



Livestock dip management in Tanzania – recommendations for a sustainable service delivery



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SNV

Connecting People's Capacities



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C. List of abbreviations

ACT – Anglican Church Tanzania
AU – African Union
CAHW - Communal Animal Health Worker
CCM - Chama cha Mapinduzi
DALDO – District Agricultural & Livestock Development Officer
DASIP – District Agricultural Sector Investment Project
DDC - District Development Councils
DVO – District Veterinary Officer
ECF – East Coast fever
ERP - Economic Recovery Programme
FAO - Food and Agricultural Organization
FMD – Foot-and-mouth disease
GDP - Gross Domestic Product
GNI – Gross National Income
GRP - Gross Regional Product
HDI - Human Development Index
IBDI – Inter Business Direction Inc.
ILRI – International Livestock Research Institute
LCB – Local Capacity Builder
LGA - Local Government Authorities
LGRP - Local Government Reform Programme
MARA-FIP – Mara Farmers’ Investment Project
NGO – Non-governmental organisation
OIE – World Animal Health Organisation
O & M – Operation and Maintenance
PRSP – Poverty Reduction Strategy Paper
RDC - Regional Development Councils
RLA – Regional Livestock Advisor
RP - Rinderpest
RVF – Rift Valley fever
SAP - Structural Adjustment Programme
SLF – Sustainable Livelihood Framework
SPS – Sanitary and Phytosanitary (SPS)
TBD - Tick and tick-borne diseases
TLU - Tropical Livestock Units
TOR – Terms of Reference
UN – United Nations
VAEO – Village Agricultural Extension Officer
VEO - Village Executive Officer
WAEO – Ward Agricultural Extension Officer
WEO – Ward Executive Officer
WDC - Ward Development Committees
WHO – World Health Organisation
WTO – World Trade Organisation

D. Acknowledgements

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E. Executive summary

Tanzania belongs to the poorest countries of the world. The country's economy is marked by a strong dependency on the agricultural sector. Livestock as a component of the agricultural sector possesses a major importance for many households and livelihoods in the country. However, livestock keepers in Tanzania are constrained by a wide array of factors. One of the key challenges is the occurrence of different animal diseases. Ticks which can transmit a number of tick-borne diseases (TBD) as the East Coast Fever (ECF) for example are recognised as one of the most severe diseases. In order to control TBD livestock keepers can dunk their animals in livestock dips. To the detriment of the livestock keepers, the condition of livestock dips in the country is very poor, because out of the existing 2,014 solely 121 (6.1%) are functioning. This leaves livestock keepers suffering from disease of their animals with harmful effects on their livelihoods.

This research shows that the communities, to which the dips have been delegated, are predominantly overtaxed with their management. In the course of the delegation process of the dips from the local governments to the communities it has been ignored to provide the community members with the necessary guidelines and instructions on how to run the dip. Thus, the community members lack enormous capacity on entrepreneurial and veterinary issues and they are rarely provided with institutional support, particularly from the government. In addition, lack of accountability and transparency in dip management result in mistrust and weak relationships between the stakeholders involved in the management process. Moreover, the absence of a clear and enforced legal framework leads to immense confusion and aggravates the problematic situation. Dip management members are often simply determined in village assemblies without giving everyone the equal chance to be elected. Consequently, community members feel ignored, although willing to participate in the management directly or at least indirectly through elections. These and further reasons are responsible for the closure of so many dips.

The research was also set out to identify the four distinctive models used to manage the dip. These models are distinguished and compared by means of five different categories which take into consideration the reasons for failure of the dips. In addition, by examining the needs of the community concerning the internal aspects of the models an assessment will be conducted which results into the recommendation of the village committee management model. This model shall ensure a good relationship and dialogue between the stakeholders resulting in improved level of trust, (indirect) participation of livestock keepers and shall establish accountability and transparency mechanisms. It is further argued that the adoption of this model in the research area Mara Region can result in a revival of livestock dips.

Keywords: Livestock sector, animal health, community-based service delivery, decentralisation, livelihoods

1. Introduction

“If you neglect cattle in Mara Region, you neglect the people.”

(Julius Nyerere, first president of Tanzania, born in Mara Region)

“Our estimates suggest that livestock form a component of the livelihoods of at least 70% of the world’s rural poor.”

(LID 1999, p. 14)

According to the annually updated Human Development Index (HDI) of the United Nations, Tanzania belongs to the poorest countries in the world (UNDP 2009, p. 173). The country is marked by a strong dependency on the agricultural sector in terms of both economy and employment (CIA 2010). Within the agricultural sector, livestock is of major importance for the livelihoods of the mainly rural population. Due to abundant natural resources, the livestock sector disposes of great potential for substantial alleviation of poverty and improvement of livelihoods (Ministry of Livestock Development 2006b, p. 5).

However, this sector faces several constraints which impede a better performance. One of the most severe is animal diseases which result in high mortality rates of animals and immense financial losses (SNV 2009, pp. 1-2). In terms of tick-borne diseases (TBD), it is estimated that Tanzania experiences a loss of 364 Mill. US-\$ annually, resulting in devastating effects on livelihoods of poor livestock keepers (Neselle 2010, p. 3). It is widely recognized that weak extension services and poor access to veterinary infrastructure such as veterinary clinics are the main reasons for this development (SNV 2009, p. 1). In order to combat and control TBD livestock dips can be utilized. There, animals are dunked into a combination of water and acaricide. Unfortunately, the condition of livestock dips in the country is very poor. As the Presidential Circular No. 1 from 2002 states, out of 2,014 dips in the country a mere share of 6% was actually operating thus leaving many livestock keepers without effective treatment against TBD (United Republic of Tanzania 2002b, p. 6).

Surprisingly, only very little is known about the actual reasons why such a multitude of livestock dips is not functioning and thus no actions were taken so far. As experienced during the fieldwork, especially the policy- and decision-makers in the district and regional headquarters as Livestock or Veterinary Officers for instance are poorly informed. Therefore, it was absolutely crucial to carry out this research in order to first, create awareness of the overall problem of non-functioning dips and to provide objective information to policy-makers. Secondly, it is vital to involve and guide the particular decision-makers from the grass-roots (village or ward) and the higher policy levels by giving them the adequate recommendations and tools to address the problem of non-operational livestock dips.

By looking at raw figures of livestock dips and their functionality, it became clear that some were not working due to rehabilitation and renovation. On the other hand, it was surely extraordinary that although dips were technically functioning, many of them were not operating. Evidently, an enormous challenge is the software side of the dips: the management and operators, on which the research was focused, disregarding the hardware side, which comprises the more technical nature.

It is noteworthy in this context that the dips were formerly managed by the central government and their use was free of charge. However, in the course of the country’s decentralisation process the management was transferred to the local governments and from

them delegated to the communities. Although this policy change is potentially an adequate measure to enhance community participation, it was entirely ignored to provide the communities with clear guidelines and approaches on how to run the dips. This gave them ample opportunity to experiment with the management which apparently too often failed.

Hence, aim of this research is to identify and to compare the different dip management models in order to ultimately recommend a best-practice model which can sustainably deliver dip services. To evaluate the models various dip-related aspects encountered during the fieldwork needed to be taken into account. The results of this research will be shared with relevant stakeholders and action plans will be formulated to take the necessary policy measures to improve the condition of the dips. The underlying assumption is that by reviving the dips, the livestock mortality rate will decrease and livestock keepers will possess healthier animals resulting in improvements of their livelihoods.

The research was carried out in Mara Region, situated on the Eastern Shore of Lake Victoria, where the condition of livestock dips is as inadequate as on the national level. Research was jointly conducted with Inter Business Direction Inc. (IBDI), a local consultancy, based in Mara Region's Capital Musoma. IBDI has already gained experience in livestock research with the Livestock Infrastructure Mapping Pilot in 2009.

This Master Thesis is subdivided into six chapters. After the introduction follows the "National and regional framework" in chapter two. This part classifies Tanzania and Mara Region geographically and analyses the livestock sector of both and other socio-economic or political issues relevant for this thesis. The third chapter considers the thematic-theoretical framework and is based on an extensive literature review. The subsequent chapter is entirely dedicated to the explanation of the research methodology and aspects entailed. Following chapter four, section five presents the main research results, divided into different sub-chapters. Finally, based on the research findings, a conclusion is drawn, which will highlight the main results and answer the research questions posed in the methodology part.

2. National and regional framework

This chapter presents the most important economic, social, political and livestock-related features and characteristics of Tanzania and Mara Region. The first part deals with national issues. After briefly positioning Tanzania geographically and by means of indicators socio-economically, this chapter will continue with explanations on the livestock sector and decentralisation issues. Subsequently, the research region Mara will be presented and the regional livestock sector will be analysed.

2.1 Tanzania

2.1.1 Geographical location and administrative division

Tanzania belongs to the geographical sub-region East Africa. The country is bordered by several countries: Kenya and Uganda in the North, Rwanda, Burundi and Democratic Republic of Congo in the North-East and East as well as Zambia, Malawi and Mozambique in the South, whereas the Indian Ocean stretches in the East of the country (CBF 2006, p. 1).

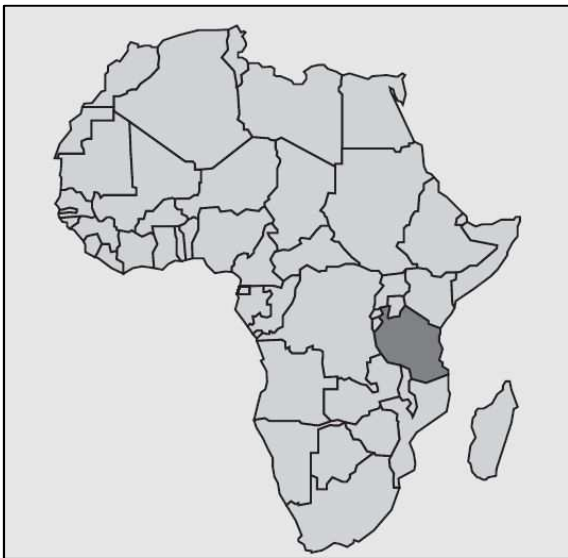


Figure 1: Location of Tanzania on the African continent

Source: CBF 2006, p. 1

Tanzania encompasses a total area of 945,087 km² and is thereby East-Africa's largest country. Next to the mainland it also contains the four Islands Ukerewe, Mafia, Unguja and Pemba (CIA 2010). Currently, Tanzania has a population of 41.9 million people. Due to the remarkable size of the country (31st largest in the world), its population density merely amounts to approximately 40 inhabitants per km² (FAO 2005a, p. 1). Compared to Tanzania's East African neighbours as Uganda (108 inhabitants per km²) or Malawi (115 inhabitant per km²) for instance, overpopulation and excessive utilization of natural resources does not pose a problem in Tanzania. Simultaneously, this is a favourable precondition for livestock, in the sense that sufficient grazing opportunities exist and the risk of overgrazing is mitigated (Ellis/Mdoe 2003, p. 1370).

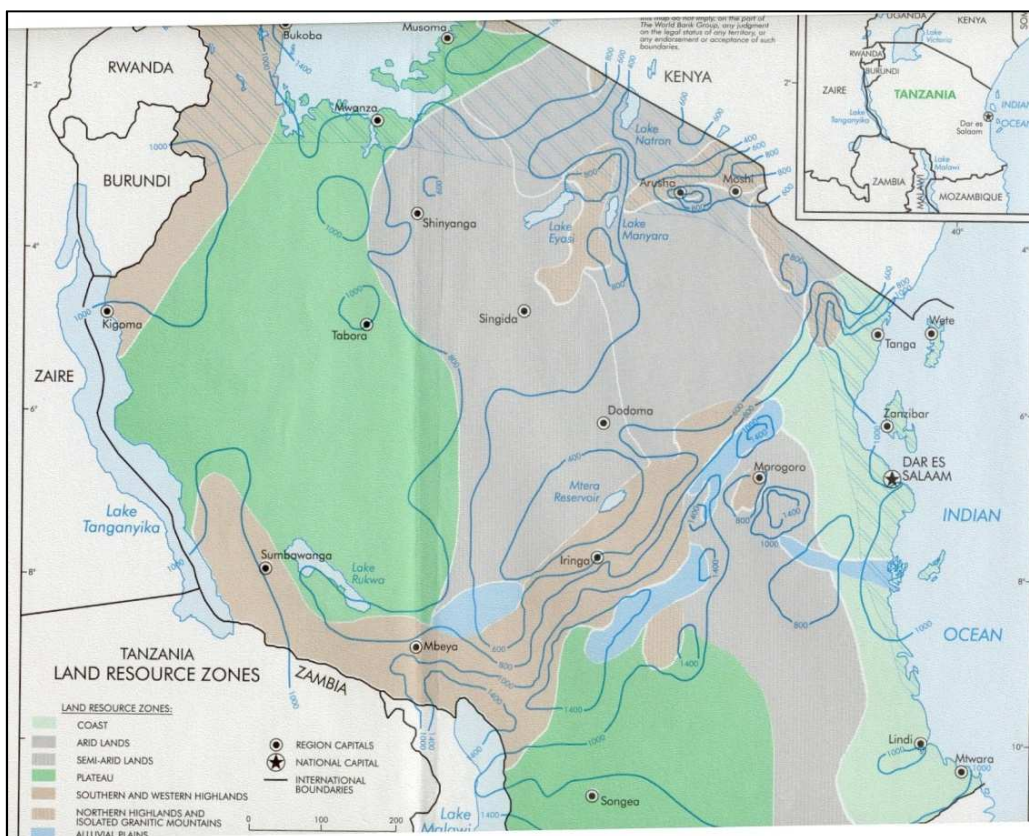


Figure 3: Agro-ecological zones in Tanzania

Source: World Bank 1994, p. 45

2.1.2 Overview of the stage of social and economic development

According to various international sources, Tanzania belongs to the poorest countries in the world (see UNDP 2009, CIA 2010, OECD 2010 for example). Several social and economic indicators prove this. In order to examine the economic performance of a country it is useful to consider the country's Gross Domestic Product (GDP) and the GDP growth. Current statistical data estimates the GDP per capita at 1,400 US-\$, which lists the country on the 202nd position in the world. Out of Tanzania's East African neighbours only Kenya and Zambia perform slightly better (1,600 US-\$ and 1,500 US-\$). The other neighbouring countries' GDP per capita is even lower, with Burundi (300 US-\$) disposing of the lowest (CIA 2010). However, figures 4 exhibits that the country's GDP per capita is even lower than East Africa's average and significantly lower than Africa's GDP per capita. The figure also shows that Tanzania achieved high GDP growth rates over the past decade. Between 2001 and 2008 GDP rose by 7% on average per year which is surely an extraordinary progress and made Tanzania to one of the fastest growing economies in Sub-Saharan Africa (OECD 2010). This growth was primarily accelerated by the mining and tourism sector (World Bank 2005, p. 10). Although Tanzania achieved impressive GDP growth rates, it is not a sufficient criteria for alleviating poverty, since it becomes not clear, who actually benefits from it. It needs to be ensured that growth is pro-poor to achieve substantial progress in tackling poverty (Thirlwall 2008, p.38). Furthermore, despite GDP growth Tanzania's economy is and will be highly foreign-dominated, particularly in the mining, banking, large manufacturing and tourism sector (Mongula 2006, p. 75).

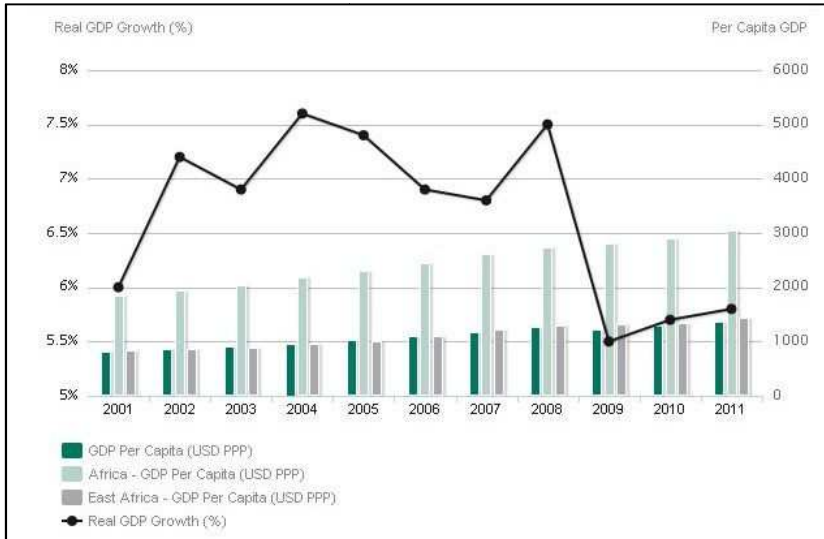


Figure 4: Tanzania's economic performance in comparison 2001-2011
Source: OECD 2010

Tanzania is seemingly on the pathway to a better future, but can still be considered as a rural economy with a low urbanization rate of merely 25%. Tanzania relies heavily on the agricultural sector in terms of both contribution to GDP and labour force. As figure 5 depicts, the agricultural sector contributes 26.4% to the country's GDP, whereas the productivity of this sector is rather low taking into account that 80% of Tanzania's population is employed in this sector, mainly in subsistence farming (CIA 2010).

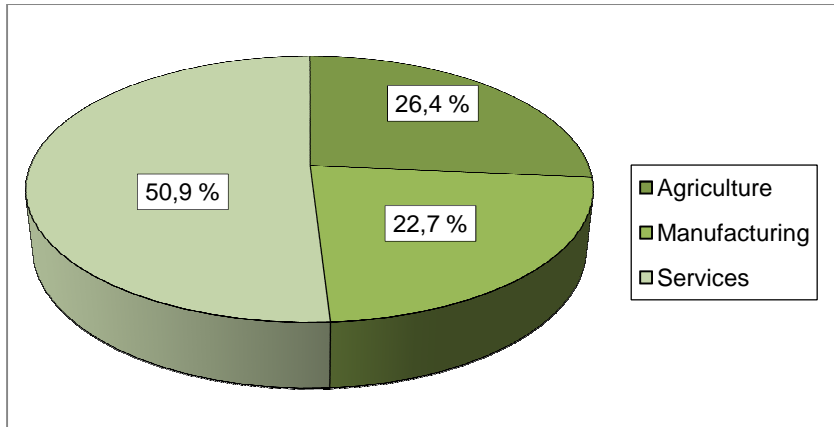


Figure 5: Composition of Tanzania's GDP 2009
Source: Own illustration, based on CIA 2010

Concerning Tanzania's export products, minerals and in particular gold (86.1% of all mineral export value), predominate, as figure 6 shows. The traditional export products in this figure comprise agricultural products like coffee, cotton, sisal, tobacco or tea (Ministry of Finance and Economic Affairs 2008, p. 80). This demonstrates the insignificance of the livestock sector as an export revenue generating segment. As will be elaborated more thoroughly in the analysis of the livestock sector in section 2.1.3, despite its great potential and comparative advantage, Tanzania fails to engage in trade with livestock or related products, which could bring about further employment and export earnings (FAO 2005b, p. 15).

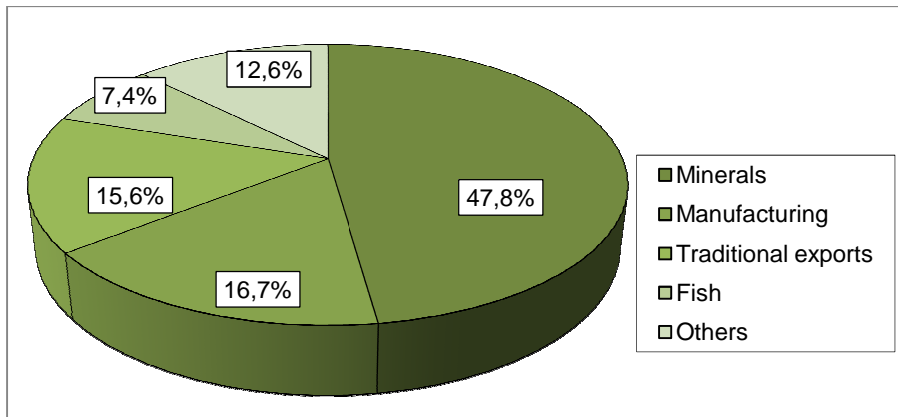


Figure 6: Share of major export products in total exports 2007 (US-\$)

Source: Own illustration, based on Ministry of Finance and Economic Affairs 2008, p. 70

The aforementioned analysis of Tanzania primarily referred to economic issues. Since this does not allow any meaningful explanations on the social development of the country, the discussion will be turned to this aspect. A widely recognized indicator, which encompasses not only economic dimensions, but acts as a broader indicator for measuring the stage of socio-economic development of a specific country is the Human Development Index (HDI). In its ranking of 2007, Tanzania is ranked on position 151 (out of 181) with a value of 0.530. The country is positioned in the lower part of the group of countries with medium human development and is situated close to Haiti (149), Sudan (150) and Ghana (152) as well as Cameroon (153). By looking at the trend of the HDI it is clearly recognizable that Tanzania has improved. The index growth rate amounted to 1.15% on a long-term basis (1990-2007) and to 2.09% in short-terms (2000-2007) (UNDP 2009, p. 173). In order to measure the extent of poverty in a country the indicator "share of population below the income poverty line", which is defined as 1.25 US-\$, can be used. In Tanzania, this indicator is extraordinarily high and amounts to 88.5% between the years 2000 - 2007. According to the statistics of the Human Development Report and as far as data is available for the whole range of countries in this report, Tanzania has the largest share of population below the income poverty line (UNDP 2009, p. 178). The Gini-Coefficient however, which portrays the degree of inequality in a certain country is noticeably lower (34.6) than in other countries of the same development stage, meaning that the Gross National Income (GNI) is more evenly spread (UNDP 2009, p. 208).

2.1.3 Livestock sector - performance and challenges

Since this Master Thesis deals in particular with the livestock sector of the country, it is necessary to execute an in-depth analysis of the sector and to highlight the main features and challenges.

In order to measure the importance of livestock for the economy and livelihoods of the population a look at statistical data is obligatory. As already mentioned, the agricultural sector in general is of great importance for the GDP, employment and the overall development of the country (Ellis/Mdoe 2003, p. 1368). The livestock sector as part of the agricultural sector contributes only a minor share to Tanzania's GDP, as depicted in figure 7. Also over time the economic performance of the sector remains steadily between 4-5% of the GDP (Ministry of Finance and Economic Affairs 2008, p. 33).

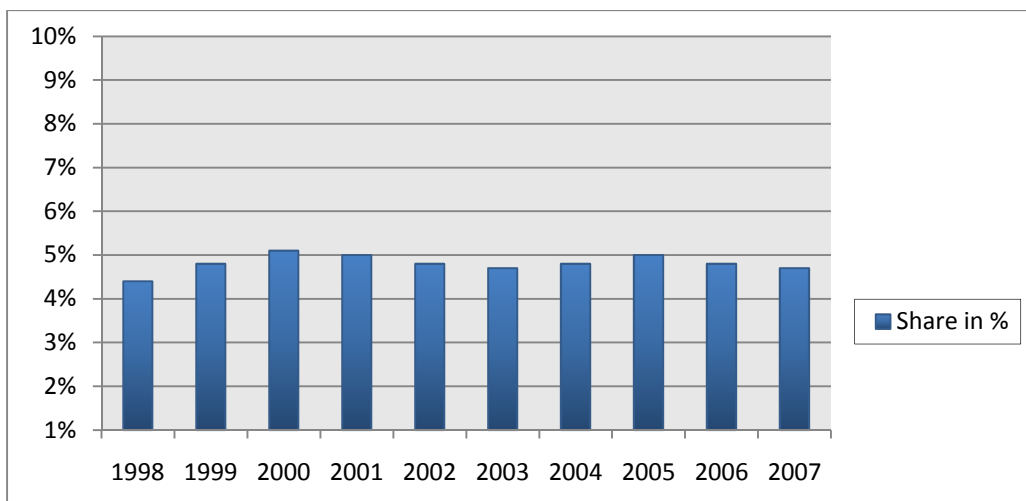


Figure 7: Contribution of the livestock sector to GDP 1998-2007 (%)

Source: Own illustration, based on Ministry of Finance and Economic Affairs 2008, p. 33

However, the livestock sector contributes a major share to the total agricultural GDP. This contribution amounts to around 30% (FAO 2005b, p. 4). The percentage comprises the production of beef (40%), dairy products (30%) as well as poultry and other stock products (30%) (Njombe/Msanga 2009, p. 1). The significance of the sector for Tanzania's population becomes evident when considering the number of agricultural households and their engagement in livestock keeping. As statistics demonstrate, out of the 4.9 million agricultural households about 36% keep livestock. 35% carry out mixed-farming and 1% purely rear livestock (Ministry of Livestock Development 2006b, p. 13).

Tanzania's livestock industry can be subdivided into two distinctive production systems that are extensive and intensive. The extensive describes pastoralist or agro-pastoralist systems which are based on the seasonal availability of forage and water and can be considered as the traditional type. The intensive on the other hand focuses on market-orientated livestock keeping and thus necessitates higher input of forage, water and the like. This production system is also referred to as the modern one (Ministry of Livestock Development 2006b, p. 11). Obviously, the country relies strongly on the pastoral and agro-pastoral production system which produces most of its milk and meat (Kipuri/Sørensen 2008, p. 10). ILRI (2002b) developed another classification of livestock production systems displayed in figure 8. It differentiates between six systems which are first subdivided into keeping "livestock only" and "mixed rain-fed", and are further divided according to their climatic conditions. The most common livestock production systems in Tanzania are arid/semi-arid, with either "livestock only and rangeland-based" or "mixed rain-fed farming" (ILRI 2002b, p. 2).

In the scientific literature it is widely recognised that Tanzania has an enormous potential in livestock (Kunze et al. 1997, Ellis/Mdoe 2003, FAO 2005b, Ministry of Livestock Development 2006b, Njombe/Msanga 2009). This potential can be traced to large livestock population, abundant natural resources and increased production of livestock products. At first, the potential of large livestock population will be explained.

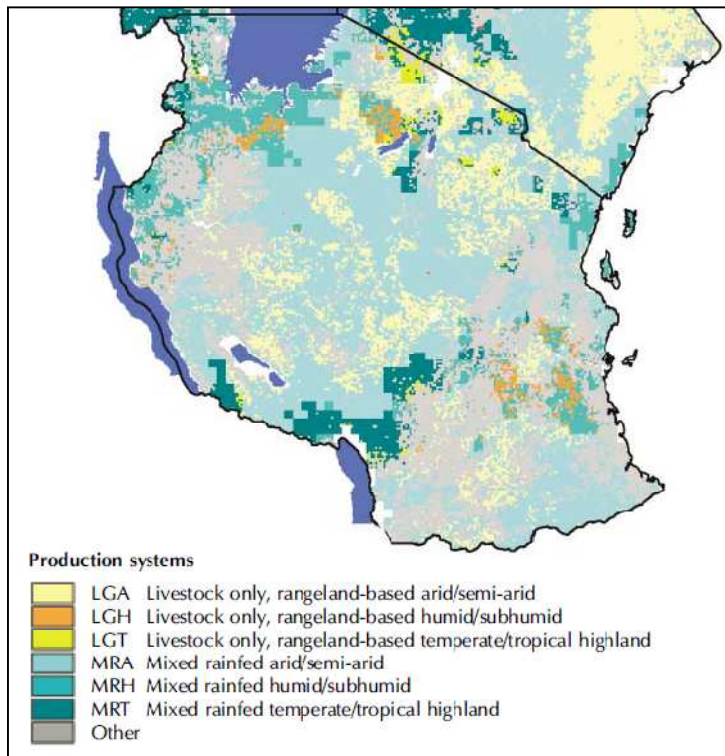


Figure 8: Livestock production systems in Tanzania

Source: ILRI 2002b, p. 2

In the country a wide array of livestock species are kept which in this Master Thesis are categorized into the most common, namely cattle, goats, sheep, pigs, and poultry. Latest data estimates that cattle (18.5 million) and poultry (53 million) have the largest population, followed by goats (13.1 million), sheep (3.6 million) and pigs (1.2 million). The latter ones are predominantly reared in the southern part of the country (Njombe/Msanga 2009, p. 1). Over time an increase of the five main livestock species has occurred which is depicted in table 1 (FAO 2005b, p. 6, Njombe/Msanga 2009, p. 1). Interestingly, Tanzania has the third largest livestock population in whole Africa after Sudan and Ethiopia (National Bureau of Statistics et al. 2003, p. 16).

Species	Numbers				
	1980	1990	2000	2002	2009 (p)
Cattle	12.6	13.1	16.7	17.4	18.5
Goats + Sheep	9.4	12.1	15.4	15.8	16.7
Pigs	0.2	0.3	0.5	0.5	1.2
Poultry	18.1	21.7	29.1	30.3	53

Table 1: Development of livestock population in Tanzania in million (Projection 2009)

Source: Own illustration, based on FAO (2005), p. 6, Njombe/Msanga (2009), p. 1

Naturally, there are regional differences in livestock population and livestock density. Exemplarily for all livestock species, figure 9 portrays the regional distribution of cattle in the country. The central and northern regions are the main cattle keeping areas with Shinyanga Region having the largest number (about 2.6 million cattle) (National Bureau of Statistics et al. 2003, p. 20).

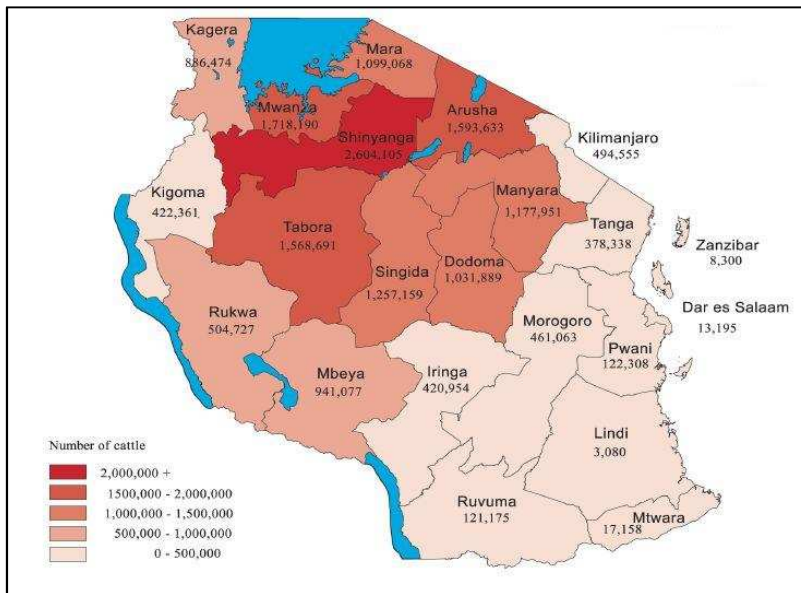


Figure 9: Regional distribution of cattle 2003

Source: National Bureau of Statistics et al. 2003, p. 20

Figure 10 also takes into account the area of the particular region and exhibits the cattle population by km^2 , the cattle density. The northern and central regions perform highest in terms of cattle density. It is noteworthy that Mara Region, where the underlying research of this thesis was carried out, has the second highest density in terms of cattle per km^2 (National Bureau of Statistics et al. 2003, p. 20).

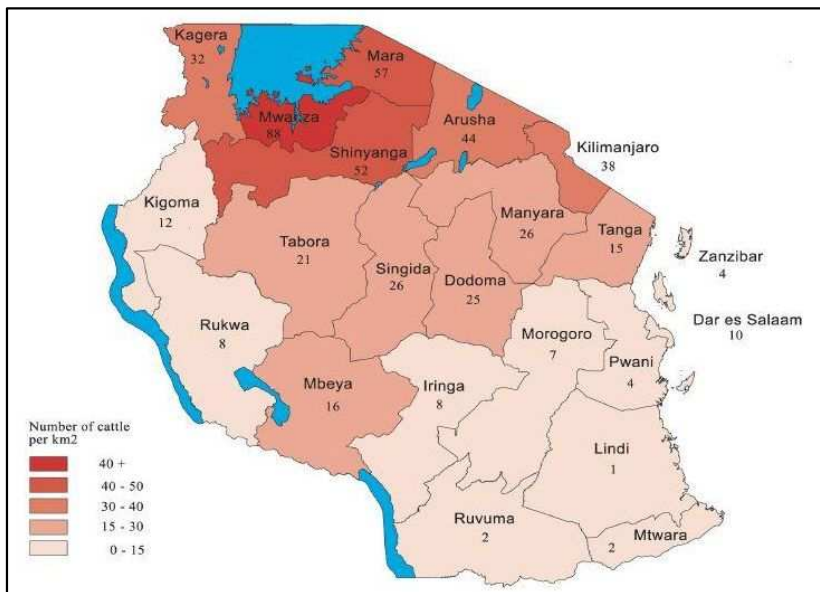


Figure 10: Regional cattle density 2003

Source: National Bureau of Statistics et al. 2003, p. 20

Although Tanzania possesses great potential with large livestock population, it has to be beard in mind that the predominant share of animals is of the indigenous type. More concretely, it is estimated that about 90% of all animals belong to the indigenous type which is known for its rather low productivity. On the other hand these animals are, opposed to cross-bred or purely European species, well adapted to the tropical environment and less

susceptible to tropical diseases. In the case of cattle, the indigenous Tanzanian Short Horn Zebu (TSZ) is the main cattle species (Ministry of Livestock Development 2006b, p. 11).

Another great potential concerns the endowment with abundant natural resources. It is estimated that 44 million hectares rangeland is suitable for grazing. Currently, around 17 million Tropical Livestock Units (TLU) occupy the rangelands of the country. With proper rangeland management, it can support more than 20 million TLU thus leaving grazing areas and carrying capacity not fully utilized and opening up opportunities for expansion (Ministry of Livestock Development 2006a, p. 7).

The third evidence of the country's potential in livestock is production of livestock products. In terms of meat and milk production, current statistical data suggests a strong production growth. Thus, total meat production increased between 1995-2007 from 244,000 tons to 370,566 tons and total milk production from 555 million litres in 1995 to 1.42 billion in 2007, whereby the traditional sector contributed the major share, since only a marginal share of animals are kept in commercial ranches, feedlots or dairy farms. On the one hand, production growth in meat and milk is certainly impressive, but for both the productivity levels remained steady. Growth can mainly be traced back to an increase in livestock numbers rather than productivity growth (FAO 2005b, p. 12).

An area where Tanzania could certainly benefit from its competitive advantage in livestock is the export market, but also here performance is poor. Out of all live animals and livestock products only a marginal fraction is exported thus leaving households or the domestic market as the main consumers. For instance, in 2002 livestock products amounted to merely 0.7% of the country's export revenues. Consequently, the export of livestock products accounted for only 0.01% - 0.03% of all livestock products in 2002 (FAO 2005, p. 15-16).

Tanzania's livestock sector disposes of an enormous potential to contribute more to the country's GDP and to substantially alleviate poverty. This becomes even more evident when considering the large share of smallholders (figure 11) engaged in this sector, who are most likely the most vulnerable of all (National Bureau of Statistics et al. 2003, p. 18)

However, this great potential remains largely unexploited. The reasons and constraints for this will be delineated in the following.

The most crucial constraints can be found in the lack of market-orientation of the entire sector, because market infrastructure is largely of poor and inadequate quality. Market infrastructure can be subdivided in the infrastructure for live animals, livestock products as well as milk products. For the purpose of meat processing, there are only two modern public abattoirs in whole Tanzania, namely in Dodoma and Arusha. Additionally, there are a number of private meat processing plants spread over the country. However, due to the country's size and long distances entailed, the number is surely insufficient. Furthermore, slaughtering of animals is usually carried out with basic technology in slaughter slabs and with absence of cold storage and cold chains for onward transport (Ministry of Livestock Development 2006a, pp. 21-22). Due to poor quality of market infrastructure and poor condition of the transportation network, livestock keepers have to cope with immense transaction costs, when selling their products. Therefore they are subject to higher financial risks making them more risk-averse which lowers their motivation for marketing (Hall et al. 2004, pp. 10-11).

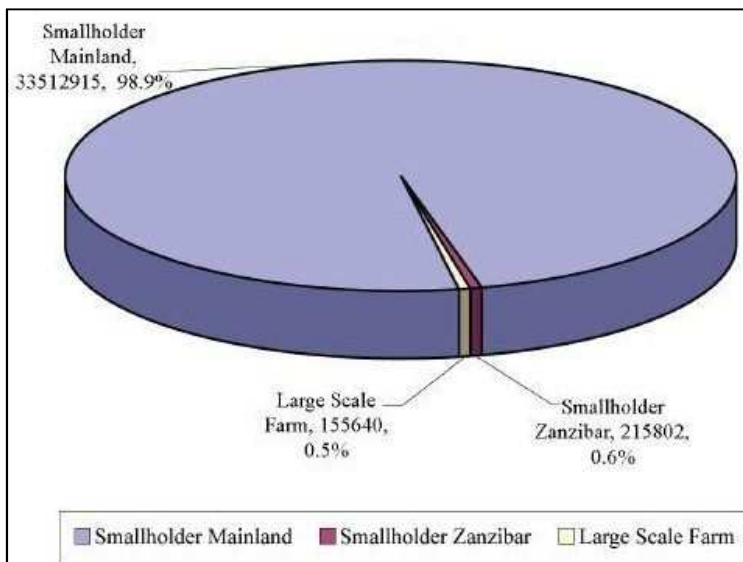


Figure 11: Livestock numbers by type of keeper
Source: National Bureau of Statistics et al. 2003, p. 18

Livestock markets as another element of livestock infrastructure can be categorized into primary, secondary and border markets. There are around 300 primary and 10 secondary in the country, whereby only a minor share is properly working resulting in the establishment of informal, black markets (Njombe/Msanga 2009, p. 6). In addition, the issue of processing is without doubt a major drawback for the livestock sector, since it would enable the generation of higher value-added and growth in disposable income (Ministry of Livestock Development 2006a, p. 13).

Similarly, in terms of the dairy industry, marketing is the major challenge. In the traditional dairy industry, around 90% of milk produced is consumed at household level and hence merely a fraction sold to both the local markets and processors. The latter's ability to produce UHT, yoghurt or butter is thus limited. Smallholder commercial dairy production could be an important tool for generating income and reducing poverty, but is as aforementioned rarely used (Mutagwaba 2006, p. 1)

Furthermore, the general demand for milk or milk products is low. Per capita consumption of milk in Tanzania stands at 34 litres, which is considerably lower than the WHO recommendation of 200 litres. This underscores the fact that a lack of milk drinking habit hampers the marketing of milk in the country (Mutagwaba 2006, pp. 1-2). Consequently, the milk processors operate with about 12% immensely under the installed capacity, resulting in higher costs and declined competitiveness in the milk market (Njombe/Msanga 2009, p. 8). In order to raise demand, specific actions as the School Milk Programmes were taken which shall create awareness of the importance of milk as a highly nutritious product and establish a positive attitude towards the consumption of milk (Mutagwaba 2006, p. 2). Moreover, there are further constraints in the milk supply chain which inhibit the commercialization and market-orientation of the products. Due to absence of good quality infrastructure and remoteness of certain milk producing areas, transport of milk from the farmer to markets or processor is a big challenge. Transport is mostly carried out by bicycles without cooling facilities. In addition, milk collection centres are often not operational, thus leaving the potential of large amounts of collectable milk unexploited (Njombe/Msanga 2009, pp. 7-8).

Another economic opportunity emerges from the production of hides and skins, which could also be a potential export revenue generating product. The performance of this industry, however, is constrained by poor quality of the products, as well as weak storage, preservation and processing facilities. In case hides and skins are exported, it only occurs in raw form without processing and adding value to the product. There is also ample opportunity for a robust growth in the tanning industry, since hides and skins are the essential intermediate products, but the seven factories operate considerably below the maximal installed capacity (Ministry of Livestock Development 2006a, pp. 13-14).

Of course, there are also certain constraints, which are not typical of either livestock or dairy sector, but hold true for both. The issue of animal disease for instance is a very crucial constraint for both. There is a continuous prevalence of trans-boundary, vector borne, zoonoses and other emerging diseases, which poses enormous problems for the farmer (Ministry of Livestock Development 2006b, p. 13). The negative effects are high animal mortality rates, particularly among calves and immense financial loss. A major reason for the emerging problem of animal disease is the absence of adequate animal health services and of access to veterinary infrastructure as veterinary clinics (SNV 2009, p. 1). As the Livestock Report of the Agricultural Census 2002-03 illustrates, for 61% of all livestock keeping households the distance to the next veterinary clinic amounts to more than 15 km (National Bureau of Statistics et al. 2003, pp. 48-49). Of equal importance is the fact that in the course of the decentralisation policy of the country, the agricultural extension services have been delegated from the central government to Local Government Authorities (LGA) and veterinary services have been privatized. Consequently, access to extension services is low due to downsizing of staff and the private sector is reluctant to provide its services in remote and scarcely populated areas because of too high transportation costs and general unattractiveness (Mwakalile 2004, p. 1). This was also confirmed by Ellis/Mdoe, who conducted research in sample villages on the magnitude of poverty and whether the Poverty Reduction Strategy Paper (PRSP) addresses those dynamics. They found that not a single out of 10 sub-villages had been visited by an extension officer in the memory of their inhabitants (Ellis/Mdoe 2003, p. 1379).

As it is the focus of this study some elaborations will follow on tick and tick-borne diseases (TBD), which are one of the biggest threats to animal health. It is estimated that between 2002 and 2009, the livestock population reduced by 16% due to TBD, particularly through East Coast Fever (ECF) (SNV 2009, pp. 1-2). As already mentioned, high mortality rates are accompanied by with devastating effects on livelihoods, and the national economy. Therefore, estimates suggest that Tanzania experiences a financial loss of over 35 million US-\$ annually in cattle mortality and 6 million US-\$ in milk production only due to ECF (Homewood et al. 2006, p. 249). Generally, there are four different methods to control TBD: utilization of livestock dips, spraying of acaricide, hand picking or rotational grazing (Neselle 2010, p. 3). As for livestock dips, there are 2,014 in the whole country, whereby merely 121 (6.1%) are functioning at present which is certainly very meagre. Interestingly, a total of 1,600 out of 2,014 are technically functioning, but not operational, which reflects difficulties in the management and operations (United Republic of Tanzania 2002b, p. 6). The Tanzania Government has issued a National Livestock Policy in 2006 which is supposed to address the various constraints impeding a better performance of the sector and to guide the direction for the ongoing reforms and actions. The National Livestock Policy sets out to attain three goals:

- (1) To encourage the development of a commercially oriented, efficient and internationally competitive livestock industry;
- (2) To support the emergence of a more diverse structure of production with a large increase in the numbers of successful smallholder livestock producer enterprises and;
- (3) To conserve livestock resources and put in place policies and institutions for sustainable resource development and use.

The three goals are summarized into one overall vision for the livestock sector, which is based on the country's Development Vision 2025: "By the year 2025, there should be a livestock sector, which to a large extent shall be commercially run, modern and sustainable, using improved and highly productive livestock to ensure food security, improved income for the household and the nation while conserving the environment." (Ministry of Livestock Development 2006b, p. 16). With its focus on livestock sector growth, the government envisages to stimulate backward and forward linkages in processing and logistics for instance and to benefit from multiplier effects. This, in turn, shall open-up opportunities for further employment (LID 1999, pp. 12-13).

The Ministry's vision to strengthen market orientation is surely the only viable and adequate option, whereby it is definitely questionable, whether this envisaged development can be achieved bearing in mind the diverse challenges which the sector faces. There is still a long way to go, but Tanzania has moved into the right direction. Furthermore, it remains the question, whether and how those well-formulated policies are put into practice. A good quality policy paper does not immediately turn into good quality practice. Hence, also here Tanzania needs to install mechanisms, which facilitate and monitor the implementation. Furthermore, it is doubtful how the whole nation shall benefit from a commercially-oriented livestock sector, since exports and trade of livestock products mainly favours large-scale livestock industries thus marginalising smallholders. In addition, it remains questionable whether large-scale intensification would lead to trickle-down effects to boost rural growth. Therefore, it might be more advantageous to promote livestock marketing in local and regional markets. As will be shown later in chapter 3.1, the demand for livestock products is particularly raising in the local and regional markets of developing countries (Hall et al. 2004, pp. 426-427).

In order to summarize the analysis of Tanzania's livestock sector, a SWOT-analysis will give some conclusive ideas about the sector's performance. However, this figure is enriched with certain aspects which have not been mentioned in this chapter, but with which the author was confronted during fieldwork.



Figure 12: SWOT - analysis of the Tanzanian livestock sector

Source: Own illustration, based on numerous authors and fieldwork experiences

2.1.4 Decentralisation process and impacts

Since almost a century, Tanzania is engaged in experimentation and implementation of decentralisation and its counterpart centralisation policies. Therefore, this elaboration begins with a chronological review (Ministry of Finance and Economic Affairs 2008, pp. 1-2). Generally, five stages of decentralisation and counter-centralisation endeavours can be discerned: the colonial period, the post-colonial phase of socialism, the years of mismanagement between 1972 and 1982, the stage of Structural Adjustment Programs (SAP) in the mid-1980s and the phase of local government reform since 1990 and ongoing decentralisation (Ministry of Finance and Economic Affairs 2008, p. 1).

The first policies which fostered decentralisation were put into practice during the phase of colonialism under British rule. By that time, a local government system with 38 local authorities was installed (Mukandala 2001, p. 6). Notwithstanding this newly established system, the indigenous population was not significantly empowered, whereby the British administration kept control over local areas, which became known as the “indirect rule” (LEAT 2001, pp. 6-7).

This however, ended in 1961, when the country gained independence. After independence the government embarked on a socialist development strategy. A milestone within this plan was the “Arusha Declaration”, which was passed in 1967. The central component of this idea was the nationalisation of private firms and the establishment of Ujamaa Villages, by which widely scattered homesteads were combined into larger villages with collective farms (Mongula 2006, pp. 70-71). In the course of socialist development planning, centralisation and bureaucratisation were favoured and resulted in power consolidation. Moreover, these bureaucratic institutions did not strengthen local institutions (LEAT 2001, p. 7).

In the following years (1972-1982), Tanzania embarked on decentralising the government administration to conform with the socialist notion of development in July 1972 (UNCDF

2001, p. 1). With the Decentralisation of Government Administration Act of 1972 Local Government Authorities were abolished. Instead, much larger Ward Development Councils (WDC), District Development Councils (DDC) and Regional Development Councils (RDC) were formed and replaced a functional local government system (LEAT 2001, pp. 7-8). Those DDCs were recognized as executive branches of the central government and supervision in terms of general activities were to be organised and coordinated by the RDCs. Hence DDCs did not dispose of authority and responsibility to plan and make decisions concerning certain politics or administrative issues. Furthermore, DDCs were financially totally dependent on the central government and gradually lost much of its influence and played a minor role in the administrative setup (Pallotti 2008, pp. 224-225). This stage was also marked by strengthening of the party's domination and power as well as comprehensive economic planning on the national level (LEAT 2001, p. 8).

Generally, this period of administrative transformation can be considered as a failure. It had the effect that widespread corruption and inefficiency in District Development Councils were regular concomitants (Pallotti 2008, p. 225). Additionally, the provision of social services deteriorated immensely and poverty could not be reduced (Ministry of Finance and Economic Affairs 2008, p. 109). Notwithstanding the continuous attempts of the government to sell this policy as decentralisation, several scholars disagree. It is argued that this period would be "too misleading and confusing to be called decentralisation" (LEAT 2001, p. 8). Due to the above mentioned failure of these policies because of mismanagement, corruption and complicated central government supervision in the period 1972-1982, opening local political space became essential for the ruling party Chama Cha Mapinduzi (CCM) (Pallotti 2008, p. 225).

Thus, in the subsequent phase, elected local governments were re-introduced in the urban and rural areas of the country. The re-establishment prompted by the ruling party CCM was part of a pre-election promise, leading to the enactment of the six Local Government Acts in April 1982. More importantly, through the amendment of the Constitution of the United Republic of Tanzania in 1984, local government authorities became constitutionally sanctioned (LEAT 2001, pp. 8-9). Simultaneously, Tanzania went through a realignment of its economic policy towards liberalisation. Nyerere, the former long-time president of the country, retired in 1985 and gave way to Ali Hassan Mwinyi, who immediately launched the Economic Recovery Programme (ERP) which intended to liberalize external and internal trade and allowed private investment. This development strategy was also triggered by the increasing pressure of international donors as the World Bank or the IMF (Mongula 2006, pp. 72-73). Hence, international donors were able to execute strong pressure on Tanzania and had a strong influence in the design of those policies through SAPs in particular. Despite of the endeavours for decentralisation, the central government still maintained its political power (Pallotti 2008, p. 225). For instance, the delivery of social services was still in the hands of the central government entailing the management of financial and human resources (Ministry of Finance and Economic Affairs 2008, p. 109).

Subsequently, democratic elements as the Bill of Rights (1985) and multi-party democracy (1992) became sanctioned in the country's constitution, so that ideas as basic freedom, political transparency and good governance came to the fore and thus laid the foundations for the upcoming decentralisation policies (LEAT 2001, p. 9). Another reason for advocacy of decentralisation at that time was that socio-economic conditions of the country deteriorated, income inequality as well as inequality in access to social services grew and no substantial reduction of poverty was attained. These developments increased the public

pressure on the ruling party (UNCDF 2001, p. 2). Scholars as Pallotti blamed these negative effects on the years of liberalisation and SAPs, which were strongly influenced by international institutions. Consequently, the Tanzanian government re-defined the instruments with which poverty reduction was to be attained and embarked on another attempt to implement decentralisation policies (Pallotti 2008, p. 221).

Hence, this led to the formulation and endorsement of the Future Local Government System in 1996, which was summarized in the Local Government Reform Agenda 1996-2000. Based on these two documents, the Local Government Reform Programme (LGRP) was put into practice in 1996 (UNCDF 2001, p. 2). The overall objective of this programme was to improve the quality of access to public services provided through or facilitated by local government authorities (Chale 2003, p. 3). The programme, envisaged by the government intended to execute a decentralisation by devolution (D by D) concept, which was implemented in three areas: political, financial and administrative decentralisation which is further elaborated in the following.

Political decentralisation means that planning and decision-making in socio-economic development issues is delegated to a holistic local government system, in which the council represents the most important local political body (Chale 2003, p. 2). Furthermore, participation of the people and civic groups should be enhanced, partly due to council elections which should extend to the ward and village (UNCDF 2001, p. 2). In total 22 Urban and 92 rural district councils have been established, which comprise 10,638 village councils which in turn consist of mitaa (neighbourhood) and kitongoji committees which further strengthens democracy and participation at the grass-root level (World Bank 2001, p. 1).

Financial decentralisation indicates that the responsibility for planning and budget alignment according to the identified priorities and preferences has been transferred to Local Government Authorities (LGA), with which the local revenue generation through taxes or user fees for instance should be enhanced (Ministry of Finance and Economic Affairs 2008, p. 1).

The third nature of the LGRP is the administrative type, which stands for the local government's possibility to recruit and fire their staff or to re-organise the council committees or LGA structure for instance (UNCDF 2001, p. 4). Additionally, the local government is also responsible for aspects as staff development and capacity-building based on good governance indicators (Ministry of Finance and Economic Affairs 2008, p. 110).

According to the LGRP, local governments possess freedom to implement strategies, actions, plans or policies without interference by central government institutions, unless they are not in line with national laws or the national policy-framework. Obviously, this clearly shows the gain in autonomy and authority by local governments. On the other hand, the roles of the central government are confined, but still of importance and can not be ignored. Accordingly, the central government fulfils a role comparable to a "night guard", who a) formulates the policy framework to which the local government has to adapt when designing policies, b) facilitates, supports and enables local governments in their service provision and c) monitors and supervises the performance of the local governments, but is restricted in terms of direct intervention (Chale 2003, p.1).

Since the implementation of the LGRP entails an enormous and complex restructuring of the political-administrative system of the country, several constraints and obstacles during this process were identified and revealed by different scholars. These critics refer to the issues of general neo-liberal notions incorporated in the LGRP, the entire financial decentralisation process, the effects on environmental management and negative impacts on

democracy on the grass-root level (Fjeldstad 2001, LEAT 2001, Mongula 2006, Pallotti 2008).

In his article "Decentralising power or spreading poverty" Pallotti's critics refer to the underlying ideology of the LGRP. He asserts that Tanzania's decentralisation policy enacted in the LGRP would go along with the promotion of neo-liberal ideas and market models in the rural areas of the country. Although mainstream literature assesses neo-liberal institutional reforms as essential for fostering popular political participation, accountability and empowerment, the threat that those notions based on individual agency could strengthen marginalisation and undermine democratic principles is acute. Referring also to Village Land Act of 1999 which allows residents to gain title deeds of their occupied land and shall draw on Hernando de Soto's idea to foster economic growth and productivity, Pallotti criticises the rapid transformation from the passive village resident to active entrepreneurs, who shall suddenly act as a homo oeconomicus and hence promote economic growth. According to him, the LGRP disregards past centralised top-down policy as well as socialist planning which left a lasting legacy on the country's population. In his point of view, such a complex institutional change can not occur over night and requires more time. Furthermore, he questions how the rural population can benefit from introduced neo-liberal policies, if during the period of Structural Adjustment exactly the same approach did not lead to the reduction of poverty (Pallotti pp. 222-227).

As abovementioned, financial decentralisation is an important component of the LGRP, whereby local governments have their own responsibility for their revenues and expenditures and plans as long as they comply with national laws and the national policy framework (Ministry of Finance and Economic Affairs 2008, p. 1). In general, local governments have three options for revenue collection: firstly, taxes and user fees, secondly, transfers of fund from central government and thirdly, financial contributions through development aid. Since there are no fixed guidelines on the tax structure, it resulted into the design of more than 110 different structures in the LGA of Tanzania (Fjeldstad 2001, pp. 6-8). Nevertheless, local governments' own revenues represent merely between 4-5% of overall revenues in 2003/04. Bearing in mind the initial goal of enhancing the financial autonomy of local governments, this is surely a very disappointing result. Instead, the funding dependency on donors and the central government has strengthened enormously and was aggravated by the abolition of the development levy, a tax which usually promised the highest revenues (Pallotti 2008, p. 226). These revenues are barely sufficient to cover operational costs, particularly civil servants' salaries (Fjeldstad 2001, p 5). Consequently, almost no funding is left to execute rural public service or development projects, so that taxpayers are often resistant to pay taxes and feel exploited, since the benefits of paying taxes are not tangible, which certainly reduces their political participation and access to social services (Fjeldstad 2001, p. 9). Obviously, this is one reason which leads to the problem of an immense gap between reported and projected revenues. Additionally, personal relationships between taxpayer and collectors, political pressure in election years, mismanagement, embezzlement and especially corruption are mentioned as the major bottlenecks for increasing revenue collection (Fjeldstad 2001, pp. 9-12)

In terms of environmental management the responsibility to protect and manage the environment has in the course of the LGRP been delegated to the local governments (LEAT 2001, p. 4). However, also in this sector several constraints emerge and impede the adequate management by the local governments. Evidently, many of those obstacles are related to the legal framework. For instance, local governments do not have the necessary legal autonomy to implement by-laws rapidly, enforce environmental laws adequately or

deter residents with high penalties for environmental degradation. Furthermore, land tenure and laws concerning access to natural resources are not properly defined and thus pose immense problems for local governments. Although governing policy for environmental management is well formulated, mechanism and plans at the local level are not adequately implemented. Thus a lack of clarity on institutional mandates prevails (LEAT 2001, pp. 18-22).

Turning the discussion to the village level, it becomes clear that this level has been largely ignored in the LGRP. The findings of Pallotti's fieldwork showed that the LGRP failed to overcome institutional obstacles on the grassroots level which hinder political participation. Moreover, the abolition of the major taxes resulted, as aforementioned, in a decline in revenue collection. Consequently, the budget flows from local to village Government decreased in the sense that funding opportunities of village government for development initiatives have shrunk. Naturally, this tightened the grip of LGA on village governments and strengthened dependency, which thus, failed to promote autonomy as envisaged in the LGRP. This was also confirmed by Ellis/Mdoe. They found out that none of the sample-villages had ever seen a proportion of tax revenues, which were beforehand collected by the Village Executive Officer (VEO) and forwarded to the district revenue department. Instead, the district government kept the money for their own purposes (Ellis/Mdoe 2003, p. 1379). Furthermore, village authorities are after years of socialism, structural adjustment with negative effects for the rural population often unable to cope with enhanced authority and autonomy (Pallotti 2008, p. 227).

A step into the right direction surely was the "Opportunities and Obstacles to Development" (O & OD) programme, implemented in 2002. This programme is seen as a new approach for village development planning in the sense that in participatory sessions, the village residents themselves identify and prioritize development initiatives and submit these to village and local Government (Mongula 2006, p. 77). However, Pallotti does not share this optimism and states that it would be "unlikely to achieve its objectives within an institutional context of centre-periphery relations, which are historically biased against the autonomy of village authorities in development planning." (Pallotti 2008, p. 227).

Presumably, the most serious issue inhibiting progress of decentralisation on the local level which was mentioned by several scholars is the lack of capacity. Therefore capacity building is a very essential component for public servants (Chale 2003, Fjeldstad 2001, LEAT 2001, Ministry of Finance and Economic Affairs 2008, Pallotti 2008, World Bank 2001). Particularly, the aspects of financial decentralisation and environmental management are subject to limited capacity. As for the case of fiscal issues, there are no experts and qualified staff, who can restructure or redefine current tax structure and improve the complicated tax revenue system. The same lack of expertise holds true for governmental tax collectors at the grass-root level. Even they have limited knowledge on tax system and how to collect them thus enhancing resistance by tax payers, who do not see tangible benefits of their payments (Fjeldstad 2001, p. 8). Therefore, the assumption that financial, respectively fiscal autonomy, would improve the delivery of public services must under these circumstances be taken with caution. In case the gap of capacity will not be closed, there is reasonable concern that inadequate personal performance will open doors for mismanagement and corruption and declined revenue collection, which is detrimental for attaining the goals of good governance and improved service delivery as far as the financial decentralisation is concerned (Fjeldstad 2001, p. 15).

A second major challenge is the continuous dependency of LGA on central governments and donors. Since the local government's own revenues merely represent 4-5% of total

revenues, it is certainly inappropriate to consider this as increased autonomy or authority (Pallotti 2008, p. 7).

2.2 Mara Region

2.2.1 Geographical location and administrative division

As displayed in figure 2, Mara Region is situated on the North-Eastern shore of Lake Victoria and bordered by Kenya in the North. Furthermore, it is bordered by Mwanza and Shinyanga Region in the South, Arusha Region in the East and Kagera Region in the West. The land area of Mara Region amounts to 30,150 km² (National Bureau of Statistics et al. 2007, p. 23). According to the latest Housing and Population Census of 2002, Mara Region has 1,368,602 inhabitants, who live in 188,203 households. Thus, the population density amounts to 45.4 inhabitants per km² which is slightly higher than the national average (United Republic of Tanzania 2002, p. 5). The GRP (Gross Regional Product) was estimated to amount to 443.2 Million TZS which is equal to the seventh position among all regions of the country (National Bureau of Statistics et al. 2007, p. 23).

Administratively, Mara Region has been subdivided into four districts namely Bunda, Musoma, Tarime and Serengeti. Recently, Tarime was split into Tarime and Rorya Districts which was not taken into consideration in figure 13 on the next page. The Capital of Mara Region is Musoma, situated on the shore of Lake Victoria (SNV 2009, p. 2). In terms of agro-ecology Mara Region is diversified. It can be categorized into three distinctive agro-ecological zones: Tarime Highlands, Midlands zone and Lowlands zone. Tarime Highlands cover about 339 km² which is only 1.1% of the region's total land area. The zone reaches an altitude of 1,500 m which ensures reliable rainfall in a bimodal type of more than 1,250 mm per year. Moreover, it is noteworthy that the population density is with 326 people per km² is much higher than the national average. Midlands zone covers 3,840 km² and stretches from Tarime to Serengeti and Bunda District. This zone receives almost as reliable rainfall as Tarime Highlands and is the main livestock keeping area of Mara Region. Lowlands comprise Musoma District as well as parts of Bunda District which amounts to 10,620 km² in total. Likewise, precipitation occurs in a bimodal way, but amounts to merely 300 mm to 700 mm per year. Opposed to Tarime Highlands and Midlands, livestock is not the main livelihood activity in Lowlands zone. Interestingly, Mara Region has in comparison with other regions of the country very favourable climatic and ecological conditions and possesses an immense potential for both crop farming and livestock keeping (Kunze et al. 1997, pp. 127-129).

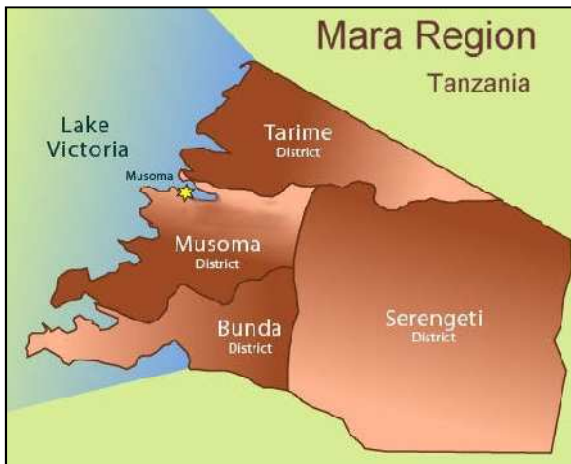


Figure 13: Administrative division of Mara region
Source: SNV 2009, p. 2

2.2.2 Livestock sector - performance and challenges

As described in chapter 2.2.1, Mara Region consists of 188,203 households. Out of these households almost 50% carry out either mixed-farming (43.8%) or purely keep livestock (1.3%). In terms of the households' cash income, annual crop farming contributes the largest share, followed by tree/forest resources, permanent crop farming, off-farm activities and lastly, livestock keeping (National Bureau of Statistics et al. 2007, p. 9). Despite the little importance for the generation of cash income, livestock is, likewise as in the entire country, an important component of the farmer's livelihood (National Bureau of Statistics et al. 2003, pp. 20-21). As stated in Kunze et al., "the livestock industry is the backbone of Mara's economy" (Kunze et al. 1997, p. 130). This becomes evident by looking at livestock densities provided by the Agricultural Census Report. Figure 10 in chapter 2.2.1 for instance shows the cattle population in Mara Region. Obviously, Mara Region has the second highest cattle density in Tanzania. In terms of goats density Mara Region has the third and concerning sheep the fourth largest density in whole Tanzania (National Bureau of Statistics et al. 2003, pp. 20-27). Generally, cattle and chicken are the most common livestock species as figure 14 shows. Nevertheless, most of livestock reared is of the indigenous type, as the Zebu cattle for example, and consequently has a lower productivity than dairy cows or cross-bred animals (National Bureau of Statistics et al. 2003, p. 14).

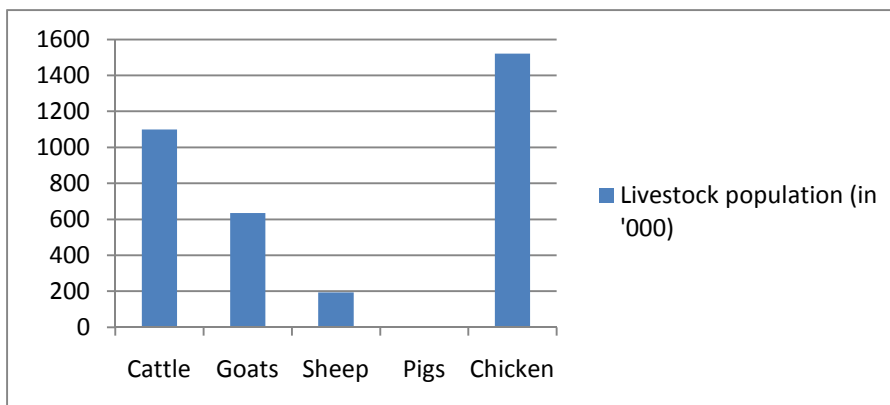


Figure 14: Livestock population in Mara region 2003 (in '000)
Source: Own creation, based on National Bureau of Statistics et al. 2007, p. 14

Similarly to the national level, also the livestock sector in Mara Region is constrained by prevalence of animal diseases. As the Agricultural Census revealed, out of all livestock keeping households, 69% indicated TBD and 17% tse-tse fly problems. One of the causes is poor access to veterinary services. For instance, 80% of all livestock keeping households in Mara Region are more than 14 km away from a veterinary clinic. This holds particular true for Tarime District and Musoma Rural (National Bureau of Statistics et al. 2007, p. 125). Tick and tick-borne diseases can be controlled by different methods. In Mara, the most frequently applied method is spraying (56%), followed by none (18%), dipping (4%) and smearing (3%). The remainder constitute other methods (National Bureau of Statistics et al. 2003, p. 259). Since dipping is presumably the most effective method it is questionable, why merely 4% apply this method. The main reason is surely that out of the 126 dips in the region not more than 24% are genuinely working. 39% are either still under construction or in need of rehabilitation or renovation. On the other hand, 37% are virtually functioning, but are not operating due to management problems (United Republic of Tanzania 2002b, p. 7). The direct consequences of inadequate veterinary services lead to high mortality rates especially among calves (SNV 2009, p. 3). In order to tackle the problem of animal diseases and to improve veterinary services, the concept of Communal Animal Health Workers (CAHW) has been initiated and implemented. CAHW are trained in veterinary skills by specific training centres and provide their service to livestock keepers which is well appreciated. Chapter 3.2, which deals with aspects of animal diseases, gives a deeper insight into this subject matter (SNV 2009, pp. 3-4).

Mara Region possesses also great potential in the dairy industry. Although most of the animals are of indigenous type, they deliver around 2-3 litres per day. Nonetheless, it is estimated that all smallholders together, produce around 155 million litres annually. Largely, milk is consumed within the household or sold unprocessed locally, leading to undersupply of the two main milk processors Mara Dairy and Musoma Dairy, both located in Musoma. The processors themselves face several problems, one of them being marketing problems. As already mentioned in chapter 2.1.3, per capita consumption of milk is rather low in Tanzania. Therefore, the two processors in Mara Region suffer from limited demand for milk products. Furthermore, it is a big challenge to find reliable distributors in the urban markets and the processors are confronted with strong competition from other brands and countries as Kenya for instance. Obviously, a viable and dynamic dairy industry in Mara Region is desirable and achievable which would also contain substantial benefit for agents upstream in the chain as farmers and milk collectors (SNV 2009, pp. 4-5).

3. Thematic-theoretical framework

Chapter 3 of this Master Thesis deals with the underlying thematic-theoretical framework. Hence, notions, theories and approaches of thesis- and research-related topics are presented based on an extensive literature review.

The first part (3.1) is about the overall issue of livestock and its importance for the poor, the magnitude of livestock keeping and its characteristics. Based on this, the various approaches and ways with which livestock can contribute to poverty reduction will be outlined. Section 3.2 comprises a certain constraint in the livestock sector, animal disease. A categorisation of animal diseases will be shown and the various direct and indirect impacts on livestock keepers and their livelihoods will subsequently be explained. Since tick-borne diseases and its control is the main focus of the research, the possibilities for controlling with a special focus on livestock dips will be presented in chapter 3.3. Furthermore, part 3.4 will shine a light on decentralisation issues and the question whether these attempts can favour poverty reduction or not. Chapter 3 closes with an analysis and some explanations on community-managed service delivery (3.5).

3.1 Livestock – an evolving tool for poverty reduction?

Livestock are ubiquitous in the developing world and a very important asset for poor households (Randolph et al. 2007, p. 2789). In the developing world, livestock systems are very heterogeneous and depend highly on agro-ecological conditions, social values and culture, population density and other factors. These systems can range from large-scale, intensive agro-industries to extensive smallholder producers. A comparison of these systems shows that smallholder livestock systems outweigh other systems by large. For instance, they represent about 20% of the world population (McDermott et al. 2010, p. 95).

Notwithstanding the complex and diverse nature of livestock systems in the developing world, estimates suggest that livestock form a component of the livelihoods of at least 70% of the rural poor, particularly in arid and semi-arid areas (Cecchi et al. 2010, p. 99). The absolute numbers are even more remarkable: McDermott et al. state that livestock production and marketing are vital to the livelihoods of more than one billion poor people in Africa and Asia (McDermott et al. 2010, p. 95). The data for the geographical sub-region East Africa, in which Tanzania makes up a large share, are equally notable. For an estimated 50 million people living in rural areas of Eastern Africa, the income from livestock products outweighs the income from crop farming (Cecchi et al. 2010, p. 109).

Livestock are furthermore a main driver of land use change. Due to activities as grazing, water drinking, production of feed (one third of worldwide produced grain is fed to livestock) and waste as well as emission of greenhouse gases, their contribution to land use change and environmental degradation is enormous. In total, activities related to the livestock sector occupy approximately 30% of the earth's terrestrial surface (Dickson-Hoyle/Reenberg 2009, p. 105).

As mentioned above, many of the poor rear livestock. But the actual reasons for keeping livestock and the roles they play for household survival have not been clarified so far. Firstly, livestock are often kept for food consumption. Livestock products as meat, milk or eggs are consumed within the household and can ensure or contribute to food security.

The nutritious value of those products as protein for example is crucial for the well-being of farmers and complements the nutrition with staple foods (Randolph et al. 2007, p. 2789). Secondly, marketing of live animals or livestock products generates cash income, which can be used to purchase things as food, shelter or health care fees for example (LID 1999, p. 16). Thirdly, livestock can be used as a store of wealth. Instead of depositing the money in bank accounts, to which the poor rarely have access, households invest in livestock, which is a relatively secure and inflation-free investment. In times of financial crisis (school fees or medical care have to be paid) livestock can be sold in order to dispose of sufficient cash income to maintain household survival. However, also storing of savings into livestock is subject to risks, since the prices at livestock markets might fluctuate considerably (LID 1999, p. 16). The fourth reason concerns mixed crop-livestock systems in which livestock keepers rely on both livestock keeping and crop production, especially in sub-humid or humid regions (LID 1999, p. 14). In this case livestock can offer valuable complementarities to crop growing by providing draught power, transport opportunities, manure to maintain soil fertility and by converting crop residues into edible products (Randolph et al. 2007, p. 2789). It is estimated that more than half of the arable land area in developing countries is cultivated with the help of draught power and more than 70% of all applied fertiliser is in the form of manure (LID 1999, p. 17). Fifthly, livestock rearing entails a socio-cultural component. Traditionally, the wealth and prestige of a livestock keeper is determined by its herd size. Hence, some livestock keepers strive for larger herds in order to enhance their social status rather than selling live animals or livestock products (Randolph et al. 2007, p. 2789). Another sometimes ignored role of livestock is empowerment of women. Since mainly women are responsible for taking care of animals and they can generate income through selling live animals or animal products. In terms of cattle however, the male household head is largely responsible for supervising grazing activities (LID 1999, p. 17). Furthermore, in pastoralist societies cattle are often used as bride wealth. The representative of the groom family approaches the intended bride family and submits his offer which also includes cattle associated with the right of the groom's family over the children born to the woman (Dekker 2004, pp. 214-215).

It should be clear by now that livestock play a very important, but complex role in the decision-making of poor households. Therefore, Randolph et al. suggest using the Sustainable Livelihoods Framework (SLF) developed by Carney, which increases understanding of this complexity (Randolph et al. 2007, pp. 2789-2790). This framework is depicted in figure 15. Starting from the left side, the household is constantly threatened by socio-economic or biophysical shocks, trends etc. which determine their vulnerability context. The various roles of livestock, illustrated as human (better nutrition e.g.), financial (higher income e.g.), physical (larger herd e.g.), natural (better soil fertility e.g.) and social asset (higher prestige e.g.), can mitigate the risks expected from the vulnerability context. Thus, enhancement of one of the livelihood assets results in dampening of risks faced by the vulnerability context. The livestock-based livelihood strategies the household ultimately opts for is furthermore influenced by institutions, policies and culture. Thus, the selected livelihood strategy based on livestock assets and influenced by political-institutional environment and culture determine the livelihood outcome, which might be increased income or higher soil fertility as positive examples. This in turn feeds back to strengthen the household's asset base (Randolph et al. 2007, p. 2790).

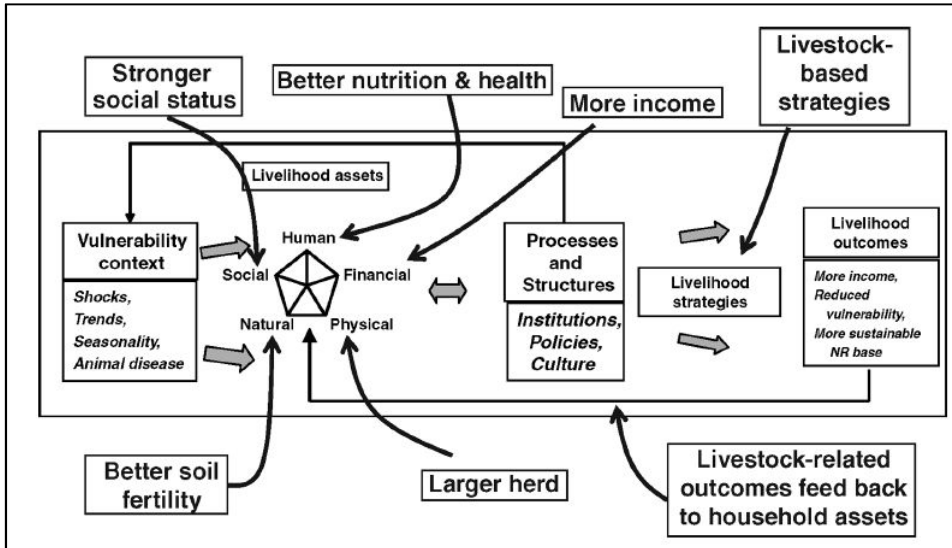


Figure 15: Sustainable livelihoods framework with focus on livestock
 Source: Randolph et al. 2007, p. 2790

Since the poor keep a wide array of livestock species within different geographical regions and different livestock keeping systems, distinctive roles that livestock species play in the livelihoods can be discerned. This is demonstrated in figure 16. It is very common by livestock keepers to spread risks and to diversify, so that several livestock species are kept simultaneously (ILRI 2002a, p. 43).

Species	Contribution to household assets				
	Financial	Social	Physical	Natural	Human
Cattle, Buffalo, Yaks	Sales of milk, meat, hides, animals, draught power services, transport Savings instrument	Networking mechanism Social status indicator	Draught power for crop cultivation Draught power for transport	Manure for maintaining soil fertility	Household consumption of milk, meat
Camels	Sales of milk, meat, hides, animal, transport services Savings instrument	Networking mechanism Social status indicator	Draught power for transport		Household consumption of milk, meat
Donkeys, Horses	Sales of animals, draught services, transport (esp. water)		Draught power for crop cultivation Draught power for transport (esp. water)	Manure for maintaining soil fertility	Provision of household water supplies
Goats, Sheep	Sales of milk, meat, hides, animals Savings instrument	Networking mechanism Social status indicator		Manure for maintaining soil fertility	Household consumption of milk, meat
Pigs	Sales of meat, animals Savings instrument			Manure for maintaining soil fertility	Household consumption of meat
Poultry	Sales of eggs, meat, fowl	Networking mechanism		Manure for maintaining soil fertility	Household consumption of eggs, meat

Figure 16: Different livestock species and their contribution to household assets
 Source: ILRI 2002a, p. 43

Bearing in mind the extent of livestock keeping in the developing world and the various ways in which it contributes to livelihoods of the poor, one can summarize that this sector disposes of an enormous potential for improvement of livelihoods and poverty reduction. However, livestock keeping is constrained by a variety of factors, depending on the particular role it plays for a certain household. The LID publication "Livestock in poverty-focused development" presents constraints which affect livestock keepers according to stages of the livestock keeping cycle (LID 1999, p. 17).

Naturally, the cycle begins with the purchase of animals. Poor household may lack sufficient capital to acquire animals. In case cash generating activities are limited, households have to rely on (micro) credit systems. However, these are often missing particularly in rural areas. Maintaining and retaining livestock as the second stage of the cycle, is subject to several difficulties. Firstly, livestock are vulnerable to animal diseases which are difficult to control or prevent, since the appropriate veterinary services might be lacking. Second, particularly in dry areas with high livestock population density sufficient fodder might not be available, especially when communal farming is practiced. The absence of access to land for grazing and to water sources may be another problem when maintaining and retaining livestock (LID 1999, pp. 17-18). This problem is exacerbated by population growth and urbanisation, resulting in increasing pressure on the land and other resources (ILRI 2004, p. 1). In case livestock or related products are sold (third cycle), households may lack access to markets due to remoteness or inadequate transportation networks (LID 1999, pp. 17-18). These and other challenges as lack of business skills, absence of business contacts, capital and credit systems are responsible for increasing transaction costs (ILRI 2004, p. 4). In the context of marketing problems, Ndambi et al. also point to detrimental effects of milk powder imports by developing countries which can have devastating effects on local dairy markets. Thus, smallholder milk sellers are frequently crowded-out of the market, although willing to sell livestock products (Ndambi et al. 2007, p. 6).

Another pertinent notion in livestock research which became prominent among scholars from various disciplines is the term "livestock revolution". This distinctive feature of the livestock sector refers to a sharp increase in demand for food, and production of food of animal origin in developing countries (Hall et al. 2004, pp. 426-427). Between 1970 and 1990 the growth for combined per capita demand and consumption in meat, eggs, and milk in developing countries amounted to about 50% (Delgado et al. 1999, p. 12). Estimates suggest that this growth in developing countries will continue towards the year 2030, although at slower pace, as figure 17 illustrates (McDermott 2010, p. 96).

It is predicted that by 2020, 60% of the world's meat and 52% of the world's milk will be produced in developing countries (Hall et al. 2004, pp. 427-428). Obviously, the sharp increase in demand for livestock products results in enormous opportunities for marketing and trading which would ultimately lead to enhanced financial livelihood asset and poverty reduction.

This strong increase in demand for livestock products can be traced back to three reasons. Firstly, raising incomes leads to diversification of nutrition towards higher quality products, disregarding usual staple food as maize or rice for example (Dickson-Hoyle/Reenberg 2009, p. 106). In this context, McDermott et al. argue that as soon as households cross the 2 US-\$ per day income threshold, the demand for livestock products increases enormously (McDermott 2010, p. 96). The correlation of per-capita income growth and increased meat consumption is also empirically proven by Delgado et al. (Delgado et al. 1999, p. 20).

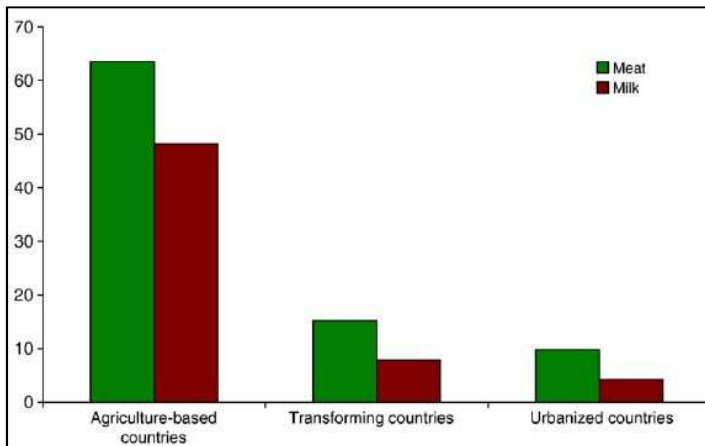


Figure 17: Changes in demand for livestock products meat and milk 2001 – 2030 in %
Source: McDermott et al. 2010, p. 96

Secondly, raising urbanisation rates associated with socio-economic and demographic changes entail the trends towards more western-style diets which usually contain more livestock products. The third reason concerns general population growth, associated with increase in total demand for livestock products (Dickson-Hoyle/Reenberg 2009, p. 106). Although scholars disagree about the geographical scope and magnitude of the “livestock revolution”, there is no doubt that this reorganisation of livestock production and demand occurs. It is furthermore widely recognized that this poses significant opportunities for livestock keepers to improve their livelihoods by benefitting from rapidly growing markets (Delgado et al. 1999, Dickson-Hoyle/Reenberg 2009, Hall et al. 2004, LID 1999, McDermott 2010, Scoones/Wolmer 2006).

Within this demand-led livestock sector restructuring, a wide range of policies and actions can be implemented to reduce poverty. Hence, according to the FAO the livestock sector plays a key role as a platform for offering pathways out of poverty (FAO 2008, p. 1). One of the worldwide leading research institutes on livestock issues, the International Livestock Research Institute (ILRI), discerned three different pathways out of poverty according to its latest strategic plan which is a good starting point for further elaborations (ILRI 2009, p. 6). The first pathway concerns the security of capital assets (natural, physical, social, human, financial) of livestock keeping households. These assets shall currently and in the future be secured and the risks and constraints they face (animal diseases e.g.) be reduced (ILRI 2004, p. 2). Secondly, ILRI envisages to improving the productivity of livestock systems of the poor. This should be achieved by higher efficiency (better use of land, labour and water e.g.) and increased inputs (feed, veterinary care) which together shall result in productivity growth (ILRI 2009, p. 9). This should especially be seen against the background of increasing land use and the fact that agricultural production in general can not simply be expanded horizontally, but productivity on the same area be enhanced (FAO 2008, p. 1). The third pathway for escaping poverty is increasing participation of the poor in livestock-related marketing activities in order to benefit from the “livestock revolution”. In order to obtain higher cash revenues, livestock keepers may add value to their products by processing them to yoghurt or pasteurised milk for example (ILRI 2009, pp. 10-11).

The organisation Livestock in Development (LID) supplements these pathways by presenting two different approaches. Firstly, LID considers increased supply of livestock products through intensification in large-scale livestock industries as an adequate instru-

ment. Increased supply should trigger a decline in prices of livestock products. Consequently, poor household would have an incentive to purchase livestock products because of lower prices and could save on food expenditure. In addition, this increased food consumption may result in improved nutrition or ensured food security. However, this approach is limited by the fact that due to demand growth for livestock products, their prices will presumably rise instead of fall. Furthermore, poor households rarely purchase costly livestock products, since they mainly rely on subsistence farming. Evidence shows that the poor spend merely 1% of their income on livestock products (LID 1999, pp. 10-12).

The second approach LID demonstrates is the generation of employment through large-scale intensification. It is suggested that these large-scale livestock industries would, through increased supply of livestock products, create employment not only on the farm, but through backward- and forward linkages also in fodder production, processing, transport etc. It is argued that by means of trickle-down effects, also poor households will participate in growth through enhanced employment opportunities. But it has to be beard in mind that such multiplier effects are much weaker in the livestock sector compared to the crop sector. Moreover, such employment creation is limited by capital- and energy-intensive nature of large-scale intensification resulting in little employment opportunities. It further implies that processing and other support industries are rather located in urban areas thus offering no employment for the rural poor (LID 1999, pp. 12-13).

In the following, a specific focus will be laid on the third pathway out of poverty of ILRI: increased participation in marketing activities due to the unprecedented increase in global demand for livestock products. The increasing importance of this pathway is also acknowledge by the ILRI such that a restructuring of funding for research was executed, implying a much stronger focus on the market-oriented pathway (ILRI 2009, p. 8).

In this regard, the literature frequently points to opportunities in export growth of developing countries to meet this dynamic demand. Behind the political rhetoric of “modernising the livestock sector” which is quite common among African countries hides predominantly the goal of boosting trade and export of livestock products, especially to the Middle East and Asia, but also Europe and North America. This approach is politically seen as a panacea for achieving economic growth and for poverty reduction, particularly since major donors as World Bank, FAO, African Union (AU) are positioned behind this notion (Scoones/Wolmer 2006, pp. 9-10).

As poverty reduction through export growth might sound easily achievable, it requires huge investment in marketing infrastructure (slaughterhouses, roads, feedlots e.g.) and in particular for veterinary care to meet certain international standards and regulations. These were established to monitor and control the movement of diseases of animal origin and may pose a significant barrier to trade and exports for livestock producers from developing countries (Hall et al. 2004, p. 431). The standards are primarily set by the importing countries and are usually monitored by the Sanitary and Phytosanitary (SPS) agreement of the World Trade Organisation (WTO) (Scoones/Wolmer 2006, pp. 11-12). To underscore the difficulties to comply with these standards one can point to a survey conducted by Henson et al. (2000) among WTO and Codex representatives from developing countries about factors which impede their nation’s ability to export food to the EU. The study clearly revealed that SPS requirements of the EU are the major burden (Hall et al. 2004, p. 434).

Next to the key constraint of meeting international veterinary standards, there are four further limitations for accessing export markets identified by Scoones and Wolmer. Firstly, they point to the widespread establishment of informal markets which defy control from tax collectors or veterinarians. Since these are often built upon social informal institutions, it is difficult to alter and transform them to real, formal markets. Secondly, Scoones and Wolmer emphasize on poor data on livestock trade in Africa which makes it difficult to document and assess where animals came from originally. Thirdly, it has to be borne in mind that competitors as Argentina and Brazil dominate the export of livestock products which may crowd out local African producers from the markets. Fourthly, role models of effective animal disease prevention as in Namibia and Botswana become increasingly fragile and out-dated. Copying these pathways may furthermore lead to immense costs which ultimately may not pay-off (Scoones/Wolmer 2006, pp. 15-16).

Considering the various challenges and constraints impeding the access to lucrative export markets, there are market-oriented alternatives. One of these alternatives is the focus on local and regional trade and markets in order to benefit from increasing demand within developing countries. Local markets in developing countries do not demand high-value products as fillets; they rather prefer brisket meat on the bone, offal and all parts of goats and sheep. In order to execute such a marketing scheme, costly compliance with international standards and regulations can be ignored and a different marketing system has to be implemented. Instead, it would be more useful to invest in basic treatment, food safety and hygiene (processing of milk e.g.) for the development of local and regional market opportunities (Scoones/Wolmer 2006, pp. 18-19).

Hence, national policy-makers are in a dilemma. They can either invest huge financial and human resources into infrastructure for export opportunities or attempt to guarantee basic food safety and hygiene and to improve domestic public health for the promotion of local and regional marketing. Generally, these two approaches are not mutually exclusive, but may have certain trade-offs (Hall et al. 2004, p. 435).

A hint in this decision-making process concerns the role of smallholder livestock keepers. It is argued that for smallholders which are the predominant and most vulnerable livestock system in developing countries, it becomes increasingly difficult to meet the SPS standards and regulations and to insert into those complex value chains (McDermott 2010, p. 97). According to Hall et al., small-scale producers become marginalized through these international standards, leaving the playing field to the relatively few large-scale producers with greater financial capacity. These producers are able to quicker respond to new regulations and standards and thus are benefactors of such policies (Hall et al. 2004, p. 434). Smallholders are, however, through the use of family labour, low input costs, most competitive in regional and local (informal) markets (McDermott 2010, p. 98). Policy-makers have to take this into account when formulating policies. Since an approach favouring the improvement of domestic public health and local markets will target a larger number of households and in particular smallholder livestock keepers who can not thus simply escape from poverty, the emphasis should be laid on this approach. This way, it is ensured that the greatest opportunity for a pathway out of poverty through market-oriented activities can be exploited (Hall et al. 2004, p. 436).

3.2 Animal diseases and the impact on livestock keepers

In the livestock keeping cycle identified by LID, the node maintaining and retaining of animals is a very crucial one. The various animal diseases are a daily occurrence and pose a significant threat for maintenance and retention of animals to livestock keepers. Their livestock are typically vulnerable to a wide range of animal diseases due to lack of knowledge on disease management and control or lack of access to veterinary care (LID 1999, p. 20).

To ease the debate on potential impacts of animal diseases it is pivotal to first elaborate on the nature of animal diseases. Generally, four distinct animal disease categories can be discerned which occur in different geographical regions and livestock keeping systems and affect the various livestock species in a variety of ways: the endemic, epidemic (or trans-boundary), zoonotic and food-borne (ILRI 2002a, p. 49).

Endemic diseases include the vector-borne haemoparasitic diseases, the multitude of helminth diseases, the enteric bacterial diseases of the neonate and bacterial and viral causes of reproductive failure, among others. Furthermore, they can be divided into the two groups “tropical” and “tropical and temperate”. Only little attention in terms of funding and control has been given to the tropical endemic diseases which predominantly occur in developing countries thus making it difficult for livestock keepers to control them. In addition, endemic diseases are often found at farm, village and community level (ILRI 2002a, p. 50).

Epidemic diseases (also trans-boundary diseases) are highly infectious and are widely spread at the farm, but also at the national level frequently distorting international trade efforts. The most prominent are certainly foot-and-mouth disease (FMD) and rinderpest (RP). Due to its characteristic to spread rapidly, epidemic disease sometimes wipe out a whole herd. Public sector involvement and control is very strong, since it concerns the lucrative export market which has to be protected (ILRI 2002a, p. 50).

The prevailing consequences of zoonotic diseases concern human beings rather than animals. Those diseases as rabies or Rift Valley fever (RVF) may cause severe illness and suffering among humans (ILRI 2002a, p. 50).

Finally, food-borne diseases are of animal origin and are exclusively common among humans. They are triggered by poor hygiene and sanitation and inadequate cooking facilities. Food-borne diseases may affect livestock keepers, processing workers and consumers (ILRI 2002a, p. 50).

In case livestock diseases occur their impacts are manifold and are associated with a wide range of biophysical and socio-economic as well as direct and indirect effects on both the local and global scale (ILRI 2002a, p. 50). In the following, these potential effects will be presented based on the large and in-depth study of the ILRI which distinguishes between overt disease and those linked to disease risk. This analysis is depicted in figure 18.

In terms of overt disease a very common and far-reaching impact is the loss of livestock productivity (left part of figure 18). This is the effect of livestock death or illness triggered by animal disease and leads to poor weight gain, poor milk yield or poor reproductive capacity for instance. Another often underestimated consequence of loss in livestock productivity arises when treating diseases: treatment costs. If veterinary medicine is available, immense financial costs and time may be required to purchase medicine. Furthermore, it is essential that provided animal health service is of good quality.

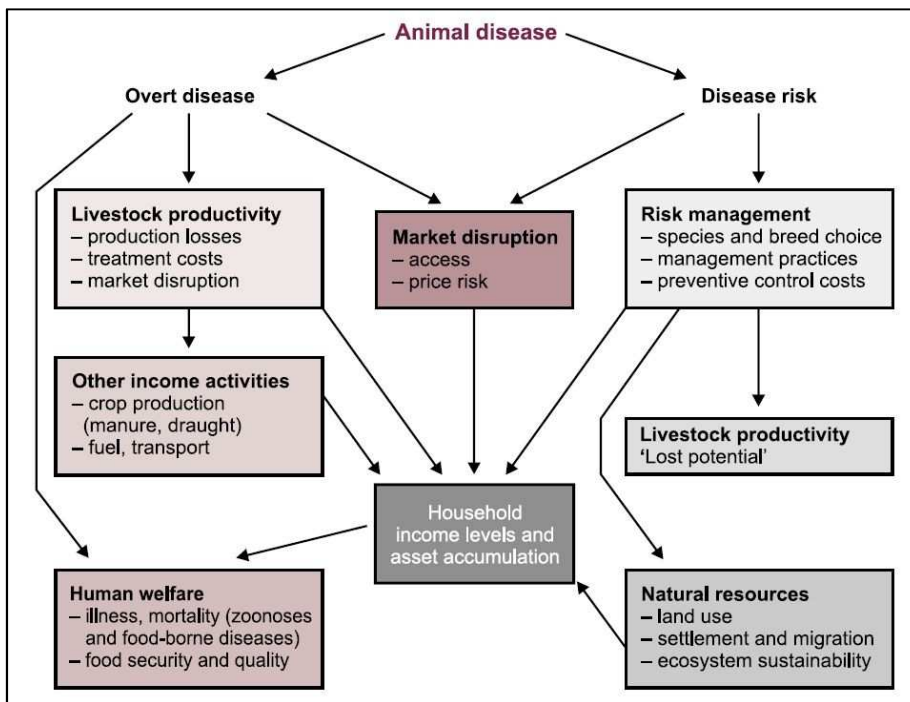


Figure 18: Potential impacts of animal diseases

Source: ILRI 2002a, p. 51

Loss in livestock productivity may also have negative effects on other livelihood assets, as the financial or natural capital. Exemplarily, less manure may be available, draught power might be reduced or the traction capacity of the particular animal can be limited resulting in reduced natural capital. Overt animal diseases could moreover result in market disruption. This takes place when movement restrictions for animals are imposed, so that farmers might not reach markets on time. In addition, due to illness of animals farmers simply may obtain a lower price. Naturally, animal disease has effects on the human capital in particular from zoonotic and food-borne diseases. This reduces livestock keeper's productivity and implies medical treatment costs and is represented in the bottom left corner (ILRI 2002a, pp. 51-53).

The right part of figure 18 concerns disease risks. Even if animal disease does not occur, the threat of eventual animal health problems has already an impact.

Typically, the poor are to a much higher extent exposed to risks. This is first due to the geographical area which they inhabit. Because of the special climate and agro-ecological nature of developing countries, parasitic infections and infestations are widespread. Secondly, delivery of veterinary services is weak and only little funding is channelled towards disease control and veterinary service delivery. The third reason for increased exposure to animal disease risk is the small market for animal health inputs in developing countries, such as vaccines and pharmaceuticals. Thus, their availability is limited. Due to these risks, the poor are obviously confronted with higher production costs to prevent diseases. Furthermore, livestock keepers refuse to invest large amounts of money into cross-bred or other exotic high-productivity breeds because of their higher susceptibility to animal disease. This is often referred to as the lost potential, also depicted in figure 18 (ILRI 2002a, pp. 55-56).

As discussed earlier, livestock fulfil various roles for the household's needs which were summarized in the Sustainable Livelihood Framework (SLF) (Randolph et al. 2007, pp.

2789-2790). In order to understand the complex impacts animal disease can have on the livelihoods of the poor the SLF can give a very structured overview (figure 19).

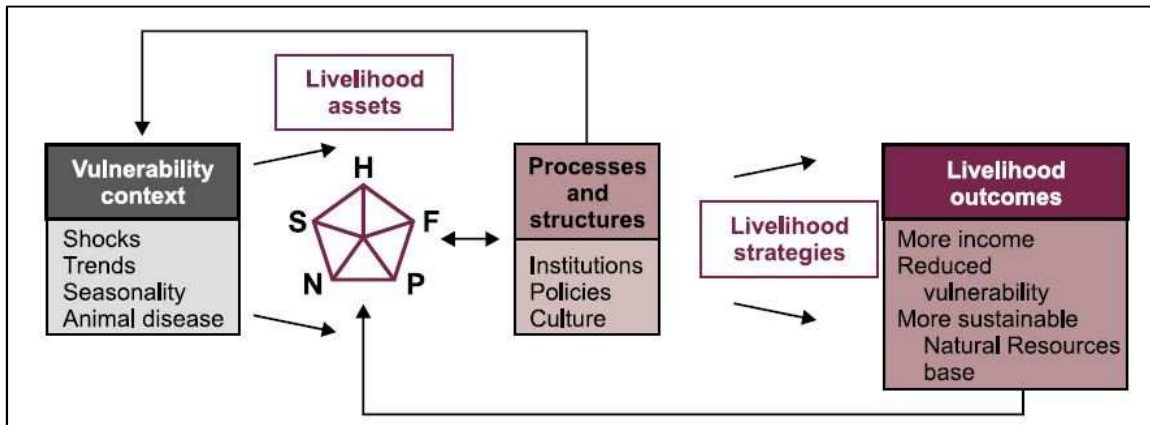


Figure 19: Sustainable Livelihood Framework and animal disease
Source: ILRI 2002a, p. 57

Households are threatened by a vulnerability context made up of various types of risks. In this framework it particularly relates to animal disease. Within this framework the vulnerability affects each of the capital assets. Financial capital may be reduced when mortality of livestock or low productivity results in less milk yield and thus lower cash income. Additionally, production costs can be raised when veterinary treatment has to be purchased. Human capital is affected when zoonotic or food-borne diseases lead to human health problems thus affecting the labour productivity or ability to work. In traditional livestock systems the wealth and prestige of a livestock keeper is determined by the herd size. Consequently, smaller herd size due to death of animals results in less prestige and thus affects social capital. In mixed crop-livestock system livestock is essential for manure leading to higher soil fertility. Is sufficient manure not available, is it likely to bring about a decline in natural capital. Finally, physical capital is affected when the herd size is reduced resulting in less availability of draught power for cultivation or traction capacity for transport of water e.g. Based on these affected capital assets, livestock keepers opt for a certain livelihood strategy which is influenced by processes and structures as well as the institutional, political and cultural environment. For this animal disease framework, the structures and processes relate to the delivery of animal health services (ILRI 2002a, pp. 56-58). To conclude, animal disease reduces the livelihood asset base of the poor livestock keeping households. The existing structures and processes are not favourable to respond affectively to risks faced. This reflects the negative effects of animal disease on escaping poverty (ILRI 2002a, p. 58).

Generally, to exploit the untapped potential arising from the “livestock revolution”, the delivery of adequate livestock services to the poor is very critical (Ahuja/Redmond 2004, p. 249). One very imperative component of livestock services is the delivery of animal health services (ILRI 2002a, p. 58). Nowadays, the general failure of delivering animal health services to poor livestock keepers is widely recognised. For instance, animal health services in Ethiopia reach only a mere 10% of all livestock keepers and in Zimbabwe 80% of backyard poultry keepers do not have access to veterinary services. This has wide impli-

cations on vulnerability through animal disease and prompts effects on livelihood assets as explained above (ILRI 2002a, p. 58).

Looking back to the era of colonialism in Africa, livestock disease control was commonly practised and veterinary and extension services adequately provided. Even in times of post-independence, public support to animal health care continued (Scoones/Wolmer 2006, pp. 17-18). The first initiatives for questioning the bureaucratic state-led and state-funded veterinary services came from International Financial Institutions as the World Bank in the beginning of 1980s. By that time, the efforts were strengthened to reduce the public sector and to favour privatization of public services integrated in the Structural Adjustment Programs (SAPs). The period of SAP was largely detrimental to governmental service delivery bringing about a decline in quality of animal health care services and an outbreak of diseases (Scoones/Wolmer 2006, pp. 18-19). Declined interest and aid flows of donors in the livestock sector over the past decades have worsened the situation (Scoones/Wolmer 2006, p. 17).

In the course of failing liberalisation of animal health care services, alternatives had to be sought (Mugunieri et al. 2004, p. 524). Consequently, NGOs embarked on programs targeting community participation in the late 1980s and the delivery of veterinary services was incorporated in this notion (Catley et al. 2005, p. 97). Through community participation in design and delivery of those services it was ensured that indigenous knowledge was understood and the needs of the community addressed. Furthermore, empowerment of people residing in local communities was achieved (Mugunieri et al. 2004, p. 524). These new approaches to animal health care which were mainly implemented in Eastern Africa manifested in the training of Communal Animal Health Workers (CAHW) as one possible delivery model. Their primary objective is to supplement the existing animal health delivery system, particularly in very remote and rural areas which were mostly undersupplied with veterinary care. Reasons for undersupply are privatisation and governmental restructuring of animal health services in the course of the continuous liberation efforts. The number of governmental veterinarians shrunk and private veterinarians were not willing to offer services in remote areas due to very high transaction costs which left these areas suffering from animal disease (Catley et al. 2005, pp. 96-97).

CAHW are trained for 10-14 days while the community is involved in selecting the appropriate candidate (Catley et al. 2005, p. 97). However, the support of CAHW is not always appreciated. Professional veterinarians see CAHW with much scepticism and question the effectiveness and quality of their services due to little training and sometimes illiteracy. This frequently results in poor cooperation by professional veterinarians and absence of institutional and legal recognition at the national but also international level (OIE, WHO) which poses a major burden to CAHW's performance (Mugunieri et al. 2004, pp. 524-525).

A study of CAHWs performance in Kenya showed that doubts about their effectiveness and quality are totally unfounded. A comparison of services provided by CAHW and professional veterinarians indicated no significant difference in the productivity indices of livestock between these two. Furthermore, CAHW are more accessible for livestock keepers in terms of mean distance and also less expensive. A further interesting feature of CAHW is spillover effects in the sense that CAHW may disseminate their knowledge to livestock keepers and a participatory learning cycle is initiated (Mugunieri et al. 2004, pp. 531-532). In a nutshell, CAHW are an important alternative for the delivery of animal health services particularly in remote areas. Thus, institutional and legal burdens should be overcome to

enable them to contribute to improved animal health which is very critical for poor livestock keepers.

3.3 Tick-borne disease control through livestock dips

In the animal disease categorisation in chapter 3.2, tick-borne diseases (TBD) belong to the endemic diseases (ILRI 2002a, p. 50). TBD comprise a number of different diseases. The most known are surely East Coast Fever (ECF) and heartwater. ECF is a major threat in East, Central and Southern Africa, while heartwater is the most important animal disease in Southern Africa. Other rather unknown TBD are anaplasmosis, babesiosis, dermatophilosis and tick infestation which occur in different livestock systems and geographical regions (ILRI 2002a, pp. 74-76).

In its large study on research opportunities in the animal health sector the ILRI classified animal diseases according to a complex set of different indicators. Diseases were ranked based on their degree of impact they have on livestock keepers. The global ranking had a range from A (high impact) to F (low impact). There, heartwater was positioned in group C, ECF ranked in D and tick infestation in F (ILRI 2002a, pp. 68-70). Despite the rather low ranking on the global level, ECF for instance, scores highest in terms of impact on livestock keepers in the category Eastern, Central and Southern Africa (ILRI 2002a, p. 71).

Several regional and local case studies show that TBD poses a major constraint to livestock keeping households through raising mortality and declining productivity for instance (Cook 1991, Okello-Onen et al. 2003, Moyo/Masika 2009). Furthermore, ticks do not only transmit dangerous diseases as ECF, they also cause tick worry, weakness of the animal, blood loss, damage to the skins, screw worm infection or bacterial infections (Moyo/Masika 2009, p. 518).

In order to prevent and control TBD several methods can be applied. Over the last 100 years tick control was mainly practised through the use of acaricides in livestock dips. Livestock dips are a chemical treatment into which the livestock and domestic animals are regularly dunked (Moyo/Masika 2009, p. 518). Next to dipping, livestock keepers can also spray acaricide, remove ticks manually or allow their livestock to graze rotationally (Neselle 2010, p. 3). Furthermore, chickens are very appropriate animals which remove ticks from cattle. In addition, old motor oil, household disinfectant or plants have also been used to control TBD in one case-study (Moyo/Masika 2009, p. 521).

In most of the cases however, livestock keepers bring their animals to livestock dip facilities. Usually, farmers have to pay for dipping their livestock which apparently is not a major burden as a study carried out in Zimbabwe suggests. In this study only 3% of the sample population indicated that they would stop bringing any of their animals to the dip in case a small amount would be charged (Cook 1991, p. 163). This observation was also shared by Ahuja/Redmond. The researchers found out that the demand for animal health services is not subject to income or wealth groups. Instead they stated that price elasticity is very low and does not vary across income groups (Ahuja/Redmond 2004, p. 256). In some cases, livestock keepers are fined if they fail to dip their animals. This occurs when dipping is according to by-laws compulsory (Cook 1991, p. 161).

Evidence from fieldwork in Uganda suggests that dipping is a very effective method for controlling TBD. Cattle were subdivided into three groups, whereby animals of group one were dipped twice a week, group two once a month and group three was untreated. The

results are remarkable. Group one animals did not only have a much lower number of ticks, their milk off-take also increased by 21%. Furthermore, their duration of lactation was longer and the monthly weight gain of calves was about 40% higher than of calves in group two and three (Okello-Onen et al. 2003, pp. 241-243).

When dips are such an effective method for controlling tick-borne diseases, why do TBD still pose such a problem? Of course, dipping is limited by a number of constraints. Firstly, ticks can develop a resistance to a certain kind of acaricide over time. Thus, dipping would fail to control TBD. Secondly, there are increasing costs for chemicals and maintenance of the dips which, depending on the management form, might not be beard, so that dips might have to be shut down (Cook 1991, p. 164). Thirdly, as occurred in the case of a dip in South Africa, farmers had to complement dipping with their own treatments due to ineffectiveness. The reasons for this was incorrect dilution (incorrect mixture of acaricide), since the manager of the dip was simply selected by the village, but had no qualifications and was illiterate. This is a fact which presumably often poses major challenges to the sustainability of dip services (Moyo/Masika 2009, p. 520). Fourthly, sometimes governments are reluctant to allow the use of acaricide, because it may result in contamination of environment and food with toxic residues (Okello-Onen et al. 1998, p. 242).

3.4 Decentralisation – blessing or curse?

Decentralisation policies have already been implemented since 40 years in developing countries. However, this concept has gained increasing momentum in the 1990s, when it became a buzzword in development cooperation (Nijenhuis 2006, p. 111). But decentralisation is a very complex issue, including several dimensions and differing in extent and form across countries (Smoke 2003, p. 8).

In the report for the World Bank, Litvack and Seddon define decentralisation as follows: “Decentralisation is the transfer of authority and responsibility for public functions from the central government to subordinate or quasi-independent government organisations or the private sector.” (World Bank 2002, p. 11).

This definition already acknowledges the four types of decentralisation which can be discerned: political, fiscal, administrative and economic respectively market. All of them have different characteristics and policy implications which carefully have to be taken into account when formulating decentralisation policies. However, these forms are sometimes difficult to differentiate and may overlap considerably (World Bank 2002, p. 11).

The first type (political decentralisation) describes a shift in power in public decision-making to citizens and their elected representatives. Political decentralisation attempts to increase the influence of those groups in the formulation and implementation of policies that affect their needs. This way increased democratisation can be attained and the gap between local politicians and citizens may be narrowed. Usually, this results in the establishment of municipalities with an elected mayor and an elected municipal council. Their jurisdiction is normally confined to a certain territorial unit. The second form concerns fiscal decentralisation. This occurs when sub-national units gain fiscal autonomy and fiscal responsibility. This entitles them to make independent decisions in terms of budget and expenditure planning according to identified priorities and preferences. Levying taxes or charging user fees are options to increase revenues for investments for example. Thirdly, administrative decentralisation indicates the shift of authority, responsibility and financial resources needed for the provision of services within the public sector (Nijenhuis 2006, p.

111). More importantly, it intends to transfer the responsibility for planning, managing and financing of certain public functions to sub-national units (World Bank 2001, p. 12). For instance, sub-national units are responsible for recruiting or firing their staff, but also have the autonomy to re-organise or re-structure the local governments according to their preferences (UNCDF 2001, p. 4). Lastly, Litvack and Seddon identified another type of decentralisation: the economic or market decentralisation. This may occur when public functions are shifted to businesses, community groups, cooperatives, private voluntary associations or NGOs. From the governments' point of view, this is the most complete form of decentralisation (World Bank 2002, p. 13).

A possibility to measure the extent of decentralization in a specific country is to calculate the share of sub-national expenditures as a proportion of total government expenditures (Nijenhuis 2006, p. 113). However, it is criticized that this definition ignores to consider the level of autonomy or the degree of accountability in any given sub-national government which are vital aspects of decentralization (Smoke 2003, p. 8).

In the growing body of literature on decentralisation a wide array of rationales and goals are presented. It is argued that local government units are somewhat closer to the people than the central government officials. Therefore, local governments are more responsive to the needs of the poor and can deliver services more adequately (Crook 2003, p. 77). Any form of local government is more knowledgeable about the wishes of the poor and thus has an information advantage. It would be very costly for the central government to gain the same knowledge about local environments (World Bank 2002, pp. 103-104). Another motivation for decentralisation policies is to simplify and streamline bureaucratic procedures. This in turn could bring about a reduction in costs for the delivery of services (World Bank 2002, p. 14). A further important aspect is political participation and accountability. Specific forms which guarantee participation in decision-making are certainly elections, but also village assemblies or any other kind of gatherings (World Bank 2002, pp. 14-15). This shall also lead to increased accountability, so that local politicians have to explain and to justify their actions (World Bank 2002, pp. 106-107). It is further assumed that when people are involved in decision-making about actions which directly target their needs, the readiness to pay taxes, user fees etc. will increase (World Bank 2002, p. 17). A political motivation for decentralisation is consolidation and maintenance of power of the ruling party. By establishing local subsidiaries of central governments, the ruling party can enhance its influence in the remote areas of the country (Smoke 2003, p. 12).

Notwithstanding the potential benefits and advantages of a decentralised country, decentralisation should not be seen as a panacea with which every problem will simply disappear. As aforementioned, decentralisation is very complex and is thus very difficult to implement and obviously contains a number of disadvantages and challenges (Smoke 2003, p. 8). A major problem is weak administrative and technical capacity at local level. There is an urgent need for training and capacity-building of sub-national employees in terms of a variety of aspects as taxation, service delivery or budget planning for instance (World Bank 2002, pp. 15-16). Naturally, when functions are decentralised to sub-national government units the central government loses control over financial resources. Since this tax and expenditure base of the central government is reduced, macroeconomic stability may be disrupted, when sub-national governments accumulate enormous debts (World Bank 2002, p. 99). This is particularly true since sub-national governments lack adequate

financial resources to properly deliver services to the poor or to employ qualified people for budget planning for instance (World Bank 2002, p. 105).

A glance into Africa's decentralisation endeavours shows diversity among African countries in terms of progressive policies towards decentralisation. A group with progressive policies towards decentralisation encompasses Ivory Coast, Mali, Mauritius, Nigeria, Senegal, Sierra Leone, Tanzania, and Uganda. The countries Botswana, Mozambique, and Namibia belong to the classification of average progressiveness, while Cameroon, Ghana, Kenya, Malawi, and Zambia have the weakest form of decentralisation (Nijenhuis 2006, p. 119). Whatever the progressiveness of decentralisation in African countries, Crook's review of decentralisation policies in sub-Saharan countries concerning the impact on poverty suggests that only little has been achieved (Crook 2003, p. 84). He sees the main reason for this in the relationships between central and local government and their mutual pursuit of the political goals of decentralisation reforms. Crook found out that this relationship was not marked by joint and committed efforts to poverty reduction which would have been necessary. Instead, the central and local public servants consolidated an alliance based on availability of patronage opportunities. Thus, local government officials remained beyond control mechanisms and the absence of accountability opened doors to widespread corruptive practises. In none of the examined African countries, decentralisation posed a real challenge to local elites, who are often resistant or uninterested in the development of pro-poor policies (Crook 2003, pp. 85-87)

3.5 Community-managed service delivery

At first it should be mentioned that community-managed service delivery often occurs in sectors as water, health or sanitation. Thus, ideas from these fields are borrowed and generalised.

Community-managed service delivery has evolved as a major tool in development programs supported by national governments, large international institutions and local NGOs. This concept is an important component of decentralisation, good governance and poverty reduction strategies and is based on neo-liberal notions of reduced state involvement (Desai 2008, p. 115). The Yaounde declaration of 2005 was a vital cornerstone within the promotion of community-led initiatives. Within this declaration it was acknowledged that "participation of communities in the design and implementation of development projects were emphasized as the absolute prerequisites for sustainable development in Africa." (Dorsner 2007, pp. 413-414)

However, concepts and buzzwords as community, community development, community management and community participation are somewhat unclear and overlapping, so that this chapter should start with a clear separation and definition (Doe/Khan 2004, p. 363).

According to Doe/Khan a community can be defined as "a place in which people live (such as a village or city), or as a population group with similar characteristics (such as rural villagers or older people), or as a concern people share in common (such as religious freedom, status of women)." (Doe/Khan 2004, pp. 361-362). Community development in turn can be achieved through community-led projects or programs. Based on a United Nations (UN) definition of 1955, community development "is a process designed to create

conditions of economic and social progress for the whole community with its active participation.” (Doe/Khan 2004, p. 363)

Harvey/Reed present an appropriate explanation for community participation and define it as “a consultative empowerment process designed to establish communities as effective decision-making entities” (Harvey/Reed 2006, p. 367). Thus, community participation mobilises a community to become involved in information sharing, consultation, decision-making, planning and implementing of a certain development project (Harvey/Reed 2006, pp. 368-369). In community management on the other hand, communities not only participate, but have also full responsibility, authority, and control over a certain community project including operation and maintenance (O & M) (Harvey/Reed 2006, p. 368). Furthermore, the management is carried out by democratically elected representatives of the community (Doe/Khan 2004, p. 362). The underlying ideas and principles of community management are that communities should play a major part in the development of the particular service delivery and preferably should also own the system and have responsibility for its O & M (Harvey/Reed 2006, p. 365). Often a community committee is founded which is in charge of management-related issues (Harvey/Reed 2006, p. 369).

When comparing these two approaches, it becomes evident that community management is a specific form of community participation (Harvey/Reed 2006, p. 368). For instance, community participation could result in the decision of the community or of community members not to manage the system themselves. In this case community participation takes place, but community management is refused. Thus, community participation does not automatically lead to effective community management, but community participation is a prerequisite for the sustainability of services (Harvey/Reed 2006, p. 368).

The concept of community management gained widespread acceptance and popularity among NGOs, international institutions and governments and was extensively promoted since the 1980s. But what were the actual drivers behind the promotion of this approach? Firstly, the delivery of services to communities was formerly executed by central governments or sub-national government units in a top-down manner (Doe/Khan 2004, p. 360). The efficiency in delivering those services, however, was very poor resulting in very low sustainability of service delivery. The lack of capacity among public servants and absence of general commitment were prevailing constraints. Thus, community-led approaches were very welcoming ideas for the governments which were already engaged in decentralisation policies (Harvey/Reed 2006, pp. 368-369). Secondly, community management was seen as an approach for poverty reduction and was an integral part of PRSP. Furthermore, it was argued that people have the right to participate in decision-making which affect their livelihood in one way or another. Thus, it should be ensured that a sense of ownership over projects is given to communities which lead to empowerment and self-reliance. Fourthly, the concepts of accountability and transparency were widely fostered by the international donor community and it was envisaged that community management was an ideal approach to promote these concepts (Desai 2008, p. 115).

Notwithstanding the extensive adoption of community management, the implementation is subject to various limitations. As already mentioned, community management is a very complex and multifaceted approach which is very difficult to attain, since the success of these projects depend on conditions and variables at community level (Dorsner 2007, p. 414). And communities are often very heterogeneous and are marked by a complex set of different interests, livelihoods, social as well as power structures (Botes/van Rensburg 2000, pp. 47-48). Consequently, the degree with which participation in community man-

agement is pursued depends on these factors. For instance, power relations in communities are a central issue. In case community leaders or other economically and socially powerful people, who have greater financial resources, better education or possess higher self-confidence, participate in community management, they might pursue their own vested interests (Botes/van Rensburg 2000, pp. 45-46). The views and opinions of these people may also not reflect the views of the whole community, which would then lead to a selective participation (Desai 2008, pp. 116-117).

Moreover, the issue of trust is very essential for successful community management. Distrust often arises, when powerful people take the lead and disregard the other community members. Moreover, embezzlement or corruption are activities which cause mistrust in a certain community. Members of the community may then lose willingness and motivation to be part of a community committee for instance and withdraw support (Harvey/Reed 2006, p. 370).

Another problem concerns political and religious differentiation in a community. In one particular case-study, a community was divided into two political parties. One of these embarked on managing the community project such that the other community group did not want to join. Similar problems may occur in countries where religious heterogeneity prevails (Dorsner 2007, p. 423). Another limitation of community management refers to the voluntary nature. Thus, there may be a lack of incentive to participate in management or to sustain this participation (Harvey/Reed 2006, p. 370). As evidence from one study suggests, members of the community were not willing to take part in management unless benefits would accrue to them (Dorsner 2007, p. 415). Moreover, it has to be kept in mind that the level of education in a community is normally very low, often accompanied by illiteracy and cultural or traditional barriers. These factors may slow down, hinder or even result in mismanagement of a certain community-managed project (Dorsner 2007, p. 414).

Despite of the various challenges and limitations, there are aspects which favour a successful completion of a community-managed project. First and foremost, dissemination of information is absolutely essential. This enables the community to make informed decisions and act upon them (Harvey/Reed 2006, p. 368). This can be guaranteed by holding regular meetings about the community management project. This can act as a platform for information sharing and for exchanging ideas and a lively discussion culture may thus be created (Doe/Khan 2004, pp. 367-368). As Botes/van Rensburg put it, such group discussions are vital to listen to community members, especially the most vulnerable or most marginalised groups (Botes/van Rensburg 2000, p. 53). Research conducted by Harvey/Reed show that in each of the study countries community management was only sustainable, where it was accompanied by institutional support, particularly by the government. This support can occur in components as motivation and encouragement, capacity-building or technical assistance (Harvey/Reed 2006, pp. 372-373). Furthermore, it is assumed that successful community management would easiest take place in a very homogenous and small community (Dorsner 2007, p. 422).

4. Methodology

This chapter will deal with all methodological aspects of the research. Presented will be the research objective, the research question and sub-questions, the conceptual model and the operationalisation. Subsequently, the selected research methods will be explained and justified also considering the emerging challenges and limitations which are part of the last section of this chapter.

Before starting with the research objective I want to point out that this research assignment was determined by SNV Lake Zone Portfolio in Mwanza. The research was geared to provide practical relevance for several stakeholders. The fact that I disposed of almost no information regarding the research topic prior to departure to Tanzania aggravated a proper preparation in terms of literature review, possible theoretical approaches, research methods and the like. The fact that this research topic is rather unusual and very specific made it difficult to underscore it with an appropriate theoretical idea which is certainly a weakness of this thesis. However, after the major part of this research was completed, SNV gave me more autonomy to decide, so that I conducted a survey which delivers some theoretical ideas.

4.1 Research objective

In March 2009 SNV Lake Zone Portfolio in Mwanza teamed up with Local Capacity Builders (LCB) and carried out a situation analysis in combination with a Participatory Action Research approach in order to deepen their understanding of the livestock sector in Mara Region. In terms of constraints the livestock sector faces, SNV found out that the occurrence of animal diseases is a major threat which is worsened by weak veterinary care and poor condition of livestock dips. In Mara Region, out of the 126 dips in the region solely 24% are genuinely working. The Livestock Infrastructure Mapping Pilot in Musoma District in 2009, executed by SNV, IBDI (my local host organisation) and the development department of the Diocese of the Anglican Church Tanzania (ACT) in Mara Region, confirmed this observation and reinforced the need to find out more about the livestock dips. As a follow-up of these activities, SNV formulated several actions plans. One of them was to shed a light on the low functionality of livestock dips, in particular on the management side. Thus, my task was to tie on these SNV activities and to pursue one of their identified preferences for further research.

Hence, this research was carried out in Mara Region and set out to address the poor condition of livestock dips in the region. The research objective can be defined as follows:

The objective of this research is to shed a light on the underlying reasons for non-functionality of dips by identifying the dip management models in operation and eventually recommending a model which can sustainably deliver dip services to the community.

It is important to note that for this research I was part of a research team. This team consisted of Dr. Moses Neselle as the lead consultant, Emmanuel Musimo, who works for my local host organisation IBDI in Musoma, and me. While Emmanuel and I formed one team and worked together in Mara Region, Dr. Neselle would have the same assignment but executed it in Manyara and Arusha Regions. At a subsequent date, Emmanuel and I trav-

elled to Dodoma and Singida Regions in the centre of Tanzania, where the preliminary findings were enriched with new aspects. Occasionally, the research team would come together for meetings at the SNV headquarter in Mwanza and exchange the findings.

The research was split up into two phases (see also Annex I for the research schedule). In phase one, an inventory of the various dip management models was carried out which should also identify the major distinctions between them. Furthermore, we were invited to look at positive and negative factors of the models which may affect the sustainability of dips in one way or the other. In this research stage we were all bound to the clear ideas and expectations of SNV, so that there was no scope to broaden the research. Then, the results of phase one were reported to different stakeholders, most importantly the reference group. This group consisted of knowledgeable people who were professionally engaged in the livestock sector. It was their task to give feedback to the findings of the research team and to identify relevant gaps for research phase two. For this phase, I proposed to carry out a survey which firstly, could underscore or maybe even refuse our findings and secondly, broaden the research focus for the Master Thesis. This was agreed with SNV, so that I was allowed to do my own research in phase two. However, it needs to be beard in mind that, as the Terms of Reference (TOR) of this study states, the research is geared to a practical solution which shall lead to the formulation and implementation of action plans in collaboration with government officials from the different levels to revive the livestock dips. The basic assumption of the overall project is that if livestock dips were revived with the proper management model, livestock keepers would use these services and dip their animals regularly. Consequently, TBD would be better controlled and animal health could improve.

4.2 Research question and sub-questions

The research question for this study is simply derivable form the main research objective. The formulation is as follows:

Which livestock dip management models can be discerned and which model contributes best to attain the goal of delivering sustainable dip services to livestock keepers?

Based on this main research question a number of research sub-questions were formulated:

- a) *What are the major reasons for the non-functionality of livestock dips?*
- b) *Which livestock keepers' needs have to be taken into account when designing a recommendation for a certain dip management model?*
- c) *To what extent do livestock keepers perceive dipping as an effective method for controlling TBD?*
- d) *To what extent are livestock keepers engaged in marketing of livestock or livestock products as a viable livelihood activity?*

4.3 Conceptual model

The conceptual model I created shall visualise the relationships between the different concepts and increase the understanding of the subject matter. The model shall mirror the entire research process, whereas the constraints facing the sustainability of the livestock dip management often resulting in its failure occur currently. The recommendations for a livestock management model, associated with a revival of dips, and the livelihood impact are prospective achievements.

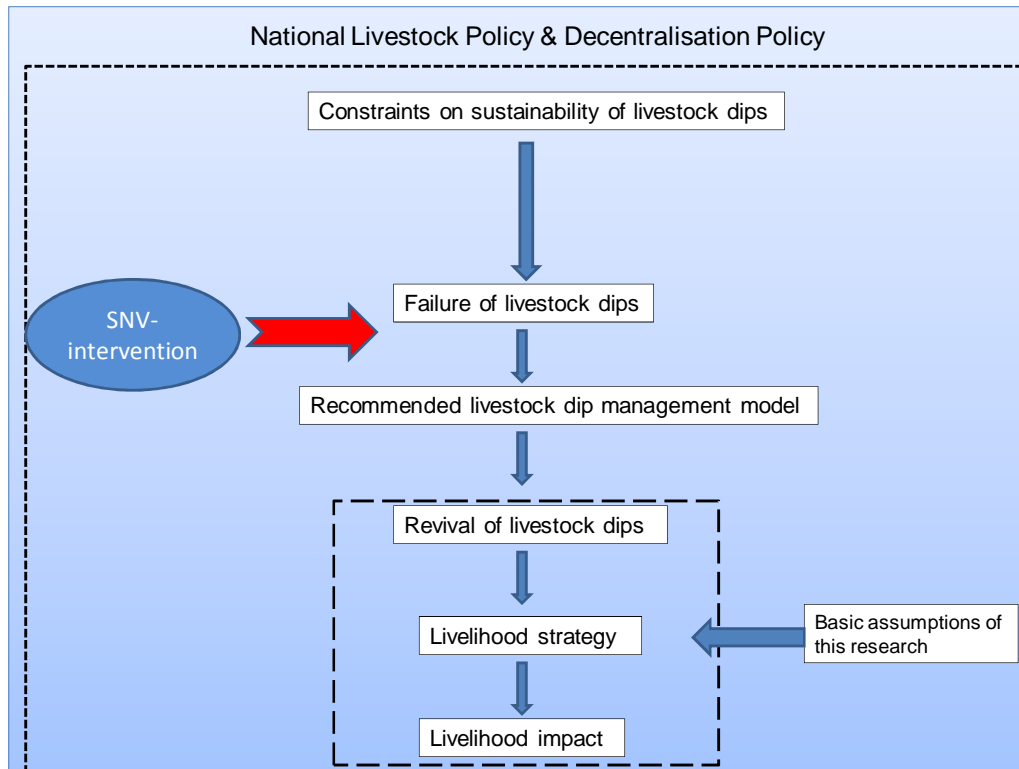


Figure 20: Conceptual model

Source: Own illustration

Depicted in this model are the National Livestock Policy and the decentralisation policy (particularly the LGRP) which represent the institutional environment in which the local context is embedded. For the local context it is obvious that failure of livestock dips is a central problem for livestock keeping households. The reasons for the non-functionality are manifold and summarised in the box "Constraints on sustainability of livestock dips" shown in the top of the local context. The intervention SNV embarked on is illustrated by the red arrow pointing to "failure of livestock dips".

The assumptions portrayed in the bottom part of the model are not part of this research, but are absolutely essential. The ultimate aim of this study is to revive the dips, so that TBD can be controlled and animal health can improve. Possessing of healthier animals or a larger herd enables households to revise their livelihood strategy which will eventually have an impact on the livelihood. In order to measure these effects on livelihoods over time, a longitudinal study needs to be conducted which was surely impossible during the comparably short stay in Tanzania.

4.4 Operationalisation

In this chapter the variables and concepts for this research will be defined so that it can be measured and expressed in quantitative or qualitative terms. However, most aspects concern a very practical nature thus making it difficult to formulate a proper theoretical background.

The central concept of this research is the term livestock dip management model. In the course of the implementation of decentralisation policies the management of livestock dips has been delegated to the communities. The communities were told to take over responsibility and to manage the dip themselves without giving them the necessary guidelines and instructions on how to run them. Therefore, communities chose different ways and approaches of managing the dip which manifested in different typologies: the livestock dip management models. Drawing on explanation of chapter 3.5 (community-based service delivery), management in this context can be defined as having “full responsibility, authority, and control over a certain community project including operation and maintenance.” (Harvey/Reed 2006, p. 368) Each of the models has its own characteristics and in order to make a distinction between them I used five criteria which encompassed the major challenges and opportunities of livestock dip management and with which the models were assessed and scored: composition of the management, legal framework, financial management, relationships, and transparency and accountability. These criteria were further broken down into a number of factors (see also Annex III – Interview guideline):

- a) Composition: How is the management formed? What are the requirements for becoming a member? Do regular elections take place? Do management have to be approved? Does the village government have the authority to remove member or dissolve the whole management?
- b) Legal framework: Are by-laws formulated and enforced? Who is in charge of enforcing them? Is the management registered? Who actually owns the dip?
- c) Financial management: Which actor sets prices and which amount is charged? Whose property is the collected revenues? What are the revenues spent on?
- d) Relationships: What is the level of trust between the stakeholders? How can the relationships between the stakeholders be characterised? Is a close collaboration taking place?
- e) Transparency and accountability: Is record keeping of dipping days done? Are financial reports provided to government authorities? Are these reports also presented in village assemblies? Is the community informed about revenues and expenditures?

Other important variables of this research are the constraints which inhibit a sustainable operation of the livestock dips depicted as the beginning of the causal chain in the conceptual model. The constraints mentioned here will be examined based on the qualitative and quantitative research results in chapter 5.2. These constraints can be divided into four categories:

- a) Institutional level: No enforcement of by-laws, lack of accountability and transparency, absence of professional support (WAEO, VAEO), social networks and trust
- b) Individual livestock keeper level: Traditional livestock keeping, lack of awareness of importance of dipping, unaffordable dipping prices

- c) Community-based constraints: Absence of participation in management, lack of capacity of dip operators
- d) National external constraints: Water scarcity, high prices of acaricide

After identifying and examining the different management models, a model will be recommended based on the five developed criteria and the community needs assessment. This has been developed by means of focus-group discussions with livestock keepers and the survey and will be presented in chapter 5.4.

For the close future it is envisaged that based on this research action plans will be formulated and implemented in a mutual agreement between government officials on different levels, whereas SNV and IBDI will play the facilitating role. The result of this process shall be the revival of dips which meet the needs of the community, so that livestock keepers are able to dip their animals regularly. According to the SLF developed by Carney (chapter 3.1, figure 15), livestock keepers face a reduced vulnerability context through improved animal health when dipping their animals which will enable them to revise their livelihood strategies. For instance, a household could opt for increased marketing of livestock or livestock products, because his animals deliver more milk or bring a better price due to better health status. This would mean an enhancement of the financial capital. In chapter five an emphasis will be laid on the opportunities and preconditions for increasing participation in marketing activities and enhancement of financial capital.

4.5 Data collection and methods

For this research I opted for a triangulation of research methods. In social science triangulation is defined “as the mixing of data or methods so that diverse viewpoints or standpoints cast a light upon a topic” (Olsen 2004, p. 3). Thus, I mixed qualitative interviews with key-informants and focus-group discussions with a survey in sample villages.

As explained in chapter 4.1, the research was carried out in two steps. In the first step, an inventory of the livestock dip management models should be carried out. In order to gain the necessary information on the models, to identify their characteristics and to understand the reasons for failure, a qualitative approach is certainly the most suitable. In Mara Region altogether 126 livestock dips can be identified. Due to limited time available for this research it was impossible for me to visit each dip. Thus, it was necessary to conduct semi-structured interviews with informants, who have a sufficient overview on the various models in operation. Therefore, we interviewed governmental employees who are in charge of the livestock sector in their particular administrative unit (see also Annex II for the list of interview partners). In 2009 my host organisation IBDI participated in the Livestock Infrastructure Mapping Pilot in Musoma District, whereby we could simply re-activate the established contacts with governmental employees. From them we received useful hints where interesting models or elements of models would be located.

Based on their hints we visited dips in certain villages to gain practical insights into the management models. In the villages we conducted semi-structured interviews with the Village Executive Officer (VEO) and the village chairman also in order to get permission for further steps. Then we interviewed the Ward Agricultural Extension Officer (WAEO) or the Village Agricultural Extension Officer (VAEO), who are usually most knowledgeable about the livestock dips. After these interviews were completed, we requested to form two

separate focus-groups for discussions: the dip management and livestock keepers. The livestock keepers were very important factors, because we wanted to deepen our understanding about their needs with regard to management models (transparency, elections e.g.) and also whether they do acknowledge the importance and effectiveness of dipping, provided the dip is working. In total we conducted eight interviews and seven focus-group discussions in Mara Region. One member of the reference group advised to visit dips in Singida and Dodoma Regions, where the management would do things differently. Therefore, we also carried out two interviews and two focus-group discussions in these regions. The research locations are depicted in the following two figures and the red points illustrate the spots where research was done.



Figure 21: Qualitative research locations in Dodoma and Singida Regions

Source: Own modification, based on EPSB 2004

After phase one was completed the results were presented to a reference group which was installed to guide the research process and to give advice on how to proceed. Since the focus of our previous research process was exclusively on qualitative methodology, I decided to carry out a household survey and to quantify our findings. Therefore, I used a questionnaire which encompassed a wide range of dip-related topics. The main categories of the survey were questions on livelihood activities of the particular household and issues concerning the marketing of livestock or livestock products. In addition, I wanted to deepen my understanding about the household's attitudes towards and opinions about dipping.



Figure 22: Qualitative research locations in Mara Region
Source: Own modification, based on Go2Africa 2010

This contained also questions regarding the evaluation of dipping and related issues as prices, by-laws and the like (see Annex V for complete questionnaire). In order to save costs and due to the time constraints in the remaining four weeks of the internship and challenges in terms of transport the survey was confined to Musoma District.

For the survey it was certainly very helpful that I could make use of information gathered during the Livestock Infrastructure Mapping Pilot in Musoma District. According to the findings of this pilot, there are 36 dips in Musoma District. Out of these 36 villages in which dips are situated a sample of four should be drawn, two in which dips were working and two where dips were not working. With help of the latest Housing and Population Census of 2002 it was possible to identify the population of all the 36 villages.

Initially, it was envisaged to draw two random samples – the first, to determine the four sample villages and the second, to select households in the particular village. The outcome of this first random sampling showed four very remote villages, which are extremely difficult to access without proper means of transport which we did not have. Therefore, I selected four different villages purposively, which were close to tarmac roads and thus easier to access. In addition, I deliberately ignored a representative selection of the different management models we might encounter in the villages, since it was first and foremost important to select accessible villages. The survey did not aim at differentiating between the models, but was set out to understand the community's needs concerning important aspects of dip management as transparency and participation regardless of the management form. The chosen villages are depicted in table two and in figure 23 on the next page. The map (figure 23) shows the result of the Livestock Infrastructure Mapping Pilot. Illustrated are the existing dips in the district and its status of operation. The villages with the red circle were selected for the survey. However, the dip in Kwibara village (depicted as Mugango ward in the figure) was at the time of conducting this survey not functioning which was not taken into account in the map.

Village	Inhabitants	Ward	Functionality	Management model
Chumwi	2,647	Nyamrandirira	Working	Group
Kwibara	3,474	Mugango	Working	Group
Bukabwa	2,791	Bukabwa	Not working	Group
Nyankanga	5,122	Nyankanga	Not working	Group

Table 2: Sample villages for livestock dip survey

Sources: Own illustration, based on ACT Mara et al. 2009, National Bureau of Statistics 2002

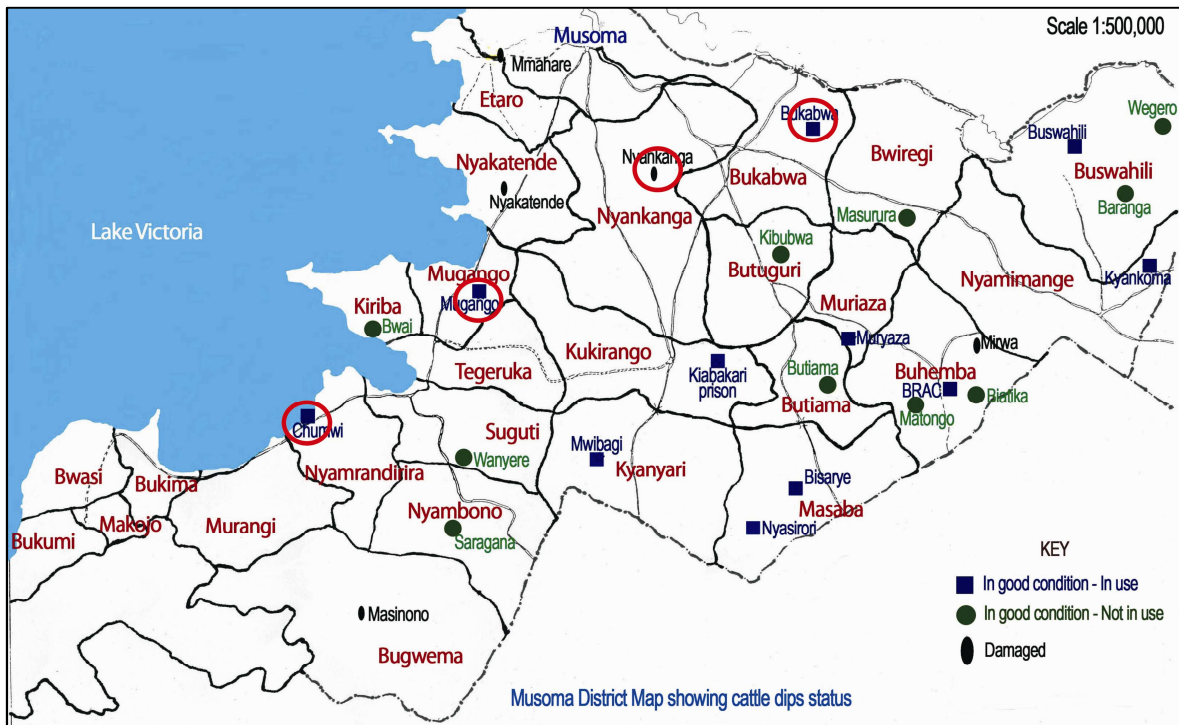


Figure 23: Livestock dip status in Musoma District and selected sample villages

Source: Own modification, based on ACT Mara et al. 2009, p. 14

As aforementioned, the survey should be targeted at household level. If a population register was available, I would have opted for executing a random sampling of households. Unfortunately, a population register is not available in any of those villages. In the four sample villages it was not even clear how many households the village comprised. Since this sampling strategy did not work out, I set out to implement a different plan. This plan contained a random starting point in each village from which we would count every n -th house, where we would question the household head. This entailed two main challenges: first, the number of households in the village was not known, so that the size of n could not be determined and secondly, the houses were, although in the same village, widely scattered, so that in some cases up to 10 km would have to be walked to get to another location where livestock keepers are concentrated. Due to these challenges I finally opted for the third and simplest plan which considered a purposive sample. Consequently, we asked the particular village government to provide us with a government official or a well-known livestock keeper, who is familiar with the environment and who can show us the livestock keepers' households to introduce us. Very fortunate for us, all village governments were very cooperative, so that the company of a central person was ensured. In

total we managed to complete precisely 200 questionnaires (see also table 3). Very remarkable is the fact the overall response rate amounts to 99.5%. This shows the degree of enthusiasm and eagerness with which village residents wanted to participate. Only in one case a livestock farmer refused to participate in the survey. The main reason for this is certainly that we were always backed by the village government and the district government from which we received a letter of introduction.

Villages	Questionnaires completed	Non-response	Response rate
Mugango	19	0	100%
Chumwi	54	0	100%
Bukabwa	67	1	98.5%
Nyankanga	60	0	100%
Total	200	1	99.5%

Table 3: Survey facts

Source: Own illustration, based on fieldwork in sample villages in Mara Region

4.6 Limitations and challenges

Research is, particularly in developing countries, always subject to certain limitations and challenges and it is important to be aware of that fact.

For this research the major challenge was surely to avoid bias. The three following examples shall illustrate the difficulties the research faced in terms of avoiding bias. Firstly, the selected villages in phase one for interviews and focus-group discussions were suggested by government officials I interviewed beforehand. Thus, I simply followed the direction they gave me without seeing behind the curtain and reflecting about why the interviewee sent us there. For instance, it could be that the respondent only selected very well functioning dips which would bias the results. Similarly, the fact that I chose 4 out of 36 villages for the survey randomly generates another difficulty concerning representativeness. Thirdly, the household survey is surely not representative. But with absence of an adequate sampling frame and the lack of sufficient time to conduct a sampling frame myself, no other sampling strategy then the purposive sampling was feasible.

During fieldwork I came across some more challenges which impeded rapid progress. The most obvious obstacle was certainly the issue of transport. Every day we had to rely on public transport, which is very time-consuming and exhausting at the same time. For instance, to Chumwi (approximately 40 km), travel time amounted to 2 hours on average, which is already quite long. However, occasionally day the Dalla Dalla needed almost four hours to get to the village. This was further aggravated by the rainy season which left some areas of villages inaccessible.

Of course, except for the interviews with government officials, all other conversations and discussions were held in Kiswahili. Luckily, my colleague Emmanuel is a very good translator and was able to bridge this language barrier. However, after some time I had the impression that it is always desirable to facilitate interviews and focus-group discussion oneself. In some cases for instance, we encountered focus-groups consisting of the VEO, village chairman, livestock keepers and dip operators, but actually we intended to talk to

them separately. Since I could not understand what was said it was impossible for me to intervene or resolve the problem beforehand.

Then, I had the impression that the issue of social networks play a major role in rural communities. I realized that relationships are very strong, so that when a village chairman was asked to mobilise livestock keepers for a focus-group discussion, his selection may be biased. In such cases it is possible that although almost the community might be dissatisfied with the delivered dip services, the village government might choose those livestock keepers who think positively about dipping services in order to deliberately give a wrong picture.

5. Research results

Chapter 5 will exclusively deal with the research results. It is divided into six sub-chapters. 5.1 will give an overview of the stakeholders involved in the issue of livestock dip management and the particular roles they play and interests they have. The subsequent section 5.2 will shed a light on the various reasons for the failure of dips. The inventory of dip management models will be presented in chapter 5.3. When designing a recommendation for a management model it is absolutely essential to consider the needs and wishes of the community which will be done in part 5.4, whereas chapter 5.5 deals with the actual recommendation of a model. As illustrated in the conceptual model, the assumption of this research is that improved condition of livestock dips will result in improved livelihoods. As an example for livelihood improvement, the preconditions and opportunities for improvement of the financial livelihood asset through livestock-based marketing are demonstrated in the last chapter (5.6).

5.1 Stakeholder analysis

In a project cycle management, a stakeholder analysis is usually carried out in the design phase. Stakeholders – people who have a stake or interest in a certain issue – are driven by their individual interests and goals, which often lead to competing claims and conflicts. A stakeholder analysis helps to identify the key actors in the system and the relationships between them. Generally, the stakeholder analysis disposes of a wide range of tools. For the purpose of this study an interest and influence matrix is chosen which is depicted in figure 24.

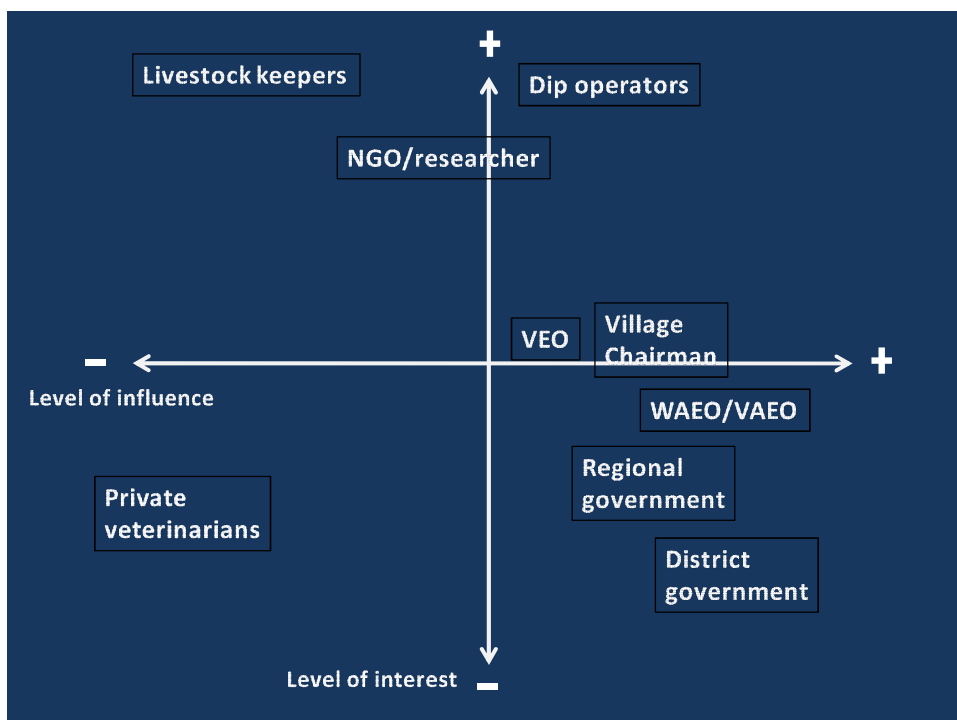


Figure 24: Interest and influence matrix for a functioning livestock dip

Source: Own illustration, based on fieldwork experience

Generally, in the context of livestock dips nine stakeholders can be discerned. The stakeholder who has the greatest interest in a well-functioning livestock dip is surely the livestock keeper. In case a dip is not operational they need to opt for other TBD control strategies which might be more expensive or less effective. However, as shown in the matrix, the livestock keepers are, together with private veterinarians, the stakeholder with the lowest level of influence. They are mostly marginalized and unable to participate in decision-making or in selection of dip management members for instance. More importantly, when no regular village assemblies are held, they do not have a platform for contributions or complaints. Another stakeholder which has an almost equal high level of interest in operative dips is the dip management. Since they are directly responsible for the management their level of influence is naturally much higher than the livestock keepers'. However, dip operators frequently lack capacity in terms of veterinary and business skills to run the dip properly and are dependent on institutional support. Therefore, their level of influence is confined.

The NGO and the researcher are positioned as the stakeholder with the third highest level of interest. It is their task to put forward solutions for the problem and to induce a positive change. On the other hand, their level of influence is solely average, because both can merely give recommendations and assist, but are not in a position to decide. In addition, it always needs to be questioned how sustainable such an intervention is.

On the government side one can distinguish between the Village Executive Officer (VEO), the village chairman, the Ward Agricultural Extension Officer (WAEO) or Village Agricultural Extension Officer (VAEO), the district government where normally the District Veterinary Officer (DVO) and District Agricultural and Livestock Development Officer (DALDO) are responsible for livestock dips and the Regional Livestock Advisor (RLA) in the regional government. From these government levels, the district government has, together with WAEO and VAEO, certainly the highest level of influence. This is because it comprises knowledgeable people (DVO and DALDO), has extensive authority and is closer to the people than a regional government official, who is responsible for a larger area of jurisdiction. However, fieldwork has shown that they lack commitment to really tackle the problem and are not even aware of the actual reasons for failures of dips. Instead, they find excuses as "we are not provided with the right working environment to go into the villages and to see what the problem is." (Respondent 4) Since district government officials do not know the exact problems on the ground, they can not take any action and maintain the status quo. Sometimes a lot of resources are used to build new dips, without first solving the problems with the large number of dips which are not functioning. Since these problems still prevail the new dips become dysfunctional soon after construction. Therefore, these stakeholders have, after the private veterinarians, the lowest level of interest.

On the lowest administrative level, the VEO and village chairman are the most powerful people, whereby the village chairman is slightly more powerful due to his function as respectful and elder person. Their level of interest is certainly higher than that of the district and regional government, because they recognise the problems on the grassroots-level. Another reason is that they might face pressure from the community when they do not address a problem on the ground. Since they do not possess either sufficient veterinary nor business skills their level of influence is limited.

Agricultural extension officers can be found at the Ward (WAEO) or Village (VAEO) level. Customarily, they possess expertise in both livestock and agriculture and provide assistance to farmers and livestock keepers and may also supervise the dip management. As we found out, village residents rarely encounter WAEO or VAEO in their residential area.

Thus, WAEO and VAEO have an above-average level of influence due to their expertise, but they rarely provide their support or have to cover an immensely large area. On the other hand, in one village we interviewed a WAEO who had a vested interest in a closed dip. He explained that instead of dipping the livestock keepers would buy spray or other products to control TBD. But we encountered this only in one particular case, whereby it should not be generalised. On the highest political level in this matrix the regional government can be found. Due to this higher level in hierarchy the particular person in charge of the livestock department has the necessary authority in decision-making processes. However, these officials have to oversee several districts and do not possess sufficient resources to resolve problems on the grass-roots level. That is the reason why their level of influence is lower than the district's or village's.

Last but not least, the private veterinarians may benefit from non-functioning livestock dips, because the community might request their service to treat ill animals. Livestock keepers may also pursue another method for controlling TBD and purchase spray from him. In addition, the private veterinarian is not in the right position to bring about change and has consequently only a low level of influence.

5.2 Reasons for failure of dips

Drawing on the categorisation of chapter 4.4 (operationalisation) the constraints for non-functioning dips are divided into four groups: institutional level constraints, individual livestock keeper constraints, community-based constraints, and national external constraints.

Institutional level	Individual level	Community-based	National external
No enforcement of by-laws	Traditional livestock keeping	Lack of capacity	Water scarcity & droughts
Absence of support by WAEO or VAEO	Lack of awareness of importance of dipping	Absence of community participation	High acaricide prices
Lack of transparency and accountability	Unaffordable dipping prices		
Mistrust & social networks			

Table 4: Categorisation of constraints for failure of dips

Source: Own illustration, based on fieldwork in Mara, Dodoma and Singida Regions

In terms of institutional constraints the absence of professional support by the WAEO or VAEO is a major drawback. The WAEO or VAEO are qualified government officials, who should provide the expert knowledge to the dip operators in terms of mixing acaricide and water for instance. However, their support rarely takes place. Some of them are simply inactive or they have to cover an immensely large area to ensure assistance in all locations. Due to retrenchment these services have been cut leading to a small number of professionals in the field. Exemplarily, this was reaffirmed by interviewee 1: "The problem is that there is no adequate staff in the field who supervises dipping. Also, there is no transport available for staff in order to get to remote areas or several places a day. More training needs to be done by the Ministry of Livestock to increase the number of qualified staff in the field." Moreover, a few of them are solely specialised on agriculture and not on livestock. An adequate example for this argumentation is the case of Bunda District. There, respondent 4 explained that he oversees solely 20 WAEOs and VAEOs in the

whole district. Out of them, 80% are specialised in agriculture and not livestock. The active private veterinarians frequently refuse to offer their services in the very remote and rural areas due to high transaction costs and general unattractiveness. Therefore, CAHW have been trained to supplement the private and governmental service providers (see also chapter 3.2 for further elaborations on CAHW). This problem was also confirmed by the survey results. Merely 46% of the respondents (n = 200) indicated to having received livestock extension advice during the past year. Out of these 92 who received this service, 77.4% have been supported by a WAEO. Remarkable is certainly that only 7.5% of the interviewees, who received a service were assisted by a VAEO. A VAEO, who is directly present in a certain village, would be very crucial, because he is able to visit every household. A WAEO on the other hand has to serve a whole ward and presumably does not have sufficient time and resources to assist all households which demand his service in his jurisdiction.

Provider	n	Percentage
WAEO	82	77,4%
VAEO	8	7,5%
Other governmental service provider	6	5,7%
NGO	5	4,7%
Large-scale farmer	5	4,7%
Total	106	100,0%

Note: Multiple choice possible

Table 5: Providers of livestock extension services

Source: Sample survey conducted in 4 sample-villages in Musoma District May 2010 (n = 200)

Chapter 3.5 of the thematic-theoretical framework confirms the importance of institutional support empirically. In their research results Harvey/Reed demonstrate that in each of their study countries, community management was only sustainable when accompanied by institutional support, particularly provided by the government (Harvey/Reed 2006, pp. 372-373).

The second institutional constraint concern the lack of transparency and accountability of the dip operators. In most of the villages we visited there was no transparency regarding revenues, expenditures or price changes for dipping. Neither the village or ward government is provided with regular financial reports nor have the dip operators to appear in village assemblies in order to disseminate information with regard to their financial situation and the dip status. However, dissemination of information about the community-managed project and regular meetings are absolutely essential, as explained in chapter 3.5. A negative example is surely the village Nyankanga, where the dip has been closed for 10 years. Interview partner 10 asserted: "The relationship between the village government and the dip operators deteriorated immensely. Due to that the village government has never seen any report or list on the dipping activities." This leaves villagers without knowledge about the status or situation of the dip and the dip management. In addition, they are not aware what their payments for dipping are spent on. In this context one livestock keepers stated: "We don't know where the money is going and we have the feeling to

make them (*the management*) rich. They keep all the money for themselves. And we don't want that. That's why we don't bring our animals to the dip anymore."

As already touched upon in the lines above, there are often no accountability mechanisms. Record keeping is mostly not done, reports on revenues and expenditures not formulated resulting in no control, no monitoring and no approval by government authorities. Instead, dip management is often autonomous and can act on its own. Of course, this opens doors for corruption and embezzlement. As the survey will show later, corrupt management in the case of Bukabwa was one reason why livestock keepers refused to bring their animals to the dip. The lack of transparency and accountability was also confirmed by interviewee 3, who explained that he as a district government official has never seen any financial reports. A problem also arises from the fact that the district is not active enough and therefore does not request those reports. A role model for enhanced accountability is Mkakatika; the VAEO is always present during dipping days and assists with the formulation of dipping reports which he hands over to the village government.

A further institutional constraint is the legal framework for which by-laws play an important role. In Tanzania it is possible to formulate and pass by-laws which ensure that dipping is compulsory. If livestock keepers fail to dip their animals, they will be fined. That way it shall be guaranteed that livestock keepers dip their animals regularly and that the dip management generates constant revenues. According to interviewee 1, laws regarding the obligation to dip are even formulated in the Local Government Act of 1982, the Animal Disease Act of 2003 and the Veterinary Act of 2003. He explained: "These are very important and very good laws, but nobody enforces them. In the Animal Disease Act it says here...An Inspector shall (a) in preventing the spread of disease quarantine, inoculate, spray, dip, wash or otherwise disinfect an animal or in the case of an animal infected or suspected of being infected with a notifiable disease deal with it in a manner as may be prescribed by the regulations for that disease; and (b) order the owner of such animal to bring the animal to such place as may be directed. But nobody cares." This problem resembles the difficulties at the village level. In most of the villages we visited by-laws were formulated by the village government and are in effect. Usually, the VEO is in charge of enforcing but they rarely do. Where by-laws are enforced, in case of Ilongero for instance, the dip management disposes of a list containing all livestock keepers in the village and the number of animals they keep. That way, they can make a comparison when villagers bring their animals to the dip and submit the results to the VEO who enforces the by-law. Enforced by-laws for dipping can thus act as an important driver for sustainable dips. The prevailing confusion of by-laws also becomes apparent in the results of the survey. One question tries to find out whether by-laws in the particular village are enforced. A look at the range of answers which were given in Chumwi as an example reflects the lack of clarity on this issue (figure 25 next page). A solution to clear up this confusion would be to organise dip-related village assemblies in which the community is informed about the by-laws and their purpose is explained.

Another important institutional aspect which is difficult to measure concerns the issue of mistrust. In some cases the relationship between the different stakeholders in the village is very bad as in Nata for instance. This results in withdrawn support of the village government in terms of enforcing by-laws, motivating livestock to dip or creating awareness of the importance, whereby livestock keepers lose willingness to dip. In some other sample villages we encountered a deteriorated relationship between livestock keepers and the dip

management, because the dip operators keep the money for themselves and villagers have the impression to make them rich. Naturally, under these circumstances livestock keepers were not willing to dip their animals, but chose an alternative for controlling TBD.

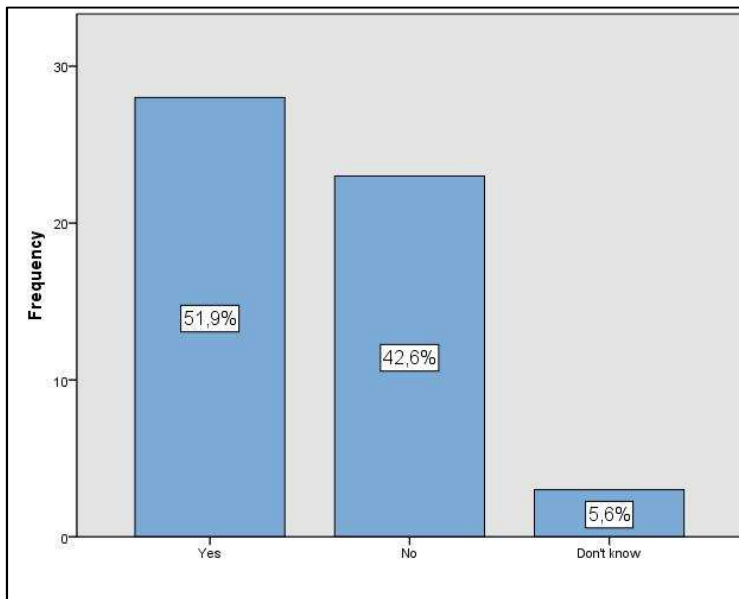


Figure 25: Enforcement of by-laws in Chumwi

Source: Sample survey conducted in 4 sample-villages in Musoma District May 2010 (n = 54)

Thus, a good relationship based on trust between village government, livestock keepers and dip management is very essential for a sustainable delivery of dipping services. A lot can be achieved when the three stakeholders find a platform for regular communication and dialogue, because this can help to set the record straight. Lack of transparency and accountability among the dip operators is frequently a trigger for mistrust between them, the livestock keepers and the village government. A requirement for trust between the three parties is close interaction in order to monitor the other party's performance. Of course, trust can not be established over night. It is a factor that needs to be developed over time. As described in chapter 3.5 communities are mostly heterogeneous, comprising different socio-cultural characteristics associated with different social networks which may play an important role. A community might consist of several social networks which are not overlapping but represent barriers. For instance, if one of these social networks is in charge of managing a livestock dip, the other social network might not trust it, because they are not part of their network and consequently refuse to dip their animals. This is also the case when power relations occur in a community, whereby economically and socially powerful people manage the dip and pursue their own vested interests as described in the thematic-theoretical framework (chapter 3.5).

The individual level constraints are divided into traditional livestock keeping, lack of awareness of the importance of dipping and unaffordable dipping prices. In the qualitative research process we found that many farmers keep their livestock traditionally. It means that they are not engaged in marketing activities, but keep their herd (particularly cattle) solely to enhance their social livelihood asset (social prestige). It was claimed that the health status of the animals would not be of any concern as long as the herd is large. Therefore, traditional livestock keepers would not be interested in dipping, because they

do not need healthy animals with higher productivity. In the survey I intended to verify this hypothesis and asked the respondents, whether they would participate in marketing of either live animals or livestock products. Astonishingly, 82% of the respondents are engaged in marketing which contradicts the findings from the qualitative research. Furthermore, only 5.1% of livestock keepers, who either do not sell live animals or livestock products indicated to keep livestock solely for enhancement of social livelihood asset. Thus, the argument that traditional livestock keeping is a reason for failures of dips should be taken with caution. More results about the market-orientation of livestock keepers will be presented in chapter 5.6.

Another individual reason, encountered in the interviews with key informants, is the alleged lack of awareness of the importance of dipping as an adequate measure for controlling TBD. This argument was stated by interview partner 3 and would imply that livestock keepers do not dip their animals, because they do not appreciate this service or do not recognise the benefits and effectiveness. However, the survey proved differently. I confronted the participants with the following statement: "Dipping is an effective method for controlling TBD" and invited them to specify on their level of agreement. The results are displayed in figure 26 below. In fact, 96.5% of the respondents "agreed" or even "agreed fully" with that statement, which clearly demonstrates that the importance and benefits of dipping is very well understood by the livestock keepers. Therefore, also this issue can not be hold responsible for non-functioning dips.

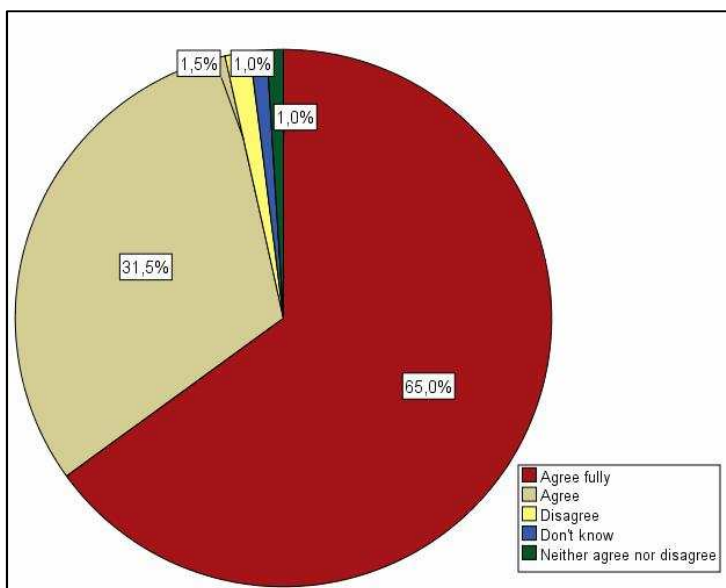


Figure 26: Dipping an effective method for controlling TBD

Source: Sample survey conducted in 4 sample-villages in Musoma District May 2010 (n = 200)

The last constraint on the individual level is unaffordable dipping prices. This claim was reinforced in focus-group discussions and interviews with key-informants. It needs to be kept in mind that, prior to the decentralisation policies dipping was formerly free of charge under the central government. Nowadays, dip operators usually charge 100 TZS for cattle, 50 TZS for goats and sheep. For other animals as dogs and donkeys prices vary much stronger. Thus, I wanted to clarify this hypothesis and asked in the survey whether the interviewees think these prices are affordable. The result is shown in figure 27. It becomes apparent that respondents are rather indecisive and have very different opinions about the

affordability of prices, since 35.5% of all respondents indicated “Neither nor” or “I don’t know”. On the other hand precisely 40% of the participants stated that the prices were either “affordable” or even “very affordable”. In this debate the financial loss for a livestock keeper when an animal dies which is equal to the current market price should be heard in mind. This should be compared to the amount of money which would have to be paid if the whole herd was dipped for a certain period of time. I am convinced that the financial loss of a dead animal outweighs the payment made for dipping, but this is certainly not easy to explain to a farmer, who has never done such calculations. In addition, it is noteworthy that DVOs confirmed that spraying is a more expensive alternative to dipping.

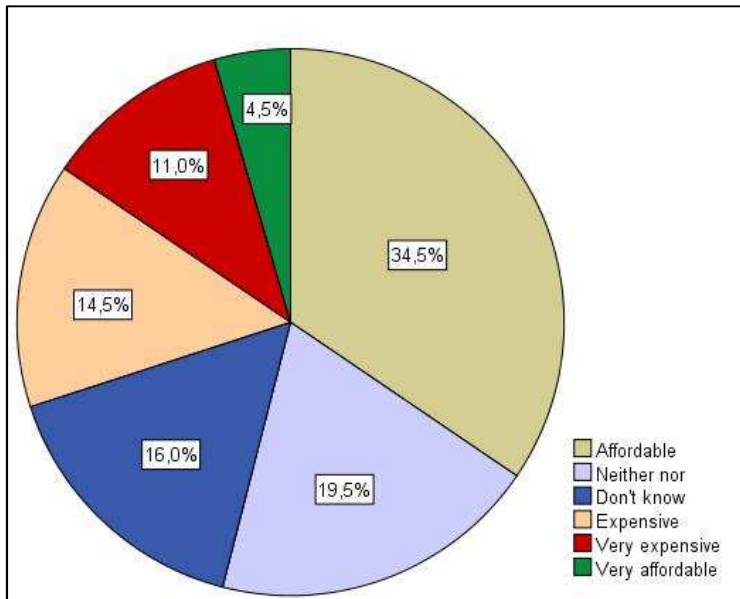


Figure 27: Affordability of dipping prices

Source: Sample survey conducted in 4 sample-villages in Musoma District May 2010 (n = 200)

The community-based constraints concern the lack of capacity of dip operators and the absence of community participation in management.

The first reason I want to elaborate on is the lack of capacity of dip operators. Regardless of the management model, they lack immense entrepreneurial capability and veterinary knowledge. As in the case of Nata, livestock keepers participating in the focus-group discussion complained: “We have no trust in the group, because they have poor knowledge on management, veterinary issues and mixing of acaricide.” Dip operators simply set the prices for dipping without calculating profit-margins, developing business plans or the like. Hence, it occurs that the management at one point is surprisingly bankrupt and can not afford new acaricide or repairs of the dip, so that it has to be closed. This is what many interview partners refer to as mismanagement. In addition, the dip management has rarely knowledge on veterinary issues which frequently leads to a haphazard mixture of acaricide and water. This may cause under dilution with toxic effects. In the case of Nata villagers criticised that recently 20 cattle died due to too much acaricide in the dip tank. On the other hand, when the dip tank contains too little chemicals, the treatment might not be effective to control TBD. The underlying problem here is that the communities have never seen any training or received any guidelines or instructions which enable them to run the dip properly. With help of the survey I attempted to confirm this finding. Therefore, I con-

fronted the respondents with the following statement and asked what their level of agreement is: “The skills and knowledge of dip operators is sufficient in order to provide proper dipping services.” Of course, I expected a strong tendency towards disagreement or even full disagreement with that statement. Surprisingly, the results were completely different than expected (figure 28) and very contradictory to what we heard in the interviews, focus-group discussions and general conversations. Figure 28 shows that in total 89.5% of all respondents indicated to “agree” or to “agree fully” with that statement. But even for the sample village Bukabwa, where the dip is not operational, livestock keepers assess dip operators quite well in terms of skills and knowledge, which is surely doubtful. In this case 94% of all participants stated they would “agree” or even “agree fully” with that statement. The sixth answer category “disagree fully” was not mentioned, so that it is not integrated in the figure. One reason for this very surprising result might be that questions which use these kinds of statements might be leading, in the sense that respondents follow the direction given by the researcher, in this case to agree. In addition, it might be that the villagers simply did not understand the question correctly. Although the picture might look very clear here, there seems to be a major mistake either within the formulation of the question or the comprehension by the participants, since the lack of skills is one of the overarching reasons I identified in the qualitative research. Therefore, I would not trust this survey result, which is not representative anyway, but maintain the argument of lack of capacity as one of the main reasons which implies an enormous need for capacity-building.

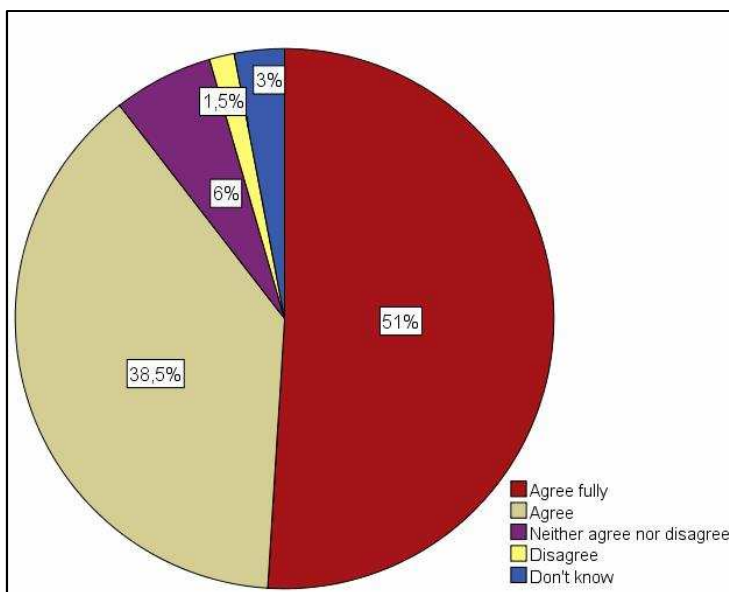


Figure 28: Level of agreement on proper skills and knowledge of dip operators
Source: Sample survey conducted in 4 sample-villages in Musoma District May 2010 (n = 200)

A second community-based constraint concerns the absence of community participation in dip management. In chapter 3.5, participation was associated with being a prerequisite for a sustainable community management. (Indirect) participation through decision-making by electing management members was also pointed out as a significant component. In most of the villages we visited regular elections of the dip management did not take place. As in the case of Nyankanga for example, the management was formed when the local governments delegated the dipo to the community and advised to form groups as it is the predominant management model. Thus, management members sometimes have a “life-

time contract” and do not have to be re-elected or approved by village government or village assemblies e.g. In addition, when they perform badly and villagers are not satisfied, there is mostly no possibility to remove certain members or dissolve the management. It became apparent that when livestock keepers are dissatisfied with the offered dipping services, but can not make their voices heard and to bring about change, they are inclined to refuse dipping their animals and opt for another method for controlling TBD. A good example in this context comes from Mekomariro. In this village the management members remain for three years. Moreover, in the case of Ilongero, we saw another possibility for (indirect) participation of village residents. Of all the revenues the management collects, a small amount (usually 5-10%) is deposited in the village or ward account. With this contribution small community projects might be funded. That way, livestock keepers get the impression that their payments are spent on something useful from which they can benefit eventually. This increases the propensity of livestock keepers to make use of dipping facilities.

The national constraints are divided into water scarcity and high prices of acaricide. The issue of water scarcity emerged during fieldwork in Dodoma and Singida Regions in the centre of Tanzania. This part of Tanzania is arid and semi-arid (see also figures 3 and 8) and water scarcity is a prevailing constraint. This also affects the livestock dips in the sense that the dip tanks can not be refilled and water sources dried out. On the other hand, one can also consider this as a simple excuse, because the problem of aridity is not new, but no concrete measures were taken to deliver the dip with water. Instead, the dip is simply closed for a specific period of time. Surely, this problem may also be traced back to the government level, since it is their task to ensure that all dips dispose of sufficient water. Instead, interview partners 2 and 5 solely stated: “One of the biggest problems that we have is water scarcity.”

Moreover, government officials and community members point to the high prices of acaricide. Apparently, dip operators would not have sufficient funds to purchase them. And when acaricide can not be renewed, dipping would become ineffective and the dip would have to be shut down. Since the LGAs were aware of these facts, they spend a considerable amount of their budgets for subsidising acaricides up to 60% of their original price. Thus, it is very questionable, why communities still criticise these high prices. A reason might be that subsidised acaricide is rarely available in rural areas. Presumably, it can only be purchased in bigger towns as Musoma. This was also confirmed during a focus-group discussion in Buswahili: “There should be a nearby place where they (*the management*) can get acaricide and other treatment. At the moment they have to buy it in Musoma and the distance is too long.” Evidently, the LGA are wasting a considerable amount of money on the subsidisation of acaricide, but too few livestock keepers can benefit. Instead of solely subsidising, the LGA should also guarantee that this acaricide is widely available, also in rural areas.

5.3 Overview of livestock dip management models

In terms of the identification and characterisation of livestock dip management models I came across an enormous extent of ambiguousness and contradiction. The models are somewhat overlapping and a specific feature of a model which I encountered in one vil-

lage might not exist in another village, although the same management model is applied implying a case-to-case difference. Thus, a very clear distinction as stated in the TOR is difficult to achieve. However, there are sufficient factors with which a differentiation is possible.

According to the qualitative research results of phase one four different livestock dip management models can be discerned: a group model, a village committee model, a private individual for public model and a private individual model. The group model is the basic model in this categorisation and is predominantly applied by the communities. Unfortunately, there is no exact data available about the management forms of all dips in the regions, but it is estimated that 70-80% of all livestock dips are run by groups. These groups have mainly been formed with support of certain initiatives as District Agricultural Sector Investment Project (DASIP) or Mara Farmers Initiative Project (MARA-FIP). These funded the construction or rehabilitation of dips, whereby the group had to co-finance the investment. Eventually, DASIP and MARA-FIP advised the communities to form groups. The introduction of the group model was thus a precondition for funding. The communities without necessary guidelines given by the LGAs subsequently held village assemblies and selected the group members. The overview of the management models with the different success factors is shown in the following table.

	Group	Village Committee	Private individual for public	Private individual
Composition	<p>—</p> <ul style="list-style-type: none"> • Formed through projects initiatives (MARA-FIP, DASIP) • Members determined in village assemblies • Criteria: village resident, livestock keeper, commitment, willingness • Normally government has no mandate to approve members or dissolve the group • Largely no elections 	<p>++</p> <ul style="list-style-type: none"> • Members elected in each hamlet which form one village • Regular elections taking place • Allegedly, members are volunteers and do not receive salary • Criteria: Livestock keepers, trustful person, literate 	<p>+</p> <ul style="list-style-type: none"> • Community committee elected in village assembly • Committee chooses private individual for management • Criteria: village resident, livestock keepers, entrepreneurial skills 	<p>—</p> <ul style="list-style-type: none"> • Constructs the dip himself • Has to use his own funds • Mostly large-scale livestock keeper • For the benefit of his own business
Legal status	<p>—</p> <ul style="list-style-type: none"> • Immense confusion on dip ownership • No legal documents on ownership status • Groups predominantly not registered • By-laws mostly formulated but not enforced 	<p>—</p> <ul style="list-style-type: none"> • Immense confusion on dip ownership • No legal documents on ownership status • Village Committees predominantly not registered • By-laws mostly formulated but not enforced 	<p>—</p> <ul style="list-style-type: none"> • Immense confusion on dip ownership • No legal documents on ownership status • Private person not registered • By-laws mostly formulated but not enforced 	<p>+</p> <ul style="list-style-type: none"> • Sole owner of the dip • Clear legal status • Predominantly not registered
Financial management	<p>—</p> <ul style="list-style-type: none"> • Dipping prices set by group • No approval necessary • Revenues group property • Revenues used for improving livelihoods, buying acaricide, refilling water, 	<p>++</p> <ul style="list-style-type: none"> • Dipping prices proposed by committee; have to be approved by village meeting • Revenues spent on acaricide and minor repairs, maintenance 	<p>++</p> <ul style="list-style-type: none"> • Dipping prices proposed by committee & approved by village meeting • Private individual no autonomy in setting dipping prices • Revenue sharing be- 	<p>— —</p> <ul style="list-style-type: none"> • Sets prices according to his preferences • No approval necessary • Revenues are his property

	minor repairs, and maintenance	<ul style="list-style-type: none"> • Remainder deposited in community account for village development 	tween private individual and committee <ul style="list-style-type: none"> • Private individual buys acaricide • Committee pays for minor repairs, maintenance 	
Relationships	<p style="text-align: center;">—</p> <ul style="list-style-type: none"> • Often mistrust • Poor collaboration of group and government authorities • Group may consist of one social network 	<p style="text-align: center;">+ +</p> <ul style="list-style-type: none"> • Close collaboration between management and government authorities • Favourable requirements for good relationships and trust • Trust due to village government involvement 	<p style="text-align: center;">+</p> <ul style="list-style-type: none"> • Close collaboration between private individual and committee essential • Government usually involved in inspection and monitoring 	<p style="text-align: center;">— —</p> <ul style="list-style-type: none"> • Little collaboration between stakeholders • Sometimes verbal communication about situation of the dip • According to law involvement of other stakeholders not compulsory
Accountability and transparency	<p style="text-align: center;">— —</p> <ul style="list-style-type: none"> • Little transparency towards government authorities and community • Rarely financial and dipping reports submitted to government authorities • Not forced to justify in village assemblies • Mostly no approval of the group's performance necessary 	<p style="text-align: center;">+ +</p> <ul style="list-style-type: none"> • Record keeping during each dipping day and submitted to Village and District Government • Reports provided in village assemblies • Subject to approval by both 	<p style="text-align: center;">+ +</p> <ul style="list-style-type: none"> • Record keeping • Reports submitted regularly • Presentation in village assemblies 	<p style="text-align: center;">— —</p> <ul style="list-style-type: none"> • Usually no accountability mechanism • No reports available • No or little transparency

Table 6: Overview of livestock dip management models and their success factors

Source: Own illustration, based on fieldwork in Mara, Dodoma and Singida Regions

As shown in table 6, four livestock dip management models can be discerned, whereas the group model is the basic and predominant model with which the analysis will be started:

Group model

The members of the group were simply determined in village assemblies in which the village residents were told that the responsibility of the dip was delegated to their community. Therefore, it is possible that the members comprise socially and economically powerful people with high self-confidence, who think they are predestined for such a task and push themselves to the fore. However, the members had to meet specific criteria as being a resident of the village, a livestock keeper, and having commitment and willingness to participate. It became clear in our research case-studies that the group members mostly do not have to be approved or to be re-elected. Seemingly, they have a kind of "lifetime-contract", so that the group can also not be dissolved or particular members be removed. This is often accompanied by a weak relationship between the government and the group in the sense that collaboration and communication does rarely occur.

There is furthermore immense confusion on the ownership of the dip. By the time the dip was handed over from the district government to the village government it was disregarded to formulate contracts which would legalise this transfer. Instead, each party claims to be the dip owner which of course may lead to arguments between the village and district government. The groups are predominantly not registered under the Cooperative Act for example. This feature is not typical of a certain management model, but prevails for almost all models equally. The role of dipping by-laws has already been touched upon. The formulation of these aims at making dipping compulsory, so that non-compliance will be fined. In most of the villages we visited by-laws are formulated by the village government, but enforcement is not taking place. Obviously, the village government has to clarify on the responsibility of enforcement.

In terms of the financial management, the dipping prices are set by the group without involvement of government officials or livestock keepers. Furthermore, these prices do not have to be approved by any institution. The revenues which are collected by the group through charging for dipping are only property of the group. With these the operators may improve their livelihoods, buy acaricide, refill water and execute minor repairs and maintenance. The fact that the group keeps the revenues for itself and is not obliged to be accountable and transparent to government officials is often the trigger for mistrust and poor collaboration. Moreover, the livestock keepers have the impression to enrich the group members which is occasionally associated with corruptive practices and embezzlement. The fact that transparency and accountability is ignored reflects the greatest weakness of this model. Lack of accountability and transparency is mostly manifested in absence of financial reports to government authorities, prevention of elections and avoidance of reporting and justifying in village assemblies.

Village committee

The second management model I identified is the village committee. As opposed to the group model, the village committee comprises elected members. They come from each hamlet which together form a village. However, members of the village committee have to meet the following criteria: the person has to keep livestock, must be a trustful person and

has to be literate. In the fieldwork cases it was ensured that regular elections (every three years in one village) would take place, so that the communities may express their degree of satisfaction with the operators. Furthermore, during research I came across the issue of voluntarism of the members meaning that they do not receive any salary. Other sources disagreed and explained that dip operators under the village committee would receive allowances.

Likewise, also the village committee is marked by an adverse legal framework without clarification on ownership of the dip and responsibility for enforcement of by-laws. The dipping prices are first of all devised by the village committee and proposed to the village government and village assembly. Both are thus involved in setting the prices and have to approve them before they come into effect. The revenues generated by the village committee are, similarly to the group, spent on acaricide, minor repairs and maintenance, but the remainder is deposited in the community account with which village development projects are funded. That way livestock keepers may recognise the value they receive for their payments.

The close relationship between the village government, livestock keepers and the village committee are favourable preconditions for a good relationship which contributes to a high level of trust. Moreover, I found out that the village committees we visited execute record keeping during each dipping day and based on this formulate reports which are submitted to the village and district government. Furthermore, general reports are every quarter of the year presented in the village assemblies. The reports have to be approved by both, the government authorities and the village assembly. Consequently, this represents surely extensive scope and opportunities for enhanced transparency and accountability.

Private individual for public

The private individual for public model displays some similarities with the village committee model. At first a community committee is elected in a village assembly. The community committee consists of representatives of the different hamlets. The elected committee chooses a private individual and delegates the responsibility for dip management to him. To be selected, the private individual has to be a village resident, a livestock keeper and needs to possess the necessary entrepreneurial and veterinary skills. Likewise, the private individual for public model is associated with the same difficulties regarding the legal framework as by-laws and ownership which have already been described for the group and village committee model. The dipping prices are customary proposed by the committee and have to be approved by the village assembly. Thus, the private individual has no autonomy, but is forced to accept the agreed the prices. The revenues collected are normally shared between the private individual and the committee, whereby the shares differ. The private individual has to buy the acaricide, whereas the committee has to bear costs for minor repairs and maintenance. Important for this model is a close collaboration between village government, the committee and the private individual which might be more difficult to attain compared to the village committee model, because there are three stakeholders involved. Concerning the category transparency and accountability, record keeping is usually done and dipping reports submitted to the village committee and village government. Furthermore, these reports are presented in village assemblies.

Private individual

The last model which is easily distinguishable from the others is the private individual model. In this case this person constructs and funds the dip himself through which he is the sole owner of the dip. This model is very common among large-scale farmers who dispose of a very large herd and use the dip for the benefit of his own livestock business. Simultaneously, the private individual allows the livestock keepers of the community to dip their animals in his dip. Hence, he sets the dipping prices according to his own preferences and the generated revenues are solely his property. Due to his ownership of the dip he is not obliged to collaborate with the village government or to meet the needs of the community. Therefore, also no accountability and transparency mechanisms as dipping reports exist.

5.4 Community needs assessment

In terms of the adoption of a certain dip management model it is absolutely vital that it meets the need of the community. Only when compliance of the community members with the management form is ensured, a sustainable utilisation of the livestock dip can take place. Therefore, I wanted to deepen my understanding of the community's needs concerning aspects relating to the different management models. Before that, I wanted to shed a light on the extent of impairment of TBD. As figures 29 displays, 97% answered that their livestock is "sometimes" (51%) or "frequently" (46%) affected by TBD which is certainly enormous.

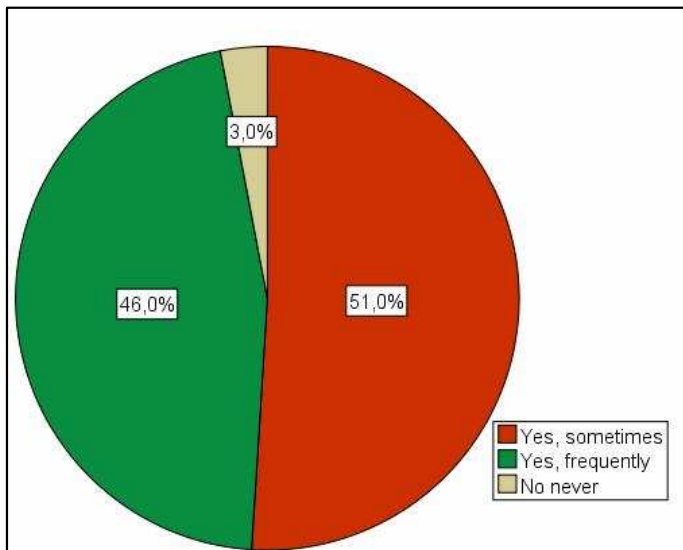


Figure 29: Livestock encountering TBD

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 200)

Interesting is also to distinguish between research locations where the dip is functioning and where the dip is not functioning. By looking at table 7 it becomes apparent that in villages where dips are operational the infection with TBD is much lower. This implies that livestock keepers make use of dipping facilities which prove to be effective.

	Dips functioning (n = 74)	Dips not functioning (n = 126)
Frequently	6.8%	69%
Sometimes	87.8%	29.4%
Never	5.4%	1.6%

Table 7: Livestock encountering TBD by research location

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 200)

Then, I also wanted to learn more about the methods of TBD control which are applied by livestock keepers. Figures 30 and 31 depict the result of this question. In villages where dips are operational 73 out of 74 respondents make use of dipping facilities which again shows their appreciation of delivered dipping services. In case dips are not functioning (figure 31) the range of alternatives to dipping is widespread. Spraying is the most common method (73), followed by smearing (41) and hand picking (31). 29 out of the 126 participants even decide to use no method for controlling TBD. From these results one can assert that, provided dips are operational, the service delivery is acknowledged and utilised. This is further reinforced by figure 27 in chapter 5.2 which shows the level of agreement regarding the fact “Dipping is an effective method for controlling” TBD. The results are quite clear and demonstrate that 96.5% “agree” or even “agree fully” with this statement.

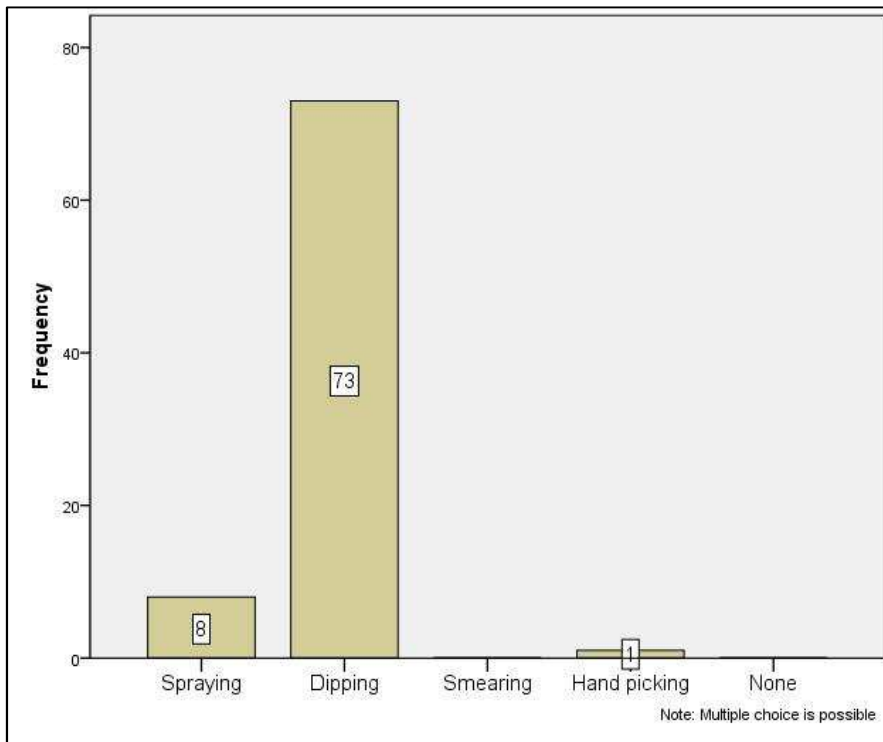


Figure 30: Methods of TBD control by study locations dip functioning

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 74)

After demonstrating that livestock keepers acknowledge the opportunity to dip their animals the question which internal factors of a dip management model they appreciate most will be answered. Figure 32 depicts the results for the factors “trust”, “good health condition of livestock”, “transparency of revenues & expenditures”, “good relationship with dip

operators”, “support of WAEO/VAEO in dip management”, “supervision of village government”, and “regular elections of members”.

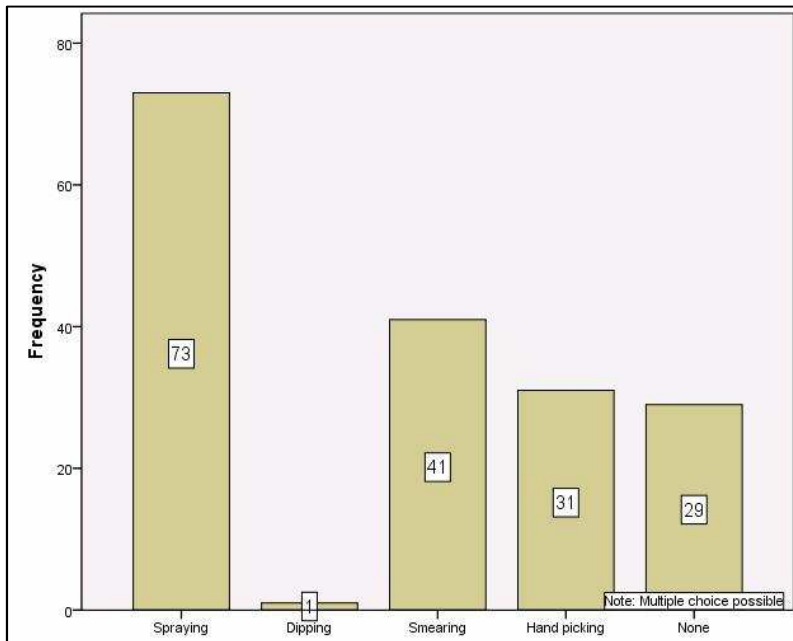


Figure 31: Methods of TBD control by study locations dip not functioning
Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 126)

In general, it is striking that all of the issues are predominantly assessed as “very important” or “important” (both together between 95.5% and 69% for all seven issues). Most frequently mentioned in the two categories “very important” and “important” are “support of WAEO or VAEO” (together 95.5%), “good health condition of livestock” (together 94.5%) and “good relationship with dip operators” (together 94.5%). These findings are certainly very useful and should be heard in mind, when designing recommendations regarding a management model. It is also noteworthy that such a large share of livestock keepers appreciates a good health condition of their animals, because in focus-group discussions it was frequently argued that livestock is predominantly kept for enhancing the social livelihood asset through a large herd implying that livestock marketing and improvement of financial livelihood asset does mostly not exist for which healthy and productive animals would be a precondition.

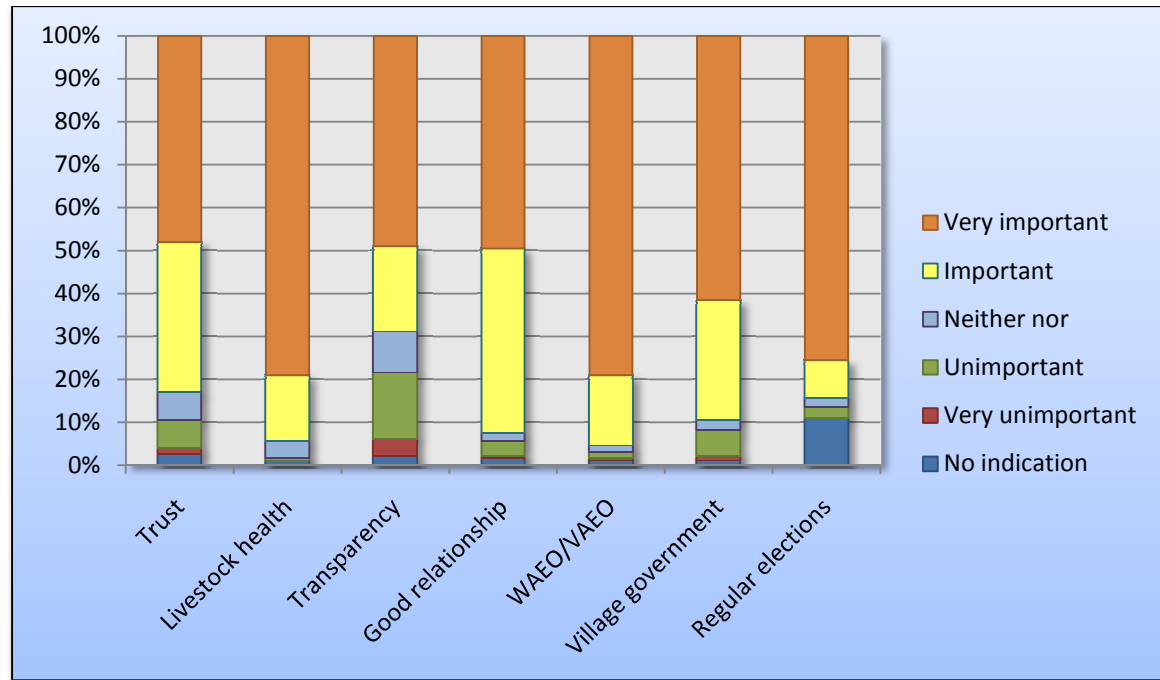


Figure 32: Importance of dip related issues for households

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 200)

5.5 Derived recommendations for a dip management model

As stated in the research objective, the ultimate goal of this research is to recommend a livestock dip management model which can be adopted in the villages in order to ensure a sustainable operation of the dip. For this recommendation one has to take two things into consideration: the constraints for sustainability of dipping services (chapter 5.2) and secondly, the community needs assessment (chapter 5.4).

Comparing the models regarding these aspects I am absolutely convinced that the village committee model has the best preconditions for delivering dip services sustainably. In the following I will give reasons for this recommendation based on several aspects.

First and foremost, with the village committee it is guaranteed that elections of the dip management members take place which may act as a means of indirect participation of the community. That way, the village residents are able to express their dissatisfaction when the dip management performs badly as opposed to the group model e.g. where the group often can not be dissolved. By looking at figure 32 it becomes evident that livestock keepers consider this as an important component. Furthermore, when regular elections are held, the dip management should be inclined to deliver decent work in order to have a chance to be re-elected. Secondly, I want to draw on the challenges of achieving transparency and accountability which is an important, but delicate issue. However, I believe that the village committee model has the best preconditions for attaining both. Record keeping mostly takes place every dipping day and reports of numbers of animals dipped as well as revenues and expenditures are submitted to government authorities and have to be presented in village assemblies. Concerning the financial management of the dips, the community is involved in setting the prices which is another essential feature. This enables, at the best, the affordability of dipping for all livestock keepers. In addition, the fact that the remainder is deposited in the community account with which community de-

velopment projects can be funded is particularly advantageous. Thus, village residents are able to (indirectly) benefit from dipping and perceive positive changes in the village with the help of the money they usually pay for dipping their animals. In order to make use of revenues deposited in the community account and invest in a certain project, village residents shall be involved in selecting the project and thus where money is being spent.

All in all, the village committee has the best requirements for sustainable livestock dips. It is the model where most consultation, information sharing and dialogue occurs which are vital for good relationship and particularly trust. However, this recommendation is based on best-practise findings from several communities, and communities are extremely heterogeneous. This means that this model is certainly not to be seen as a panacea for the functioning of livestock dips, since it may smoothly be adoptable in one village, but in the other fail due to different reasons external to the model.

In the course of the research process we encountered other important best-practice elements which might be added to a village community model. Firstly, in order to create awareness of the importance of dipping for a good health condition of livestock, it is essential that village leaders as village chairman, VEO or VAEO and well-known livestock keepers of the village also dip their animals. Thus, they can act as a sort of role model which can be adopted by the community. Secondly, a yearly livestock census should take place on hamlet level, organised by hamlet leaders, which is to be compiled to a village census. Thus, it is ensured that the dip operators have an overview on the ownership of livestock of each household. This can also help to enforce by-laws.

5.6 Livelihood improvement through increased marketing activities

The National Livestock Policy of 2006 sets out to modernise the sector implying a stronger focus on market-led livestock sector growth. The industry shall be “commercially oriented (...) and internationally competitive.” (Ministry of Livestock Development 2006b, p. 16). It is envisaged to benefit from the emerging demand growth for livestock products worldwide, but especially in developing countries referred to as the “livestock revolution” (Hall et al. 2004, pp. 426-427). It has also been explained in chapter 3.1 that increased participation in trade and export of livestock products is extremely difficult due to a wide array of reasons. Instead, it has been argued that emphasis should be laid on growth in local and regional markets within developing countries which could be a more viable pathway out of poverty for livestock keepers, especially when taking into consideration the large number of smallholders (Scoones/Wolmer 2006, pp. 18-19).

Based on this idea, this chapter draws on the results of the survey and attempts to shed a light on the opportunities and preconditions for increased participation in local livestock-marketing. With that said, it shall also be examined whether poor animal health is a constraint for selling live animals or livestock products.

First and foremost, a look at figure 33 shows that out of the 200 participants, 199 carry out mixed-farming and solely one respondent keeps only livestock. This proves that most livestock keepers diversify their livelihood, so that they rely on both crop farming and livestock keeping. Thus, drawing on the SLF (figure 15), livestock also plays an important role as natural livelihood asset by providing manure for soil fertility and physical livelihood asset to provide transport of agricultural products.

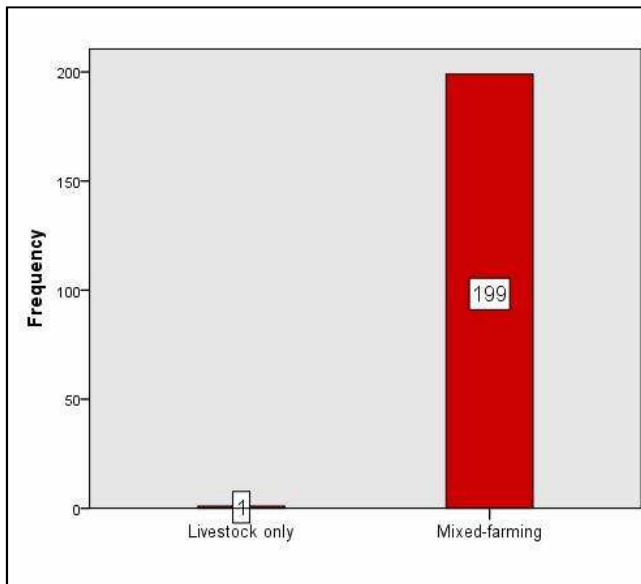


Figure 33: Type of agricultural household

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 200)

Generally, the participating households not only diversify their livelihoods with crop farming and livestock keeping. They also generate off-farm income (26% of all respondents), opt for fishing (10%) and have support through remittances (5%). In the ranking of these activities, crop farming and livestock keeping are the most important however. Out of all respondents, who mentioned crop farming as a livelihood activity, 85.5% ranked it as their most important. On the other hand, only 12.5 % of all livestock keepers ranked livestock rearing as their primary livelihood activity. This shows that for the selected households, crop farming is of much higher significance for their livelihood. Thus, the emerging livestock-based market-oriented potential (enhancement of financial livelihood asset) might be secondary for the households and mostly ignored, so that their focus could solely be on crop farming.

Opposed to the statements of interview partners and participants of focus-group discussions the survey revealed that a large number of livestock keepers are engaged in market-oriented livestock keeping. In total 82 % indicated to sell either live animals or livestock products. The marketing of live animals is more common than marketing livestock products. 78% of all participating households stated to sell live animals, and 48% stated to be engaged in marketing of livestock products. As table 8 depicts, animals most frequently sold are goats (84.7% of all household selling live animals) and cattle (77.7%) followed by poultry (45.2%) and sheep (15.3%).

	n	Percentage
Selling cattle	122	77.7%
Selling goats	133	84.7%
Selling sheep	24	15.3%
Selling poultry	71	45.2%
Selling others	2	1.3%

Table 8: Type of live animal sold by household

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n =157)

Table 9 displays the type of livestock products which are marketed by all livestock products marketing households. It becomes clear that milk is the main product with 85.4% followed by meat (42.7%), eggs (33.3%) and hides and skins (23%). Presumably, milk is largely sold unprocessed in the villages. However, there are two large milk processors in Musoma District (Musoma Dairy and Mara Dairy) which collect and buy unprocessed milk and produce UHT, yoghurt or cheese. This would certainly be an opportunity for enhanced marketing of livestock, although it is not clear here, whether this opportunities have not been exploited already.

	n	Percentage
Selling milk	82	85.4%
Selling meat	41	42.7%
Selling hides & skins	23	24%
Selling eggs	32	33.3%

Table 9: Type of livestock products sold by household

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 96)

In the case a household does not market either live animals or livestock products I wanted to find out what the underlying reasons for this are. Figure 34 exhibits the result of this analysis. It is obvious that the human (“ensuring food security”), physical (“store of wealth”) and natural (“animal use in agriculture”) livelihood assets are the major reasons. Surprisingly, with only five indications, the social livelihood asset (“keeping for prestige”) plays only a minor role, probably because herd sizes are only average (for cattle 17,56 for example) and secondly, because typical traditional pastoralists are not represented in this survey.

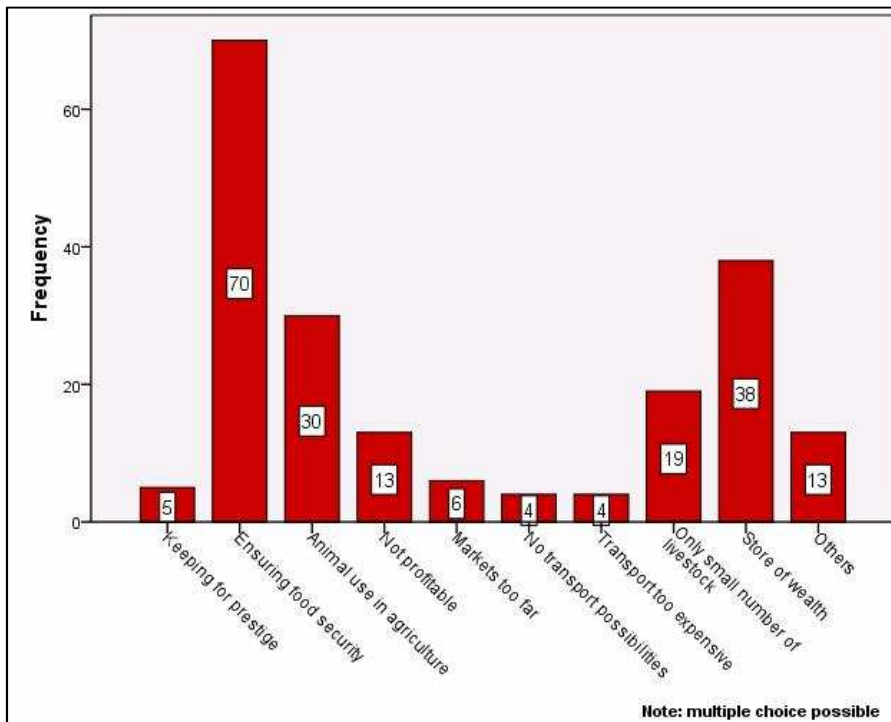


Figure 34: Reasons for non-participation in marketing of livestock or livestock products

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 98)

Surprisingly for these largely remote areas, long distances to the market (“market too far”) or transport problems (“transport too expensive”, “no transport possibilities”) do not seem to have influence on the household’s decision making.

In addition, I tried to find out whether a correlation between the occurrence of TBD and marketing of livestock or livestock products exist. The cross-tabulation below reveals some evidence. It becomes apparent that there is no relationship between marketing and being affected by TBD. For both, “frequently affected by TBD” or “sometimes affected by TBD”, the share of households engaged in livestock-related marketing activities is with 88% respectively 80.4% very high and only slightly different.

	Livestock encountering TBD			Total
	Yes, frequently	Yes, sometimes	No never	
Households selling livestock or livestock products	81 88,0%	82 80,4%	1 16,7%	164 82%
Households not selling livestock or livestock products	11 12,0%	20 19,6%	5 83,3%	36 18%
Total	92 100,0%	102 100,0%	6 100,0%	200 100%

Table 10: Cross-tabulation of livestock marketing and encountering TBD

Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 200)

Furthermore, it needs to be examined which constraints and challenges livestock keepers face, who are already engaged in marketing of livestock or livestock products. This could give some ideas about which barriers will have to be removed to increase participation in market-related livestock keeping in Musoma District. Figure 35 displays that a wide range of constraints occur. One can see that marketing is not very profitable, since the existing trader and market prices are classified as too low. The reasons for this are surely difficult to determine, but I could imagine that a value-chain analysis could give insights into under which circumstances and how these prices would come about. As for the challenge “markets are too far”, it has much in common with the response options “transport too expensive” and “no transport possibilities”, which were also mentioned quite often. This implies that there is a general problem concerning the market access due to long distances. This is certainly true considering the remoteness of some of the sample villages. Remarkable is also the fact that “poor health condition of animals” was only mentioned 17 times, bearing in mind the impairment by TBD. This shows that TBD increases the vulnerability context for livestock keepers, but affects only slightly the decision for livestock-related marketing-decisions as table 10 has already shown.

It becomes clear in this sub-chapter that only a minor share still carries out subsistence farming (18%), whereas 82% of the respondents already participate in livestock-related marketing. The reasons for not participating particularly concern the human, natural and physical livelihood assets. However, the fact that the increase of the financial livelihood asset through marketing is constrained by too low market and trader prices is certainly an

issue which prospectively might hinder livestock keepers to take part in market-oriented livestock keeping.

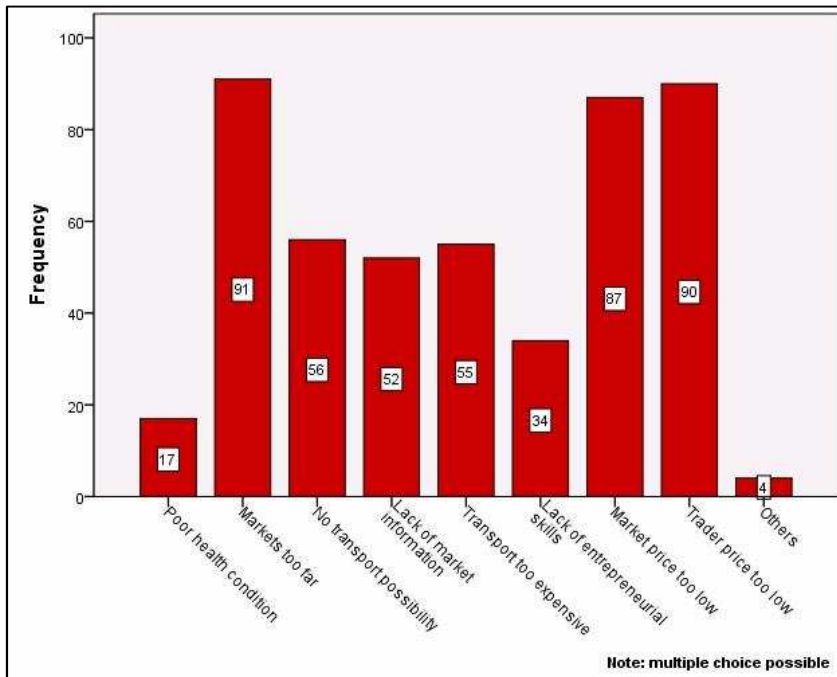


Figure 35: Constraints of participation in marketing of livestock or livestock products
Source: Sample survey conducted in 4 villages of Musoma District May 2010 (n = 164)

6. Conclusion

The Tanzanian livestock sector has and will also in the future have a major importance for the countries economy and the livelihoods of the mainly rural population. The Sustainable Livelihood Framework (SLF) has highlighted the various roles livestock plays for a household, illustrated as the five livelihood assets (financial, social, natural, physical and social). The household is however constantly threatened by the vulnerability context which for this study is associated with the occurrence of animal diseases. The thematic-theoretical chapter on TBD control through the utilisation of livestock dips has shown that dipping is a viable and accepted option which will result in a reduction of the vulnerability context though animal diseases. It is claimed that improved animal health has positive effects on productivity levels of livestock, for instance on the increased milk yield. Therefore, increasing participation in livestock-related marketing activities to enhance the financial livelihood asset is an opportunity with which livestock keepers may benefit from better animal health.

The research process was guided by a research question and several sub-questions. In order to come to a conclusion, these questions, although already answered in chapter 5 will be highlighted and summarised again. To recall, the main research question was formulated as followed:

Which livestock dip management models can be discerned and which model contributes best to attain the goal of delivering sustainable dip services to livestock keepers?

In the process of delegating the authority for the management of the dips to the communities it was disregarded to provide the communities with the necessary guidelines and instructions on how to run the dip. Thus, the communities had to mobilise themselves and selected their own ways for running the dip which apparently too often failed. Due to advice of investment projects as DASIP or MARA-FIP, the communities predominately decided to implement groups (*kikundi* in Kiswahili) which, given the large number of not operational dips, comprise inadequate elements for sustainability of livestock dips. Since not every community opted for a group model, but experimented with other management forms, the research was geared to reveal the different dip management models in operation. Although fieldwork proved immense overlaps and ambiguousness between the models, four different livestock dip management models can be discerned:

1. Group model
2. Village committee model
3. Private individual for public model
4. Private individual model

The four models were compared and assessed by means of the five categories composition, legal status, financial management, relationships as well as accountability and transparency. In the analysis phase it became clear that the group model is inappropriate for

the management of livestock dips. Their high degree of autonomy and independence aggravates proper monitoring and ignores to hold them accountable for their actions. The lack of transparency within this model is another crucial barrier resulting in scepticism and mistrust in the group. Furthermore, lack of transparency and accountability opens doors for corrupt and dishonest behaviours and relationships. The village committee model is on the other hand marked by close collaboration between the management and the village government, whereas the community is also involved through information sharing in village assemblies and participation in elections. A further strength of this model is the guarantee of accountability and transparency through regular record keeping, submission of financial reports and strong involvement and supervision by the village government which is also requested by the community.

The private individual for public model has some similarities with the village government model and is therefore also appropriate for delivering dip services to the community. But there are two things which favour the village committee model. Firstly, it is questionable whether the private individual possesses the necessary business and veterinary skills to run the dip properly. This holds also true for the village committee, but in this case several members are active and may complement each other. Secondly, the structure of the private individual for public model with three stakeholders might complicate the relationship and collaboration, and lead to confusion about the particular roles and reinforces the likelihood of disagreements.

Lastly, the private individual model is a very clear-cut management form. Despite of its uniqueness it offers little benefits for the community, since it is primarily geared to meet the needs of the owner. Due to the issue of ownership, the operator is neither obliged to be accountable to anyone nor does he have to be transparent. Therefore, this model is certainly the least adequate.

It should be stressed again that for my recommendation I am very convinced that the village committee is the best model in order to manage the dip adequately considering the community needs assessment and the challenges affecting the sustainability of the dip. Of course, in order to implement this management model, the district and regional policy-makers need to be involved. Based on their agreement, action plans should be implemented which target the lower administrative level, the village. There, a livestock-dip related village assembly is vital to inform the community members about the plans and to explain the purpose of the new model. However, the lack of capacity is an enormous barrier to proper management and will certainly not be removed by adoption of any of the models. Therefore, it needs to be emphasised again that institutional support through WAEO or VAEO is absolutely crucial.

Next to the research question, four sub-questions have been formulated. These started with the following:

a) What are the major reasons for the non-functionality of livestock dips?

The research results suggest that a wide array of reasons is responsible for this. They range from institutional drawbacks, individual livestock keeping behaviour to constraints on the community level and to national external barriers. Some of these are certainly difficult or impossible to alter, others require sufficient time for change. The institutional constraints refer to absence of institutional support, particularly by the government in the form of WAEO or VAEO, lack of transparency and accountability, mistrust and social networks,

and no enforcement of by-laws. The most important are certainly absence of institutional support and lack of transparency and accountability. If the latter was ensured, it would probably build trust and establish trustful relationships between the different parties. The absence of institutional support points to the second category, the community-based constraints. Evidently, the dip management lacks enormous capacity of both business and veterinary skills. Furthermore, community is often not able to participate in dip management, be it directly as a management member or indirectly through elections. The constraints on the individual level which have been brought forward particularly in interviews with key-informants have to be taken with caution, since the results of the survey reveal a different picture. For instance, it was often asserted that lack of awareness of the importance of dipping among livestock keepers would be a major drawback. However, the survey findings demonstrate that the community acknowledges dipping as a significant and effective option for TBD control. Similarly, traditional livestock keeping behaviour was made responsible for the collapse of dips. It was argued that farmers would keep their livestock traditionally meaning that a large herd is of utmost importance for prestige ignoring the chance to participate in livestock-related marketing. Since for a large herd healthy and productive animals are not that important compared to marketing, livestock would not make use of the dips. Lastly, there are national constraints which are external to a certain model. Water scarcity in some regions of Tanzania leads to dried out water sources so that the dip tank lacks sufficient water. Moreover, it was claimed that acaricide prices would be unaffordable for the dip management resulting in major difficulties to bear the operational costs.

Which livestock keepers' needs have to be taken into account when designing a recommendation for a certain dip management model?

This question was answered in chapter 5.4. Research has shown that in general livestock keepers make use of dipping facilities as table 7 and figure 30 illustrate, provided they are functioning. During focus-group discussion it became apparent that community members wish to be informed about dip-related issues which certainly show their need for transparency. Furthermore, they are willing to be part of the decision-making process, be it directly through engagement in management or indirect participation through electing management members, who share the same views. In addition, the livestock keepers strive for harmony and a good relationship between the dip management, the government and them, which will enable trust to be established (see also figure 32). This will be eased by extensive involvement and supervision by the village government which is another crucial expectation of the community.

To what extent do livestock keepers perceive dipping as an effective method for controlling TBD?

The answer to this question has been ambiguous after the qualitative research phase. In the quantitative stage it became clear that livestock keepers understand the importance of dipping for controlling TBD and also consider it as an effective method. This is proven with figure 30 in chapter 5.4 for instance. This demonstrates that out of 74 respondents, 73 usually use dips for TBD control. This finding is reinforced by figure 27 in chapter 5.2 which depicts the level of agreement regarding the fact "Dipping is an effective method for controlling TBD". The results are quite clear and express that 96.5% "agree" or even

“agree fully” with this statement. In addition, by looking at table 7 it becomes apparent that in villages where dips are functioning the infection with TBD is much lower. This implies that livestock keepers make use of dipping facilities which prove to be effective.

To what extent are livestock keepers engaged in livestock-related marketing as a viable livelihood activity?

In focus-group discussions I was often confronted with the claim that farmers would keep their livestock traditionally. This implies a strong focus on the social livelihood asset with a large herd disregarding the opportunities to participate in marketing. However, the survey in Musoma District presented a different picture. The analysis demonstrates that 82% of all respondents either market live animals or livestock products. The reasons for not participating in the livestock-related market opportunities can particularly be found in strong reliance on the human (nutrition), natural (animal use in agriculture as fertiliser) and physical (larger herd for store of wealth) livelihood asset. Despite of the large share of livestock keepers participating in livestock-related marketing, they face several challenges as depicted in figure 35. The most important challenges are market access (long distance and transport issues) and the low revenues they can generate (low market and trader price).

It should be clear that these research results are not the end, but just the beginning of a process which aims at improving animal health by reviving the livestock dips. It can only be hoped that the stakeholders involved in the process cooperate effectively and develop enthusiasm and commitment to bring about change which also includes monitoring and facilitating by SNV in order to give the policy-makers an understanding of our ideas. In addition, it needs to be ensured that the district government officials become active in supervising the activities in villages related to livestock dips which will be essential, because, despite of the re-organised livestock dip management, problems will most likely emerge. For a sustainable management these problems have to be solved adequately and so that on the long-run trustful relationship are not affected.

In addition, in order to measure the effects of revived dips on animal health and livelihood outcomes a longitudinal study needs to be conducted in the future. Only that way it can be found out whether the whole intervention can be seen as a success.

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Annex I – Research schedule

Weeks	Task	Location
Week 1 (8.2. - 14.2.2010)	Introduction to SNV/ Working on re- search proposal	Mwanza
Week 2 (15.2. - 21.2.2010)	Working on research proposal	Mwanza/ Musoma
Week 3 (22.2. - 28.2.2010)	Finalizing research proposal/ Portfo- lio Meeting/ Desk study	Musoma/ Mwanza
Week 4 (1.3. - 7.3.2010)	Research team meeting/ Agreement on time frame & common framework	Mwanza
Week 5 (8.3. - 14.3.2010)	Field period 1 – phase 1	Mara Region
Week 6 (15.3. - 21.3.2010)	Field period 2 – phase 1	Mara Region
Week 7 (22.3. - 28.3.2010)	Field period 3 – phase 1	Dodoma Region
Week 8 (29.3. – 4.4.2010)	Analysis of phase 1 field period/ Mid-term reflection/ Reference group meeting	Mwanza
Holidays (5.4. - 18.4.2010)	Reflection	
Week 9 (19.4. - 25.4.2010)	Developing field tools for field period phase 2	Musoma
Week 10 (26.4. - 2.5.2010)	Field period 1 – phase 2	Musoma District
Week 11 (3.5. - 9.5.2010)	Field period 2 – phase 2	Musoma District
Week 12 (10.5. - 16.5.2010)	Analysis of phase 2 field period	Musoma
Week 13 (17.5. - 21.5.2010)	Reporting/ Finalising	Musoma

Annex II – List of interviewees and focus-groups

Interviews

1. Name: Dr. Mzee
Position: Regional Livestock Advisor Mara Region
Place: Musoma
Date: 4th March 2010

2. Name: Dr. Mniko
Position: Regional Livestock Advisor Dodoma Region
Place: Dodoma
Date: 22nd March 2010

3. Name: Dr. Swai
Position: District Veterinary Officer (DVO) Musoma District
Place: Musoma
Date: 8th March 2010

4. Name: Dr. Dhyanabo
Position: District Veterinary Officer (DVO) Bunda District
Place: Bunda
Date: 18th March 2010

5. Name: Dr. Tito
Position: District Veterinary Officer (DVO) Serengeti District
Place: Mugumo
Date: 18th March 2010

6. Name: unknown
Position: Livestock Field Officer Bahi District
Place: Bahi
Date: 23rd March 2010

7. Name: Andrew Sumara James
Position: Village Chairman
Place: Buswahili, Musoma District
Date: 12th March 2010

8. Name: Mrs. Neema
Position: VAEO
Place: Mayamaya village, Bahi District
Date: 24th March 2010

9. Name: Mr. Makura
Position: Village Chairman
Place: Mayamaya village, Bahi District

Date: 24th March 2010

10. Name: Mr. Masau Magwara
Position: VEO
Place: Nyankanga village, Musoma District
Date: 9th March 2010

Focus-Group discussions

1. Number of participants: 3
Position: members of dip management
Place: Bushwahili village, Musoma District
Date: 12th March 2010
2. Number of participants: 4
Position: livestock keepers
Place: Buswahili village, Musoma District
Date: 12th March
3. Number of participants: 3
Positions: WAEO and two dip management
Place: Ilongerero village, Singida District
Date: 29th March 2010
4. Number of participants: 18
Positions: VEO, Village Chairman, 8 livestock keepers, 8 members of dip management
Place: Nyankanga village, Musoma District
Date: 10th March 2010
5. Number of participants: 5
Positions: WAEO, 4 members of dip management
Place: Nata village, Serengeti District
Date: 17th March 2010
6. Number of participants: 7
Positions: livestock keepers
Place: Nata village, Serengeti District
7. Number of participants: 11
Positions: 1 member of Livestock Department Bunda District, 5 livestock keepers, 5 members of dip management
Place: Mekomariro village, Bunda District
Date: 14th April
8. Number of participants: 8
Positions: WAEO, 4 members of dip management, 3 livestock keepers
Place: Wegero village, Musoma District
Date: 12th March 2010

9. Number of participants: 7

Positions: Ward Councilor, Village Chairman, WEO, VAEO, Field Extension Officer
Bahi District, 1 member of dip management, 2 livestock keepers

Place: Mkakatika village, Bahi District

Date: 24th March 2010

Annex III - Interview guideline

Government officials:

1. How many livestock do you have in your administrative unit?
2. How many dips are there in your administrative unit?
3. What is the status of those dips?
4. Could you give us an overview of the dip management models in your particular administrative unit?
5. Depending on the management model: how was this formed and what are the major characteristics?
6. What are the most obvious constraints/problems with this model?
7. Are there any accountability and transparency mechanisms installed?
8. Do you know the reasons why livestock dips are not functional?
9. Which actions do you take to improve the dips?

Annex IV – Focus-group guidelines

Livestock keepers

Management:

1. Who is managing the dip and how is the management selected?
2. What do you think of the composition of the management members?
3. Is there any inspection and supervision on the dips management? Who is doing the exercise and how often?
4. How do you see the role of the Village Government in the dip management?
5. To what extent does the community (do you) feel involved in the dip management/selection of members?

Legal framework:

1. Are there any by-laws in effect concerning dipping?
2. Which consequences do enforced by-laws have for you?

Financial issues:

1. Who determines dipping prices?
2. How much is charged for one animal?
3. Were the dipping prices stable in the past? *In case of changes, why?*
4. How would you consider/assess these prices?

Accountability/ transparency:

1. Are you (as a villager) informed about financial situation or spending and expenditures of the dip management?
2. Do you know where the dipping revenues are spent on?

Utilization and importance of dip facilities:

1. Do you regularly dip your cattle?
No: why not?
Yes: Do you see any benefit?
2. Do you use any other means of disinfection? *Why?*

Evaluation:

1. What's your general opinion on this dip management model?
2. What do you think could contribute to a better performance of this model?
3. Does the dip management meet the need of the community?
4. Do you have trust in the persons in charge of management?

Dip operators

Management:

1. How would you describe your management model?
2. What is the structure of your management form?
3. How are the members of the management selected?
4. Do the members of the management model have to be approved?
5. Is there any inspection and supervision on the dips management? Who is doing the exercise and how often?
6. Do you have a regular contact with the Village Government? What is their role concerning the management?
7. To what extent is the community involved in the dip management?

Legal framework:

1. Who owns the dip?
2. Are there any by-laws in effect?
3. Are you as operators registered? *What are the benefits?*

Financial issues:

1. Who determines the dipping prices?
2. How much do you charge for one animal? How do you come to these prices?
3. How are the revenues utilized?
4. In case of rehabilitation or repair is needed? who has to pay for it?

Accountability/ transparency:

1. Are there any income and expenditure report provided? *To Village/District government, village assembly? How frequently?*
2. Do you inform other stakeholders about revenues and expenditures?

Evaluation:

1. Which are the major constraints you are facing in running the dip?
2. What could contribute to a better performance of this management model?
3. Does the dip management model meet the need of the community?

Annex V - Questionnaire



Questionnaire number: _____



Questionnaire on livestock dipping

I. Livelihood activities

1. What is your type of agricultural household?

- Livestock only Pastoralist Crop and livestock

2. Which animals and how many of them do you own?

- Cattle _____ Goats _____ Sheep _____ Pigs _____
 Poultry _____ Others _____ (please specify)

3. Which are your most important livelihood activities?

- Crop farming Livestock keeping Off-farm income Remittances
 Fishing Others _____ (please specify)

4. Please rank those applicable in order of importance! (**1 most important & 6 least important**)

- | | Rank |
|----------------------|-------|
| a) Crop farming | _____ |
| b) Livestock keeping | _____ |
| c) Off-farm income | _____ |
| d) Remittances | _____ |
| e) Fishing | _____ |
| f) Others | _____ |

II. Livestock Marketing

5. Does your household sell livestock (*live animals*)?

- Yes No → please continue with question 7

6. Which animals? (*Multiple choice is possible*)

- Cattle Goats Sheep Poultry Pigs Others _____ (please specify)

7. Does your household sell livestock products? Yes No

8. Which livestock products? (*Multiple choice is possible*)

Milk Meat Hides & skin Eggs Others _____ (*please specify*)

9. What are your major reasons for **NOT** selling livestock or livestock products? (*Multiple choice possible*)

Keeping livestock for prestige Ensuring food security Animal use in agriculture
 Not profitable Markets too far No transport possibilities
 Transport too expensive Livestock as store of wealth
 Others _____

10. What are your major constraints in selling livestock & livestock products? (*Multiple choice possible*)

Poor health condition of animals Markets too far No transport possibilities
 Lack of market information Transport too expensive
 Lack of entrepreneurial skills Market price too low Trader price too low
 Others: _____

III. Livestock disease and dipping

11. Does your livestock encounter tick and tick-borne diseases (TBD)?

Yes, frequently Yes, sometimes No, never

12. Which methods of tick control are you currently using? (*Multiple choice possible*)

Spraying Dipping → when mentioned please continue with **q. 13** Smearing
 None Hand picking Other _____ (*Please specify*)

13. How often do you dip your animals?

More than once a week Once a week Once in two weeks
 Once a month Once in two months Once in half year

14. What is your level of agreement on the following statement: Dipping is an effective method for controlling TBD.

Agree fully Agree Neither agree nor disagree Disagree Disagree fully

15. How important are the following dip-related issues to you? Please indicate on a scale from 1-5? (1 = very important, 5 = very unimportant)

Trust in the dip operators _____
 Good health condition of livestock _____
 Transparency of revenues & expenditures (through reports e.g.) _____
 Good relationship with dip operators _____

Support of VAEO/WAEO in dip management _____
 Supervision of village government of dip management _____
 Election of dip management members _____

16. Did you receive any livestock extension advice on disease control during the past year?

Yes No → please continue with question 18

17. Who provided this service/advise? (*Multiple choice is possible*)

Ward Agric. Extension Officer (WAEO) Village Agric. Extension Officer (VAEO) Other government related service provider NGO/development project Large-scale farmer Other _____ (*Please specify*)

IV. Dip management & evaluation

18. What is your level of agreement on the following statement: The skills and knowledge of the dip operators is sufficient in order to provide proper dipping services.

Agree fully Agree Neither agree nor disagree Disagree Disagree fully

19. How much is being charged for dipping of the following animals?

Cattle_____ Goats_____ Sheep_____ Pigs _____ Others_____ (*Please specify*)

20. What is your opinion on those prices?

Very affordable Affordable Neither nor Expensive Very expensive

21. Are there any dipping by-laws enforced in your village?

Yes No Don't know

22. What is your opinion on appropriateness of by-laws to support the running of the dip?

Very appropriate Appropriate Neither nor Inappropriate Very inappropriate

23. How do you evaluate the overall performance of the dip management on a scale of 1 to 5? (*1 = Very good, 5 = very poor*)

24. Do you have any suggestions on how to improve dip services? (*Open question*)

25. Personal questions: Sex of household head: _____ Age of household head: _____
Household size: _____