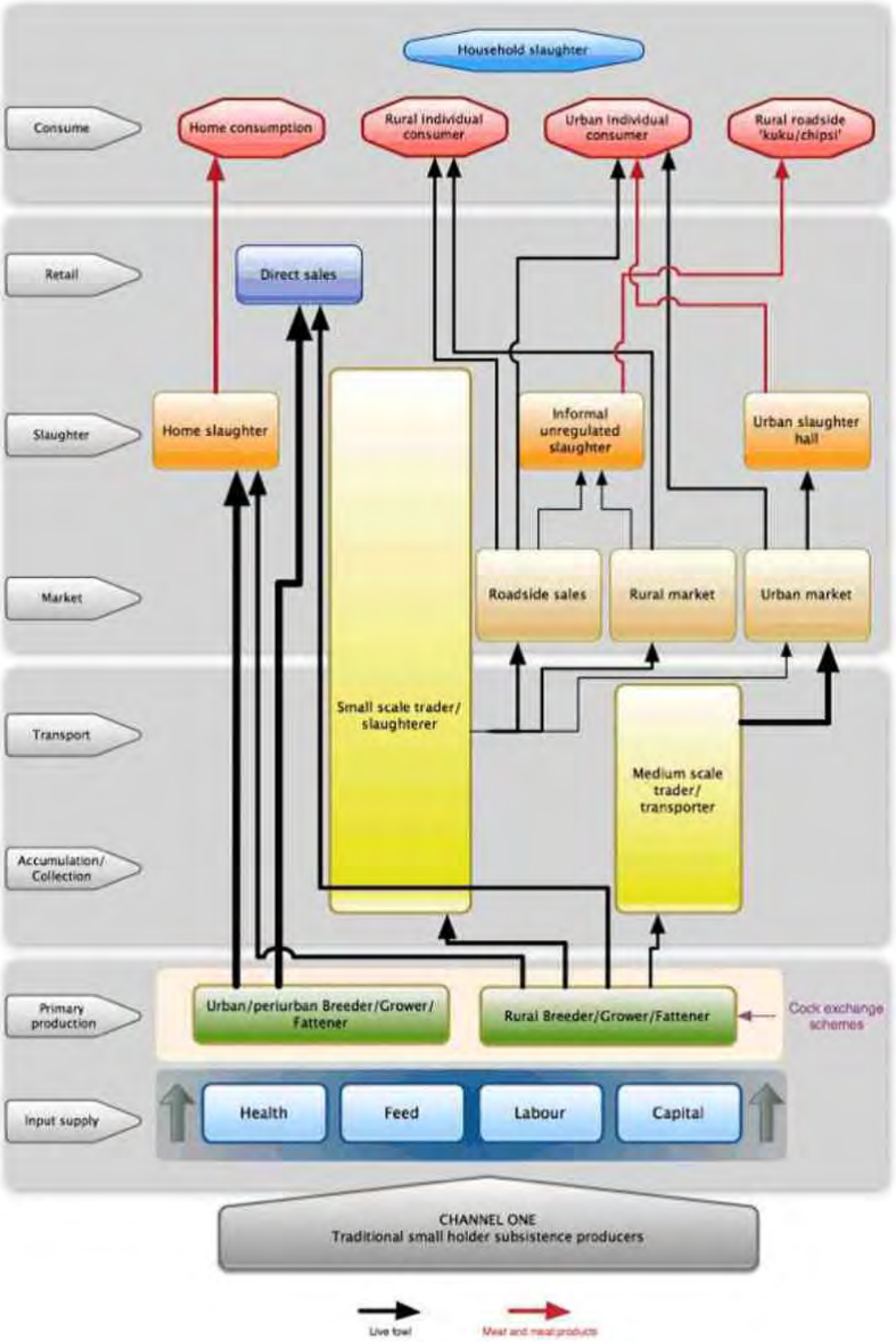


Figure 3c: The Broiler Value Chain in the Southern Highlands

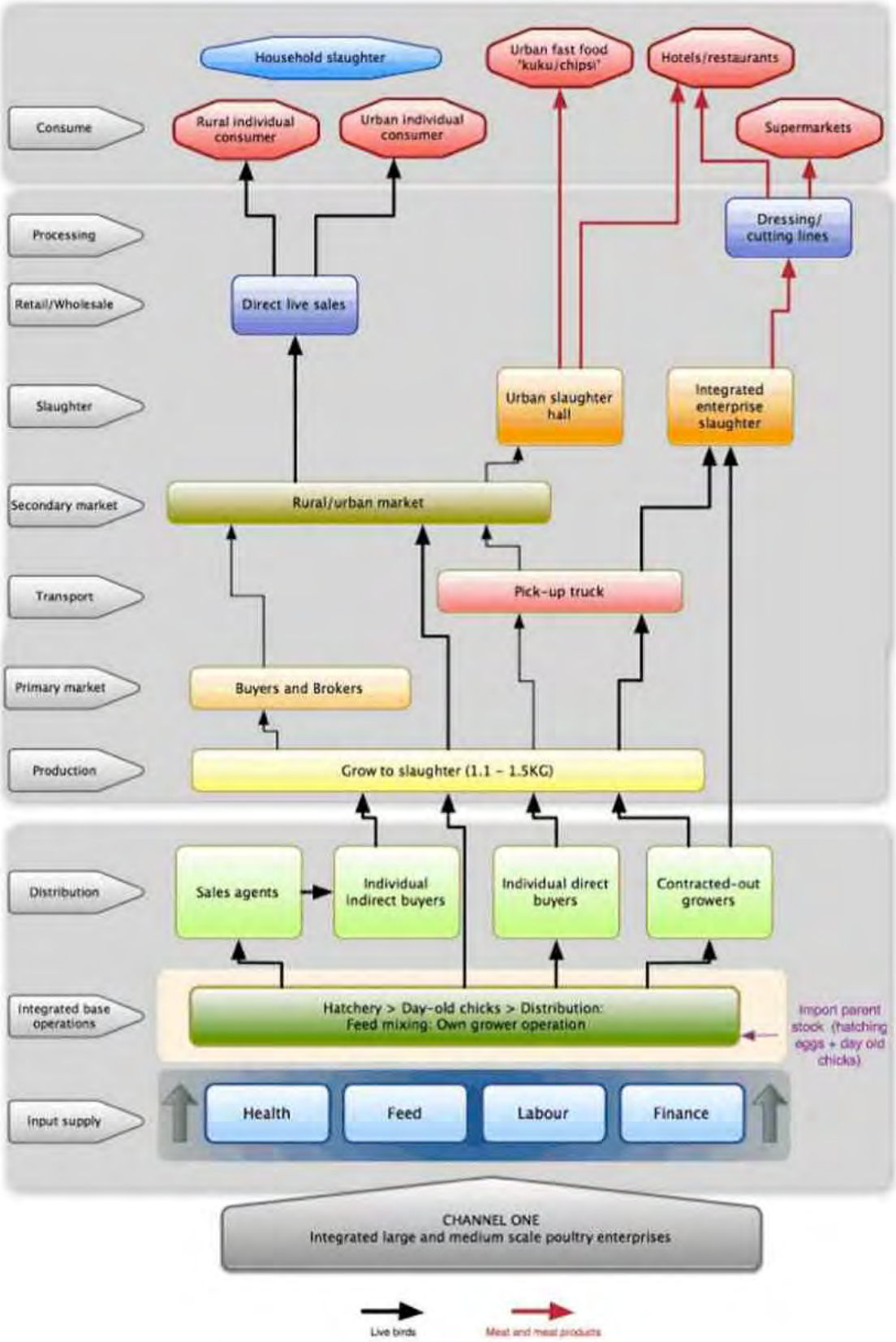


Table 3: Participants and functions in the Southern Highlands white meat value chain

Participants	Functions
Research	Pig and poultry research is very limited. Uyole Agricultural Research Institute in Mbeya has responsibilities for training and extension services. The Iringa Veterinary Investigation Centre is the reference laboratory for diseases in the Southern Highlands.
Feed manufacturers and suppliers	Several large-scale (and numerous small- and medium-scale) feed compounders operate in Dar es Salaam and in the main towns in the Southern Highlands. Numerous small private retailers (c. 500 have trading licences) sell small quantities of feed, feed additives and supplements. The main products are 'Chick Starter' (and a more expensive version containing a coccidiostat), 'Layers', 'Broiler Starter', 'Broiler Growers' and 'Broiler Finisher'. In 2013 all products were in the form of mash although some firms have — or will shortly have — pelleting capacity. There is no regular production of pig compound feeds. Many small producers buy ingredients and mix their own concentrate feed.
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 are kept by traditional smallholders who keep mixed breed pigs and indigenous domestic fowl types. Outgrowers purchase day-old broiler chicks direct from integrated poultry enterprises or through their agents. Several Christian mission stations keep better quality pigs that serve as a reservoir for distribution to local smallholders.
Traders	Primary buyers and secondary buyer-agents operate throughout the region. Trading usually takes place at the point of production. Some long distance trade towards the Dar es Salaam market by road transport is undertaken but most is more local.
Slaughterers and processors	The majority of pig-slaughtering takes places 'informally' and is done at — or very close to — the point of production. Pigs are sometimes slaughtered at rural slabs: these are often not registered and not inspected. There are many registered pig slaughter slabs in Dar es Salaam (and other main towns) that are subject to control and meat inspection (coverage is not yet loo percent). There is one specialist processor who turns pig meat into value added products in Morogoro. Poultry are usually slaughtered at the point of consumption. Kisutu market in central Dar es Salaam is the principal recognized controlled slaughter point for poultry. Three integrated poultry enterprises have slaughtering, dressing and processing lines (though one is not currently operating).
Retailers	Pig meat is usually retailed through recognized but informal businesses. There are specialist eating-establishments for pig meat (called '*kitimoto*' locally); processed products (sausages and bacon) imported from Kenya or from very small local processors are sold in many non-Muslim supermarkets. Live poultry are sold at roadside stations and in rural, suburban and urban markets. Hotels, restaurants and supermarkets buy poultry at some larger markets. Whole dressed birds and speciality cuts are available at most supermarkets and some specialized retail shops.

White meat production in the Southern Highlands is based on traditional systems that use very little modern technology. Most pigs originated as imported European breeds and have become 'indigenized' (and in part degraded because of inbreeding). Domestic fowl are also indigenous types that lay small discrete clutches not more than three times per year. The 'modern' pig sector is represented by a few herds living on Christian mission stations and private farms. The latter are mostly owned by European settlers or long-term expatriates who control breeding, provide balanced feed rations and regular veterinary care.

The modern poultry sector is largely made up of small- to medium-scale producers who own between 200 and 2000 birds and provide housing, balanced feed and veterinary care. The birds are obtained from the main integrated poultry enterprises that produce day-old chicks. In traditional systems, both pigs and poultry derive feed almost entirely from scavenging. Pigs that are housed usually receive some maize bran as a basal ration but are mainly raised on cut and carried green feed. Most pigs and poultry receive little in the way of animal health treatments such as protection from ticks (and the diseases they carry) or control of internal helminths (though an increasing number of poultry in the traditional system are now being vaccinated against Newcastle Disease by a

thermostable vaccine produced by the TVLA in Dar es Salaam). Consequently, many animals die prematurely — death rates are particularly high in piglets and very young chickens — and overall growth rates are low. Overall output is thus greatly reduced, in particular because growth rates are very slow due to a combination of poor health and inadequate malnutrition.

Several technological interventions are available but, for the most part, are not used by producers and probably not even communicated to them by technical staff. Some are, indeed, too sophisticated or expensive for use in regional herds and flocks in their present state of development. The low adoption of available technologies is caused by poor extension services, difficulties in gaining access to technologies (in terms of both cost and 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. Its impact is limited, however, by low staffing levels and limited budgets. Similarly the official extension services suffer from the same problems.

The 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. Such interventions include:

- strict implementation of the tick control regime recommended by the veterinary authority;
- vaccination against epidemic and endemic diseases, both 'trade' and 'production';
- regular (daily at least) access to water; and
- use of mineral and vitamin supplements to target groups.

The failure to take advantage of available, effective, cheap and simple technologies will inevitably result in an even greater loss of competitiveness, since Tanzania's livestock-producing and processing peers in neighbouring countries, especially Kenya, are making widespread use of them.

3.3 Input Supply and Demand

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

- animal health products, including drugs and vaccines;
- nutritional supplements (such as concentrates, mineral and vitamins);
- fixed and mobile equipment and tools;
- breeding animals (mostly males but also females for pigs); and
- credit.

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

Access to extension services is apparently not quite so limited as access to credit but is nevertheless not 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 these for their livelihoods.

Public veterinary services are supposedly widely available but there is clearly inadequate provision. Only 29 percent of households, according to the NPS, use any form of vaccination, and the 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 able to supply a wide range of drugs (both local and international), health supplements and nutritionally-balanced compound feeds (Figure 4).

Figure 4: Sales agent for chicks and feed in Iringa (left); compound poultry feed manufactured in Njombe (right)

There is considerable purchased concentrate feeds in the broiler section of the white meat chain. Several maize and wheat flour millers produce animal feeds: there are several specialized companies in Dar es Salaam and its environs, and many more in the larger towns (see Annex 4). Millers who produce feed are, in effect, using a by-product — wheat or maize bran — of their operations to produce a high-value product whereas specialized firms have to obtain their ingredients from a variety of sources. They obtain maize and wheat bran from internal resources: sunflower cakes from the local oil milling industry (limited amounts of cotton seed cake are also used), and fishmeal (made from pounded 'dagaa') mainly from Lake Victoria. Soybean meal is increasingly used as a protein replacement for fishmeal; imported meal from India is preferred, as it is better quality, more consistent and cheaper than the local product. The Tanzania Animal Feed Manufacturing Association (TAFMA) represents animal feed manufacturers. Compound feeds are more widely available in populated areas than in remoter parts of the country where most pigs and poultry are found. Many medium-scale producers resort to mixing their own compounds from individual commodities, especially in the rural areas and especially for pigs. This imbalance between location and the availability of inputs — both health and nutritional — is a fundamental problem for the chain.

The import and distribution of most veterinary drugs and vaccines have been privatized but there are exceptions with some specified biologicals. The thermostable I-2 Newcastle Disease vaccine, for example, is produced only by the TVLA. Government exempts all specialized livestock-related inputs from import and sales taxes. These measures are intended to reduce the costs of livestock production. There are very few distribution centres in rural areas, especially in remoter pastoral areas, and producers are therefore forced to travel long distances to towns to purchase inputs. Producers can obtain some inputs at rural markets and other informal distribution points but the risks here are that the products are counterfeit or have been diluted and there is little quality control. The procurement of inputs from informal channels — combined with the administration of drugs by untrained livestock keepers — can make the cure worse than the disease.

Maize bran is the major by-product of the flour milling industry and a potential major feed supplement for white 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.

The National Microfinance Bank (NMB) and the Cooperative Rural Development Bank (CRDB) are the main and largest providers of credit to agriculture 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 SME loans for processors. Collateral requirements are strict and until recently livestock has not been accepted as collateral. Recently, however, NMB has said it will accept livestock as collateral provided they are individually identified and at least one entrepreneurial pig and poultry producer has received a loan following the presentation of a detailed business plan (see Annex 8). Interest rates are based on Treasury Bills plus i or 2 percent and range from 19 percent for Small and Medium Enterprises (SME) 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), the National Bank of Commerce (NBC) and Exim Bank Tanzania (EBT) operate in the Southern Highlands (see Table 4) 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[5] and has made a start with the Agriculture Window Unit in the Tanzania Investment Bank.

Table 4: Banks operating and providing loans in the Southern Highlands

Item	Bank				
	NMB	**CRDB**	**TPB**	**NBC**	**EBT**
Loan amounts (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	Offer a whole range of financial products to individual clients: these include savings, loans, money transfers, 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 loans to rural agriculture comprise about 25 percent of its total lending. NMB has extended significant lending in agriculture whereas TPB, NBC and EBT continue to lend to individual farmers as demand arises.				
Financing sources and capital structure	SACCOS and other MFIs are able to generate funds from banks, NGOs and their own members.				

Source: SIDO, 2009

[5] 'Kilimo Kwanza' aims to utilize the private sector to develop agriculture.

Box 2: Let them eat cake — supplements and concentrate feed manufacture

There is strong and growing demand for concentrate and supplement feed for the white meat chain and for table egg production (poultry feed production increased from 490 000 tonnes in 2001/2002 to 574 90 tonnes in 2006/2007). The market for poultry feeds comprises a range of products including: Chick Starter, Chick Special Starter (with a coccidiostat included), Layers Mash, Broiler Starter, Broiler Grower and Broiler Finisher: each has a different formulation and is sold at a different price. 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); there are also many large-, medium- and small-scale feed manufacturers (as well as many small-scale village millers) who produce animal feed as well as 'home mixers'.

Some large millers are equipped with 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, fishmeal (powdered '*dagaa*'), locally grown whole ground soybeans, meat and bone meal, salt, lime and superlick. There are legal requirements to declare the ingredients, and to display the proximate composition of the mix on the packet, but these are not enforced. Larger firms usually have analyses done by commercial laboratories (usually the Tanzania Bureau of Standards, Tanzania Industrial Research Development Organization or Sokoine University).

There is some interest in increasing the social contribution of feed firms. International TanFeeds Ltd is a shareholding company based in Morogoro that purchases cereals, cereal by-products and other feed ingredients from farmers and processes them into animal feed. The company was formed in 2008 but has been producing feed since 2005. It aims to develop a value chain starting with smallholder crop farmers, moving through rural and urban livestock keepers and finally reaching consumers of livestock products. The mission of the company is to produce high-quality animal feeds in order to promote efficient livestock production; it envisages adding value to crops and turning by-products into high quality animal feed. Maximizing local feed resources is a key to providing a sustainable market for smallholder farmers. The vision is to become a leading animal feed producer based on efficient use of locally produced resources. The management includes specialists in animal production, nutrition and health and is in the process of becoming the most modern animal feed company in Tanzania with the introduction of new machinery and various new processing technologies.

3.4 Production

White meat production in Tanzania is overwhelmingly the domain of small-scale traditional producers. It is commonly estimated that up to 99 percent of white meat production is derived from the traditional sector, and there can be little doubt that this situation will continue well into the future. Overall, the prognosis for production in the white meat value chain to change is not very positive; in the case of poultry, however, there are medium-term possibilities for increasing the output of better quality meat.

Pig and poultry genetic resources

There are no truly indigenous domestic pigs in Tanzania, Christian missionaries, of German or Swiss origin, first introduced domestic swine at the end of the 19th and beginning of the 20th century. There has since been a long tradition of pig breeding at missionary stations, for example, at Ndanda (Mtwara) and Peramiho (Songea, Rukwa); the latter had 180 pigs in January 2013. It may be presumed that the early pigs of these missionaries were local to their areas of origin.

Pure-bred Large White pigs from England were bred and reared at Kongwa Ranch in Dodoma region in the 1950s and 1960s but these have been allowed to die out. Some European settlers in the Southern Highlands — as well as in the northern area around Arusha — also kept pure-bred pigs up to the 1960s. Pure or crossbred commercial production is now on the increase in the northern areas.

There has apparently been little renewal of breeding stock in the 50 years since Independence (although import 'data' for the period — in terms of both numbers and value — are unreliable and often conflicting). There is anecdotal evidence (for example, from the Regional Veterinary Officer for Songea Region, and the Livestock Manager of Peramiho) that young breeding males — of the Large White, Landrace and Saddleback breeds — were imported from Germany and Holland by Benedictine missionaries to Peramiho during the 1960s and 1970s. According to records in the 'Import Section' of the Ministry of Livestock, 22 pigs — including Landrace, Large White, Duroc and Sussex Cross — were imported from Kiambu in Kenya in February 2009 by a private company based in Arusha. A further 54 pigs were imported from Kenya in October 2010, and five boars were imported from Denmark in October 2011 by a Tanzania-Danish private company with a land holding near Dar es Salaam. Breeds imported in the last consignment were Large White and Duroc (Figure 5).

The absence of systematic breeding, poor husbandry practices, genetic drift and possible mutation have resulted in pigs in the smallholder sector being of varied genotype and phenotype (Figure 5). In a study of the Southern Highlands, 78 percent of pigs had lop ears (Landrace type?), and were significantly heavier with a longer body length than those with erect ears (Large White?). White pigs (28 percent) were more common than black and white (24 percent) and solid black ones (20 percent) with other colours and combinations of colours accounting for the remaining 28 percent of the population.

Figure 5: Pig genetic resources in Tanzania: Saddleback boar at Peramiho Benedictine Mission; Duroc and Large White boars on a commercial farm near Dar es Salaam; mixed-breed sow and boar in the free-ranging traditional system

Some ‘pure-bred’ animals are kept on institutional farms (for example, at Sokoine University of Agriculture or SUA) and some on mission stations (e.g. by the Benedictines in Peramiho and Ndanda, and the Anglicans in Tanga Diocese). A very few pure-breds are also kept by progressive private companies and entrepreneurial farmers. Mission stations continue to maintain high-grade animals and to try to limit inbreeding by exchanging young breeding males between themselves (for example, Uwemba Mission Centre in Njombe and Peramiho in Songea). Less than 5 percent of small farmers have access to a pure-bred or improved boar, and are further limited by financial considerations. Thus, in the small-scale system there is little control of the reproductive process, with females usually being bred by free-roaming boars within a village group.

At least six different species of poultry are kept by producers in Tanzania (see Figure 7). Domestic fowls (‘chickens’) are by far the most numerous species, being 40 times more common than ducks and over 400 times more common than turkeys. Pigeons, guinea fowl and geese are minor species. Guinea fowl are kept by relatively few smallholders and are not fully domesticated birds as they always lay their eggs in the bush away from the homestead. Geese are essentially a hobby bird. Unlike neighbouring Kenya and Zimbabwe, where ostriches are important components of the guild of domestic poultry, there are no ostrich enterprises in Tanzania.

Five ecotypes of local domestic fowl — Mbeya, Morogoro-medium, Ching’wekwe, Kuchi and Singamagazi — have been identified. The Singamagazi and Kuchi (see Figure 6) types are considerably heavier and larger than the other ecotypes with longer shanks and produce larger eggs. Within all ecotypes, naked neck birds (an adaptation to heat) are not uncommon. The ecotypes differ both in productivity and in disease-resistance potential. Ducks in Tanzania are mainly if not entirely Muscovy (*Cairina moschata*) rather than the common duck (*Anas platyrhyncos*) probably because this species is less dependent on water.

Exotic breeds include White Leghorns, Rhode Island Red, Light Sussex and Plymouth Rock and these types are often used in cock exchange schemes which aim at modifying the genetic make-up of the native types in the hope of improving their growth rates and egg production. The commercial sector almost exclusively uses hybrids such as Hi sex, Hybro, Shavers (I, II, III), Boyan Brown, Boyan Gold Line, Arbo Acres, Kasila, Ross 208, Nera and Hubbard. Commercial grandparent and parent stock have been imported either as eggs or day-old chicks from Kenya, Uganda, South Africa, Zimbabwe, Malawi, Mauritius, Egypt, the United Arab Emirates, Israel, France, Germany, the Netherlands and the United Kingdom.

Figure 6: Local resources of domestic fowl: Morogoro medium hen and Kuchi cock

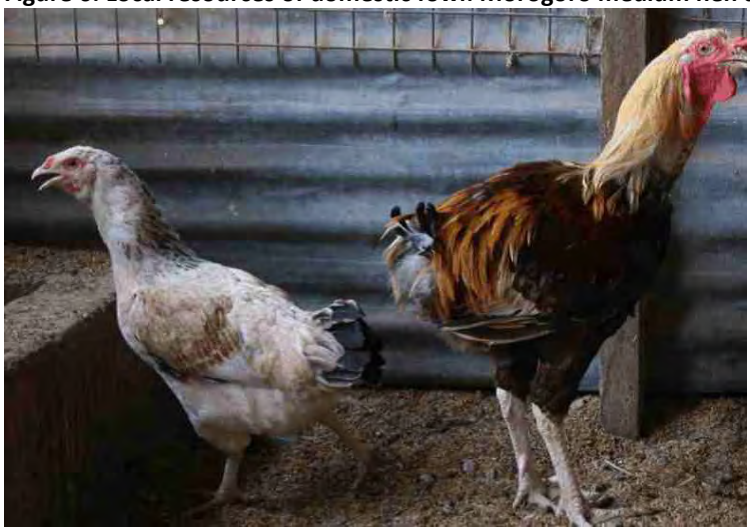


Figure 7: Poultry genetic resources in Tanzania: the domestic fowl, Muscovy duck, turkey, pigeon, guinea fowl and goose

Herd and flock demography

At a national level, the pig population is made up of 17.6 percent breeding males, 44.4 percent breeding females, 8.5 percent castrated males, 13.4 percent young males and 16.1 percent young females (URT, 2012).

Commercial pig production is limited to institutions and those few farmers who have a regular income and are able to invest in purchased feedstuffs. There were only 8 316 pigs on large-scale

farms in 2008 (representing 0.53 percent of all standing stock).[6] The remaining 99.47 percent of pigs are owned by the 18 percent of households that keep livestock (or 11 percent of all households). The average numbers of pigs is 3.04 per unit (with a range of between 2 to 48 heads). Some 93.7 percent of owning households have 19 or less pigs and 69.2 percent of all pigs are kept in the two household groups with the least number of animals: the percentage of pigs owned rises to 84.4 for households owning 14 pigs or less. Thus, only 15.6 percent of pigs in the traditional sector are kept in units of 15 heads or greater (Table 5). Mean herd sizes in the Southern Highlands appear somewhat larger than the national average where they are 7.6 ±4.4 for all ages combined and include 1.9 ± 0.78 for breeding sows (range 1—4). Many pigs in urban areas are totally confined in rudimentary though airy houses made of local materials (wood and thatch); others are kept in appalling conditions of housing and drainage that can best be described as porcine ghettos (Figure 8). In rural areas most pigs are allowed to roam free, or are tethered during the day and housed at night.

Table 5: Household ownership and pig herd sizes in Tanzania, 2008

Number of pigs in household	Household rearing pigs		Number of pigs		Mean number of pigs per household
	Number of households	% of all owning households	Number	% of total pig population	
#4	437 951	84	771 324	48.8	1.76
5-9	51 708	110	323 173	20.4	6.25
10-14	20 918	4	240 315	15.2	11.49
15-19	7 023	1	111 892	7.1	15.93
20-24	2 115	0	44 821	2.8	21.19
25-29	730	0	19 562	1.2	26.80
30-39	971	0	31 146	2.0	32.08
$40	817	0	39 164	2.5	47.94
Total/overall	521 872	100	1 582 396	100.0	3.03

Source: adapted from URT 2012

Figure 8: Urban pigs in Dar es Salaam under relatively good (left) and appalling housing conditions (right)

In the mid-1990s there were 18 000 cross-bred dairy cattle, 37 000 pigs, 40 000 goats, 1.2 million laying hens, 0.6 million broiler chickens, 132 000 local fowl and 37 000 ducks within Dar es Salaam's city boundaries, Compared with the 1980s, dairy cattle had increased 4-fold, poultry 3.5-fold, pigs 4.5-fold and goats 15-fold. In Morogoro town in 1999 there were more than 5 300 improved dairy cattle, almost 2 000 goats, some 260 sheep and almost 1 000 pigs. At this time in Morogoro, 4.7 percent of all households — and 12.3 percent of households keeping livestock — herded pigs either under total confinement (required by a municipal by-law) or stalled at night and free roaming during the day; the average number of pigs kept was 10.5. In Mbeya, 17.2 percent of all households — and 22.2 percent of households owning livestock — kept pigs with an average herd size of 4.6. Pigs are

[6] The definition of a large-scale farm is one that is more than 20 hectares in size or keeps more than 50 head of cattle or 100 head of sheep or goats

usually free ranging or tethered in Mbeya Region. As might be expected from the fewer numbers and lower densities, the number of households owning pigs in Dodoma Region is only 9 percent.

Men nominally own the majority of pigs but women provide most of the labour associated with production (at least up to the market and slaughter stage). It would appear that many farmers keep pigs on an opportunistic basis. In Iringa District, for example 70.7 percent of households with pigs kept only 'growers', whereas 48.8 percent had 'adults' and only 21.9 percent had piglets. Almost all pig keepers feed maize bran to their pigs at some time; about one third also provide oil seed cakes; only a minority, however, provide minerals (13.9 percent), salt (5.6 percent) or blood meal (2.8 percent). Other feed — including rice bran, green leaves, vegetables, potatoes, household waste and residues from home brewing — are provided on an irregular and opportunistic basis.

Poultry production systems are categorized into four main 'sectors' by FAO (Table 6). In Tanzania there are no producers in Sector 1, few in Sector 2, a few more in Sector 3, but with an overwhelming majority in Sector 4. The official data shows that 64 percent of all rural households own indigenous poultry but this is almost certainly an underestimate. Poultry production in Tanzania primarily remains the domain of traditional smallholder producers. Almost 99 percent of indigenous poultry is kept by small-scale traditional producers whose birds mostly scavenge for their food (only 1.1 percent is kept on large farms). The majority of ducks and turkeys also live on small farms. Estimates of the numbers of layers in 2008 were 1.3 million birds and 0.6 million broilers. The average numbers of indigenous fowl is 11.1 per unit, with a range 1 to 300+ head. Some 98.67 percent of owning households have 49 or less birds and these account for 91.5 percent of all indigenous fowl (see Table 7). Mean flock sizes in the Southern Highlands appear somewhat larger than the national average where they are 7.6 ±4.4 for all ages combined, and include 1.9 ±0.78 breeding sows (range 1-4). Many poultry in urban areas may be totally confined in rudimentary though airy houses made of local materials (wood and thatch); others are kept in appalling conditions of housing and drainage that can best be described as poultry ghettos (see Figure 8). In rural areas, almost without exception, poultry are allowed to roam free during the day, but are provided simple housing at night or are allowed to roost in the homes of their owners. In urban areas, they are tethered during the day and housed at night. Very few rural households keep non-indigenous birds (although there have been cock exchange schemes — usually instigated by NGOs — that have introduced exotic roosters to replace local birds). Most households that do maintain a 'flying flock' of broilers have to renew it constantly by buying day old chicks; birds are sold at about eight weeks of age. Many urban and suburban families keep larger flocks of broilers.

Table 6: FAO classification of poultry production systems

Sector designation	Production system	Characteristics
1	Industrial integrated	High level of biosecurity; birds/products marketed commercially (e.g. farms that are part of an integrated broiler-production enterprise with clearly defined and implemented standard operating procedures for biosecurity)
2	Commercial (1)	Moderate to high biosecurity; birds/products usually marketed
3	Commercial (2)	Low to minimal biosecurity, birds/products entering live bird markets (e.g. a caged layer farm with birds in open sheds, a farm with poultry spending time outside the shed, a farm producing chickens and waterfowl)
4	Village or backyard production	Minimal to no biosecurity; with the birds products consumed locally

Table 7: Number of households owning — and flock sizes of — indigenous poultry in Tanzania, 2008

Number of birds in household	Households rearing birds		Number of birds		Mean number of birds per household
	Number of households	% of all owning households	Number	% of total fowl population	
#49	3 728 714	98.6	38 326 920	91.5	10.28
50-99	47 148	1.2	2 691 593	6.4	57.01
100-299	5 260	0.1	681 761	1.6	129.61
$300	573	0.0	195 331	0.5	340.89
Total/overall	3 781 695	100.0	41 895 605	100.0	11.08

Source: adapted from URT, 2012

Based on limited studies of the traditional village poultry system in Tanzania (as well as studies from other parts of Africa) a typical household flock in the village system would comprise 1 or 2 cocks and 4 to 12 hens of laying age. The flock would also have 8 to 20 chicks and 4 to 10 growers. Direct observations have shown the ratio of chicks to growers to adults to be 10:10:14.

A model that included improved husbandry, veterinary interventions and better nutrition showed that it should be possible to change the chick to grower to adult ratio to 34:32:1.

Individual animal output

In addition to producing meat and eggs, pigs and poultry have many important non-physical and even non-financial outputs: they provider manure, are repositories of wealth and used as media of exchange. Livestock also have roles in religious traditions and other customs, as well as for dowry payments.

Overall performance is far from optimal as a result of low levels of management, inadequate and unbalanced nutrition, poor provision of health services and the stress to which these factors lead. Some 'information' provided by producers is clearly incorrect and arises from wishful thinking, other 'information' is partial knowledge gleaned from the rare visits of veterinary and animal production personnel, or from the application of 'standard' parameters that cannot be achieved under local conditions.

In free roaming village pigs inbreeding is a major problem and depresses performance; it also gives rise to abortions, stillbirths and congenital morphological deformities. Piglets are born small and grow slowly. Puberty is delayed until gilts are approaching one year old; there are long intervals of eight or more months between parturitions and a litter usually comprises 5 or 6 young. Most farmers err on the high side when providing information on litter sizes and speak of 9 to 12 young per parturition: the higher number can be achieved in exceptional cases if pigs are housed, carry a fair proportion of genes from improved breeds, and receive adequate feed and appropriate health care (Figure 9). A sow's longevity is curtailed if (as is often the case) she has to be sold to provide for some pressing cash need of the family. As a result, the lifetime output of piglets by a gilt/sow is usually less than 40 (whereas it should be in the region of at least 80). Growth rates are slow to very slow, averaging 200-250 g/day (whereas even with mediocre management they ought to be 400—500 g/day), and slaughter live weights of 70—80 kg (to give a carcass of 50—55 kg) are not reached until 9—12 months of age. In one particular study of Mbeya Region, the age at first farrowing was 13.8 months ±2.5 months; the interval between successive farrowings was 12 months ±2.2 months; the total lifetime farrowings were 6.4 ±0.7; the litter size at birth was 6.6 ±1.), which was reduced by weaning at 3.4 months ±0.4 months to 4.3 ±0.9. The overall mean birth weight was 0.9 kg and the weaning weight 10.8 kg. The average mature boar body weight was 57 kg and for sows 54 kg (although there was a wide range from 30 kg to 64 kg).

Similar strictures affect the individual output of poultry, and performance is far from optimal. Although there is increasing use of the l-2 thermostable Newcastle Disease vaccine and some use of the vaccine against Gumboro disease (also known as Infectious Bursal Disease), there are still millions of smallholder producers who do not use — or are ignorant of — the benefits of simple health interventions. Nutrition and management continue to be major constraints. A local hen under existing conditions starts to lay at 24 weeks of age (it would be 16—18 weeks in modern systems), produces up to three clutches of 12—15 eggs per year (if she lives that long), thus producing annually only about 40 eggs (compared with the 300 eggs laid by a modern hybrid layer). In addition, each egg weighs only 30—40 g (a 'medium' egg produced in modern systems is 55+ g). Left to her own devices she broods her eggs after each clutch (although many farmers do not allow their hens to brood all their clutches). Egg fertility rarely exceeds 80 percent — and is often 70 percent or less — and 90 percent of fertile eggs are expected to hatch. If approximately 50 percent of eggs are taken out of production for household consumption (or, more rarely for sale) then the annual number of chicks hatched per hen can be expected to be about 12 (with 8 per clutch brooded). Young chicks confront a high risk of death from the moment they are hatched, not only from disease but also from terrestrial and aerial predators, with the result that the average indigenous hen rears about six chicks to independence at about eight weeks old (Figure 9). Cocks that are not eaten by the household are sold at 9—12 months old when they weigh 900—1200 g.

Figure 9: Landrace-type sow under improved management with 12 piglets (suburban Morogoro); an indigenous hen under scavenging management with a brood of six chicks (rural Iringa)

White meat output

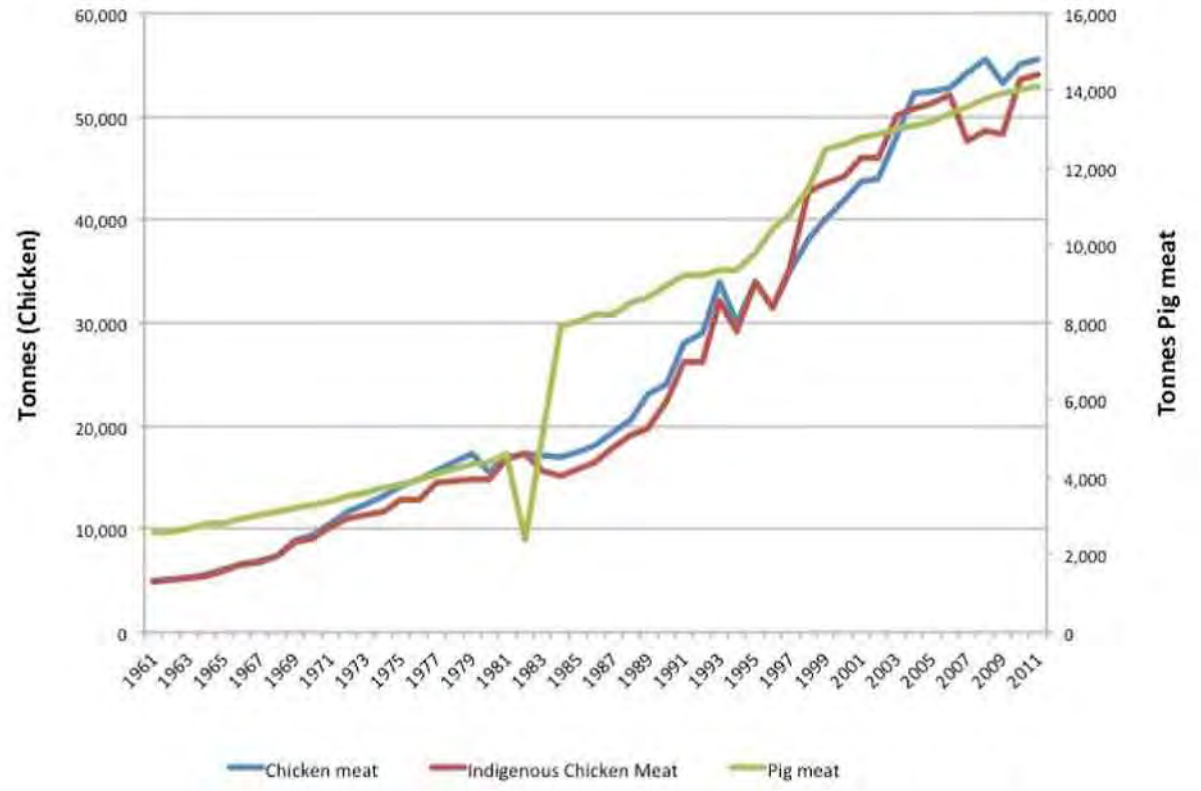
According to national data there were 1 581 396 pigs in Tanzania in 2008. This is an increase of more than 300 percent from the 1995 population of 434 638 pigs (see Annex 6)[7]. At this stage they were equivalent, in numbers, to 3.62 percent of the quadruped meat-producing species. The national data indicates that annual numbers grew by 13.5 percent between 1995 and 1999, by 3.5 percent between 199g and 2003 and by 10.2 percent between 2003 and 2008 to give an annual increase for the whole 14—year period of 10.2 percent. The production of pig meat in 1961, as estimated by FAO, was 2 600 tonnes (see Figure 10) which was obtained from 65 000 animals slaughtered, implying a carcass weight of 40 kg. The FAO estimate of pig meat production in 2011 was 14 120 tonnes from 350 000 slaughtered animals implying a carcass weight of 40 kg (i.e. one that had not increased in over 50 years).

Most pigs are located in the Southern Highlands regions of Iringa, Mbeya and Ruvuma where more than 60 percent of the national pig population is raised. Morogoro, Dodoma and Kilimanjaro also

[7] FAO data differs substantially to national figures. According to FAO there were an estimated 350 000 pigs in 1995 and 485 000 pigs in 2008 (with numbers having risen from 93 000 at Independence in 1961). It should be noted that throughout the last 50-year period FAO has used its own estimates and never made use of national data (see: www.faostat.fao.org/site/573/DesktopDefault.aspx?PageID=573#ancor).

have considerable numbers, followed by Manyara, Rukwa and Kagera. There are relatively small numbers in other mainland regions, and very few pigs on the predominantly Muslim islands of Zanzibar and none at all on Pemba.

Figure 10: Trends in the annual production of pig and poultry meat in Tanzania, 1961—2011



Overall pig densities are low. They are, however, highest in the largely urban region of Dar es Salaam (27 per km^2), followed by Kilimanjaro Region (9 per km^2), then by Mbeya (6 per km^2), Iringa (5 per km^2), Ruvuma and Dodoma (both 3 per km^2). Other regions have pig densities of 2 per km^2 or less. The 2007/2008 sample census for poultry estimated that there were 43 745 505 indigenous fowl on small farms and 494 866 on large farms, 1 191 799 ducks on small farms and 5293 on large farms, and 84 178 turkeys on small farms and 612 on large farms. In addition there were an estimated 1 265 872 modern layers and 584 028 broilers.[8] Broiler numbers have increased steadily since their widespread introduction in the early 1990s. However, the rate of increase has fallen over time (see Annex 6) as both small outgrowers and independent growers struggle to (a) make money even with increased feed prices (in 'normal' times these are more than 60 percent of the cost of production) and (b) to find markets at the optimum time for sale.

FAO estimates that the poultry meat output in 1961 was 4 932 tonnes (from 7.05 million slaughtered birds), of which all but 31 tonnes (0.6 percent) was from indigenous birds. In 2011 poultry meat output had risen to 55 500 tonnes (from 61 million slaughtered birds), of which all but 1 470 tonnes (2.6 percent) was from indigenous birds. The average carcass weight of indigenous chickens is estimated at 900 g. Meat from the modern or non-indigenous production system mostly derives from broilers, whose carcass weights are between 1 000 and 1 500 g depending on market segment demand, a proportion of production also arises from spent hens (i.e. layers at the end of their career).

[8] It should be emphasized yet again that data sources are contradictory and often self-contradictory with regard to numbers and distribution of all livestock species.

Like pigs, most poultry are located in the Southern Highlands regions of Iringa (which has an estimated 2.34 million birds), Mbeya (3.57 million birds), Ruvuma (1.71 million birds) and Rukwa (1.59 million birds). Morogoro, Tabora, Dodoma, Tanga and Pwani also have considerable numbers of poultry, these being followed by other regions with lesser populations (Annex 6). With the exception of Mbeya, however, the regions of the Southern Highlands have low densities of birds; the highest density (> 900 birds/km^2) is in urban Dar es Salaam where many poultry are broilers or layers.

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 element of public policy towards the subsector. The high level of reported disease can be linked to the low-level use of veterinary pharmaceuticals and vaccination (for example, in the 2008 Sample Census only 19 percent of households said they treated their pigs against internal parasites and just over 20 percent reported vaccinating against Newcastle Disease). Poor nutrition is another major constraint to improved output, one which is perhaps coequal with health. These and other constraints need to be overcome if livestock production is to be financially and economically viable throughout the chain and yield adequate returns to the land, labour and capital that is employed in its production.

In spite of the conventional wisdom that traditional livestock production is not highly lucrative there are considerable margins to be made for a range of outputs. This is because what is usually considered the 'major input cost' — i.e. the base feed supply — is 'free' to the user (though it may impose a cost on the wider community and on the environment). Paradoxically, in some cases, it appears that low-input/low-output enterprises may be more profitable overall than high-input/medium-output ones. While it will take time to improve the output of the white meat chain as a whole, there are possibilities to improve parts of it more quickly.

There are two principal kinds of traditional smallholder pig production. The one is a breeding operation; the other is concerned solely with growing and fattening. Tentative gross margin analyses show that both these operations are profitable at the farm level (see Table 8), indeed extremely profitable if the non-monetary cost of labour is excluded, (It should also be noted that pig-breeding enterprises should not have to buy pigs after the first cycle). There is very little commercial production of pigs and so far it is on a very small scale.

The poultry meat produced in Tanzania comes from two major systems. The first is the traditional scavenging sector in which the production of eggs is a major component (perhaps coequal with — or even in excess of meat — in terms of food production and income for the primary producer). The second is usually from small (c.200 birds) or medium (c.800—1000 birds) scale producers who reside mainly in urban or suburban areas. In the scavenging system there is effectively no management, no feed provision (or very little), and usually only limited and spasmodic use of health care. In contrast, in the broiler system there is a moderate to good level of management, feed is provided (most often in the form of a manufactured concentrate) and health care is of a relatively high order. Profits in the scavenging system (see Table 9) are considerable — especially in view of the absence of inputs — in the context of income generally in Tanzania. In the broiler system the situation is not so clear-cut and profits depend on a number of factors, not least of which are the growth rate of birds and the ability to sell the birds at the optimum time for market. (N.B. Producers tend to quote the 'party line' from the integrated enterprises for growth and conversion rates but these seem to be rarely achieved.)

Table 8: Gross margin analyses comparing smallholder primary production of pigs for breeding, and rearing/fattening operations

Item	Activity	
	Breeding operation (2 sows) (TSh)	Fattening operation (2 pigs) (TSh)
Costs		
Animal purchase	80 000	80 000
Feed	240 000	120 000
Drugs/vaccination	50 000	10 000
Labour	300 000	150 000
Other	5 000	3 000
Total variable costs	675 000	363 000
Revenue	900 000	500 000
Gross margin	225 000	137 000

The assumptions for Table 8 are:

1: For the breeding operation: two weaner guts are bought at 2 months old, mated at 8 months, produce (and/or rear) a litter of 6 pigs at 12 months and a second litter at 18 months. They are sold at 20 months for TSh 250 000 (50 kg carcass at TSh 5000/kg); 10 piglets are sold at 2 months for TSh 40 000 each; 2 gifts are kept for the next breeding cycle. The feed is maize bran and the pigs are fed at 2 kg total per day for 600 days at a cost of TSh 200/kg; green feed is cut and carried for 1 hour/day (600 days total) at a labour opportunity cost of TSh 500/hour.

2. For the fattening operation: two weaners (6—8 weeks) are bought and reared for 300 days at a daily gain of 250 g to attain a final live weight of 75 kg and a carcass weight of 50 kg. The feed is maize bran and the pigs are fed at a rate of 2 kg total per day at a cost of TSh 200/kg; feed is cut and carried for 1 hour per day (300 days total) at a labour opportunity cost of TSh 500/hour; pig is sold to a trader live, with payment for carcass weight at TSh 5000/kg.

Table 9: Gross margin analyses comparing smallholder primary production of indigenous fowl with small-scale broiler production

Item	Activity	
	Indigenous fowl (5 hens) (TSh)	Broiler production (200 birds) (TSh)
Costs		
Birds purchase	0	270 000
Feed	45 000	416 000
Vaccination/supplement	0	20 000
Labour	0	56 000
Other	5 000	73 000
Total variable costs	50 000	835 000
Revenue	445 000	893 000
Gross margin	395 000	58 000

The assumptions for Table 9 are:

1. For the indigenous fowl operation: the flock of 5 hens is 'inherited' from the family at no cost; minimal whole grain maize is provided daily (200 g at TSh 500/kg) over a 15-month cycle; no vaccination or other veterinary care is provided; labour is a nominal 30 minutes per day at no opportunity cost (children); there are minimal other costs. A hen lays 4 clutches of 15 eggs each, of which 5 from each clutch (100 eggs in total) are sold at (or have a non-monetized value of) TSh 250 per egg; 10 eggs of each clutch are brooded of which 6 hatch (120 chickens); there is 50 percent mortality (60 chickens survive); 5 hens are retained for breeding; 5 older ones are sold); 60 birds are sold over 15 months (65 weeks) at TSh 7000 each (indigenous birds are much preferred over modern broilers). In such a situation, the total return over 15 months is equivalent to just under US$ 250.

2. For the broiler operation: 200 one-day-old chicks are bought at TSh 1 350 per bird; the feed conversion ratio is 2:1 (and not the 'standard' 1.7:1.0) and each bird consumes 2.6 kg to produce a slaughter weight of 1.3 kg and at a food cost (mix of starter/grower/finisher) of TSh 800/kg (the average daily gain of chicks is c. 22.3 g); one vaccination against Newcastle Disease (TSh 50) is given at 2 days and there are other health/metabolic costs (minerals/vitamins (TSh 50); there is hired labour for 1 hour/day at TSh 1000/hour (urban casual rate) for 56 days. Other costs include charcoal for heating (1 bag at TSh 45 000, see Figure 11), electricity and water (TSh 10 000) and rice husks or wood shavings for bedding (3 bags at TSh 6000/bag). 5 percent mortality occurs during the cycle (which would very marginally reduce feed costs) so that 190 birds are sold at the production site to a trader who then covers transport costs to the final sale point. In comparison to indigenous fowl production the total gross margin of broiler production over 15 months (allowing a 2-week period between batches for cleaning and disinfecting the hen house) is US$235 (i.e. less than for indigenous fowl production, which also involves much higher risks and considerably more work).

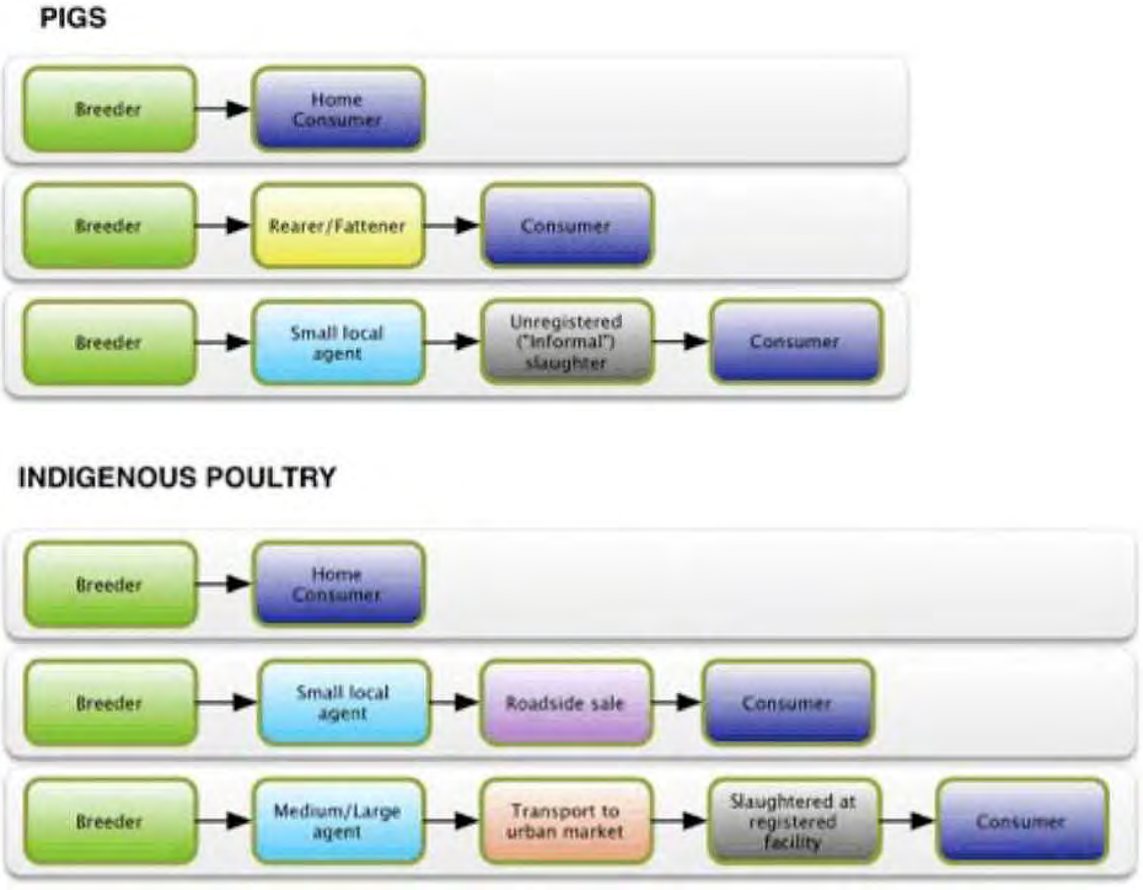
Figure 11: Small-scale broiler production: 2-day old chicks with electric and charcoal heating in Njombe (left); ready-for-sale 8-week old birds in Iringa urban (right)

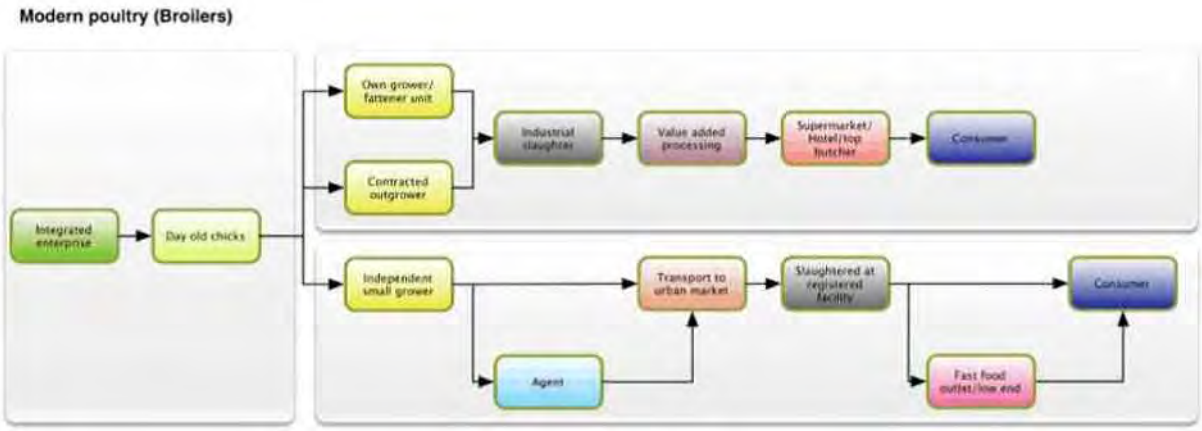
3.5 Processing

The incredible journey —from farm gate to consumer plate

Processing may be considered to start at the moment a pig or a bird 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 a pig or a domestic fowl can follow before ending up as meat (Figure 12).

Figure 12: Some examples of pathways followed from the point of production to final consumption for pigs, scavenger (indigenous) fowls and small-scale broilers





Marketing

There are no formal markets for pigs or poultry. When producers need to sell their stock it is usually done through individual or group bargaining or by standard auction procedures. This does not mean, however, that there is not an active and keen trade in the two species. The movement chain is subject to onerous legislation and regulation at many points. Much is not very productive and is not enforced (it is often even unenforceable, especially in relation to indigenous poultry). In theory, and according to the law, stock can only move along the chain following veterinary inspection, a health check, and the issue of a movement permit (in some circumstances, the animal must also possess a vaccination certificate) A number of veterinary checkpoints located at regional boundaries and natural barriers (e.g. the bridges across major rivers) may make further inspections, issue permits or impound animals that are in breach of the regulations. Internal official checks are not always very effective but most pigs that are transported over any distance arrive at the final distribution point after one or more 'facilitation fees' have smoothed the path of progress. The movement of poultry to any type of collection point is totally unregulated.

Pigs that are not consumed at home follow two main routes to their final point of consumption. In Route 1 the breeder keeps the pigs until they reach their slaughter weight; they are then sold to an individual to be slaughtered later for the purchaser's own consumption, or killed and sold as '*nyama kawaida*' to a local agent or collector (who may then sell the meat onto a larger agent), or sold directly to a larger agent. The Southern Highlands are a key source of pigs for the Dar es Salaam market and are transported there by the lorry load. Pigs in transport are subject to legal checks (see Box 3) as well as to a plethora of illegal ones for which Tanzania roads are notorious. Pigs marketed by Route 2 are sold as weaners at 6—8 weeks of age to a specialist rearer whence they follow one of the tracks of Route 1.

Trading, in the sense of a professional middleman buying and selling live animals at some point along the chain, is an important — indeed 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 analyses of indigenous poultry trading operations for local roadside sale and for a medium-scale trader moving birds from Iringa to Dar es Salaam (Table 10) show that this is not the case. The risks born by traders are, of course, much less than those likely to occur at other points in the chain (such as, for example, the deaths of animals whilst still in the hands of primary producers.

Figure 13: A typical roadside sale site for indigenous fowl on the Iringa-Morogoro road (left) and a stand in the Kisutu urban poultry market in Dar es Salaam (right)

Box 3: 'Many a slip twixt cup and lip': Tanzanian Officers Impound Lorry with Consignment of Pigs

An article by Clement Sanga, which appeared in *The Citizen* newspaper on 2 March 2011.

A lorry carrying 99 pigs worth over TSh12 million has been impounded in an operation against the African Swine Fever (ASF), a highly contagious disease that attacks pigs. The deadly disease is said to be caused by a virus and usually attacks domesticated pigs, warthogs and bush pigs.

Speaking to journalists yesterday, the livestock officer-in-charge of the Southern Highlands Zone, Mr. Hamza Mwamhehe, said officials from his office impounded the truck that was heading to Dar es Salaam from Mbeya. He explained that the government had recently imposed quarantine on transportation of pigs in Mbeya and Iringa regions to stop spreading the disease that was initially reported in Malawi. He said that during the operation the officers arrested six people alleged to have been ferrying the pigs to Dar es Salaam. According to Mr. Mwamhehe, the suspects claimed that they had obtained a permit to transport the pigs in Makambako.

He said the suspects would be charged in court and, since no vaccine exists for the disease, all the pigs would be slaughtered and buried. "Apart from what will be decided by the court, the suspects will be obliged to foot the cost of slaughtering the pigs as part of their punishment," he said.

In a separate incident, another lorry carrying more than 80 pigs was also impounded at Igawa village in Mbeya Region, only hours after the Iringa incident. "As we are speaking here another lorry with a consignment of pigs has also been impounded in the neighbouring Mbeya Region. This proves how big the vice is in the two regions," Mr. Mwamhehe lamented. He said the order to outlaw pig transportation in the two regions was issued several weeks ago. The ASE is among three most dreaded diseases attacking pigs. The other two are Swine Vesicular Disease (SVD) and Foot-and-Mouth Disease (FMD).

According to Mr. Mwamhehe, the ASF is very dangerous to human beings as well. This is because of its infectious nature, means of spreading, high morbidity rate and lack of a reliable vaccine. The disease has been reported in four villages of Kyela, Ileje and Rungwe districts in Mbeya Region.

Table 10: Gross margin analyses comparing indigenous poultry traded through short-distance roadside sales with long-distance transport to an urban market

Item	Activity	
	Small trader selling at roadside (TSh)	Medium trader selling in Dar es Salaam (TSh)
Costs		
Purchase at farm/primary producer	150 000	750 000
Transport	2 500	67 500
Feed	0	7 500
Labour	12 500	56 000
Other	0	41 400
Total variable costs	165 000	922 000
Revenue		
Sale of birds	175 000	1 080 000
Gross margin	10 000	158 000

Source: author's enquiries

The assumptions for Table 9 are:
For the small trader: 25 indigenous fowl are purchased from a farm at TSH 6 000 per bird; the trader hires a bicycle for half a day at TSh 2 500 to visit farms, and carries the birds on poles back to the roadside. The birds are sold over a 2-day period direct to passing traffic but are not fed during this period as they scavenge around the sale site (see Figure 13). The opportunity cost of labour is 20 hours at TSh 600 per hour (rural rate); all birds are sold at TSh 7 500 each; the cycle is 2.5 days.
For the medium trader: 100 indigenous fowl are bought around Iringa over a 24-hour period at a farmgate price of TSh 7 500 (these are bigger birds than for the roadside market, and the trader also buys a few rabbits and pigeons occasionally on an opportunistic basis). The trader travels by bus from Dar es Salaam to Iringa at a cost of TSh 15 000 (1 day), hires a bicycle at TSh 2 500 and rents space on a lorry for his return with the birds at TSh 40 000 (1 day). He has to feed the declining number of birds for 5 days (1 on the road and 4 at the market) at a cost of TSh 7 500. The opportunity cost of his labour is TSh 1 000 per hour (urban rate) for 56 hours at a total cost of TSh 56 000. He has 2 nights' accommodation in Iringa at TSh 5 000 per night, buys 2 baskets in Iringa for bird transport at TSh 15 000 each and has costs of TSh 200 per day for 7 days for rental space at Dar es Salaam market (Figure 13). With 10 per cent mortality, he sells 90 birds at TSh 12 000 each; the cycle is 7 days.

Slaughtering

There are no publically owned slaughter facilities for pigs. Private 'slabs' are found throughout pen-urban and urban areas. Most 'slabs' consist of a concrete slab (pitted and broken, though sometimes with a tiled floor) and are situated in inappropriate locations, in areas of dense human habitation and without drainage facilities.[9] None has any facilities (such as gantries or lifting aids); the loudly squealing pig is usually wrestled to the floor by several highly excited men and boys, and killed and dressed there. The kill is achieved by hacking through the pig's throat without the prior benefit of stunning. (Stunning is not required for animals under 'halal' or religious slaughter regulations. However, pigs do not, of course, fall into this category, and cruelty, is against the provisions of the Animal Welfare Act.) Some urban slabs are registered with the municipal authorities, and in such cases the presence of a meat inspector (who is also empowered to ensure compliance with the provisions of the Welfare Act) provides a minimal element of food safety (inspectors are not always present throughout the entire period of slaughter, however). Totally uncontrolled and unsupervised backyard slaughtering is widespread and is indeed the norm for pigs; this carries with it all the attendant health hazards.

Most indigenous poultry is slaughtered 'informally' and for home consumption. The process simply consists of cutting the bird's throat and holding it (or hanging it) head down for the blood to drain away. In such cases, there is clearly no formal inspection for disease or hazards to human health. A

[9] For further discussion of slaughter slabs and their relation to food safety see Section 4.1 ('Food safety and quality').

small proportion of indigenous birds pass through urban markets and these may be subject to a somewhat more formal process (though also usually far from satisfactory).

Birds from the small-scale modern broiler industry are usually taken to a central market (though they may also be bought singly by individuals for home slaughter). Other broilers may be bought in smaller or larger lots at the same market by supermarkets or hotels, and slaughtered in a facility provided by the local authority.

At Kisutu — the main poultry market in the centre of Dar es Salaam — the municipality has a slaughter room that is sublet to a slaughter cooperative, known as the Kisutu Poultry Cooperative Society Limited. The facility is registered with the municipality, the TBS and the TDFA. The birds — which are largely bought by supermarkets, hotels and fast food outlets (Box 4) — are slaughtered by members of the cooperative society who are all of the Islamic faith and ensure that meat is 'halal'. The procedure is carried out in primitive and crowded conditions that are conducive neither to animal welfare nor food safety, and consists of cutting the throat, scalding in boiling water, defeathering, giving a cursory health inspection to some birds, removing the head and feet and dressing roughly (see Figure 2). The feathers are taken away for disposal by the municipality; women traders buy the heads and feet for further processing.

More formal — and more humane — slaughter of poultry is done at those integrated enterprises which include processing as part of their operations. Birds are first electrically stunned and then have their throats cut. Defeathering is carried out mechanically and birds are inspected for disease and health hazards. Further processing into specialized value added components is then carried out in an organized line (Figure 14).

Added value processing

The market for value added and processed pig products (such as sausage, bacon, smoked ham and liver patty) makes up only a tiny fraction of Tanzania's overall demand for white meat. There is a similarly limited demand (in the context of the total market) for value added poultry products such as 'halal' chicken sausages, liver, gizzards and breasts. Supermarkets, some specialist urban butchers, hotels, and other food service areas (including mines and institutions) are the main outlets for processed products. There are small but increasing imports of processed products from South Africa by the supermarkets that have their main operations in that country. The pork sausage and bacon market is mainly supplied by Bright Choice (the Tanzania subsidiary of Kenya's Farmers Choice). The market is growing quite rapidly and can be expected to grow further in the future as the target audience expands to include wealthier urban dwellers and an emerging middle class.

In response to local demand, there is already a small processing industry in Tanzania, owned entirely by the private sector (Table 11). Its range of products is generally small as is its production capacity. Some manufacturers specialize in supplying a very restricted market within the overall niche market. Thus, for example, the Meat King Company in Arusha recently asked its clients to place orders for Christmas turkeys and advertised several smoked pork and poultry products.

Figure 14: Poultry 'added value' products from a local integrated operation, on sale in a Dar es Salaam supermarket in 2013

Box 4: *Finger lickin' good* — the fast food trade in Dar es Salaam: *Kuku na chipsi*

Venues serving fried chicken and chips (*kuku na chipsi*) — sometimes also with an egg or a small serving of salad — are common throughout Dar es Salaam and other larger towns. Many also serve '*mishkaki*' and '*ndizi choma*' as a variation to the ubiquitous chicken. Venues range from low-key stalls to top-end establishments that attract the upwardly mobile and aspirational '*wasichana*' and '*vijana*' of the city's business districts. One of the latter is the well-known and extremely busy 'Edo's Chips' in Msasani.

Many fast food outlets have a poor reputation for hygiene and a good one for causing stomach upsets. Mlay Elias — the owner, head buyer, managing director and CEO of Edo's — is not happy with this generalized reputation. He prides himself on running a cleaner establishment than his contemporaries, changes the oil in the chicken and chip pans every day, and does not open on Sundays which is his day for giving everything a thorough clean.

It is hard to get a clear picture of the economics of these businesses but they must yield a good rate of return. Mlay buys broiler chickens from Kisutu market every day, paying TSh 5 700 per bird (and selling the head and feet to market women for TSh 300, thus covering the slaughter and dressing fee he pays to the Kisutu Poultry Cooperative Society for its services). His portions — one chicken is cut into four quarters — sell at TSh 3 500, a price affordable only to the better-paid private sector and NGO staff (who frequent the facility) and not to the more poorly-paid government and public service workers (who do not). The daily outgoings associated with the business include: the transportation of the birds from market (TSh 10 000); two 20-litre drums of vegetable oil (TSh 26 000 each); charcoal (one bag at TSh 45 000), labour (TSh 110 000), eggs (TSh 500); potatoes, salad and spices.

A butchery and small manufacturer similar to Meat King operates in Dar es Salaam and is called The Butcher Shop. The latter buys meat from the Arusha abattoir and imports from Kenya, and produces a range of high-quality processed products from pig meat (and to a lesser extent from poultry meat). Both Meat King and The Butcher Shop are owned and managed by South African expatriates. It is therefore encouraging to see two operations that have been started up by Tanzanian entrepreneurs (one solely for pig products, the other for both pig and poultry — see Box 5). Other niche-market suppliers that complement the white meat chain include those dealing in extra-large organic chickens, free-range rabbit meat and products, and pork products.

Three of the vertically integrated poultry enterprises also slaughter and process broiler chickens (though one of these was not operating in January 2013, and another was experiencing operational and financial difficulties whilst attempting to provide specialist retail outlets in Dar es Salaam — see Figure 15). Most processing operations are based in Arusha or Dar es Salaam although there are nascent specialist businesses developing in other parts of the country. The processing industry can be expected to grow in the future.

Table 11: Manufacturers and retailers of 'value added' pig and poultry meat products

Company	Location	Daily processing capacity (kg)	Products	Target market	Status
Meat King Company	Arusha	228	Pork products, smoked pig and poultry meat	Niche (South African community)	Operational
The Butcher Shop	Dar es Salaam		Speciality pork items, limited poultry	Niche market (upper end Dar es Salaam)	Operational
Happy Sausages Ltd	Arusha	1 130	Sausages	Niche market	Operational
Tanzania Meat Products	Dar es Salaam		Sausages	Retail trade	Operational
Shoprite	Dar es Salaam (3), Arusha (1)		Imports from South Africa and Kenya	Retail trade	Active supermarkets
Other supermarkets	Dar es Salaam		Imports	Retail trade	Active supermarkets
Bright Choice	Dar es Salaam		Imports from parent company in Nairobi	Retail, hotels	Active imports-reselling
Tandan	Pwani		Sausages, smoked meats, pâté	Retail, hotels	Development phase
Mazimbu Agro Enterprises	Morogoro		Pork joints, dressed chicken	Retail, hotels, fast food	Development phase
Interchick	Dar es Salaam / Morogoro	3 000	Whole/dressed chicken	Retail, hotels, mining companies	Fully operational
Twiga Foods Ltd		3 000	Whole/dressed chicken	Retail	Not operational
Bahari Bounty (Kukupoa Ltd)	Mwanza		Dressed chicken [organic chilled chicken]	Retail, export — fish ISO (UK), Fairtrade (Germany)	Breaking into market

Source: compiled by consultant

Box 5: Doing well by doing good: Two local initiatives for quality meat production and processing

Tandan Farms Ltd is a joint venture between a Tanzanian individual and the DANIDA Business Partnerships Programme. It aims to boost the local production of quality pork, and so compete with imported pork. The partners hope to help change the culture of pork production (which currently operates under poor conditions and produces poor quality pork because of a lack of knowledge on how to breed, feed and slaughter animals). The quality of the meat, easy access and rapid delivery will be the main reasons for the big restaurants of Dar es Salaam to buy Tandan Farms' meat. The Danish Norringlund company will train outgrowers to produce pork for Tandan, the Tanzanian partner will supply the labour for operations on the ground. At the new facility (nearing completion at Vikindu, some 30 km from Dar city centre) feed preparation and hygiene management will be up to Danish food health and safety standards. Quality, access and fast deliveries are part of Tandan's Strategic plan to allow penetration into the Tanzanian market.

Mazimbu Agro Enterprises (MAE) is a privately owned entity located in a low-density area in Lukobe that is authorized for livestock production by Morogoro Municipality. The owner graduated from Sokoine University with a Bachelor of Science degree in Agricultural Economics and Agribusiness in 2011. In April 2012, at the age of 24, he started MAE in order to fulfil his dream of being a job creator, not a job seeker. The business concept is to improve value chains in livestock products and produce high quality meat so as to contribute to food security. MAE will produce pork and chicken meat branded as '*kuku nyama*' for sale to hotels, food vendors, supermarket and individuals around Morogoro. Start-up funds were obtained via a National Economic Empowerment Council (NEEC) grant, a bank loan and the owner's own equity towards a total capitalization of TSh 4 billion for infrastructure, other fixed assets and working capital. The business plan envisages purchasing pig and poultry parent stocks. MAE will initially purchase 4 pigs and 150 chickens per month. It will contract local farmers to complement its own output and, via such partnerships, source 35 percent of its projected need whilst also contributing to socio-economic advances in the local area. It is expected that by Year 3, the company's turnover will be TSh 600 million.

Hind view

The processing part of the white 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:

- there is no formal market chain for pigs (although there is an active, and probably efficient, informal one); the market chain for poultry is also largely informal (aside from the small segment that deals with broilers);
- a lack of real competition among animal buyers (farmgate prices are similar throughout the country, except in larger urban areas, and sellers seem generally to accept these without too much complaint);
- the uncontrolled (often illegal) slaughter of both pigs and poultry;
- there are no proper slaughter facilities for pigs or poultry leading to food safety and animal welfare concerns (the exceptions are the two or three facilities owned by the larger integrated enterprises, and the totally inadequate Kisutu market operation in Dar es Salaam);
- complicated and conflicting regulations that are not usually enforced;
- untrained and unskilled staff throughout the links;
- lack of (or inadequate) equipment and tools throughout the links;
- potentially valuable by-products (heads, feet, feathers, blood, glands, etc.) which are not
- fully valorized and pose environmental hazards;
- little interest from the majority of domestic customers in terms of quality or value added products;
- the limited quality and quantity of the range of processed products;

- further processing of diversified meat products is limited in quantity, and aimed only at a small market segment;
- 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.

Figure 15: A retail outlet of a major integrated poultry enterprise, and a specialist one-man butchery in Morogoro supplying bespoke products to a niche market

3.6 Wholesale and Retail Distribution

The wholesale trade for pigs is limited to supplies from the Kenyan company Farmers Choice, which works through its Tanzanian subsidiary Bright Choice to channel meat into many of Tanzania's locally owned supermarkets. The South African-owned supermarket chain, Shoprite, has three outlets in Dar es Salaam and one in Arusha and imports products from South Africa. The wholesale business for poultry also passes through Shoprite from South Africa but is complemented by wholesale dealings within the country by Interchick, Twiga Feeds Ltd (if and when it resumes operations) and increasingly by Kukupoa (see Table 11). The retail distribution chain for pigs is extremely fragmented and mainly comprises direct sales by primary producers or via small-scale traders/retailers. Processed pork products — primarily sausages and bacon — are mostly sold through local, non-Muslim supermarkets. A similar retail distribution system operates for poultry, whereby whole birds (fresh, chilled or frozen) and some speciality pieces are sold mainly through supermarkets after

receiving wholesale supplies from large integrated enterprises (Figure 16). For this part of the white meat business, however, there are only a few organized markets where small-scale producers sell indigenous poultry and modern broilers (producers usually buys lots of 200—500 birds from integrated poultry enterprises). As indicated in the earlier Section 3.5 ('Value added') there are a small number of retail outlets serving the expatriate community, higher income groups and — to a limited extent — the exclusive restaurants, hotels and safari camps of Arusha and Dar es Salaam.

Prices are lowest in remote rural areas, and rise through the gamut of outlets, usually increasing as human population densities increase, and reaching their height in heavily populated urban areas. Similarly, prices increase from the low-level 'pure' butchers, through budget to middle class supermarkets, and reach their zenith in elite butchers catering for a very discerning clientele. 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. Since they sell the lowest quality unweighed beef or goat meat, combine that with the service element of cooking, offer it as a 'take-away' item with the addition of '*chipsi*' or even vegetables, it is impossible to calculate the real price of the meat element of the package.

Figure 16: A special van for the wholesale delivery of poultry to retail outlets (left) and the retail market for broiler chickens at Kisutu in Dar es Salaam (right)

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, while livestock sales contribute only 7 percent to total agricultural production, they contribute 25 percent to total agricultural sales, and are 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 have herds that 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 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 differential rates of use of inputs and services do not indicate discrimination in access *per se* as they may be equally 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.

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.

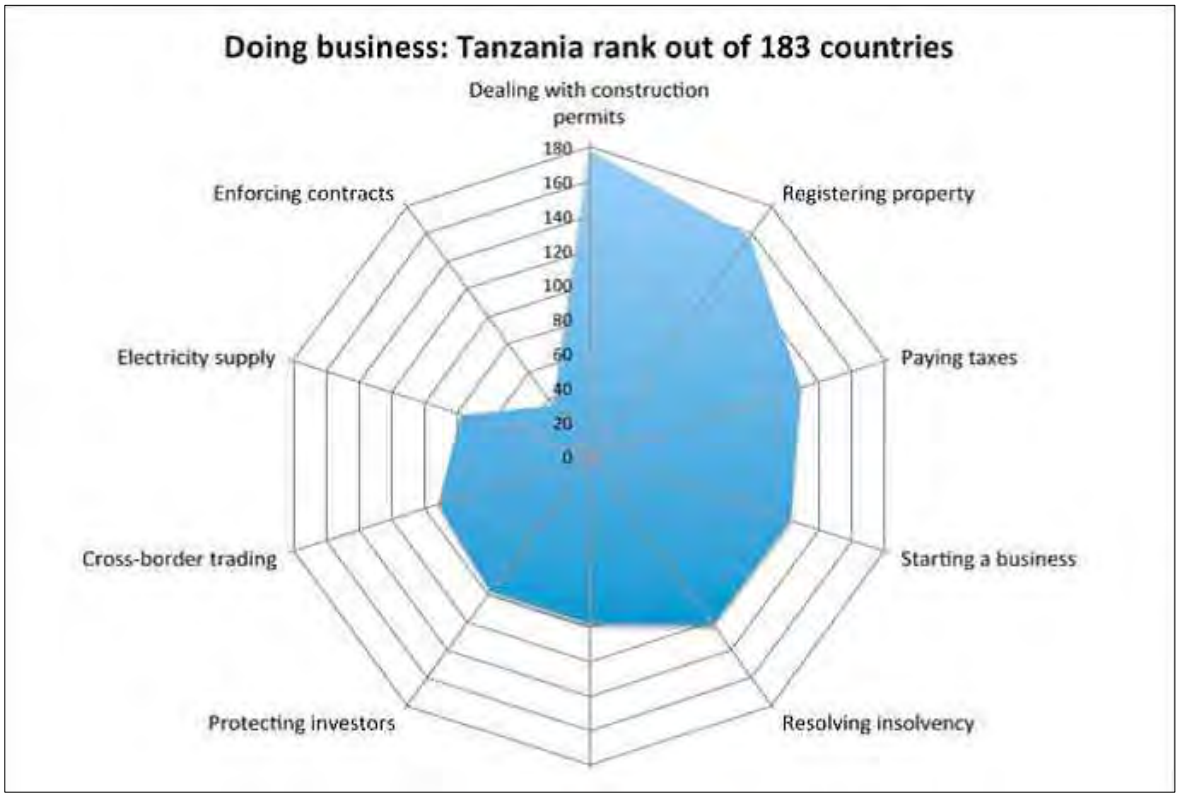
Legislation and regulations

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 6). 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 12).

In addition to those listed in Table 12, other acts or regulations include (but are not limited to):

- The Food, Drugs and Cosmetics Act No 1 of 2003 (which 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.

Figure 17: Doing business in Tanzania: How Tanzania rates out of 183 countries



Source: World Bank, 2014

Box 6: The sound and the fury — over regulation and under enforcement of livestock trade activities

The following permits and licenses are required for the following white 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).

Table 12: Principal recent legal instruments that may affect white 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 carcases 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

Land rights and land markets

Land tenure in Tanzania is in the form of a right of occupancy and leasehold. All land belongs to the nation and there is no freehold system. The primary legislation governing land ownership is the Land Act No 4 of 1999 and the Village Act No 5 of 1999. Under the Land Act, there are several categories of land but the most relevant is 'general land'. The Commissioner for Lands may grant a right of occupancy or leasehold for this type of land (upon application and fulfilment of certain conditions). Village land is administered at grass roots level and a Certificate of Title can be granted to the holder(s). As indicated previously, although the right to land can theoretically be obtained by investors for varying periods, anecdotal evidence suggests that this 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, the Medium-Term Plan (5-Year MTP), the Long-Term Plan (15-Year Plan), and the Tanzania Development Vision 2025. LSDP is also intended to transform the sector from its current status to one with the potential for a progressive livestock sector that is economically, socially and environmentally sustainable. LSDP further seeks to enhance the coordination of support for livestock development within a coherent and comprehensive national system taking into consideration the Decentralization by Devolution (D by D) approach.

It is to be noted with regard to pig production that commercial activities are limited to a very few farmers and most pork products come from very small-scale operators. Inbreeding (and lack of proper recording) has caused problems within the existing pig population. Inadequate support services, lack of slaughter and marketing infrastructure, disease, and cultural and religious taboos that restrict the eating of pig meat also continue to affect the development of the pig industry.

In order to promote pig production, increase its contribution to food security, improve human nutrition and increase household incomes (whilst simultaneously conserving the environment), the Government's policy is to:

- support and strengthen the technical support services and the use of appropriate technologies;
- promote the production of quality animal feeds and encourage the use of locally-available raw materials and feed additives;

- promote inventorization, characterization, evaluation and selection of pig breeds for increased productivity;
- encourage and promote the establishment of standard slaughtering facilities and marketing infrastructure in major pig producing and consuming areas; and
- create awareness — of and encourage the formation of— pig producers' and traders' associations.

In both traditional and commercial systems, the production of poultry is constrained by diseases, poor quality feeds, inadequate technical support services, a presumed low genetic potential of local domestic fowl types, and weak farmer organizations. There is also said to be an inadequate regulatory framework for hatcheries and breeding farms.

In order to increase the quantity— and improve the quality of— poultry and its products, to satisfy domestic demand, to contribute to exports and to promote sustainable poultry production, the Government's policy is to:

- support and strengthen technical support services and use of appropriate technologies in poultry production;
- promote inventorization, characterization, evaluation and selection of indigenous poultry breeds;
- promote, in collaboration with other stakeholders, the improvement of the genetic potential of the traditional flock in order to increase livestock productivity;
- promote investment in poultry production, processing and marketing;
- encourage the establishment of quality breeding farms and hatchery facilities; and
- create awareness of— as well as encourage and promote the establishment of— poultry producers' and traders' associations.

Food safety and quality

Animal health is inextricably linked to food safety and consumer health. The production chain should aim to deliver safe food and high quality products to consumers. Animal health management is, therefore, of paramount importance in both the early and later stages of the chain. Food safety and consumer health issues should start by focussing on husbandry practices, farm management and disease surveillance, and continue throughout the chain to slaughter, processing and the presentation of meat to the consumer. This does not happen. Adequate legislation has been enacted to assure food safety and consumer health throughout the chain but almost nowhere is there adequate surveillance and implementation.

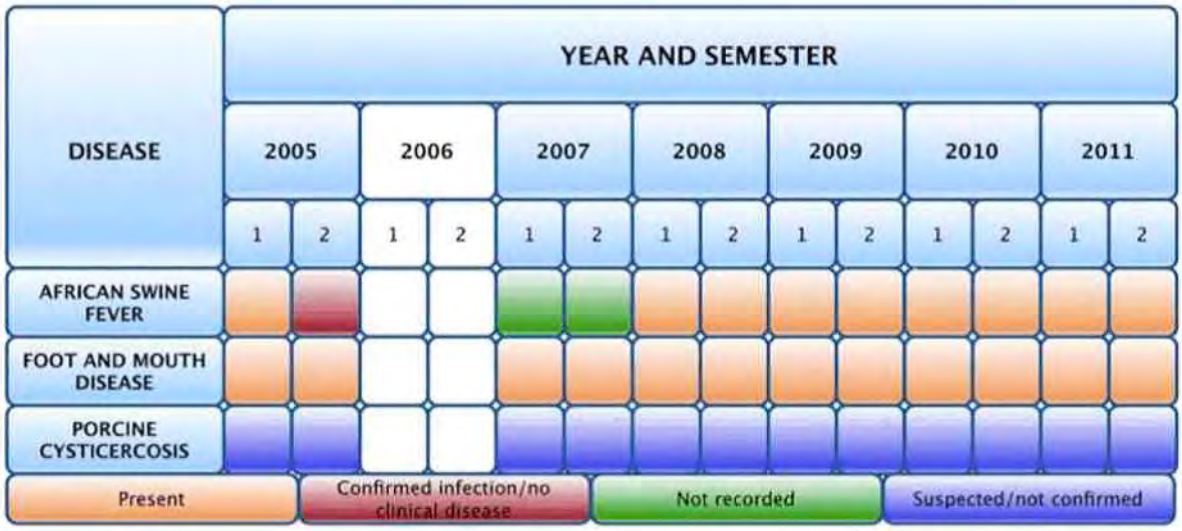
The major diseases affecting the pig and pork industry are African Swine Fever, Foot-and-Mouth Disease and porcine cysticercosis, all of which are regularly reported to the World Organization for Animal Health (Office International des Epizooties or OIE) by the Directorate of Veterinary Services (DVS) — see Figure 18. The last is an important zoonosis and thus affects people as well as pigs; it will be a key barrier — should Tanzania ever produce surplus pork — to export. The metacestode larval stage of *Taenia solium* is the causal agent of porcine cysticercosis; humans are, however, the definitive hosts and harbour adult worms in the small intestine. The disease affects 50 million people worldwide and causes 50 000 deaths each year. Most cases of epilepsy in Africa are now associated with cysticercosis. Overall 17 percent of smallholder pigs show signs of infection.

Within Tanzania, the relationship between pigs and human cysticercosis has been a major subject of research, with concomitant studies and advice on health education to reduce the infection risk. Parasite identification is both ante-mortem (by lingual examination) and post-mortem (isolation of cysts and detection of circulating antigens by Ag-ELISA). Cysticercosis appears to be endemic in the Southern Highlands and northern Tanzania but not in Morogoro. Some 32 percent of pigs are

infected in Mbozi District (as are 17 percent of humans), 31 percent in Mbeya Rural District and 5 percent in Chunya District (all districts are in Mbeya Region). In another study, 7.6 percent of 722 live pigs in Chunya District, 8.4 percent of 808 pigs in Iringa Rural District, and 16.9 percent of 302 pigs in Songea and Mbinga Districts (Ruvuma Region) were found to be infected on lingual examination. It is estimated that 10.6 percent of all cysts would be seen if proper meat inspection was carried out. In still another study, 8 percent of 731 pigs slaughtered in Dar es Salaam were found to be infected with porcine cysticercosis: when data was disaggregated by their place of origin, it was found that infection rates were 8.2 percent for pigs from Dodoma, 8.2 percent for pigs from Manyara, and 6.9 percent for pigs from Mbeya. The factors contributing to the high infection rates in Mbeya Region are the free-range or semi-confined management of animals, and the use of rivers or ponds as a source of their drinking water (whether a household used a latrine or not did not appear to affect disease incidence). Identified risk factors in Chunya and Iringa Rural Districts were the lack of latrines, free-range management, home slaughter, lack of pork inspection and poor oversight of barbecued meat ('*nyama choma*' or '*kitimoto*' in urban restaurants that serve pork).

Ascariosis caused by *Ascaris suum* is one of the leading causes of pig liver condemnation during post-mortem meat inspection. A Northern Highlands study recorded a prevalence of 44.3 percent of *A.suum* infection. Some 15.8 percent of the 23 212 pigs slaughtered and inspected in Dar es Salaam between January 2006 and September 2007 were infected with *A.suum*, with pigs from Morogoro having a higher rate than those from other areas. *A.suum* was formerly considered to be a parasite that only affected pigs but recent studies in Denmark have reported cross-infection to humans. Hydatidosis has been demonstrated in humans in northern Tanzania. The infection of pigs in the country appears to be low, however, and only 0.4 percent of more than 23 000 pigs slaughtered in Dar es Salaam (though originating from other regions) were recorded as being infected.

Figure 18: Calendar of pig disease events as reported to OIE by Tanzania, 2005—2011



Source: adapted from the OIE database, 2012

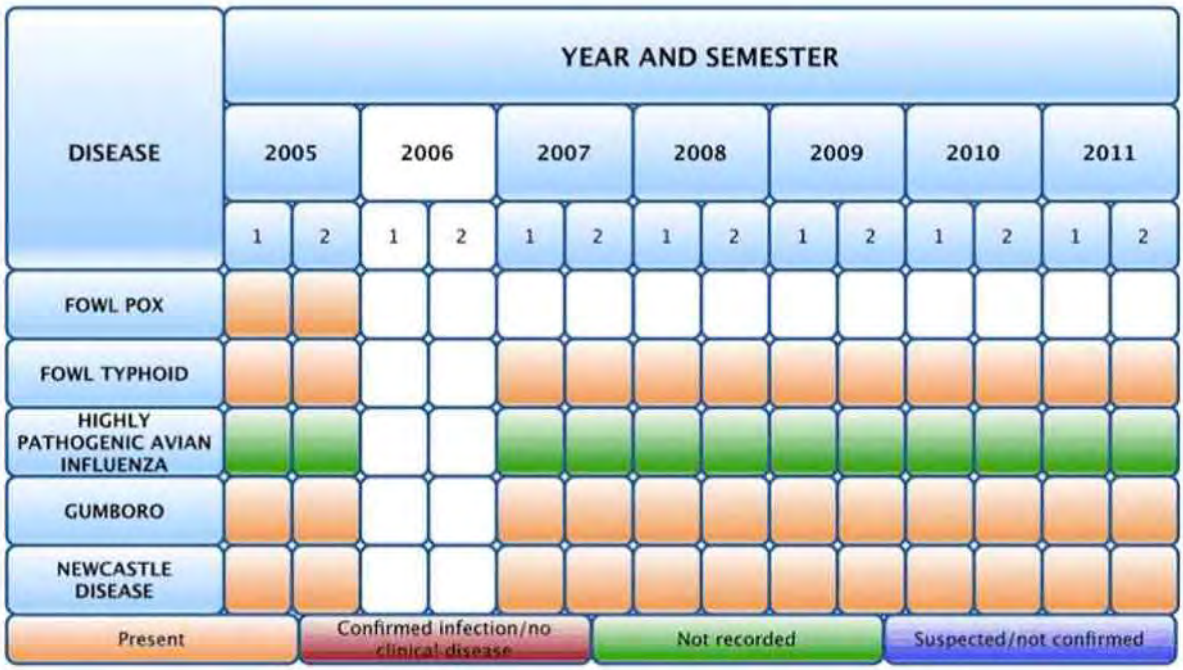
Studies by academics at SUA are scathing about hygiene during pig slaughter. There are no public pig-slaughtering facilities in the country. There is some official pork inspection at private slaughter slabs in Dar es Salaam but this is not carried out systematically. None of the slaughterers and butchers of pigs is likely to have undergone the official health checks required by law. No pig is slaughtered in conformity with the Animal Welfare Act, which requires stunning before killing (except where for religious reasons they cannot be stunned, which clearly does not apply to pigs). All the 24 privately-owned Dar es Salaam pig slaughter slabs are described by SUA to be "substandard, wrongly located, poorly designed and constructed, and lacking most basic requirements for a slaughterhouse…

Because of inadequate slaughtering, disposal and cleaning facilities, the slaughter slabs are unhygienic, with questionable safety, soundness and wholesomeness of the pork produced." Slaughter, dressing and meat handling at slabs in Morogoro, according to SUA, "are done on the ground under unhygienic conditions and all slabs are dirty and have neither tap water nor drainage systems". The slabs operating in Dar es Salaam are approved by the municipality, and assigned a government employee to oversee their operations and perform meat inspections. However, the efficiency of the inspection is doubtful since there are insufficient inspectors for the number of slabs. After the early morning session, no inspection is done, as the inspectors have to leave for other duties. At six small privately owned slabs in Morogoro, SUA found there was no official meat inspection at all. A Dar es Salaam city by-law requires pigs to be slaughtered at authorized slabs (and thus, presumably, also inspected).

Some 23 212 pigs were slaughtered and inspected between January 2006 and September 2007. However, this figure fails to take into account the number of animals slaughtered at slabs but not inspected, or the unknown — but undoubtedly vast — numbers slaughtered at home. The situation is similar throughout the country.

In the poultry sector, the major diseases affecting the bird population are Newcastle Disease, Gumboro (or Infectious Bursal Disease), Fowl Pox and Fowl Typhoid. Marek's Disease is a potential problem in intensive layer flocks. Regular reports of the occurrence and status of poultry diseases are submitted to the CIE by the DVS (Figure 19). The disease of most concern to the poultry industry worldwide is Highly Pathogenic Avian Influenza (HPAI) that has occurred in many countries in Asia, Europe and Africa since 2003 but (so far) has not been recorded in Tanzania. The main danger of HPAI (which is a zoonose), as with other diseases, lies in the way in which humans interact with and handle the production, distribution, processing and marketing of live poultry and poultry products.

Figure 19: Calendar of poultry disease events as reported to OIE by Tanzania, 2005—2011



Source: adapted from the OIE data base, 2013

In the small-scale scavenging system in particular, birds have regular contact with fomites contaminated with disease organisms, impure water (including surface drainage and human urine), rodents, wild animals, free-flying birds, insects and contaminated feed. These are common paths along which infectious diseases are transmitted and spread from one farm to another. Because

poultry mortality (especially high death rates as a result of Newcastle Disease) has been a common occurrence, village poultry owners have resorted to salvaging something for their benefit. The sale and consumption of sick birds is thus a common practice among resource-poor farmers and represents a potential danger to human health, Lack of hygiene throughout the chain but especially at slaughter where conditions may be very dirty (see Figure 2) is certain to ensure that enteric bacteria such as *Escherichia coli*, *Salmonella pullorum* and *Salmonella gallinarum* are present. Other disease-causing organisms — including fungi such as Aspergillus, and mycotoxins that proliferate rapidly in hot and humid climates like Dar es Salaam — are common, as are protozoa such as *Coccidia* spp.

Public infrastructure

It is usual to read that Tanzania is well endowed with public infrastructure including roads, rad, 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 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.

4.2 Vertical and horizontal linkages and value chain governance

Integration

Extremely weak vertical and horizontal linkages affect the whole pig/pork value chain in the small-scale sector. Actors and enterprises do not generally cooperate or coordinate (indeed the latter seems to be a totally alien concept). There is extremely limited vertical integration with, for example, agents acting as slaughterers and retailers, and with only very primitive and limited processing. However, two nascent enterprises (described in Box 5) offer hope that progress can be made in the pig industry.

There are some indications of horizontal integration in the small-scale poultry value chain, though most of this is outside the Southern Highlands. At the producer level, most (if not all) associations have been developed, sponsored, driven and supported by international NGOs or development agencies. Oxfam, for example, was instrumental in the formation of 143 chicken producer marketing

groups between 2008 and 2010, and by December 2011 had expanded this to 301 groups with a total of 8 942 members. Kyeema, an Australian NGO, supports small-scale poultry production (see Box 1) as does Research into Use (RIU, an organization sponsored by the UK Department for International Development). The latter provides particular support for indigenous poultry production and has established both horizontal and vertical linkages in this segment of the poultry industry (see Box 7). RIU considers that "production of local chicken is currently to a large extent quasi-commercial and its vision is that the sector will become much more commercialized in the next five years. In particular we anticipate that producers of local poultry will regard chicken keeping more as a substantial business and less as a side-business or subsistence activity. This will result in much higher productivity, which will enable the chicken keepers to sell their chicken at a lower price per unit and still make a much higher income from chicken rearing." There has to be some doubt — indeed the associations themselves express doubt — about the long-term future of these associations.

There are regional traders' associations in every region and urban traders' associations in all urban centres but little cooperation between them. (They seem primarily to perceive themselves as advocacy groups to local government and municipal authorities). There is no umbrella organization covering the entire small-scale indigenous sector (one that focuses on its development, or supports cooperation, or disseminates relevant information to various market participants).

Box 7: Against the grain: Horizontal integration supported by Research into Use (RIU)

RIU Tanzania is currently placing advertisements in local newspapers seeking commercial partners who can:

- buy and/or sell 10 000—50 000 mature indigenous chickens per month;
- provide holding facilities for more than 10 000 live mature indigenous chickens before slaughter or sale to traders and markets;
- run a slaughterhouse with a minimum capacity of 1 000 chickens per day;
- supply large amounts of high-quality drugs and vaccines to farmers in remote areas;
- provide extension/advisory services to rural farmers and other growers;
- manage breeding/grandparent farms and become a clean source of parent stock;
- produce and supply fertilized eggs to hatcheries from quality breeder flock/parent stock;
- partner RIU to expand the initiative to other regions in Tanzania and reach more farmers.

Key facts about the RIU-backed indigenous poultry business in Tanzania:

- network of more than 3 500 farmers in Pwani, Dodoma and Singida regions each with 100—300 birds.
- chickens mature in 3—4 months: 50 000 mature chickens are ready for consumption every month (volume is increasing as more regions are covered and more farmers are recruited through contract poultry keeping);
- contract farming assures farmer's ability to purchase inputs including chicks, drugs, vaccines, feeds and extension services;
- network of 13 hatcheries producing about 91 000 chicks a week;
- 15 out-growers have signed contracts to raise medium to large-scale parent stocks and supply fertilized eggs to the 13 hatcheries whose total growth capacity is expected to reach 250 000 chicks per week this year;
- stakeholders are well coordinated to deliver poultry services and inputs including drugs, vaccines;
- poultry feeds, extension, technical information and relevant business development services;
- contract farming is being rolled out to 6 more regions this year (Morogoro, Tanga, Iringa, Njombe, Ruvuma and Mbeya) as well as reaching more farmers in the current regions;
- more vulnerable groups like the elderly, people living with disability (i.e. the blind, physically-challenged, deaf, albinos, etc.) are being supported to enter into poultry contract keeping.

Source: RIU website

Vertical integration in the white meat value chain is essentially confined to the commercial poultry (broiler and layer) segment of the industry. Many firms (see Annex 7) practising vertical integration exist in Tanzania, although integration is usually incomplete. Firms usually engage in all or some of the following activities: growing feed ingredients, importing feed ingredients (especially soybean meal from India as this is de-fatted, of more consistent and better quality, more reliable in supply and cheaper than Tanzania-produced full fat meal), milling and compounding specialist feeds, producing broiler and layer day-old chicks, selling day-old chicks, growing out broilers to slaughter weight, slaughtering, processing (to various degrees), and conducting wholesale or retail marketing of birds and bird products. The largest and most complete enterprises include lnterchick (Box 8) and Twiga Feeds. Integrated enterprises are normally located in pen-urban and urban areas, mainly in Dar es Salaam and its surroundings, though there are other enterprises in various parts of the country. Production is primarily based on imports of parent stock either as day-old chicks or hatching eggs. Imports of broiler grandparent stock for production of parent stock took place in the past but proved impossible to maintain to the required standards, imports of grandparent stock were abandoned in the early 1990s. The Tanzania Poultry Breeders Association (TPBA) whose aims are to promote, develop and safeguard the interests of poultry breeders in the country in order to make Tanzania poultry self-sufficient was registered in July 2011.

In summary both horizontal and vertical integration, other than for broiler and layer production, remain marginal. The white meat value chain may be considered a 'market-type governance' with many producers, traders and consumers. Relationships among stakeholders in the chain are mainly determined by the product sale price. Coordination of the whole chain for all participants is needed to generate communication and trust.

Box 8: Onwards and ever upwards: Interchick, a vertical integration model for poultry production and processing

In 1994 the International Finance Corporation's African Enterprise Fund (AEF) lent US$ 1 million to Tanzania Breeders and Feedmills Ltd (Tanbreed), a company set up in 1992 in Mbezi (on the northern outskirts of Dar es Salaam). Tanbreed was an outgrowth of Interchick and both are universally known as 'Interchick'. Over the years, Interchick has become a large-scale vertically integrated operation consisting of feed mills, a hatchery, contract growers and a processing facility. It provides feed and chicks to contract growers, and plans to substantially expand the present number. The application of good production practices has reduced animal mortality from 30 percent to 10 percent (although education of its employees in biosecurity remains a problem). Almost 70 percent of its business is in the greater Dar es Salaam area. To overcome the shortage of eggs and to increase product demand, Interchick imports chicks, eggs and some processed poultry products from its Kenyan parent company, Kenchick, as well as its Zambian associate, Hybrid.

Factors that limit the company's expansion include: distribution logistics, the limitations of hatchery equipment and capacity, the limited availability of eggs, the need for slaughter-line upgrades and maintenance, limited human resource capacity, and high investment capital costs. Expansion strategies include: the purchase of another refrigerated truck to aid distribution, modification of the slaughter-line to improve efficiency, expansion of hatchery facilities from 260 000 to 600 000 chicks (three week cycle), increasing the number and volume of grower contracts, consumer awareness programmes, implementing value-added processing and the adoption of quantity management programs and HACCP-based systems.

Future initiatives include identifying alternative sources of feed protein (soya) to minimize the risk of introducing salmonella, and eliminating the quality issues sometimes associated with a fish protein based diet (i.e. the fishy smell and taste). To overcome the problems of obtaining parent stock and quality feed, in February 2012 the company set up a new integrated facility and farm near Morogoro. There are plans for future export of their products.

Governance

The Southern Highlands White 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* — Governance mechanisms are underdeveloped; participants operate in an uncoordinated and disorganized 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 resources to do this;
- *Too many small participants and small transactions* — The chain is characterized by too many small producers resulting in increased costs;
- *Lack of market coordination* — There is no lead or coordinating organization in relation to markets, technologies and information so that producers and processors have no incentives to improve their product (or the chain process) to promote sustainable income earning opportunities;
- *Unclear and conflicting roles and mandates in district councils* — District Councils have been given responsibility for many former central government activities but have neither the skills nor the staff to perform these effectively (e.g. in terms of regulation, animal welfare, health care, food safety);
- *Industry associations* — Associations are weak at most levels of the chain;
- *Operating procedures* — Standard procedures are inadequately enforced, or not enforced at all, in part because of relaxed production and trade regulations; and
- *Integration* — There is little horizontal and vertical integration of producers, mid-chain participants and retailers (other than in the broiler segment).

4.3 Related to 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. Numerous service providers are purported to operate in Tanzania's white 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, the Tanzania Veterinary Council (TVC), AGRI, the Tanzania Livestock Research Institute (TLRI), the Tanzania Dairy Board (TDB) and TMB etc. Other services in related ministries — e.g. TFDA, the Tanzania Bureau of Standards (TBS), Small Industry Development Organization (SIDO), and the Centre for Agricultural Mechanisation and Rural Technology (CAMARTEC) — also have important roles to play.

Tanzania Meat Board

TMB was established following the passing into law of the Meat Act of 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 white meat chain needs capital and recurrent financing, yet up to early 2013 most chain participants have not been able to obtain finance. Many financial institutions provide some credit for agriculture (see Section 3.3 and Table 4) 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 white meat chain seems to be constrained by high interest rates, high investment costs in some enterprises (especially integrated poultry enterprises) 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, small-scale broiler producers, traders and small processors do not generally have the knowledge or skills to develop viable 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 small-scale broiler producers, traders, slaughterers and retailers; and
- owners of the limited 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 risk.[10]

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 CEBO) 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

[10] The Consultant writing this report had two pedigree beef bulls die over a 15-year period. These were insured with by the National Farmers Union. The Union found clauses in the policy that excused them from paying the claim.

supplement public extension services (although this has hardly touched the livestock industry in general or pigs and poultry in particular).

Extension workers are trained at one of six Livestock Training Institutes (LITIs) located around Tanzania. LITIs provide training that results in the award of a Diploma in Animal Production, Diploma 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) included interventions aimed at developing human resources in the livestock sector. Emerging aspects, or aspects that are likely to (and should) emerge from the white 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).

Veterinary services are provided by both the public and private sectors. 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 degree).[11]
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.

[11] The low proportion of female students contrasts with the situation in Europe where more than 70 percent of veterinary students are women. Unusually (in terms of veterinary education in Africa), Tanzania awards a Bachelor's 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, to augment the industry's contribution to the national economy, and to improve livelihoods. Various stakeholders currently undertake research. The lead institution for animal *production* is TLRI and for animal *health* is AGRI. The Veterinary Faculty of the Sokoine University of Agriculture undertakes both production and health research (including, in contrast to the public sector, on pigs and poultry). 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.

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.

Market 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, but has no data on pigs and poultry sales or prices.

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. Pigs moving long distances out of the Southern Highlands are usually transported as back loads in lorries that have travelled into the Southern Highlands with other commodities. Poultry are moved by a wide — and often imaginative — array of methods including on buses, trucks, bicycles and as head loads.

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 white 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 13) a series of Components and Subcomponents (Table 14) have been developed for implementation by the Livestock Sector Development Programme of 2011.

Table 13: Existing policies, strategies & programmes relevant to the white 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/docsmkukutalldraft.pdf	2005	Builds on four key fundamentals: (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 strategic areas: (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.
'*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.

Policy / Strategy / Programme	Launch year	Objectives / areas of intervention
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 *Kilimo Kwanza* 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.
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 14: 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)

SWOT analysis: PIGS

Strengths	Weaknesses
• Species widespread throughout the country • Little need for specialized land areas • Can be handled and managed easily by women • Short(ish) life cycles allows rapid returns on investments • Omnivorous and scavenges on a wide range of feed • Short reproductive cycle and larger litters • Near organic production in rural areas, thus suitable for niche markets	• No producer, processor or butcher organizations • Little 'management' by producers • Diseases (especially zoo noses) very common and access to veterinary services limited • Inadequate road services in remote areas lead to high transport costs over long distances • Insufficient measures of biosecurity • Minimal research and extension on breeding, production and nutrition
Opportunities	**Threats**
• Organization of segments (or whole value chain) into groups/associations to strengthen and empower • Rapidly rising internal demand for pig meat (as a result of increased individual consumption and population growth) • Young population (promises more consumption in future) • Adding value to basic products through differentiation ('choice cuts') • Potential important source of quality protein to human diet • Improved pig nutrition through better formulated compound feeds • Good potential for rapid growth • The agricultural and livestock sectors are national priorities (hence 'Kilimo Kwanza' or 'Agriculture First' initiative)	• Endemic diseases common and poorly controlled (ASF outbreaks have drastic effects on pigs and will act against the future expansion of exports) • Contamination/pollution from slaughter slabs and butchers is rampant and poor waste disposal will come under increasing regulatory control (increased costs) • High interest rates and an unstable macroeconomic environment (in terms of exchange rates and inflation) • Climate change may affect some aspects of production • Cheap imports of poor quality products from neighbouring countries have a negative effect on local value-added processing • Lack of government support for pigs and religious objections from some sections of the population

SWOT analysis: POULTRY

Strengths	Weaknesses
• Very large numbers of birds adapted to local conditions • Land 'neutral' • Very suitable for women and children • Very rapid life cycle brings early returns on investment • Near organic production in scavenging system ideally suited to local tastes and suitable for future niche markets • If grains are used for feeding, there is a better conversion ratio than for ruminants • Layers can produce income or food every day in the form of egg production	• Few producer, processor and butcher organizations • Supposedly low genetic potential of indigenous breeds • Livestock diseases are common but accesses to veterinary services are limited • Inadequate road services in remote areas lead to high transport costs over long distances • Insufficient measures of biosecurity • Limited research results and information not extended to producers • Entrepreneurs usually have difficulty in obtaining finance/credit
Opportunities	**Threats**
• Organization of segments (or whole value chain) into groups/associations to strengthen and empower • Enormous internal and external markets for poultry meat • Young and expanding population (promises more future consumption) • Adding value to basic products through differentiation ('choice cuts') • Agricultural and livestock sectors are national priorities (hence 'Kilimo Kwanza') • Investment opportunities for grandparent stock within the country	• Diseases are common and only partially controlled • HPAI is still a real and present danger • Lack of animal welfare, biosecurity and food safety issues will hinder entry to lucrative export markets • Contamination/pollution from limited urban slaughter facilities and poor waste disposal will come under increasing regulatory control (increased costs) • High interest rates and an unstable macroeconomic environment (in terms of exchange rates and inflation) threaten broiler production in particular • Climate change may affect some aspects of production • Inability of Tanzania to maintain grandparent stock for broilers and layers • High cost (and likely increases) of feed in modern sector — feed costs are more than 60 percent of total costs • Cheap imports ('dumping') of poor quality retard the development of local integrated processing • Continued lack of government support

5.3 Value chain competitiveness strategy

Strategic interventions would improve the competitiveness of the value chain. These 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 for pigs;
- promoting fair and competitive farm gate prices;
- strengthening the 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 SAAFI);
- increasing the amount — and improving the quality of — processed white meat products;
- ensuring that Tanzania's white 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 white meat production.

5.4 Proposed strategy components

The strategic objectives of the white meat value chain are to develop a competitive and efficient sector that will boost the national economy and contribute to improve livelihoods for all Tanzanians. To achieve these objectives the strategy will:

- make a contribution to national food security, using increased production, processing and marketing of pig and poultry products to meet national nutritional requirements;
- contribute to improving the living standards of people engaged in pig and poultry production through the generation of increased income from product sales;
- increase the quantity and quality of live animals and pig and poultry products as raw materials for local industry and for export;
- promote the integrated and sustainable use and management of natural resources related to pig and poultry production in order to achieve a sustainable environment; and
- promote the production of high quality 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 13). 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 an 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 gazetting of large areas as national parks or game reserves has also, inevitably, reduced 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). 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 lands for sustainable production. These include the need to further development a National Land Use Plan, which will entail demarcating land for particular uses, providing title and ownership of land for livestock producers, preparing land management plans, improving feeding and water facilities for livestock, creating awareness in producers (and in institutions connected to the grazing resource) of the current situation, promoting investment in feed production (especially in yellow maize and soybeans), 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 for all types of livestock and the latter are now greatly diminished in both quantity and quality.

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 (see Annex 5). 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 in spite of government incentives for them to do so (Box 9). 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 both pig and poultry meat, Tanzania has yet to produce a sufficient amount to provide an exportable surplus. 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 enabling existing and new commercial pig and poultry farms — as well as 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 pig and poultry production on affordable terms;
- promote and support the establishment of grassroots savings and credit associations for livestock stakeholders;
- facilitate linkages between and among pig and poultry 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) improving the genetic potential of existing stock[12], (ii) increasing the number of improved stock, (iii) commercializing the chain, (iv) increasing processing capacities and (iv) improving marketing efficiency. Cattle are the source of most of Tanzania's meat and account for 53 percent of the country's total meat production; sheep and goats contribute about 22 percent; the remaining meat comes from poultry, pigs and non-conventional animals. Pig and poultry meat is produced almost exclusively for the domestic market in spite of the potential for export.

[12] There has apparently been a considerable loss of genetic potential in pigs in the last 50 years as a result of inbreeding and the poor quality of boars. The situation is even worse in indigenous poultry.

The ability of pigs and poultry to multiply and grow faster than ruminants (and at a considerably lower cost) makes them attractive to small-scale farmers. The current obstacles to increasing the production and productivity of meat animals include: a lack of available fast-growing animals, inadequate infrastructure, an inconsistent supply of quality feed resources, a lack of disease control, inefficient marketing, the poor provision of technical support services and the inadequacy of producer, processor and retail organizations.

It is commonly held that livestock by-products (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 (usually 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.

Box 9: 'Put your money where your mouth is': Incentives available to investors under the Tanzania Investment Act

Fiscal incentives:

- Import duty and VAT exemption on project/capital goods
- Import Duty Draw Back Scheme:
    - Refunds of duty charged on (i) imported inputs used for producing goods for export and (ii) goods sold to foreign institutions (like the United Nations and its agencies in Tanzania).

Non-fiscal incentives:

- Immigration quota of up to 5 people
- Guaranteed transfer of:
    - Net profits or dividends of the investment;
    - Payment in respect of foreign loans;
    - Remittance of proceeds net of all taxes and other obligations;
    - Royalties fees and other charges;
    - Payment of emolument and other benefits to foreign personnel.

Strategic Investor Status:

- Investors can ask for special incentives from the Government for big projects (>US$ 20 million) that offer specific or significant impact to society or the economy.

Import Duty Draw Back Scheme:

- Refunds of duty charged on (i) imported inputs used for producing goods for export and (ii) goods sold to foreign institutions (like the United Nations and its agencies operating in Tanzania).

Other Incentives:

- Export Processing Zones Act 2002;
- Mining Act 1998;
- Petroleum Exploration and Production Act 1980;
- Special Economic Zones Act.

Source: Tanzania Investment Centre

Specifically there is a need to:

- promote a full inventory, characterization, evaluation and selection of pig and poultry types for increased productivity and conservation;
- encourage the private sector to establish quality pig and poultry breeding farms and hatcheries;
- 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 pig and poultry production;
- initiate national recording and selection schemes through breeders' societies for pigs and poultry;
- 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 for pig and poultry 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 pig and poultry in 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 diseases and the 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 epidemiogical surveillance is extremely low and apparently reducing: in 2007, for example, 1 172 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. (CIE 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. The sustainability of research has been a major bottleneck in the development of appropriate technologies for improving the livestock industry. Challenges in pig and poultry 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

The institutional and financial empowerment of participants along the entire value chain will include 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 organizations.

Support should be provided along the chain to build relationships with a view to becoming a formal body. For producers the example of the Mkombozi Poultry Producers' Group (see Box 1) could be drawn upon. For traders, the Tanzania Livestock and Meat Traders' Association (TALIMETA) could provide a model, as could the activities of Kisutu Poultry Cooperative Society (see Box 4) at a more local level. 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 etc. — 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 white 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 coordinate the various ministries and institutions that impinge on the livestock sector.

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 production 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' association).

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 trans-boundary 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 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 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.
- Halifa M Msami: Director of Surveillance and Diagnostic Services, Tanzania Veterinary Laboratory Agency. hmmsami@gmail.com. 0754 360 104/0713 847 199.
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- Emmanuel S Swai: Senior Veterinary Officer, Ministry of Livestock Development and Fisheries. esswai@gmail.com.
- Gren J Moshi: Administrative Director (and co-owner), Twiga Feeds Limited. 0713 223 126/0767 223 127.
- Clemencia Kombo: Owner, Interchick Franchise Retail Outlet. Clemencia.Maliro@gmail.com. 0787 261 480.
- Tony S Lovell: Advisor, CP Thailand (by e-mail), tonyslovell@yahoo.com.
- Josephine Siarra: Proprietor, The Horse Club, Dar es Salaam. thehorseclubdar@yahoo.com. 0754 000 234/0715 700 011.
- Ali Munge: Medium-Scale Livestock Entrepreneur, Kimbiji, Temeke, Dar es Salaam. 0713 443 786.
- Nelson xxx: Urban small-scale pig producer, Kimbiji, Temeke, Dar es Salaam.
- Mr X: Owner, Fast Food Outlet, Msasani.
- Mr Y: Owner, Fast Food Outlet, Msasani.
- Mr Z: Operator, Fast Food Outlet, Msasani.
- Sinare: Private Veterinary Consultant, Dar es Salaam. drsinare@gmail.com. 0784 325 000.
- Alyosha Reilly: Managing Director, Interchick Company Ltd, Mbezi, Dar es Salaam. yoshreilly@interchicktz.com. 0689 514 662.
- Ahamad Sultan: Production Manager, Interchick Company Ltd, Dar es Salaam. 0787 431 480.
- Pius Kamili: Farm/Livestock Manager, Peramiho Benedictine Abbacy.
- Callistu Nyilawila: CARITAS (Catholic Relief Services) Coordinator, Diocese of Njombe. carlymebb@yahoo.co.uk. 0767 810 153.

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- Agnes Sawella: Mkuu wa Ufugaji wa Kituo cha Elimu ya Viziwi, Kanisa Kilutheran, Njombe. 0755 906 927.

- Gaspar H Chiwanga: Veterinary Research Officer, Tanzania Veterinary Research Agency, Iringa. chiwanga2000@yahoo.com. 0784 537 613.

- Saros Paolo: Large-scale private poultry farmer, Iringa Urban. 0754 53 857.

- Allen Katyale: Medium-scale private poultryfarmer, Iringa Urban. akatyale@yahoo,com 0754 444 131/0784 997 448.

- Bibi Titi Kalange: Traditional smallholder poultry producer, Iringa Urban.

- Linus Mbiliiny: Medium-scale private poultry farmer, Iringa Urban. 0755 006 924.

- Ahmed H Lulanga: Small-scale traditional poultry farmer, Iringa Suburban. ahmad.lulanga@gmail.com 0652 310 025.

- Michael Chonga: Small-scale traditional pig producer, Iringa Urban.

- Juma Abdallah: Small-scale traditional poultry producer, Dodoma Road, Iringa.

- Julius Kalange: Small-scale traditional poultry/pig producer.

- Martin Magagura: Regional Veterinary Officer, Singida Region. mmagagura@yahoo.com. 0756 177 081.

- Richard David: District Veterinary Officer, Singida District Council. 0784 603 884.

- Madoi Njou: Founder/Leader, Mkombozi Poultry Group, Sing ida District. 0755 702 585.

- Hassani Hamidi: Member, Mkombozi Poultry Group, Singida District. 0759 802 066.

- Salumu Mugea: Member, Mkombozi Poultry Group, Singida District. 0762 533 647.

- Josephati Lida: Member, Mkombozi Poultry Group, Singida District. 0763 879 127.

- Paulina Lumdeay: Member and Community Vaccinatrix,, Mkombozi Poultry Group, Singida District. 0762 109 929.

- Alexander Itaeli: Smallholder pig producer.

- Ivone Tiemai: Smallholder poultry farmer.

- J Sultan: formerly Livestock Coordinator FarmAfrica Babati Project; independent Consultant to Mifugo and animal health advisor to farmer groups associations.
- Anna Moshi: Professional exotic goat breeder, treasurer Toggenberg Breeders Association.
- Silvia Mjengo: Member, Toggenberg Breeders Association.
- Margrit Kijenge: Member, Toggenberg Breeders Association.
- Saleh S Bathawab: Chairman, Tanzania Poultry Farms Ltd, Momella, Arusha. Tanpoultry@hotmail.com 0784 326 177.
- Amin S Bathawab: Managing Director, Tanzania Poultry Farms Ltd, Momella, Arusha. Tanpoultry@hotmail.com 0784 326 177.
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- Elirehma Kiangi: Agriculture Field Officer. 0714 121 722.
- James Mjata: Pig rearer, Lewa Village, Korogwe.
- Theresa Mjata: Pig rearer, Lewa Village, Korogwe.
- Charles Kileo: Pig rearer, Lewa Village, Korogwe.
- Daniel Whiyo: Pig rearer, Lewa Village, Korogwe.
- Herbert Martini: Pig rearer, Lewa Village, Korogwe.
- Togolal Shekilenko: Pig rearer, Lewa Village, Korogwe.
- Justice Mtata: Pig rearer, Lewa Village, Korogwe.
- Sara Julius: Poultry producer, Lewa Village, Korogwe.
- Zubeda Julius: Poultry producer, Lewa Village, Korogwe.

- Rehema Hashimu: Poultry (duck) producer, Lewa Village, Korogwe.
- Mzee Antony Mdeme: Pig breeder, Weles Village, Korogwe.
- Mama Kristina Mdeme: Pig breeder, Weles Village, Korogwe.
- Mzee Deves Kihiyo: Pig breeder, Weles Village, Korogwe.
- Ibahati Kihiyo: Pig breeder, Weles Village, Korogwe.
- Several poultry dealers/traders: Korogwe/Chalinze road.
- Mlay Elias: Proprietor, Edo Chips, Msasani Road, Dar es Salaam. 0786 117 364/0784 483 949.
- Nicholaus J Kampa: Managing Director, Tandan Farms Ltd, Kisemvule Area, Mkuranga. tandanfarms@yahoo.com. 0784 509 555.
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- Daidi Ramadhani Kibwana: Chairman, Wakukect Chama cha Kuku, Kisutu Retail Market, Dar es Salaam [kuku was kisasa].

- Juma Ham za: Chairman, Kisutu Poultry Cooperative Society Limited, Kisutu Retail Market, Dar es Salaam [wachinjaji wa kuku]. 0657 553 391.

- Yared Petro: An independent medium-scale long-distance poultry trader (Iringa/Dar es Salaam).

- Chris Statham: Director, Tai Mobile Solutions. mobilemoneyconsultant@gmail.com 0659 176 965.

The following people were met during the course of the red meat study and have relevance to the white meat study:

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- 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.

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- Silvanus Mruma. Advisor (Private Sector Development), SNV, Morogoro. Smruma@snvworld.org, 0755 744 327.

- Salim Said: General Manager, Energy Milling Co Ltd., Sumbawanga. 0767 198 537.

- Numerous Butchers and Input Suppliers in Dar es Salaam suburbs.

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Annex 4. Poultry feed manufacturing enterprises in Tanzania

No	Region	me of animal feed plant	Type of animal feed(s) produced	District	Production (Tons/day)	
					capacity	Production
1	Arusha	Kjenge Animal Product Ltd	Poultry, pig, dairy and hose feeds	Arusha		
		Fammy Poultry	Poultry feeds	Arusha		
		HAFVET Products	Poultry , pig and dairy feeds	Arusha		
		WAPO animal feeds Product	Poultry feeds	Arusha		
		Ilboru Animal feed	Poultry and dairy feeds	Arusha		
		Nanenane Animal feed	Poultry and dairy feeds	Arusha		
		Dhariwal Trading company	Poultry and dairy feeds	Arusha		
2	DSM	Interchick Co	Poultry feeds	Kinondoni	66	20
		Tausi Animal feeds	Poultry and dairy feeds	Kinondoni	40	16
		Hill Animal Feeds	Poultry and dairy feeds	Kinondoni	24	15
		Igo Animal Feeds	Poultry and dairy feeds	Kinondoni	50	20
		Lengesia Animal Feeds	Poultry and dairy feeds	Kinondoni	10	3
		Rimayi Animal feeds	Poultry and dairy feeds	Kinondoni	15	5
		Jadide Animal Feeds	Poultry and dairy feeds	Kinondoni	15	5
		Mfugaji Animal feeds	Poultry and dairy feeds	Kinondoni		
		Fide Animal feeds	Poultry and dairy feeds	Kinondoni	30	15
		Kimara Animal feeds	Poultry and dairy feeds	Kinondoni	16	5
		A + Z Animal feeds	Poultry and dairy feeds	Kinondoni	40	20
		Mkomboa	Poultry feeds	Ilala	5	
		Barkhesa	Wheat meal, Wheat bran, Bone meal, Fish meal	Ilala	65	
		Moselmach Tanzania Ltd	Poultry feeds	Ilala	10	2
		Farmers Centre	Poultry and dog feeds	Ilala	15	3
		Tanzania Breweries	Poultry feeds	Ilala	3	
		Multivet	Poultry feeds	Ilala	5	
		B A F	Poultry feeds	Ilala	80	20
		Farmbase	Poultry and dog feeds	Ilala	20	
		Benfeed	Poultry feeds	Ilala	25	

		Furahisha Co. LTD	Poultry feeds	Ilala	30	
		Twiga Feeds	Poultry , pig and dairy feeds	Temeke	25	10
		Best Chicken Feed	Vyakula vya kuku	Temeke	?	
		FALCON	Poultry and dairy feeds	Temeke	50	10
		Ideal Chicks	Poultry feeds	Temeke		
		Amadori	Poultry feeds	Temeke	20	8
		Nassad Feeds	Poultry feeds	Ilala	40	15
3	K'njaro	M6 Milleniuam animal feeds	Poultry and dairy feeds	Hai		2
		Machame animal feeds	Dairy feeds	Hai		
		Harsho animal feeds plant	Poultry, pig and dairy feeds	Moshi (M)	5	3
		Union store animal feeds plant	Poultry, pig and dairy feeds	Moshi (M)	8	2
		Josho plant	-	Moshi (M)	3	1/2
		Shengana mineral lick plant	-	Same		
4	Mbeya	Kaijunga	Poultry feeds	-		
		Omury	Poultry feeds	-		
		Taraja Agrovet	Poultry feeds	-		
5	Morogoro	International TanFeeds LTD	Poultry, dairy, and pig feeds	Morogoro (M)		
		Donfeed	Poultry and pig feeds	Morogoro (M)		
		Chesterfeed	Poultry, pig, dairy and dog feeds	Morogoro (M)		
6	Mwanza	Misenani Agriservice	Poultry feeds	Ilemela		
		Posho Mill	Fish meal	-		
		Ghana feed Centre	Poultry feeds			
		Elly Mushi Aninmal feed processors	Poultry feeds	Nyamuga ne		
		Vess Posho mill	Poultry feeds	-		
		Ndakeji fish and Posho mill	Fish meal	-		
		Kaita fish meal	Fish meal	-		
		Itale Mbisu fish meal	Fish meal	-		
7	Pwani	Pantoni Animal Feed	Poultry feeds	Kibaha		
		JKT Animal Feed	Poultry feeds	Kibaha		
		Mungʻana Agrovet	Poultry feeds	Kibaha		
		Vitu Farm	Poultry feeds	Kibaha		
		Kongowe Feed and Millers	Poultry feeds	Mkuranga		
8	Shinyanga	Kaijunga	Poultry feeds	-		
		Omari	Poultry feeds	-		
		Taraja Agrovet	Poultry feeds	-		
9	Singida	VETA Singida	Poultry and dairy Feeds	Singida		

Annex 5. Investment opportunities in the livestock sector in Tanzania[13]

1. BACKGROUND

Policy and Legal Framework

Tanzania has an open market economy. The Government's role remains to formulate conducive policies and enabling legal frameworks that can pave the way for private sector growth and development. In the process of implementing these policies, Tanzania has launched (among other initiatives '*Kilimo Kwanza*'. This aims at facilitating the involvement of the private sector in agricultural activities including livestock farming. Thus, 'Kilimo Kwanza' is part of the Government's commitment to promoting investment in the livestock sector.

In order to promote private investment, the Tanzania Investment Centre (TIC) has been established. TIC is the focal point for all investors' inquiries and is intended to facilitate project startups, encourage joint venture investment and disseminate investment information. It also serves as a one-stop centre for providing information about land acquisition, taxes, exemptions and other investment incentives packages.

National Livestock Policy

The National Livestock Policy (2006) aims to stimulate the development of the livestock industry in order to exploit the available potentials. It aims to increase the contribution of livestock to the national economy while ensuring environmental conservation. Secondly, it recognizes the importance of the private sector in promoting a commercialized livestock industry. The policy is one of many initiatives intended to invite and open the door wide for private sector investments. Various acts have been enacted for effective policy implementation and regulation of the industry, including the Veterinary Act No. 16 of 2003, the Animal Diseases Act No. 17 of 2003; the Dairy Industry Act No. 8 of 2004; the Meat Industry Act No. 10 of 2006, the Hides and Skin Act No. 18 of 2008, the Animal Welfare Act No. 19 of 2008; the Livestock Identification, Registration and Traceability Act No. 12 of 2010 and the Grazing-land and Animal Feed Resources Act No. 13 of 2010.

2. INVESTMENT ENVIRONMENT

Political Stability and Related Factors

Tanzania has enjoyed political stability for the 50+ years since Independence. This is in part a result of the existence of democratic institutions, which have contributed effectively towards good governance, human rights observance, the rule of law and ethnic and diversity stability. Tanzania is, also, a signatory to various international conventions and protocols, which lay out its commitments to human rights, good governance, gender and environment.

Market Access

With more than 45 million people, Tanzania offers a sufficient market for agricultural products and in particular livestock and livestock products. The national economy grew steadily at 5-6 percent annually between 2005 and 2009. In addition to the domestic market, the East African Community (EAC), comprising Kenya, Uganda, Rwanda, Burundi as well as Tanzania offers potential markets for investors. Beyond the EAC there are at least three other markets to which investors in Tanzania have access. One is the Southern African Development Community (SADC) with its 215 million consumers; another is the European Union, to which Tanzanian exports have access arrangement under the EU's Everything But Arms (EBA) initiative; and the third is the United States, to which Tanzania has access

[13] This Annex is taken almost in its entirety from 'Investment Opportunities in the Livestock Sector,' published in 2011

under the provisions of the African Growth and Opportunity Act (AGOA). Tanzania also has seaboard, inland water ports, land and air links that provide it with reliable access to export markets.

3. AREAS OF INVESTMENT

Pig Production

More than 90 percent of the 1.9 million pigs in Tanzania are kept by small-scale farmers mostly in the Southern and Northern Highlands and under traditional production system. The demand for pork is increasing in urban and pen-urban areas as a result of increasing customer preference for its meat. However, current production does not meet the demand of either the domestic or export markets. Pig production can be improved through proper husbandry practices, adequate support services, disease control and appropriate slaughter and marketing infrastructure. Intensive pig production for commercial purposes is limited to very few farmers. They make a regular income, but have to meet the high cost of concentrate feeds among other requirements.

Areas for investment in pig industry include:

- establishment of breeder's farms;
- establishment of commercial farms; and
- establishment of slaughter and processing plants.

Poultry production

There are two key poultry production systems in Tanzania: the traditional and commercial. Current production is estimated at 58 million chickens (indigenous 23; commercial 35) and 1.2 million ducks. Poultry production offers a lot of opportunities for private sector investment. The Small and Medium Enterprises have managed to increase the numbers of local chickens from 27 million in 2001 to 30 million in 2006, while commercial stock increased from 20 million to 25 million. On average 5.5 million hatching eggs and 1 million day-old parent chicks are imported annually to produce a total of 25 million day-old chicks for commercial purposes. This figure is low compared with the current requirement of 60 million day-old chicks per year. Egg production increased from 2.4 million in 2007/2008 to 2.9 billion in 2009/2010. The observed increase is a result of sensitization on good poultry husbandry practices and the use of thermostable New Castle Disease vaccine. The per capita consumption of eggs has increased from 50 to 75 eggs per person per year. The rising demand for day-old chicks, meat and eggs calls for more investment.

The areas for investment in poultry industry include:

- establishment of breeders farms for grand and parent stock; and
- establishment of commercial layers and broiler farms

Animal Feeds

Animal feed are important inputs in livestock production and account for more than 70 percent of production costs. The main types of animal feed resources available in Tanzania are pastures, fodder crops, crop residues and compounded feeds. However, almost all ruminants in the country depend on natural pastures. The area for grazing and pasture production is dwindling as a result of increased land requirement for crop production and climatic change, and this has led to a seriously shortage of pastures during dry season and conflicts between livestock and crop farmers. In respect of this, the government decided to demarcate certain land area specifically for livestock grazing and pasture production. The land demarcated for pasture for livestock is about 1 890 419.19 hectares and spread over 17 regions of the Tanzanian mainland. Potential areas for investing in pasture production are the southern, central, lake and western zones.

Compounded Animal Feeds

An estimated 800 000 tonnes of compounded animal feed is produced every year, though the potential demand stands at 2.5 million tonnes. There are about 57 animal feed mills/plants in the country which are not operating to their optimal capacity; most are located in Dar es Salaam, and the Coastal, Arusha and Mwanza regions.[14]

Existing Potential:

- there are skilled and experienced human resources in animal feed production;
- feed ingredients are abundant and easily available: the main ingredients are cereals and their by-products, seed cakes (sunflower, cotton), fishmeal, limestone, bonemeal and bloodmeal;
- there is a high demand for compounded animal feeds for the emerging commercial livestock production;
- there is the potential for own cereal and soybeans production;
- there is minimal tax imposed for packing bags; and
- there is available land for building factories/industries.

[14] See Annex 4 for a partial list of feed mills

Annex 6. Pictorial presentations on pig and poultry statistical data

Figure 20: Total number of pigs in Tanzania, 1995-2008

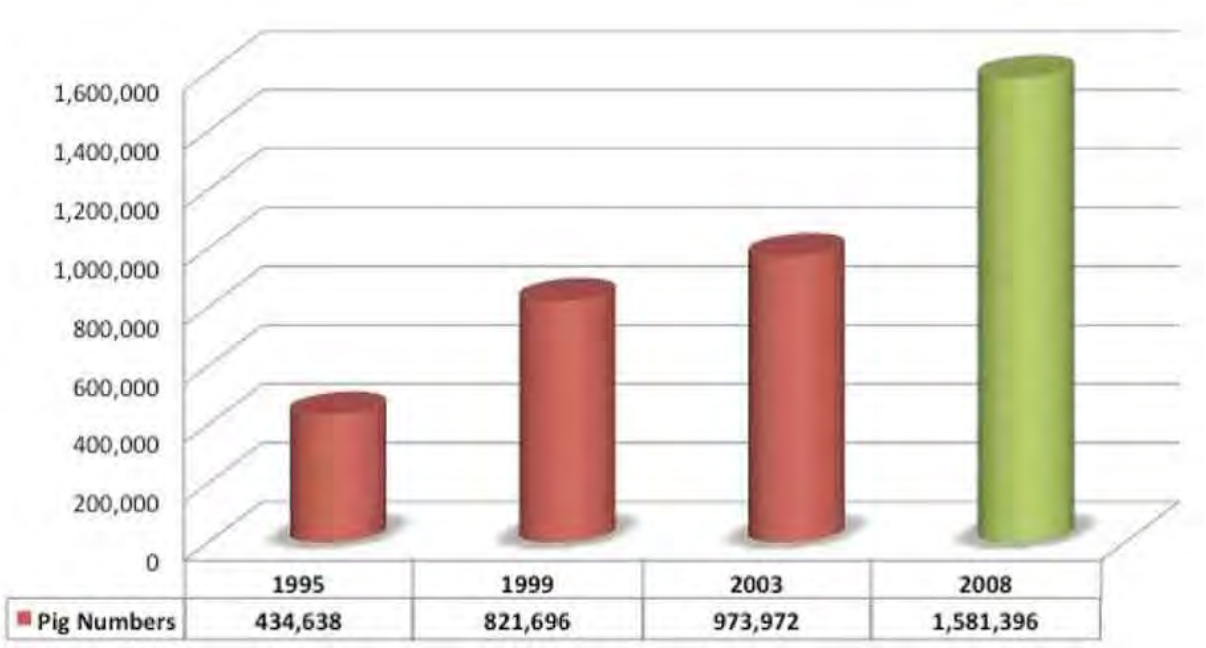


Figure 21: Annual growth rate of pigs in Tanzania, 1995-2008

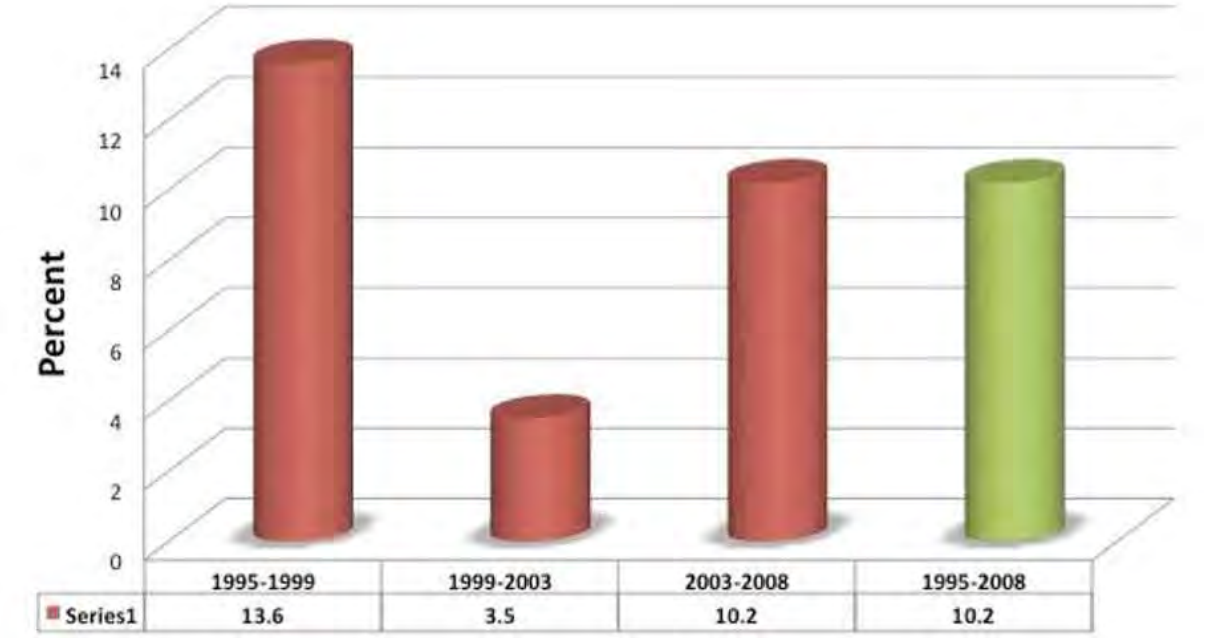


Figure 22: Numbers of pig in Tanzanian regions, 2008

Figure 23: Density (number/km2) of pigs in Tanzania regions, 2008

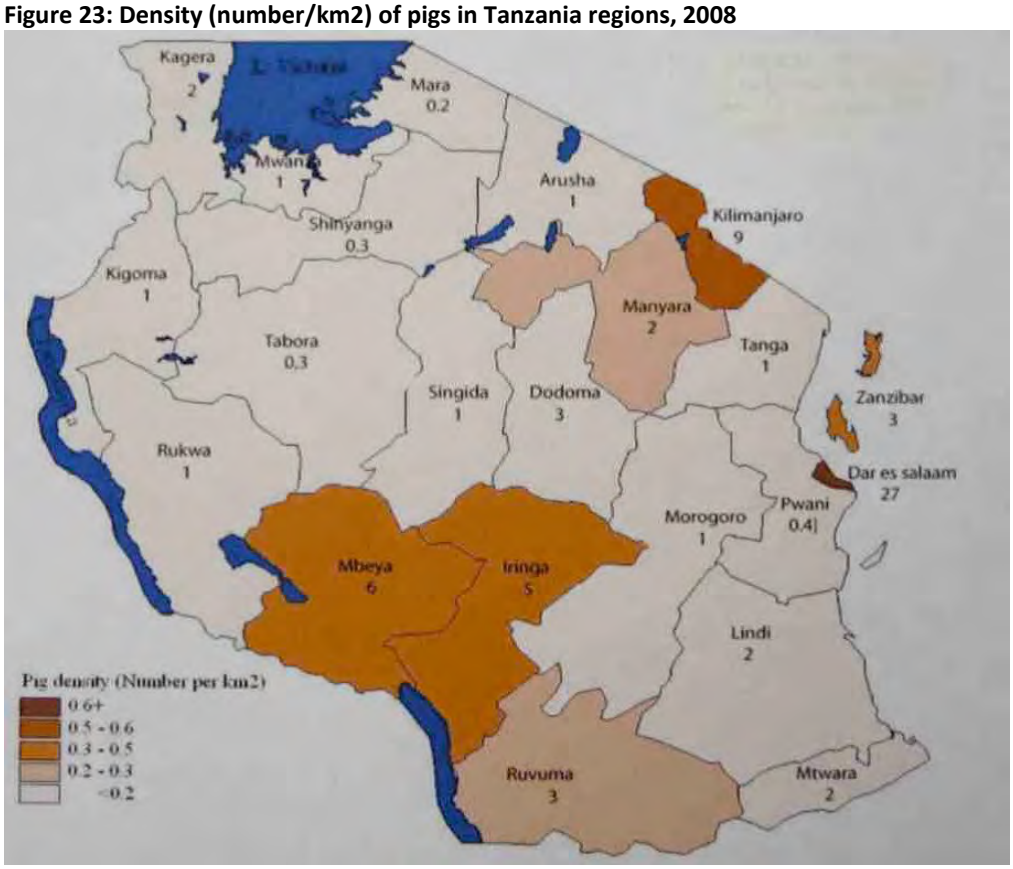


Figure 24: Total number of domestic fowl in Tanzania, 1995-2008

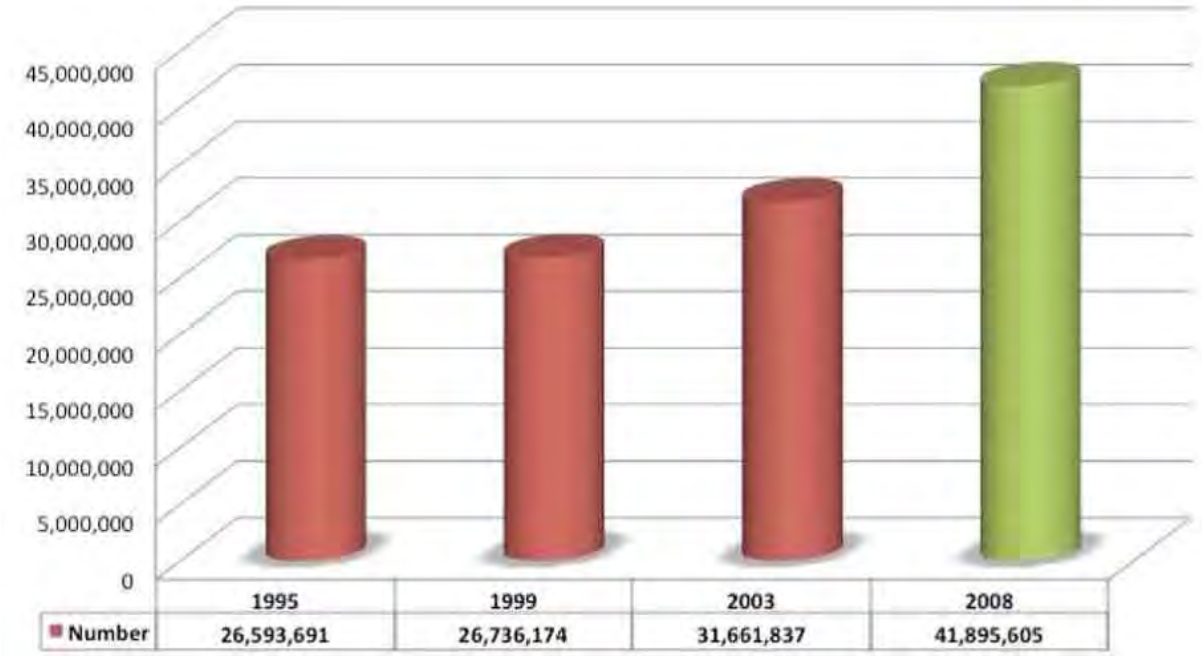


Figure 25: Annual growth rate of domestic fowl in Tanzania, 1995-2008

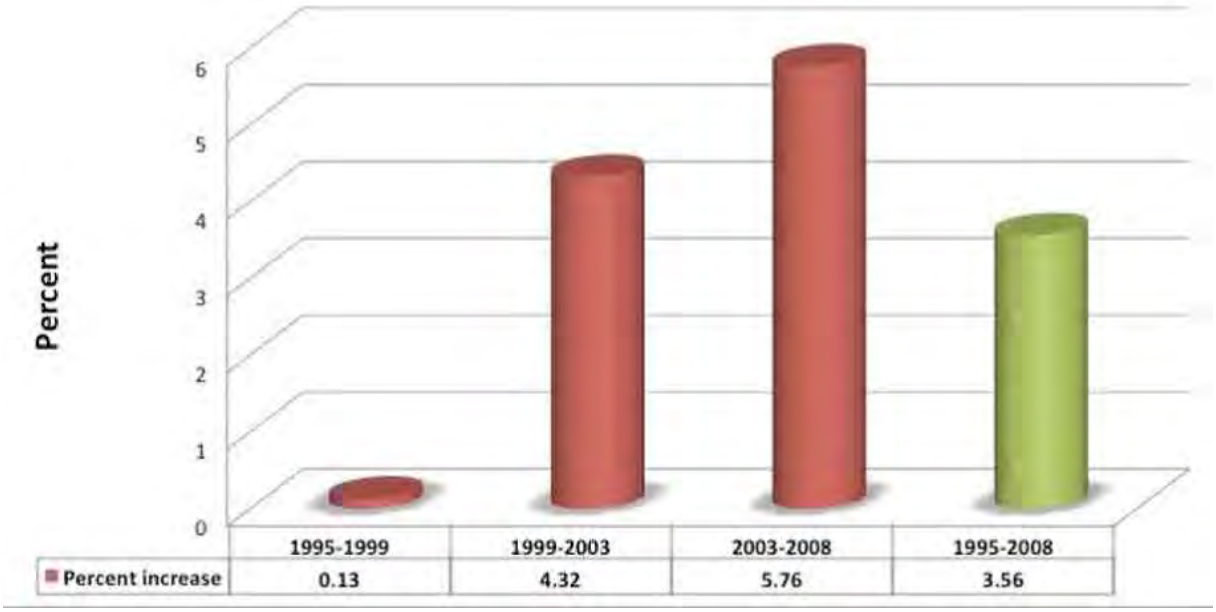


Figure 26: Numbers of domestic fowl in Tanzanian regions, 2008

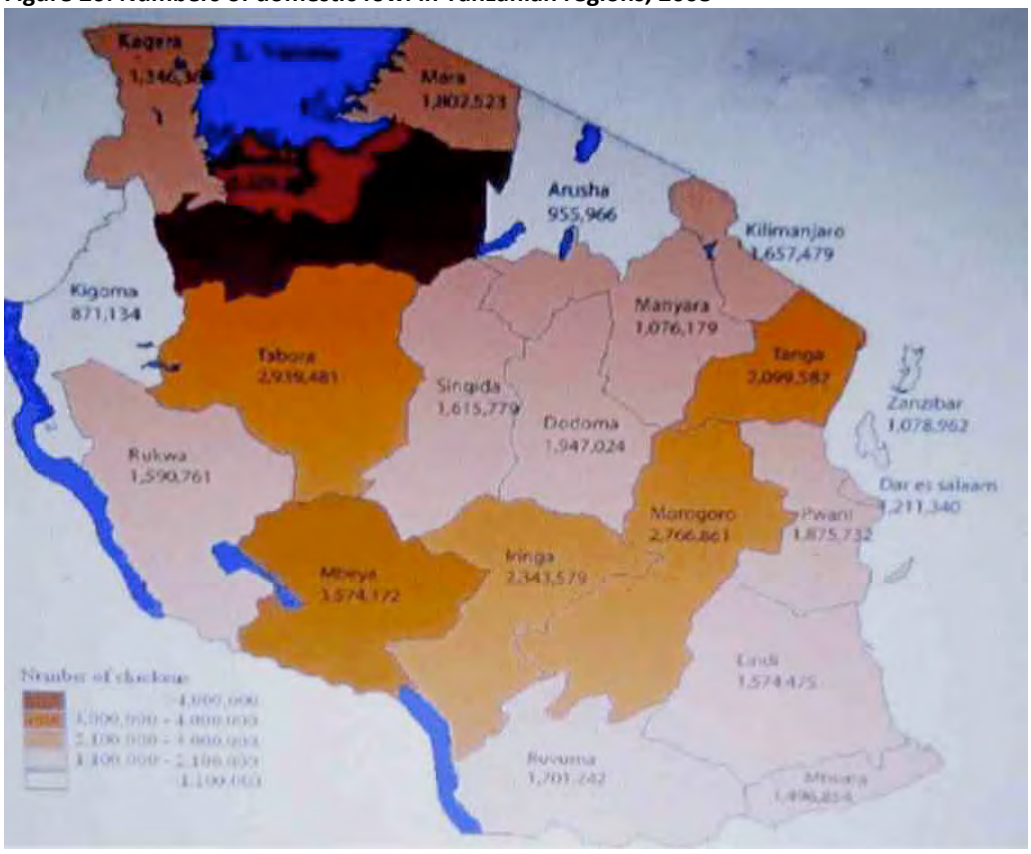


Figure 27: Density (number/km2) of domestic fowl in Tanzania regions, 2008

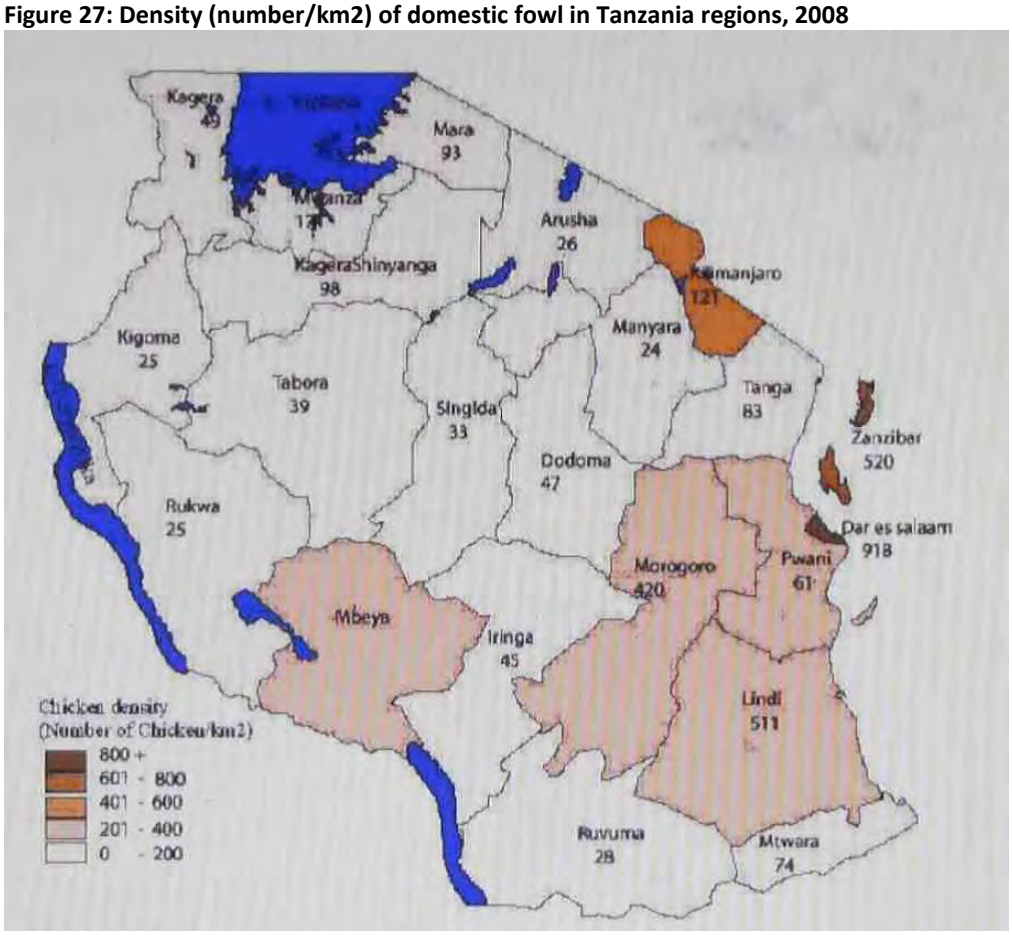


Figure 28: Total number of broilers in Tanzania, 1995-2008

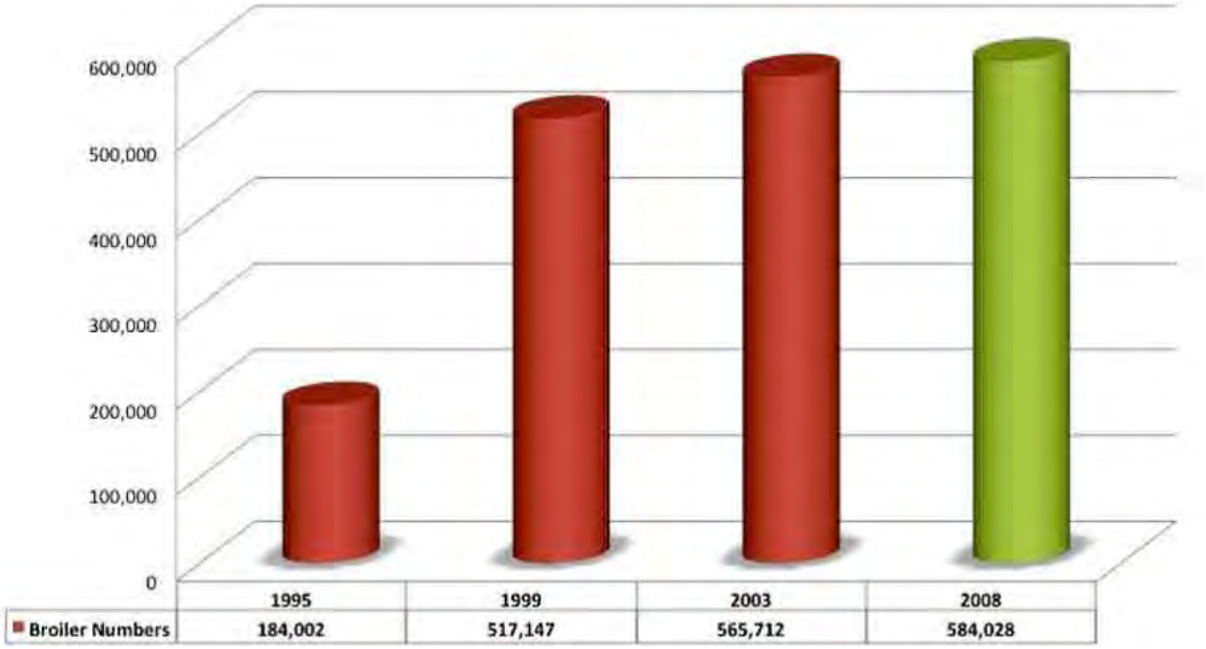
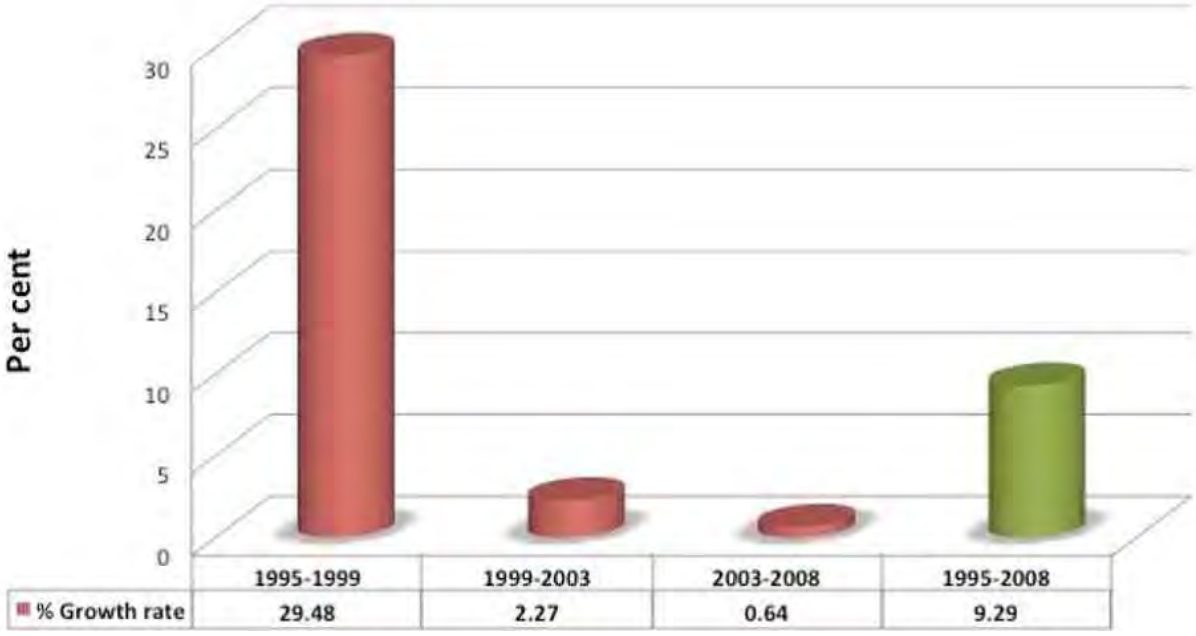


Figure 29: Annual growth rate of broilers in Tanzania, 1995-2008



Annex 7. Vertically integrated poultry production enterprises in Tanzania

Company	Location	Products	Notes
Mkuza Chicks Ltd	Kibaha (Pwani)	Broiler DOC/a Layer DOC Chicken Meat Poultry feeds	Broiler Parent Stock 41 000; Layer Parent Stock 24 000; Broiler birds 35 000 per batch; Hatchery capacity 520 000 per month; Broiler processing plant 24 000 birds per day (would not allow consultant to visit)
Kibaha Education Centre	Kibaha (Pwani)	Broiler DOC Layer DOC Poultry feeds Egg trays	Broiler Parent Stock 16 400; Layer Parent Stock 4 600; Hatchery capacity 240 000 per month (no poultry activities in January 2013)
Ruvu JKT Poultry Farm	Bagamoyo (Pwani)	Broiler DOC Layer DOC	Broiler Parent Stock 3 800; Hatchery capacity 20 000 per month; Indigenous fowl (Kuchi and Vishingo) 5 400
Euro Poultry (T) Ltd	Mkuranga (Pwani), Temeke (Dar es Salaam)	Broiler DOC Layer DOC Hatching eggs Table eggs Poultry feeds	Layer Parent Stock 65 000; Broiler Parent Stock 48 000; Hatchery capacity 460 000 per month. Hatching eggs supplied to Interchick 20 000 per week and Twiga 8 000 per week; Commercial layers 40 000
Tomatho Holdings Ltd	Kibaha (Pwani)	Broiler DOC	N/A
Visiga	Kibaha (Pwani)	Hatching eggs Table eggs	N/A
Ideal Chicks Ltd	Kinondoni (Dar es Salaam)	Broiler DOC Layer DOC Poultry feeds	Layer Parent Stock 19 116; Broiler Parent Stock 28 109; Hatchery capacity 62 000 per batch
Twiga Feeds	Kinondoni (Dar es Salaam)	Broiler DOC Poultry Feeds	Broiler Parent Stock 32,000 (not operating in January 2013)
Interchick Co Ltd	Kinondoni (Dar es Salaam)	Hatching eggs Chicken meat	Hatching eggs 80,000 per month, Broiler processing plant
Kiluvya Chick Company	Kinondoni (Dar es Salaam)	Broiler DOC Layer DOC	Broiler Parent Stock 14 000; Layer Parent Stock 2 500; Hatchery capacity 120 000; 54 000 chicks per week
Tanzania Poultry Farms Ltd (Kiliagro & Livestock Products Ltd)	Momella (Arusha)	Broiler DOC Layer DOC	N/A
Kijenge Animal Products Ltd	Arusha municipality	Broiler DOC Poultry Feeds	N/A
Kibo Poultry Products Ltd	Moshi municipality	Broiler DOC Layer DOC Spent layers	N/A (allowed visit but refused to provide information in January 2013)
Missenani Agri Services	Ilemela (Mwanza)	Broiler DOC Layer DOC	Broiler Parent Stock N/A; Layer Parent Stock 5 500, Hatchery capacity 82 000 per month
Mama Vero Mushi Farm	Mwanza municipality	Table eggs	Commercial layers 5 800; Egg production 45 000 per month

Company	Location	Products	Notes
Songwe Poultry Farm	Mbeya	Broiler DOC Layer DOC	N/A
Mateka Poultry Farm	Songea Ruvuma	Table eggs	Commercial layers 6 000; Egg production 135 000 per month
Peramiho Poultry Farm	Songea Ruvuma	Table eggs	Commercial layers 12 000; Egg production 225 000 per month

Note: a: Day old chick

K.L.P Background:

Kiliagro & Livestock Products Limited (K.L.P), is under the umbrella of Bathawab Investments Group which is a private business company dealing both locally and internationally. K.L.P aims to be the number one producer of chicken products in Tanzania under the recognition of TBS.

Location:

K.L.P is located in Arusha Region at Mbuguni/Mererani road, which is approximately 37 Kms away from Arusha town. The location is the most appropriate area to conduct poultry business as it guarantees the most hygienic and pollution free environment in order to grow healthy chicken.

Management:

We have dedicated management team, who are highly experienced in poultry industry. Most of the Management personnel are in middle age, thus ensuring the efficiency, teamwork, activeness and goals oriented. K.L.P also incorporate a training and support scheme to improve the level of local growers of chicken in the industry.

Our Motto:

"We are about the CHICKA-AN"

Vision:

To be the leader in Poultry Industry in the region and expand the business locally and export outside the country.

Mission:

We are committed to provide the highest quality of frozen/chilled chicken and excellent service to our clients.

Core Business and Values:

Meet our client expectations, by producing the highest quality frozen and chilled chicken in a highly hygienic environment.

As always, we ensure our client with quality and the attainable standards services, that consists transparency, honesty, fairness and customer's confidentiality in our day to day responsibilities.

Contact Us:

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P.O. Box 336,
Arusha - Tanzania.
Cell: +255 732 971762
+255 732 971763

Email: info@kiliagro.com
Web: www.kiliagro.com

Kiliagro & Livestock Products Ltd.


TWIGA CHICKS
VIFARANGA VIFARANGA
JIPATIE VIFARANGA KWA BEI NAFUU TOKA TWIGA FEEDS LTD.
VIFARANGA
VYENYE NGUVU NA UBORA WA HALI YA JUU SANA
Wasiliana nasi
Mbezi Industrial Area, Dsm
Simu No: 2628161 / 2628186 / Fax: 2628164.
Mobile: 0741 - 533078, 0741 - 783299
Nunua/Agiza leo


MADINI MUHIMU KWA KUKU WA MAYAI
TAM POULTRYMIX
KUKU BORA LAYER
KUKU BORA
TAM Poultry Mix
Faida
Mauzo
ABCON CHEMICALS LIMITED

Annex 8. Business Plan — Mazimbu Agro Enterprises

ACRONYMS

AO	Assistance officer
BRELA	Business Registration and Legal Authority
EPINAV	Enhancing Pro poor Innovations in Natural Resources and Agricultural Value Chain
MAE	Mazimbu Agro Enterprises
NEEC	National Economic Empowerment Council
NBS	National Bureau Statistics
SUGECO	Sokoine University Graduates Entrepreneurs Cooperative
SUA	Sokoine University of Agriculture
TFDA	Tanzania Food Drugs Authority
TANFEE D	International Tanfeeds Ltd
TIN	Tax Identification Number
TBS	Tanzania Bureau of Standard

EXECUTIVE SUMMARY

Mazimbu Agro Enterprises (MAE) is a privately owned local entity formerly registered tinder Business Name Registration Act with Registration number 247224 of 4th October 2011 Tax Clearance Certificate No 0121161 and TIN No 117 – 385 – 361. The proprietor of MAE is Mr. Alexander Benny Jokoniah a young man aged 24 years and graduated from Sokoine University of Agriculture majoring in Bachelor of Science in Agricultural Economics and Agribusiness - 2011.

The proprietor started to operate on April, 2012 immediately after graduated from the university college in order to fulfill the dream of job creator rather than job seeker. The main ideal was/is value chain in livestock products and produces high quality meat for food security and began by raising 500 broiler chicks and 10 piglets. Throughout the operation the demand for local chickens and pork meat remain high.

Thus, there is a need to commercialize both piggeries and local chickens because now days the market of organic products is growing rapidly after people knowing the benefits of organic product to their health and today's meat business is about improving due to the high population growth of 44 929 002 people in Tanzania (National Bureau Statistics, 2012) and the meat production is very low for the year 2011/2012 for both local chickens and pork meat respectively. According to the Ministry of Livestock and Fisheries, 2012 the production of local chicken meat and pork meat was 84 524 tons and 47 246 tons respectively.

For that reason, MAE is going to use that gap of high population which need meat for food security and low quantity production which is available to produce and sell chicken meat branded as KUKU NYAMA means chicken meat and MAE meat means pork meat to Hotels, Food vendors, Supermarket and Individuals in town.

The source of funds to implement this business is National Economic Empowerment Council (NEEC) grants of TSh 400 000 000 and own equity of TSh 30 000 000. The total capital for implementing this business is TSh 4 030 000 000 which will be used for building infrastructure, buying fixed assets and working capital.

This business plan will start official on April 2013 by buying parent stock for both local chickens and piggeries. The purchasing cost of parent stock will be TSh 8 000 and TSh 500 000/= of a good breed

for both local chicken and pig respectively. In this regard, MAE will purchase 150 chickens and 4 pigs every month for year one of the businesses from MVEK company ltd and SUA respectively. After involves in production for the one year and produce high quantity of pigs and local chickens will start to slaughter, packing whole, half and parts of both chickens and pork meat and sell to hotels, food vendors, supermarket and individuals. In other side MAE will enter into partnerships with local farmers to complement our own production. Through this partnership the enterprises will be able to source about 35 percent of the total requirement from contract farmers.

The location of the business will be Morogoro municipality specifically Plot Q. 2148 Lukobe. This area it is within strategic authorized for livestock production, accessible (along Mazimbu road specifically Lukobe area) and low density area. In this regard, the area has enough space for commercialize both local chickens and piggeries respectively. Sales will start second year and expected to increase by 20 percent for the third years and sales turnover will be TSh 600 480 000 for second year.

1. PROFILE OF THE BUSINESS

Current status

Mazimbu Agro Enterprise (MAE) is a privately owned local entity formerly registered under Business Name Registration Act with Registration number 247224 and Tax Clearance Certificate No 0121161 and TIN No 117 – 385 – 361. The proprietor of MAE is Mr. Alexander Benny Jokoniah a young man aged 24 years and graduated from Sokoine University of Agriculture majoring in Bachelor of Science in Agricultural Economics and Agribusiness -2011.

Short history

MAE is a venture managed by young graduate who is a proprietor. It was established immediately after graduated from the university in order to fulfill the dream of job creator rather than job seeker. It started to operate on April 2012 with the key object of value chain in livestock products and produce high quality meat for food security and began by raising 10 piglets and 500 broiler chicks. On late of February 2013 another business unit of raising local chickens will be established as well. The source of capital for broiler chickens business provided by Prof F. P. Lekule (my university teacher) with interest-free in-kind credit in form of feeds and 500 day old chicks payable upon selling mature chickens, raising improved local chickens business will be the grant of TSh 20 000 000 (twenty million only) granted by the government of Norway and Tanzania under the project of Enhancing Pro poor Innovations in Natural Resources and Agricultural Value Chain (EPINAV) after serious competition of graduate business plan writing and already won and Piggery business was my own equity later on I applied for loan from commercial bank (CRDB in Tanzania) and received a loan of TSh 20 000 000 on August 2012 for expansion piggery business and collateral was the University Academic Certificate to show the bank committed of job creator rather than job seeker.

The performance of the business is encouraging and sales per day is approximately to be 100 chickens and 90 kg of carcass meat of pork as sources of protein in human body. The end of December 2012 MAE has managed to sell more than 15 475 pieces of broiler chickens meat to more than 100 customers and the current stock of broiler chickens is no longer in-kind credit rather than my own saving from profit gained from the business. To date the stock is 3 500 broiler chicken and 106 pigs respectively.

Management and ownership

The owner of the Enterprise is Mr. Alexander Benny Jokoniah who is the key player in this business. As top leader, I devote most of my time to lead and make the business grow and attain its goals. As the business expanded I was able to invite advisor of the business to form a strong and sustainable livestock production Entity. Also the enterprise is run by 5 workers (team work) in which the founder who is the proprietor is among. I intend to hire more personnel as I will implement this business plan.

2. BUSINESS DESCRIPTION

Vision of MAE
The vision of MAE is to become one of the leading enterprises in the livestock sector in East Africa.

Mission of MAE
The mission of MAE is to use professionalism to provide and market the quality livestock products to the clients for growth.

Objectives of the enterprises
The main objective of the enterprises is value chain in livestock products and produce high quality meat for food security.
The specific objectives of the enterprise:

- To involve small farmers in production both local chickens and piggeries for improving their livelihood.
- To increase the market Share. A need to open for more markets beyond our existing clientele within and outside the country and establish agencies in major towns in East African Countries.
- To provide efficient and high quality services to our customers by introducing innovative and creative ideas for improved products and services.

Purpose of the project
The main purpose of the project is to enhance the financial and business capability so as to improve enterprises operations and produce high quality meat. It is the intention of the enterprises to capture opportunities available in Agricultural and Livestock Sector. This will be possible through securing the financial package which will enable the enterprises to increase the volume of business, capture a wide area for business expansion and earn substantial Revenues.

Business model and value proposition
MAE intends to commercialize the local chicken and piggeries production in Tanzania. This business has been chosen to the fact that the indigenous poultry and pork meat have higher demanded than any other alternative protean sources such as beef broiler, fish and beaus. According to market studies have shown that the demand of local chickens and pork meat is considerably high in both rural and urban areas. In major urban centre in Tanzania such as Dar es Salaam, Arusha and Mwanza, the market price of local chicken and pork are almost twice as much as that of an exotic chicken and beef meat because of low production and farmers have been unable to produce significant. Due to that, any large and stable local chicken and pig ‘s production that meets the market available will be benefiting for both parties producers and consumers).

Thus, MAE need to commercialize improved indigenous poultry and piggeries production through an innovative intervention by applying semi-intensive and intensive firming products by using modern farming management, use vaccine and treat when chickens and pig sick.

The business strategy will be production and packaging of the produce at source so that it can be selling for domestic market outlet without further packaging. To ensure the desire quality and supply meat, it will be important for MAE to enter into partnerships with local farmers to complement our own production. Through this partnership the enterprises will be able to source about 35 percent of the total requirement from contract farmers. Through this strategy, the enterprises will provide interest-free in-kind credit to contractor farmers in form of feeds, vaccine and good breed of local chickens and piggeries for production and being payable upon selling mature chickens and piggeries. Due to that MAE will have its own nucleus of farm production unit to meet a certain level of

requirements and a network of farmers for the supply of indigenous poultry and piggeries produce explicit indicate the price as well as other quality dimensions that are important for delivery of the desired produce.

By entering into a supply contract, farmers will enjoy the benefits of an assured market for their farm produce while at the same time benefiting from the fact that their farming activities risk will be minimized by the certainty with which their production decision is made. Farmers will enjoy an assured price for various kilograms of live chickens and piggeries produce that they deliver to contract enterprises. Due to the relative involvement of the contractor in the production process, farmers will apply innovate interventions by applying semi-intensive and intensive farming products by using modern farming management and use vaccine. This partnership will involve farmers who have already raising either local chickens or piggeries to their home places.

Product

MAE offers and continues offering to its customers a package of demand driven, high quality meat:

- 1.5 – 2.5kg of chicken carcases.
- 80 – 100kg of carcase meat of one pig
- by product

Marketing structure and analysis:

Environmental situation of pork and local chicken marketing in Tanzania

Currently, consumers have become more health conscious and began to question production methods for exotic chickens. The perception that broiler chickens were raised using drugs and hormones with potential health hazards to consumers became widespread, leading to a sudden fall in demand for exotic poultry products, even as demand for indigenous chickens and eggs surged. Markets studies revealed that consumers had more trust in the way local chickens are raised, felt that the chickens had a better taste than exotic breeds, and are willing to pay more for the local chickens. To date, indigenous chickens remain the most consumed poultry type in rural areas. ln addition, the relatively more health conscious and affluent middle and upper classes in urban areas continue to be a niche market for the indigenous chicken products. On the other side the pig production is becoming popular in many pails of the country and provides significant contribution to meat supply and the price of one kg of pork is high than goat, beef and fish meat and middle and upper class are more who consume pork meat.

Target market and customer base

MAE targets the local market. The customer bases are individual households, supermarkets, hotels and food vendors. These customers have been chosen because consumer attitude and behaviour towards food is rapidly changing on a worldwide scale. There is a strong focus on health issues and clients are sceptical and want guarantees about flic meats they eat.

Table 15: The target market and customer base, reasons for selecting these markets

Target Customer	Reason for Selection	Customer character	Demand
Supermarket/ individuals	The demand of local chickens and pork meat is high while the supply is very low	They always need local chickens and pork meat for consumption	500kg and 400kg chickens and pork meat per day
Hotels	They don't have reliable supplier of local chicken and pork meat	They need local chickens and pork meat under contract basis	300 chickens per day and 200 kg of pork meat
Food vendors	Most of them have no reliable supplier	They need constantly supply of local chickens and pork meat	400kg and 100kg of chicken and pork meat respectively

Source: MAE marketing research, 2010

Market size and potential

The total population of chickens in 2010 was estimated to be 38 967 752 out of which 35 204 764 were indigenous chicken (Research into Use, 2012). In 2002, the Food and Agriculture Organization of the United Nations (FAO) projected overall chicken consumption in Tanzania to be 42.7 metric tons. Rural and urban consumption volumes were 33.2 and 9.5 metric tons respectively. Consumption of poultry meat in 2030 is projected at 170.7 metric tons, of which 104.7 metric tons will be consumed in rural areas and 66 metric tons in urban areas. In other side the pig population is 2.01 million and the consumption of meat is an average of 5 kg per year, which is very low, compared to FAO recommendation of 50 kg per person per year.

MAE sees the local chicken and pork meat market growing at a faster pace. This is due to the fact that the production of meat is very low and the population is increasing. Due to that, any large and stable piggeries and local chicken production that meets the market available will be benefiting for both parties (producers and consumers).

The Marketing objectives:

- To cover the local market opportunity by the end of the three year of operation.
- To cover the market of East African countries of the fourth and fifth years of the business operation.
- To maintain the constantly supply of the products to the potential clients.

Competitor analysis

The major competitors of MAE are Mkuza Company Ltd and JKT Ruvu. The other competitor is the medium size suppliers supplying both similar and close substitute products. The presence of these competitors pose a serious competition that requires the enterprises to offer competitive packaging and prices, improve distribution services, provide customers with a wide range of products in order to win customers and widen the market share.

Table 16: The capacity of competitors

Names	Sales per month	Strengths	Weakness
J. KT Ruvu	90 000 old day broiler chicks	Long experience and enjoying economic of scale	Lack of constantly supply Not produce local chickens and piggeries
Mkuza Company	320 000 old day improved chicks	Covered Dar es Salaam market Long experienced in the business	Concentrate on one market point Not raising chickens and piggeries
Middle man (MKONDIA)	Not clear information	Many consumer consume beef, fish as substitute of a chicken and pork Low price compare to the chicken meat	Lack of knowledge on packaging meat They not produce They depend on small farmers Low quality meat they sell Selling unprocessed

COMPETITIVE ADVANTAGE

Product uniqueness

MAE will upscale local chickens and piggeries production, raise till reach the market weight of 1.5kg and 80 kg and above of carcases meat respectively. The weight of the local chicken and pork meat will make the product to be different with others who selling without considering the weight. Additionally to that the unique brand as KUKU NYAMA means chicken meat and MAE meat means pork meat is also a competitive advantage.

Producing and packaging demand driven product

After raise local chickens and piggeries for eight months will be processed ready for marketing. The technology to use; well packed materials which longer for one year is the added advantage to the business. Due to the good packaging and different prices of whole and part of chickens and pigs will make different customers to buy the product. Addition to that MAE will continue to provide efficient and high quality livestock products to customers by introducing innovative and creative ideas for improved products and services and diversification into other similar/related products. Progressive innovation and design of new products is among the enterprise's top priority given the market situation.

Strategic operations and location

Local chicken and piggeries business will be located within strategic authorized farming area Plot Q.2148, accessible (along Mazimbu road specifically Lukobe area) in Morogoro, Tanzania and low density area. In this regard, the area has enough space for raise and process of piggeries and local chicken within the farm.

System selling

In additional to normal sales, the enterprise gives customers an option to purchase a package of whole or sonic parts of chickens and pork meat. The selling points will be in some retailer's shops in towns to make easily access our products. Also in both big and min super market around in town will sell our product as well at affordable prices and therefore sharpening its competitive edge in the market.

Experienced staff

MAE has young innovative, energetic, tolerant and long-time experienced staff, particularly the Managing director and advisory member. In order to get competitive advantages overcome the risk of existing and potential competitors. MAE will often seeks and will go on seeking customer specifications in event of an order is placed and then deriver within or even more than customer expectation.

Promotion

In its efforts to realize the preset sales targets, MAE will use trade show, providing free transport of our products to larger customers, visit customers, using newspapers, communicate with clients constantly through phones, brochures and business card to get customers know about the products uses, importance, and uniqueness in terms of quality, price and availability and reliability. More importantly, the enterprise will also be required to network with National Economic Empowerment Council, Tanzania Agricultural Boards, Sokoine University of Agriculture, Tanzania Chambers of Commerce, Industry and Agriculture (TCCIA) and other related institutions. MAE will do so because of the likelihood of making larger sales from them given the ongoing initiatives/development projects of agriculture activities.

In summary, MAE will always strike a balance of promotion mix that is, advertising, personal selling, sales promotion and publicity depending on the prevailing market situation.

SWOT Analysis

To achieve the vision and mission, the Enterprise organizational position is as follows (SWOT ANALYSIS)

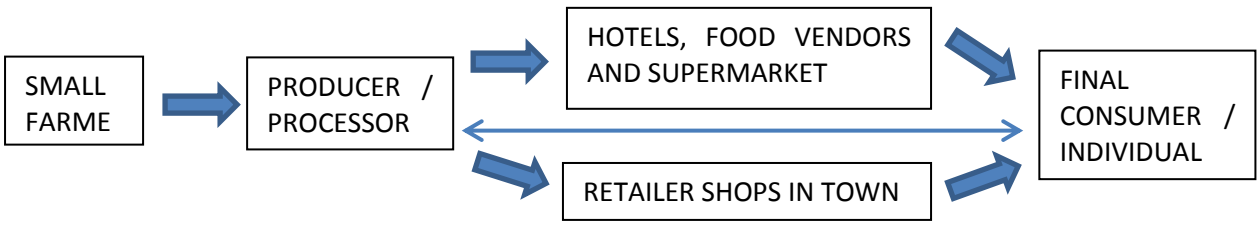
Strengths	**Weaknesses**
• Strong and creative of the founder and Entrepreneurial • Ability to manage and solicit thuds for business expansion • Skilled and Experienced in the field • Wide operation and production space • Strongly advice from SUA expert (animal production expert) in tile farm	• Lack of Investment and Working Capital • Lack of facilities: such as land, electricity, water and chicken and piggeries houses, offices in the farm and processing meat unit • Lack of slaughtering machine • Lack of staff who specialized in animal health and production
Opportunities	**Threats**
• Consumer attitude and behaviour towards food is rapidly changing on a worldwide scale. There is a strong focus on health issues including organic farming (local chickens) • Clients are sceptical and want guarantees about the meats they eat whether its local or not • Agricultural and Livestock sectors are national priorities • KILIMO KWANZA means Agriculture first • Demand for pork meat is high and production is very low. • Increasing population in Tanzania • The growing livestock sector in Tanzania	• Epidemic diseases for livestock in Tanzania • Climate change which leads the high cost of feeds. • High costs of slaughter equipments • Ever declining disposable income of households which is among our target market • Competitors selling the substitute product at low prices compared to the chicken and pork meat price

Product distribution channels

So far MAF will use the producer – consumer and producer-retail-consumer channels of distribution. Also the producer — wholesaler-retailer-consumer channel will be used whenever deemed worthy. Furthermore, will providing free transport of our products to larger customers within Morogoro municipality, Dar es Salaam and Dodoma who are capable to buy 300 chickens and 100kg of pork meat at once. For small customers the transportation services will be at the expenses of their own till when the enterprise will strategically see it necessary to provide it for free. Addition to that I will use cell phone to communicate with the potential customers concerning my products. The products will be supplied by multiple outlets. That means products will be supplied to the dealers and some will be sold at the office when the local customers came.

The plan is to open Chicken min supermarket (CMS) in major towns in East Africa countries this will make more easily to reach the customers.

Model for product distribution channels



Assumptions:

- Sales will increase because of free transport which will lead to enjoy the economics of scale and production will increase as well.

- Cost of distribution is TSh 50 000/per day.
- Potential customers will buy my product because they will enjoy free transport services.

Pricing and sales

Basing on the previous trend and market research, the price of local chicken and pork meat in Morogoro town ranges from TSh 9 000/= to TSh 13 000/=, TSh 6 000 to TSh 8 000 while in Dar es Salaam is TSh 10 000/= to TSh 18 000/=, TSh 7 000/= to TSh 10 000 respectively . Therefore, I will set the price to be the same as the one who sell at minimum provided that I will get profit and this price will be TSh 9 000/chicken and TSh 6 000/Kg of pork meat. The price so projected will be achieved using the above mentioned marketing practices which will lead to reach the sales target of TSh 600 480 000/= for 2014-2015 periods. Furthermore the selling price of the product will be ruled by the open market operation and the targeted clients are medium and high income earners who will buy products.

Table 17: Price breakdown of the products

Product of chickens	Units	Prices (TSh)	Product of pigs	Units	Prices (TSh)
Whole chicken	1	9 000	Whole pig	1	480 000
Half chicken	1	5 000	Half pig	1	250 000
Quarter of chicken	1	2 500	Quarter of pig	1	130 000
Wings	2	1 000	One kg	1	6 000
Gizzard	2	1 000	1/2kg	1	3 000
Breasts	1	2 000	1/4kg	1	2 000
Chicken fillets	6	5 000	Loin	1	3 000
Rib	1	1 000	Fillet	1	10 000
Drumsticks	2	2 000	Head	1	4 000
Giblets	5	1 000	Chest	1	6 000

Assumptions:

- One chicken and pig will gain 1.5kg and 80kg of carcases meat respectively.
- Every month expect to sell 3 000 of chicken of which 1 050 will be obtained from small farmers.
- MAE will lose 500 chicks every month.
- Every month expect to sell 48 pigs of which 16 pigs will be obtained from small farmers.
- Customers will purchase the products at different parts and price.

Marketing costs

In order to be competitive in the market the following are marketing costs:

Table 18: Marketing/promotion cost (TSh)

Items/Years	Year 1	Year 2	Year 3
Cell phone	1 080 000	1 350 000	1 400 000
Distribution cost	18 000 000	21 600 000	25 920 000
Promotion cost	3 600 000	4 150 000	5 600 000
Brochures	1 200 000	1 300 000	1 460 000
Business card	500 000	600 000	6 500 000
Total cost	**24 380 000**	**29 000 000**	**40 880 000**

Sales Forecast

Sales projection

Sales will start at year 2 of the business. After I start selling will be continuously every month and expect to sell 3 000 chickens and 48 piggeries every month, this implies that this is not seasonal business. The targeted customers are hotels, individuals and supermarket and food vendors.

MAE is targeting to make sales of TSh 600 480 000 for the year 2014 to 2015. The sales will increase by 20 percent every year. The sales so projected will be achieved using the above mentioned marketing practices.

Table 19: Sales projection

Items/Years	Year 1	Year 2	Year 3
Sales	600 480 000	720 576 000	864 691 200

3. OPERATION PLAN

Production process and procedures

I will buy parent stock which will be used to produce high quantity of local chickens and piggeries for year one of the projects. The purchasing cost of parent stock will be TSh 8 000/= and TSh 500 000/= of a good breed for both local chickens and piggeries from MVEK company ltd and Sokoine University of Agriculture (SUA) respectively. In this regard, I will purchase 150 chickens and 4 pigs every month for year one of the businesses. After the production of one year will stall to process the local chickens and pigs and sell well packed meat. The sales will be continuous, and in order to be reliable of supplying meat it will be important to buy 35 percent of the local chickens and piggeries from small farmers; 31 house hold will benefit by this business where by will be given interest-free in-kind credit in form of feeds, 50 chicks and 1 pig per household, vaccine and training and thereafter, will sell their mature chickens and piggeries to MAE at TSh 7 000/= and TSh 450 000/= and repay free interest loans of in-kind. After deduct all costs, farmers will gain TSh 92 500/= and TSh 120 000/= per bunch as a profit of raising local chicks and pig. The assumption is that 10 chicks will die, 10 will be consumed by household members as a source of protein and pigs will not die.

Table 20: Purchasing parent stock of local chickens and piggeries and production projection

Items/Months	1	2	3	4	5	6	Year 1	Year 2	Year 3
N^{o} of chickens	150	150	150	150	150	150	1 800	4 140	9 936
N^{o} of piggeries	4	4	4	4	4	4	48	96	
Eggs produced	2 250	2 250	2 250	2 250	2 250	2 250	27 000	64 800	77 760
Piglets produced				32	32	32	384	922	2 213
Chicks produced		2 150	2 150	2 150	2 150	2 150	25 800	61 920	148 608
Chicks to farmers		1 000	1 000	1 000	1 000	1 000	12 000	28 800	69 120
Piglets to farmers						11	66	132	317
Start to sell chickens							4 500	36 000	72 000
Pork meat/kg								46 080	92 160

Stock list

Feeding will be done twice at exactly same time every day. The concentrate of feeds (complete) cost approximately TSh 33 000 000/= and TSh 12 900 000/= for 39 600 chickens and 498 piggeries for year one. In addition, there will be close supervision to individuals' farmers and to the enterprises by insuring that the vaccine is given to chicks and piggeries at right time and treat chicks and pigs when get sick. The cost for treatment and vaccine will cost TSh 5 000 000/=. The purpose of use vaccine is that, to reduce new castle diseases and mortality rate. Furthermore the price of ingredients normally change throughout the year depending on availability, thus it will be important to store feeds.

Service Method

Tendering —MAE will seek tenders from different information sources and from potential clients and apply for it.

Delivery – The enterprise will sell products by multiple outlets. Free transport will be given for customers buys more than 300 chickens at once within Morogoro, Dar es Salaam and Dodoma.

Key features – I will contact with BRELA, TBS and TFDA so as to get trade mark and certificate of selling meat that will differentiate my products from the current existing chicken meat products.

Plant & equipment selection

MAE will buy truck car, ear notches', overalls, slaughtering and processing machine, gumboot, troll, feeders, freezers, tanks of water and drinkers for the business. Truck car has the capacity to carry out 5 tonnes of meat and is very economical in fuel consumption, it is approximately to consume 2 liter of diesel per 15 km. Slaughtering machine has the capacity to slaughter 200 chickens for 30 minutes, processing machine has capacity to process 150 ducks for 20 minutes ready for marketing, This will make the business to run smoothly.

The source of the suppliers will be in locally and international ways. Slaughtering and processing machine and truck car will be bought from Japan and china respectively.

Table 21: The equipments cost and supplier of each

Source of supplier	Types of goods	Amount (TSh)
Trust car dealers in Japan	1 truck car to supply meat	18 000 000
Agro Vet shop	1000 drinkers	5 000 000
Agro Vet Shop	500 feeders	4 000 000
Agro Vet shop	200 pars of gumboot	180 000
Agro Vet shop	30 pairs of over lorry	450 000
Hardware shop	10 troll	3 000 000
Hardware shop	5 tanks of water	4 000 000
Dealers from China	20 cool box	4 000 000
Agro Vet in Tanzania	10 ear notches'	1 000 000
Yug Kim Company	1 Slaughtering machine	9 270 000
Yug Km Company ltd	1 Processing machine	15 540 000
Yug Kim Company ltd	20000 packaging materials	6 000 000
J.J company ltd	10 freezers	10 000 000
Grand total		**80 440 000**

Office supplies and consumables

MAE will purchase 4 computers, 1 printer, 15 chairs, 10 tables, 2 cupboard, 500 invoice books, 500 receipts book, 100 exercise books and 100 peas. The cost of purchasing consumable goods will be TSh 5 000 000/=.

Supply chain and inventory management

Supply chain

The local chicken and pork meat will be packed to the packaging material and sold to multiple outlets, 10 percent will be kept as a stock, and 90 percent will be sold by cash.

Inventory management

Some amount of the products (10 percent of the products) will be stored as a stock for future sales during the time when the products become scarce in a market. The stock will be stored into the cold rooms so as to maintain the quality of the products. The stock will be equivalent to the demand of the customers: therefore the products will be available throughout the year. The main purpose of having a stock is to retain the customers and acquire new customers as well.

Infrastructure and facilities requirements

The land for local chickens and piggeries production is already available. It is located within strategic authorized farming area, accessible (along Mazimbu road specifically Liikobe area) Plot Q.2148 and low density area. In this regard, the area has enough space for raising local chickens and piggeries within the farm. The required infrastructures are brooder rooms, Office, cold rooms, fence, and house for workers, toilet rooms, kitchen room, drilling water, Electricity installation, generator and stores, chicken houses, piggery hens, slaughtering rooms, processing rooms and sales room.

Figure 30: Chicken house

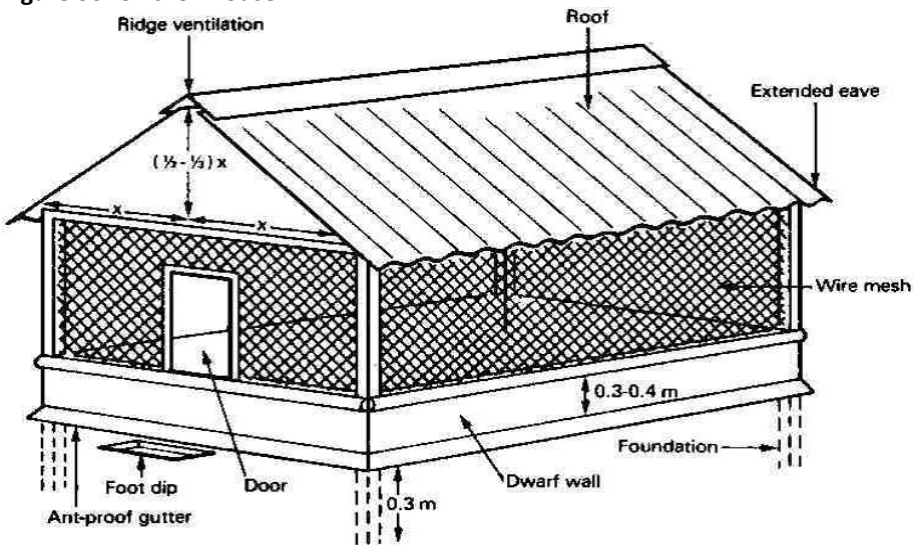


Table 22: Infrastructure and facilities cost

Particulars	Number of items	Amount (TSh)
Brooder rooms	8 brooders rooms	12 000 000
Local drilling water (well) and water system	1 well	10 000 000
Chickens house	20 chickens house	25 000 000
Stores	5 stores	10 000 000
Office	1 Office	13 000 000
Cold rooms	2	14 000 000
House of workers	5	5 000 000
Kitchen	1	1 500 000
Electricity installation		2 355 000
Generator	1	5 669 000
Piggery hens	100 hens	30 000 000
Slaughtering rooms	3	10 000 000
Processing rooms	3	15 000 000
Sales room	1	5 000 000
Land		2 121 500
Grand total		**160 645 500**

Capacity analysis

The capacity of 36 000 chickens/year of local chicken meat and 576 piggeries/year will be produced, and each will have 1.5kg and 80kg and above of the carcase. The capacity will increase by 20 percent every year of the business.

Economies of scale

In this planning the production can be maintain while reducing the cost by buying raw materials for feeds in bulk. Therefore, the amount of production will sharply rise while cost of operation will be low.

Quality Control

Quality assurance control begins from raw materials evaluation to final products. The assistant officer (AO) will ensure every morning that the materials to be used have satisfied the required standard and authorize their usage in writings. After working hours the AO will evaluate the quality of the produced meat. Also by maintain the hygiene and quality of the meat will be quite different to the existing livestock keeper's. By using meat laboratory will assure the quality meat produced.

Management and information systems

Direct talk and writing approach will be used by the management as the system of information amongst the team and urgent e conditions where one may be phoned at any time and should respond as positively as possible

Environmental management, health and safety

Environmental management: the business will have negative impact on the environmental. Addition to that, the manure is a friendly for environment. Thus, this business has positive impact on the environment.

Health: the business will buy the first aid kit for any case, however, the business area and environment has no any reason for the workers to be injured.

Safety: the workers will wear gumboot, groves and working clothes that protect workers from transmission diseases from human body to chickens and chickens to human body as well.

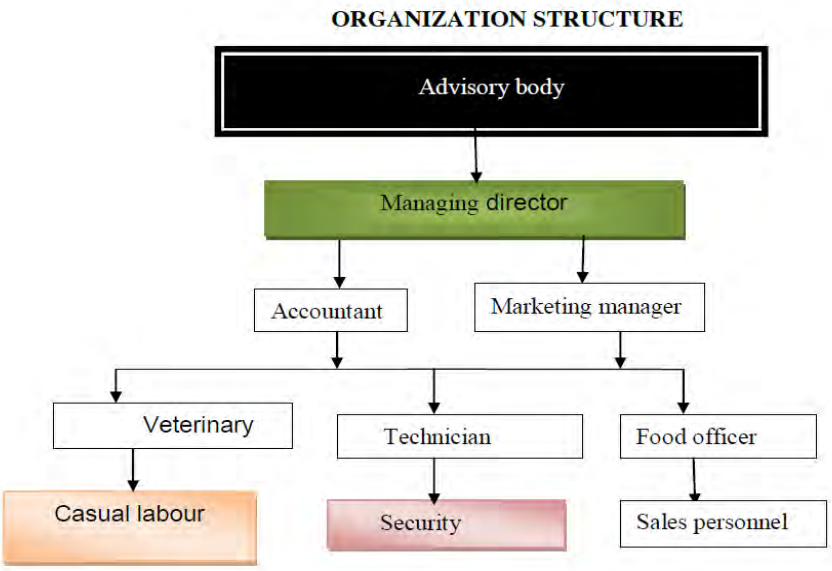
4. MANAGEMENT AND ORGANIZATION PLAN

An entrepreneur

The days to day activities are managed by Mr. Alexander Benny Jokoniah who is a Degree holder in Bachelor of Science in Agricultural Economics and Agribusiness. As top leader, he has the capacity to manage the enterprises for more than one year.

Management team

MAE has strong team who are experienced in livestock business. The owner of the business has Bachelor of Science in Agricultural Economics and Agribusiness. Advisory team of the business is a professor of Animal Science and Production and has practical experience in livestock business for more than 20 years. Also MAE collaborates with SUGECO and SUA. In this regard, this business will be sustainable and expect to employ other key staffs when implementing this business plan.



Key positions

Key positions	Job Description	Key qualifications
Advisory	• Mentoring coaching • Advice the owner of the business accordingly	• Hold masters, PhD in livestock production • Have experienced in livestock business more than 10 years
Managing Director	• Day to day supervisor (monitoring and evaluation) of the enterprise • Financial management, administration, budgeting and budget control • Over all the activities done in the farm	• Bachelor of Science in Agricultural Economics and Agribusiness or any other education background related with agriculture specifically livestock • Have enough experience in livestock management plan • Good entrepreneur skills
Accountant	• Responsible to control finance in the farm • Keeping financial record • Prepare financial report of every month	• Bachelor of Science in Accountant • Working experience for more than 1 year • Able to use accountant packages
Marketing Officer	• Responsible to acquire and maintain customers • Responsible to design strategies of winning market • To sales all products produced	• Bachelor of Science in Marketing or Agricultural Economics and Agribusiness from recognized college • Ability to find, attract and extend market • Experienced for more than 1 year in the similar or related field will be added advantage
Technician	• Responsible for control slaughtering and processing machine • Responsible for all machine available in the farm to insure that are in good condition all the time • Ability to repair the machines available in the farm	• Diploma in machine making and designing • Experienced for more than 2 years is added advantage
Veterinary Officer	• Day to day supervision (monitoring and evaluation) of activities done by casual worker in the farm and visit small farmers in their homes and advise them accordingly to ensure they use vaccine and well management of chickens in order to reduce mortality rate • Ability to identify animal diseases	• Holder of Bachelor/Diploma in animal health and production from recognized institution • Should have experienced in livestock production at least 1 year
Driver	• To drive truck car • To insure that the car is in good condition • To keep record of fuel consumption and distance used in terms of kilometre at every evening	• Certificate in mechanics and driving school from recognize institution • 4 months experience is added advantage

Key positions	Job Description	Key qualifications
Food officer	• To control and maintain the quality of meat produced • Insure that the meats are in good condition	• Bachelor of Food Science and Technology from recognized institution • Working experience is added advantage
Security Guard	• Day to day guard of enterprises properties	• The organization experienced in security guard sector more than 3 years • Have good historical background and trustworthy
Sales personnel	• Ability to sell products • Ability to convince customers to purchase MAE products	• Certificate in marketing in recognized college • Working experience is added advantage
Casual Labour	• Feeding chickens • To insure drinking water is available all the time in drinker vessel • Maintain the hygiene of the enterprises in general	• Energetic form is added advantage • Experienced in livestock production more than six months

Staff selection and promotion

Staff will be selected on qualification basis according to jobs/vacancies present in the enterprises. Promotion will base on their input and performance they showed during a certain working time (1 year basis) Staff who proved underperformance will be warned in writings and upon any other misconduct will be suspended from work following their legal contract which must be signed prior starting working for the enterprises. In every year staff and labour salary and wages will be increased by 10 percent.

Table 23: Annual salary bill For Key Staff Only

Salary/Wages	N° of Staff	Monthly rate each	Year 1	Year 2	Year 3
Managing Director	1	785 000	9 420 000	10 362 000	11 398 200
Advisory body wage	1	100 000	1 200 000	1 320 000	1 452 000
Veterinary officer	3	612 300	7 347 600	8 082 360	8 890 596
Marketing manager	1	520 000	6 240 000	6 864 000	7 550 400
Driver	2	360 000	4 320 000	8 640 000	17 280 000
Food officer	1	520 000	6 240 000	6 864 000	7 550 400
Sells personnel	2	450 000	5 400 000	5 940 000	6 534 000
Casual labour	10	1 300 000	15 600 000	17 160 000	18 876 000
Technician	1	220 000	2 640 000	2 904 000	3 194 400
Accountant	1	530 000	6 360 000	6 996 000	7 695 600
Security guard	1	300 000	3 600 000	3 960 000	4 356 000
Total	**24**	**5 697 300**	**68 367 600**	**79 092 360**	**94 777 596**

Employee review process

The employ review process will be based on enterprises demand and performance. Already recruited staff and experienced ones will be given the first priority. Gender issues will be adhered provided the candidate is competent enough.

Partners and sponsors

I expect to work with NEEC, SUA, TANFEEDS, MUVEK because these partners have experienced in projects which will be added advantage when implementing this business plan. The sponsor of this business plan is NEEC who will support this business idea.

Professional advisors

The business has proficient person who experienced in the livestock business for more than 20 years and SUGECO team chaired by Dr. Anna Temu are also the advisor of this business. The following are the professional advisors of the business:

Professor Faustin Lekule
Sokoine University of Agriculture
P.O. Box 3004 Morogoro, Tanzania
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E-mail: sugecosua@yahoo.com

5. FINANCIAL PLAN

Investment plan: A - Financed needed

In order to commercialize local chickens and piggeries TSh 430 000 000/= four hundred and thirty million is needed for production, buildings, buying machines, truck car and working capital.

Projected budget for the years 2013 to 2015

	Year 1 (TSh)	Year 2 (TSh)	Year 3 (TSh)
A: Income: Sales		600 480 000.00	720 576 000.00
B: Costs			
Production cost	89 300 000.00	128 000 388.00	167 294 066.60
Salary	68 367 600.00	79 092 360.00	94 777 596.00
Purchase of fixed assets	80 440 000.00	231 000 000.00	95 000 000.00
General office and Administration expenses	29 380 000.00	33 000 000.00	44 680 000.00
Sub total	267 487 600.00	471 092 748.00	401 751 662.60
A – B	**(267 487 600)**	**129 387 252.00**	**318 824 337.40**

Projected income statement for years 2013 to 2015

Description	Year 2013 (TSh)	Year 2014 (TSh)	Year 2015 (TSh)
Revenue	4 000 000.00	608 480 000.00	729 576 000.00
Cost of Sales	24 380 000.00	29 000 000.00	40 880 000.00
Gross Profit	**(20 380 000.00)**	**579 480 000.00**	**688 696 000.00**
Expenses			
Staff costs	68 367 600.00	79 092 360.00	94 777 596.00
Financial cost	12 500 000.00	18 550 000.00	22 130 000.00
Total expenses	**80 867 600.00**	**97 642 360.00**	**116 907 596.00**
Profit before tax	(60 487 600.00)	481 837 640.00	571 788 404.00
Income tax	-	48 183 764.00	57 178 840.40
Profit after tax	**(60 487 600.00)**	**433 653 876.00**	**514 609 563.60**
3% of the profit for social matters		13 009 616.28	15 438 286.91

Cash flow statement for the year 2013 to 2015

Items	Year 1 (TSh)	Year 2 (TSh)	Year 3 (TSh)
Inflow			
Grant from NEEC	400 000 000		
Own equity	30 000 000		
Sales		600 480 000	720 576 000
Other income	4 000 000	8 000 000	9 000 000
Total inflow	**434 000 000**	**608 480 000**	**729 576 000**
Outflow			
Production cost	38 400 000	45 000 000	67 003 600
Feeds and drugs	50 900 000	83 000 388	100 290 466.60
Salary	68 367 600	79 092 360	94 777 596
Infrastructure	160 645 500	12 000 000	4 000 000
Plant and equipment	80 440 000	5 000 000	10 000 000
Marketing cost	24 380 000	29 000 000	40 880 000
Office equipment	5 000 000	4 000 000	3 800 000
Contingency	22 321 987	24 797 369.27	21 089 462.29
Pickup to supply chicks to farmers		36 000 000	
3% of the profit for social issues		13 009 616.28	15 438 286.91
Tax		48 183 764	57 178 840.4
Milling and mixing animal feeds		120 000 000	
Incubator machine		70 000 000	
FUSO to collect raw materials for feeds			85 000 000
Total outflow	**450 455 087**	**569 083 498**	**499 458 252**
Net/Loss cash flow	**(16 455 087)**	**39 396 502**	**221 117 748**
Closing difference	**(16 455 087)**	**22 941 415**	**244 059 163**

Investment plan: B - Plan to acquire the capital

Own contribution

In this business I have already contributed in the business by acquiring the land for commercializing both local chickens and piggeries. The contribution to this business worth TSh 30 000 000 for existence of 48 parent stock of piggeries as my own source and other source of the capital is a grant from NEEC.

Table 24: Capital to invest in the business

Name of organization/individual	Type of finance	Amount (TSh)
Alexander Benny Jokoniah	Own contribution	30 000 000
Total investment already done		30 000 000

Table 25: Capital still needed

Name of organization/individual (if known)	Type of finance	Amount (TSh)
NEEC	Grant	400 000 000
Total investment still needed		400 000 000

Financial assumptions

The acquisition of the capital will be as planned without delaying.

6. IMPLEMENTATION SCHEDULE

This business expected to start officially on April 2013. The table below is detailed proposed schedule for implementing this business plan for the first and second years.

Table 26: Implementation schedule

	Year 1 (April 2013 – March 2014)												Year 2					
Activities	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Preparation of the implementation																		
Launch of the enterprises																		
Building infrastructure																		
Announcing the vacancies																		
Purchase of equipments and fitting																		
Purchase parent stock of local chickens																		
Shift parent stock of pigs to new farm																		
Identify contractor farmers																		
Provide in kind credit to contractor farmers																		
Selling chicken meat and pork meat																		

Risk Assessment and Contingency Plan

Risks	Measures to overcome risks
New castle diseases	To use vaccine of new castle
High cost of feeds	To store feeds during harvest seasons
Epidemic diseases	Using the advisor team who has experienced more than 20 years in the field and other professional staffs will be advantage to control diseases To control the visitors in the farm. Every visitor should pay TSh 5 000/= as a fee in farm this will lead to reduce number of visitors in the farm
Thieves	Trained guard will be employed for security. Also will be good relationship with people in the neighbourhood of the farm.

Sensitivity analysis

The sensitivity analysis is done on assumption that price, revenue and cost of operation can change. Thus, the revenue will decrease by 5 percent and cost of production will increase by 5 percent yet business is profitable.

Assumptions

- Sales volume will change. Thus the sales volume will decrease by 5 percent.
- The price of the product will decrease by 5 percent.
- The cost of production will increase by 5percent.

7. THE DEVELOPMENT IMPACT

MAE triggers to up-scaling and implement improved local chicken and piggeries business. However, such efforts would not be sustainable without a sound institutional/organization support system for

reliable financial. Consequently, the quantity of local chicken meat and pork will increase by 2 percent of the current meat produced when implement this business.

Local economic impact of the business

To commercial indigenous poultry and piggeries industry will go a long way to contribute to rural development with multiplier effects for employment, poverty reduction and livelihood improvement, especially for the contractor farmers who will be fully involved in the business.

Local social impact of the business's products or services

The community living around in the farm will have access to know how to control disease of their chickens because it is approximately that every household in village of Tanzania is raising local chickens. Due to the reason that the farm is located near in the village will be advantage to them to access knowledge and skills of raising chickens and they will sell their produce to the enterprise. Also per house hold income will increase as well.

8. APPENDIXIES

CV of Entrepreneur

<table>
<tr><td>1</td><td>Names</td><td colspan="3">ALEXANDER BENNY JOKONIAH</td></tr>
<tr><td>2</td><td>Business idea</td><td colspan="3">COMMERCIALIZE THE LOCAL CHICKEN AND PIGGIRIES</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Host Organization</td><td colspan="2">Name</td><td>Physical, postal address, phone, fax, email</td></tr>
<tr><td colspan="2">MAZIMBU AGRO ENTERPRISES</td><td>P.O. BOX 1752 Morogoro
Mobile: +255 717601266, +255 769601266 and +255 787601266
E-mail: mae.agro@yahoo.com</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Education – (tertiary and above unless highest qualification held is less than tertiary)</td><td>Dates</td><td>Qualification</td><td>Institution</td></tr>
<tr><td>NOV 2011</td><td>Bachelor of Science in Agricultural Economics and Agribusiness</td><td>SUA</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Work Experience</td><td>Dates</td><td colspan="2">Position held and main duties</td></tr>
<tr><td>April 2012 – To date</td><td colspan="2">managing pigs and poultry farm 85%, I devotes most of my time to lead and make the business grow and attain its goal</td></tr>
</table>

BN. 21

THE UNITED REPUBLIC OF TANZANIA

The Business Names(Registration) Act (Cap. 213)

Search No NIL Fees paid Shs. 1000/= ERV 43676214 *of* 04-Oct-12

Extract from Register

Business Names No 247224 Date of Registration 04-Oct-12

1. Name of Business : MAZIMBU AGRO ENTERPRISES
2. Proprietor ALEXANDER B. JOKONIAH
   Partners

3. Principal Place of Business Plot No: 123 J, Block No: NIL
   Street / Road: KIHONDA
   Unsurveyed Area: NIL
   House No: NIL District: MOROGORO
   Region: MOROGORO
4. Authorize to Operate Bank Account etc
   ALEXANDER B. JOKONIAH

DAR ES SALAAM.
25-Oct-12

Deputy Registrar of Business Names

ITX 421.01.E - Tax Clearance Certificate

TANZANIA REVENUE AUTHORITY

TAX CLEARANCE CERTIFICATE

(Issued under Section 90 of the Income Tax Act, 2004)

CERTIFICATE No. 0121161

TO:
TRADE OFFICER
BOX 166
MOROGORO

Issuing Office: MOROGORO
P.O. Box: 988
Tel: 3560
Fax:
Email address:
Date of issue: 7 / 2 20 13

This is to certify that the tax affairs in respect of

TIN: 1 1 7 [redacted] 3 8 5 [redacted] 8 6 1

have been fully complied with as per the Law
We, therefore, have no objection for further process of the services requested as hereunder:

(A) REALISATION OF INTEREST ON LAND OR BUILDINGS

KUFUGA KUKU NA KUUZA NYANA NA MAYAI

(B) INCOME TAX ON FREIGHT EARNINGS BY NON RESIDENT:

Permission to clear Customs

ALEXANDER BENNY JOKONIAH

This certificate is valid only if it is embossed with the official seal. It should be retained by you.

Issuing Officer
Full Name: [redacted]
Designation: TAX ASSISTANT
Signature: [redacted]
Date: 07/02/2013

OFFICIAL SEAL

Authorising Officer
Full Name: KILOMBA M. KANSE
Designation: ARM - DEBT
Signature: [redacted]
Date: 07/2/2013

OFFICIAL SEAL

MAE during National Agriculture Exhibition

MAE participated on National Agriculture exhibition famous Nanenane in Morogoro Municipality - 2012 for the first time with the aim of exposing itself to quality competition and external advert of its products and consultant services. Over 870 people including Prime minister and other top of the government officials were visited MAE booth during Nanenane. For this reasons MAE is well known.

Figure 31: Managing Director (MD) of MAE during Nanenane exhibition 2012 for different days

Picture N^{o} 1, is MD showing packaging; N^{o} 2, put fresh chickens in the freezer and; N^{o} 3 selling well packed chickens to customers when visited the MAE booth at Nanenane.

Managing director of MAE during work hours. I work very close with other subordinate in order to achieve the goal. The left person in the picture is Mr Alexander J.B (Managing director of MAE awl the right person in the picture is a subordinate. The below picture is MD looking the feeds.