



The multi-functionality of  
goats in rural Mozambique:  
Contributions to food security  
and household risk mitigation



RESEARCH  
PROGRAM ON  
Dryland Systems



# The multi-functionality of goats in rural Mozambique: Contributions to food security and household risk mitigation

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## Abstract

It is widely acknowledged that goats in developing countries fulfill multiple functions and can contribute to improved livelihoods of smallholders. The multi-functionality of goats in rural Mozambique however is fairly unknown. The objective of the paper is therefore to identify and create a deeper understanding of the multiple functions goats currently play in the smallholders sector in Mozambique. The paper takes a sociological approach by advancing the thinking that the functions of goats are socially and culturally constructed, and not 'given'.

Qualitative data were collected by means of historical timelines in six communities and individual in-depth interviews with 18 smallholder goat keepers (three per community) in Inhassoro district, Inhambane province. In addition, findings of the quantitative baseline household survey (n=83) were used.

Results showed four categories of goat functions in Inhassoro district, based on respondents' perspectives: 1) sale in times of need, 2) exchange for services and products, 3) social life, and 4) consumption.

Based on these findings, the paper discusses implications of the multi-functionality of goats for development projects, in which goats can function as financial saving and insurance, as contributors to food security, as contributors to social capital, and as commercial production commodities. Subsequently, the paper addresses a few fundamental questions about projects aiming to commercialize smallholder goat keeping, i.e. linking smallholders to markets.

# I. Introduction

It is widely acknowledged that goats in developing countries fulfill multiple functions, such as meat and milk production, manure, insurance, bride wealth and ceremonies. Combined with the fact that goats are often owned by poor smallholders, it is frequently stated that goats can contribute to improved livelihoods of smallholders in developing countries (e.g. Bosman et al., 1997; De Haan, 2001; De Vries, 2008; Devendra and Chantalakhana, 2002; Dossa et al., 2007; FAO, 2012; Kosgey et al., 2008; Lebbie, 2004; Peacock, 2005; Rumosa Gwaze et al., 2009; Swanepoel et al., 2010; Udo et al., 2011). The roles of goats and the relative importance of each role, however, are not static, but vary by agro-ecological zone, production system and socio-cultural context (FAO, 2012; Kosgey et al., 2008). The current paper focuses on the functions of goats for smallholders in a specific context: Inhassoro district, Inhambane province in southern Mozambique.

Mozambique is a specific context with regard to goat keeping in the sense that the civil war (1980-1992) largely depleted the livestock population (Pinho Morgado, 2007) and in the decades following the civil war, the country suffered severely from flooding, droughts and cyclones, which again affected the livestock population. Goats are quite popular in livestock programs aiming to reduce poverty and improve livelihoods, especially in areas that suffered from natural and other disasters (Budisatria and Udo, 2013). Also in Mozambique, goats were part of the restocking and other livestock-related programs<sup>1</sup> and were distributed in rural areas by the Mozambican government with support from international aid and non-governmental organizations (NGOs), (ILRI, 2011; Maciel, 2011). There is limited documented information on how goats are used by smallholders in Mozambique to improve their livelihoods. Maciel (2009) mentioned that the main reasons for goat keeping are home consumption and the sale of goats to raise cash for health and school fees, but an in-depth study of the roles of goats in the smallholder sector in Mozambique is lacking. The current paper is based on the idea that a deeper understanding of smallholders' reasons for goat keeping is crucial for any goat development or research project (Kosgey et al., 2008). Hence, the objective of the current paper is to identify the multiple functions of goats and create a deeper understanding of the roles they play in the smallholder sector in Mozambique.

After the introduction, section 2 describes the context of the current paper – goat keeping in Mozambique – in detail. Section 3 describes the sociological approach of the current paper, which is based on the theory of social constructivism. Research methods were largely qualitative – six historical timelines with key informants and 18 in-depth interviews with smallholders – supplemented with quantitative data from 83 baseline household surveys (section 4). Section 5 presents the main findings of the study by describing different roles of goats and smallholders' priority of these. The paper ends with discussing possible implications and recommendations for goat development projects and reflections on goat commercialization when taking the multiple roles of goats into account.

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1. Information on evaluation of livestock programs in Mozambique is scarce. In other countries, some livestock program evaluations have been conducted, but the impact on people's livelihoods has not been assessed (LEGS 2009). Moreover, it is not the purpose of the current paper to evaluate restocking programs in Mozambique, but the authors recognize that these restocking programs may have had implications on the ways goats are currently being used (see e.g. Budisatria and Udo 2013).

## 2. Goat keeping in Mozambique

Mozambique is one of the poorest countries in the world; it ranks 184th (out of 187 countries) with a Human Development Index value of 0.322 (UNDP, 2011). The country has a population of 23.9 million, of which about 61% lives in rural areas (UN, 2011). About 60% of the population lives below the international poverty line (1.25 US dollars (USD) a day) and almost 80% is considered 'multidimensionally poor' (UNDP, 2011). About 80% of the population depends on agriculture for their livelihoods (UNDP, 2001). The majority of agricultural products are produced by smallholders on their *machambas* (subsistence agricultural plots) with an average area of 1.1ha/family (INE, 2010). In 2008, the country reported an estimated population of about 4.3 million goats (INE, 2010).

The present study was conducted within a project, which aimed to increase incomes and food security in a sustainable manner by enhancing pro-poor small ruminant value chains in India and Mozambique, imGoats for short (ILRI, 2010). In Mozambique, the project was implemented in Inhassoro district, which is situated in the northern part of Inhambane province, the most northern province of the southern geographical zone of Mozambique. Inhambane province has been included in governmental restocking programs (ILRI, 2011). In 2010, the province had 11% of the national goat flock, which translates to almost 416,000 goats (INE, 2010). Inhambane province ranks highest in terms of goat population in the southern provinces of Mozambique (ILRI, 2011). In 2013, the provincial government livestock census identified 44,222 goats in Inhassoro district. It is estimated that only 9% of the goat production in Inhassoro district is commercialized (MAE, 2005). The district has about 52,275 inhabitants with a population density of only 11 inhabitants per km<sup>2</sup>. About 87% of the district population lives in rural areas and agriculture is the main source of income. The main agricultural products are maize, cassava, beans, and groundnuts (MAE, 2005).

## 3. Socially constructed functions of goats

### Functions of goats in developing countries

The roles and functions of goats can be structured in different categories. Lebbie (2004) presented five products and services that goats in Sub-Saharan Africa can provide. Dossa et al. (2007) identified the six reasons for goat keeping in southern Benin. Based on a study in India, Rangnekar (2006) identified an output function, an input, risk coverage or asset function and socio-cultural functions. In a study in Kenya, Kosgey et al. (2008) differentiated between tangible, i.e. cash income from meat, milk and manure, and intangible benefits, i.e. banking or insurance against emergencies and display of status. Although there are some differences in categorization between these studies, most of these studies recognize the following possible contributions of goats to rural communities (FAO, 2012):

- Food security: Direct consumption (meat, milk), income to buy food, increase crop production.
- Resilience to shocks: Insurance, risk spreading and savings.
- Farm production and productivity: Using resources (e.g. by-products and manure).
- Income generation: Cash economy and value addition (sale of products e.g. meat, skins).
- Social and cultural functions: Religious ceremonies, status, social occasions, weddings, and births.

Moreover, to better understand the pathways through which goats can contribute to development outcomes like increased income and food security, it is not only important to identify smallholders' objectives for goat keeping, but also to know how smallholders rank the different functions of goats (e.g. Budisatria et al., 2007; Dossa et al., 2007; Kosgey et al., 2008; Rumose Gwaze et al., 2010) and to understand their reasoning behind their priority.

### Social constructivism and multi-functionality of goats

The studies mentioned above demonstrated the multiple roles and functions of goats, also known as 'multi-functionality'. Some of these studies took a rather economic approach by quantifying financial benefits from goat keeping, such as insurance and income from sales (e.g. Bosman et al., 1997; Moll et al., 2007). The current paper, however, takes a more sociological approach by looking at the different roles and functions of goats within the historical and socio-cultural context of Mozambique and more specifically in Inhassoro district. We are advancing the thinking that functions of goats are socially and culturally constructed, and not 'given'. As such, we used the theory of social constructivism, which describes the social and cultural meanings of phenomena.

One of the main underlying principles of social constructivism is the idea that reality is constructed as 'it is available to the common sense of ordinary members of society' (Berger and Luckmann, 1967: p33). The theory of social constructivism has been widely applied to many different topics over the past decades (Demeritt, 2002; Sismondo, 1993). In general, a social construction can be described as a typology of collective meanings of phenomena. Over recent years, there has been an increasing interest from social scientists using social constructivism to study human-

animal relationships, which departs from the idea that the way humans relate to and see animals is not 'given' but instead is socially and culturally constructed over time (e.g. Emel et al., 2002; Jones, 2006; Tovey, 2003; Wilkie, 2005). When studying the multi-functionality of goats, a social construction refers to a typology of collective meanings of functions of goats, as defined by the people themselves, i.e. smallholders. The theory of social constructivism has at least two implications for the present study.

Firstly, a social construction is not static, which implies that collective meanings can change over time (Berger and Luckmann, 1967). As such, functions of goats are transferred by smallholders from generation to generation and are dynamic over time. Hence, to better understand current collective meanings of functions of goats, one needs to understand the historical context of goat keeping in which these meanings have been constructed.

Secondly, the theory generally assumes that phenomena only exist because of the way society has constructed them and that they would look differently if constructed by another society, with different values, needs or interests (Boghossian, 2001). Hence, collective meanings are subjective and as such there is not one reality, but there are multiple realities, which vary according to their geographical, social and cultural context. Consequently, functions of goats are context-specific and vary according to the meanings smallholders themselves ascribe to goats.

With this background, this paper addresses three research questions that seek to better understand why smallholders keep goats and how those are used in Inhassoro district:

- What is the history of goat keeping in Inhassoro district?
- What functions and meanings do goats currently have for smallholders in Inhassoro district?
- What are the most and least important functions of goats for smallholders in Inhassoro district?

## 4. Data collection and analysis

### Baseline household survey

The objectives of the baseline study were to characterize existing goat production systems and markets and to identify opportunities, constraints and possible interventions to improve goat production and marketing in Inhassoro district. Baseline data were collected in August 2011 through household surveys in six of the 22 imGoats project communities in Inhassoro district, with 14 respondents per community, resulting in 84 respondents. The six communities (Chichangue, Cachane, Vulcanjane, Nhapele, Mabime and Rumbatsatsa) represented differences in agro-ecological zones (coastal and interior) and market access (distance to tar road). Data were collected in the local language *Xitswa* by eight enumerators who were trained the week before.

After analysis, it became clear that the categories to identify reasons for goat keeping were interpreted differently by the enumerators. Moreover, it seemed that respondents did not identify their reasons for goat keeping according to the defined categories<sup>2</sup>, but – as we will show in the results – respondents talked about situations in which they sold, used or consumed a goat. Hence, the baseline question and data on reasons for goat keeping could not be interpreted correctly and therefore the additional qualitative in-depth interviews and historical timelines were conducted. Other baseline questions were interpreted correctly and some of these quantitative findings of the household baseline survey have been used in the present paper, though the major part of the paper is based on the historical timelines and in-depth interviews.

### Historical timeline with key informants

In order to better understand the historical context of goat keeping in Inhassoro district, historical timelines were constructed with key informants. A historical timeline is a 'list of key events in the history of the community that helps identify past trends, events, problems and achievements in the people's life' (FAO, 2004: p130). After constructing a general timeline, the following topics and their changes over time were discussed: a) Origin of goats in the community, b) Reasons for goat keeping, c) Goat keeping practices, and d) Goat meat consumption. One historical timeline was constructed with three-eight key informants per community, including the community leader, the community animal health worker, one or two elderly people and a few smallholders. The general structure of the exercise was the same for all communities, but specific questions were adapted according to the history of the community.

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2. There appeared to be a significant relationship ( $p < 0.001$ ) between enumerators and reasons for goat keeping, showing that almost all enumerators used 'sale in times of emergency', whereas one enumerator reported 100% of her interviews under 'Cash income a few times a year to meet regular needs'. Similarly, another enumerator reported almost all the responses of his interviews in 'Cash income on regular basis', whereas other enumerators hardly used this category.

## Individual in-depth interviews

To gain a better understanding of individual smallholders' reasons and motivations for goat keeping, in-depth interviews were conducted. The interview consisted of three parts: a) Start of goat keeping, b) Reasons for goat keeping, c) Goat keeping practices. Respondent's reasons for goat keeping were explored in detail by asking about the reasons for goat sales in the past years, as the sale of an animal is an event that many smallholders will remember (Moll and Dietvorst, 1999). To identify priorities for goat keeping, a ranking exercise has been commonly used in other studies (e.g. Budisatria et al., 2007; Dossa et al., 2007; Kosgey et al., 2008; Rumose Gwaze et al., 2009). In the current study, the respondent ranked the reasons for goat keeping in order of his/her personal priority for that moment by means of illustration cards with a line drawing of each reason. Subsequently, the ranking was discussed.

In each baseline community, three smallholders were interviewed, resulting in 18 in-depth interviews. All respondents were participants of the imGoats project. The aim was to interview a variety of smallholders, based on a mix of the following criteria: gender, age, herd size, years of goat keeping and sale of goats. Data on these criteria had been collected during the baseline household survey. Based on these criteria, a list with eight potential respondents per community was composed. When arriving at the community, available smallholders were requested to participate.

Data were collected in almost two weeks (14-26 May 2012), with two days per community: on day one, the historical timeline and one or two individual interviews were conducted, and on day two, the remaining individual interviews were done. The interviews and historical timelines were conducted in the local language *Xitswa* and translated into Portuguese. During the interviews, respondent's answers were written down and afterwards entered into a text-document in English: one document per respondent. Data were analysed by structuring and categorizing the texts according to the research questions.

## 5. Results

### Historical context of goat keeping in Inhassoro district

Over the past decades, Mozambique has gone through three identifiable successive periods: (1) National liberation struggle resulting in Mozambique's independence in 1975 followed by its aftermath (2) Civil war throughout the 1980s, ending in the 1992 political peace settlement (3) The post-war period to present (Jacobson, 2006). In Inhassoro district, key informants remembered the civil war period as such an important historic event that the three periods were referred to as 'before', 'during' and 'after' the civil war. Each period is briefly discussed below including the roles of goats.

#### Pre-civil war period

Around 1964, the national liberation war began which resulted in Mozambique's independence in 1975 (UNDP, 2001). Key informants' memories went back to the 1940-1950 period, varying by the age of the key informants. In all communities, goats had been present in the years before the civil war, just as poultry and sheep, whereas hardly any community had cattle or pigs. In general, reasons for goat keeping were similar in all communities: goats were mainly used for special occasions like ceremonies, weddings, festivities, special visitors, and—in some communities—for status. An important ceremony—mentioned in all communities—was the ceremony to honour the ancestors.

Key informants mentioned that goat meat had always been eaten in the communities; they were taught by their parents. Key informants also reported that severe hunger periods occurred only once every 10 years, for example a severe hunger period occurred in 1970 due to drought—as mentioned in four of the six communities. However, goats were rarely consumed in times of severe hunger. Instead, people helped each other in times of hunger; those with a large production of food would give food to those in need. Mutual assistance systems were also reported in times of natural disaster, like a cyclone or flood: community members who were less affected gave seeds and animals to the ones who were severely affected. Goats were hardly sold before the civil war: only in two communities it was mentioned that some goats were sold during festivities, to buy clothes or to help family.

The key informants mentioned very little about the 1975-83 period after national liberation. Their memories only referred to the severe hunger period due to drought from 1980-83 as no food was available in the shops, and consequently, this was the only period they could recall when goats were eaten due to severe hunger.

#### Civil war period

The exact year of the beginning (1979–83) and ending (1990-94) of the civil war varied per community, according to key events that marked the beginning and end. With regard to the civil war, two points were made in most of the communities. Firstly, the beginning of the civil war coincided with severe hunger (see section 5.1.1), which was explained by the key informants as a combination of drought and the absence of labour on the *machambas*

(subsistence agricultural plot) due to the war. Secondly, many inhabitants left the village and most villages were destroyed and abandoned. Some villages were uninhabited for about 10 years, whereas in other villages people tried to resettle during the war. Similar situations occurred in other parts of the country, as about 50% of the Mozambican population was dislocated (USCR 1993 in Unruh, 1998).

At the same time, a severe and rapid decline of the goat population occurred in all communities for a combination of reasons: goats were eaten by the villagers due to severe hunger (1980-83); goats were taken or eaten by the soldiers who entered the village; goats were eaten by the villagers before the soldiers arrived; villagers took the goats with them when leaving the community; and goats were left behind when villagers left the community. Consequently, the goat population in most communities was completely depleted by the end of the civil war.

## Post-civil war period

The first period after the civil war was characterised by an enormous return of displaced persons, which was a difficult process in many ways for example due to a combination of land claims by various people with largely destroyed social relations in the communities (Tanner, 1996; Unruh, 1998). Key informants mentioned that there was hardly any – if no – livestock in the community and several methods were reported to increase the goat population in their community. First of all, it was reported that the only place in Inhassoro district where goats survived the civil war were the Bazaruto Islands, and as such, goats were transported by boat to Inhassoro town, where some villagers bought goats, whereas others asked to be paid with goats for their work. Secondly, some communities reported their own internal systems to gradually restock the goat population, as also mentioned in other studies (e.g. Mash, 2003). Other key informants mentioned that community members sold goats to each other for low prices. Despite these efforts, in many communities the goat population remained very low the first decade after the civil war; only in the second decade the goat population gradually increased according to the key informants.

Key informants in all communities mentioned two key events in the post-civil war period in Inhassoro district: floods from 1999 to 2001 and the cyclone 'Favio' in 2007. Both events affected the goat population, although the severity varied between communities. After the floods and cyclone, communities had different ways to increase the number of goats in the community, such as lending goats for reproduction to others, buying new goats, selling goats to community members for low prices, and exchanging goats for work on the *machamba* (subsistence agricultural plot). Price agreements still exist in some communities. In general, restocking projects in Inhassoro district started after the floods and mainly included cattle, although some NGOs, like ATAP and CARE, also distributed goats in a few communities, according to the key informants.

With regard to hunger periods after the civil war, two major changes were reported by the key informants; the hunger has become more 'constant' and the number of people that helped each other decreased. Hence, more goats are currently being sold due to hunger, because nowadays one has to buy food, seeds and animals, instead of receiving support from community members, which one key informant described as 'our ancestors were better organized than we are'. To conclude, it seems there has been a general shift in reasons for goat keeping after the civil war; although goats are currently still used for ceremonies and mutual assistance in the communities, there has been an increased focus on keeping goats to sell in times of emergency.

## Reasons for goat keeping in Inhassoro district

In-depth interviews were conducted with 18 smallholders with an average age of 47 years, including nine female smallholders, five female smallholders of male-headed households and four female-headed households (Table 1). On average, respondents had been keeping goats for about 10 years, which coincided with the period after the floods until 2001, as one respondent described 'I started with chickens around 1990, but I waited to buy goats until 2001 for better conditions.' (resp 11). These findings are in line with the quantitative household survey findings, where respondents (n=83) also had kept goats for about 10 years. As children, some respondents had looked after their parents' goats, whereas other respondents came up with the idea to keep goats from their neighbours and other community members, where they saw that goats can 'help' when sold in times of need.

Table 1. Respondents' characteristics for in-depth interviews (n=18) and household survey (n=83)

Variable	In-depth interviews				Baseline household survey				
	n	Av.	min	max	n	Av.	min	max	s.e.
Age of respondent	18	46.6	31	70	83	49.6	18	83	1.4
Years of goat keeping	18	10.4	1	30	83	10.1	1	45	0.91
Goat herd size	18	9.1	2	40	83	8.8	1	30	0.77
	n	%			n	%			
Female respondents	9	50%			39	47%			
FHH <sup>a</sup>	4	22%			21	25%			
Selling goats	15	83%			55	66%			
Consuming goat meat	15	83%			63	76%			

<sup>a</sup> Female Headed Household (FHH)

Quantitative baseline findings showed that the main occupation of most respondents was cultivating their *machamba* (64%; n=53), whereas goat keeping was mainly a side-activity. The following sections present respondents' reasons for goat keeping in four categories based on respondents' perspectives (Table 2): 1) Sale in times of need, 2) Exchange for services and products, 3) Social life, and 4) Consumption. Categories are not mutually exclusive, but may overlap at certain points. Below we discuss each category in more detail.

Table 2. Reasons for goat keeping based on in-depth interviews (n=18)

Smallholders' reasons for goat keeping a	Respondents (n=18)	
	n	%
Sales in times of need		
for food	9	50.0
for health	11	61.1
for school	7	38.9
for planned savings	2	11.1
for consumables	6	33.3
Exchange		
for <i>curandeiro's</i> services	5	27.8
for agricultural labour	4	22.2
for consumables	1	5.6
Social life		
for family members	10	55.6
for ceremonies (for ancestors and funerals)	7	38.9
for <i>lobolo</i> (bride wealth)	2	11.1
for social status	3	16.7
Consumption		
for special occasions	15	83.3

<sup>a</sup> Functions are not mutually exclusive, but may overlap at certain points. For example, someone may have exchanged a goat for *curandeiro's* services who helped conducting a ceremony for the ancestors.

## Sales in times of need

In the quantitative baseline survey findings showed that 66% of the respondents were involved in goat sales, asked as 'Do you sell goats?'. In the in-depth interviews, 15 respondents (83%) were involved in goat sales, which meant that a respondent had sold a goat at least once over the past years (Table 1). Sale in times of 'emergency' was a rather broadly defined category as respondents used this to refer to the sale of goats when there was a concern, problem or need in the family, such as food shortage, illness, school costs, or other household needs like clothes and blankets. As such, 'emergencies' also included sales to fulfil more regular household needs, such as school costs and clothes. Each reason for goat sales is briefly explained below.

Half of the respondent group (n=9) reported to have sold a goat in times of hunger in order to buy food. Respondents sold one to three goats and bought bags of rice, maize flour or sorghum (*mapira*); one goat usually covered the costs of about one 50kg bag of flour (*farinha*). A few respondents mentioned that the hunger was not so bad, and they had other ways to overcome this situation: by selling chickens, selling ground nuts, collecting and selling stones, cutting wood, building a house for neighbours, and earning money with an off-farm job. The quantitative baseline findings showed that a majority of the respondents (64%; n=53) had crop production (*machamba*) as their main occupation and livestock keeping as side-activity. Food shortage usually occurred from the end of the dry season to the beginning of the wet season, i.e. ranged from July to December, when crop production was insufficient. As such, goat sales for food was prioritized. Other studies also showed that livestock can form a major insurance against food shortage (e.g. Moll et al., 2007).

Many respondents (n=11) reported that they had sold a goat in times of illness of themselves or a family member, especially a child or wife. The main expenses were transportation costs to the hospital as villages are remote and dispersed. The nearest hospital is in Inhassoro town, which ranged from 10 to 40km distance from the communities: 'If you can't walk you need to arrange transport, e.g. rent a bicycle or motor bike from someone.' (Resp17). The transport costs depended on the location of the respondents. Some respondents only needed to sell a chicken because they lived closer to the hospital. Chicken—instead of goats—were also sold when the health situation was not too severe. Another illness-related expense was food for the patient in the hospital. In case of illness, some respondents made use of the services of a *curandeiro* (traditional healer), which often also involved goats (see section 5.2.2): 'In case of illness, I sell a goat to go to the hospital or a *curandeiro*' (Resp14).

Seven respondents sold one or more goats to cover school costs. Goats were usually sold around December and January, because of good prices in December and the fact that school registration fees (*matricula*) had to be paid at the beginning of the year. When children were older, goats were sold to cover housing costs for boarding school.

According to the respondents, other school-related expenses were clothes—e.g. uniforms, soap to wash the children's clothes and school materials such as pencils. School expenses could also be covered with other income sources: if costs were not too high, a chicken could cover. Two female respondents mentioned that they cover school expenses by the making and selling of traditional drinks. When asked if school costs were considered an 'emergency', a female respondent answered 'school and food are all emergencies, because a child needs to go to school' (Resp10). Hence, it seemed that respondents did not differentiate between household 'needs' and 'emergencies'; most needs were considered an emergency, even if they occur every year at a regular moment. A study of Bosman et al. (1997) also reported that the financial requirements at times of school fees were experienced as most pressing by smallholders. Davendra and Chantalakhana (2002) also mentioned that goats are sold when smallholders are in need of cash to pay fees for children's education, clothes and books, and as such, goats provide (medium-term) savings for smallholders.

Only two respondents mentioned the use of money from goat sales for planned savings. One woman kept the money of goat sales in her house, whereas another woman made use of *Xitique*. *Xitique* is a traditional micro-finance arrangement, which can be described as an 'informal savings and credit arrangement based on mutual trust. Two or more people contribute a fixed sum, which is loaned in turn to one member of the group' (Marsh, 2003: p17). The female respondent started using the system in 2007, because then she would have money available at any time she

needed, e.g. when a family member is ill. Twice- per month she needed to contribute to *Xitique* and therefore sold two goats per month. When asked if she considered these sales as an emergency, she responded 'Yes, because I don't have anything else' (Resp 2). This again showed again that the term emergency has different meanings, not only to the situation in which one sells a goat, but also to the livelihood options one has.

Six respondents mentioned selling goats also for other consumables, e.g. to cover expenses for festivity days in December, to cover travel costs to visit family, to buy blankets, to buy clothes and to buy food products they do not produce in their own *machamba* such as sugar.

The ranking exercise showed that for many respondents, sales in times of need were the most important reasons to keep goats (ranking first, second or third). In general, food shortage and illness were the most important reasons, explained as: 'if you eat well, you have power to do other things, e.g. go to school' (Resp 11) and '[illness] is a big suffering. You have to do anything to save your child' (Resp 16). Also important, though often ranked after food shortage and illness were school costs for different reasons, for example that school is obligatory and 'If a child does not go to school, the family will not respect you' (Resp 5) and as investment for the future 'Children have to learn and will help you in the future' (Resp 1). These findings are in line with the quantitative baseline survey findings, which showed that 58% (n=32) of the respondents who gained an income from goats in the past 12 months, used the money to buy food, followed by 51% (n=28) for education, 46% (n=25) for human health and 36% (n=20) for consumables, including expenses for clothing, housing and family events (Table 3).

Table 3. Expenses covered from goat sales based on household survey (multiple response question)

Expenses covered	Respondents (n=55)				Responses (n=114)
	Main categories		Sub-categories		%
	n	%	n	%	
Food	32	58.2			28.1
Education	28	50.9			24.6
Human Health	25	45.5			21.9
Consumables	20	36.4			17.5
Clothing			12	21.8	
Housing			6	10.9	
Family event			2	36.4	
Cropping	3	5.5			1.8
Other	6	10.9			5.3
Total (%)					100

## Exchange for services and products

Respondents were asked if they had exchanged goats for products or services and in most of the cases the answer was no. However, when discussing in more detail, respondents explained that they paid with goats for certain services and products, such as *curandeiro* (traditional healer), agricultural labour and products from South Africa.

Five respondents exchanged a goat for a *curandeiro's* services. A *curandeiro* is a traditional healer who is consulted in various situations, such as illness, family problems, and the performance of traditional ceremonies. A key informant in one community explained: 'Before the civil war, chickens—not goats—were used to pay a *curandeiro*, but nowadays, chickens are not enough anymore and a *curandeiro* prefers money and goats.' In addition, goats were sometimes needed as specific elements of the healing ceremony. Key informants in one community explained for example that people brought and still bring a goat to a *curandeiro* if a woman cannot become pregnant. The current study did not go into detail about how (parts of) goats were used in different healing ceremonies, but wanted to establish if goats were used. Results from the historical timeline showed that in three of the six communities, goats were and still are used to pay a *curandeiro*, but probably in every community there is one or more *curandeiro* as it is still common practice in Inhassoro district. In general it can be concluded that in Inhassoro district goats fulfil an important role in the payment of *curandeiros*, as well as the rituals performed by *curandeiros*. These services are closely linked to other roles of goats in people's lives and overlap with the categories 'sale in time of illness', 'helping family members' and 'conducting ceremonies for the ancestors'.

Four respondents mentioned that they had used a goat to pay a worker on their *machamba* (subsistence agricultural plot). An agricultural worker can be paid with goats, as well as money, depending on the preference of the worker. 'If people want to be paid with a goat, they mark an area that equals a goat' (Resp18). An elderly female-headed household explained: 'I have a large *machamba* but want to have a larger *machamba*. I need to sell goats to pay the workers for weeding and sowing' (Resp13).

Key informants in two communities explained that before the civil war goats were hardly ever sold, but more used to exchange for products. After the civil war, goats were less used for exchange, although it still happened for example for a blanket or a chair. One female interview respondent mentioned she had exchanged one goat for a blanket and one goat for a water jerry can of 60 litres.

The ranking exercise showed that respondents who mentioned these reasons, ranked agricultural work and *curandeiro*'s services as quite important, following directly after sales in times of food shortage or illness. It should be noted that *curandeiro*'s services are closely linked to goat sales in situation of illness, because some respondents prefer to go to a *curandeiro* rather than the hospital.

## Social life

For many respondents of the in-depth interviews goats played an important role in their social life. Social life in Mozambican rural areas includes the living as well as the dead and those to be born (UNDP, 2001). Goats were used to help family members, conduct ceremonies and rituals, make linkages with ancestors, pay bride wealth (*lobolo*), and gain social status. Each role of goats in people's social lives is briefly explained below.

Ten respondents mentioned having helped one or more family members by offering them one or more goats. Recipients—e.g. aunt, uncle, father, brother, grandparents, nephew—as well as reasons and frequency varied. For example, goats were offered to family members who did not have goats yet and subsequently they could start goat keeping. Goats were also offered to a family in case of illness, so that the family member could sell the goat to cover hospital costs or could offer the goat to a *curandeiro*. Several respondents offered a goat to family members for ceremonies, such as a wedding, family reunion or ceremony for the ancestors (*mhambas*), as one female respondent explained: 'When my brothers come to ask for goats for *'mhambas'*, I give maximum one goat to them. If they need more, they have to go elsewhere' (Resp13). Other studies have also reported the important role of goats in helping family, for example a study in Tanzania (De Haan, 2001) showed that when family members were in trouble, they were given high priority by the goat producer group and received goats.

The most important ceremony that involved goats was *'mhamba'*, which is a ceremony to honour the ancestors. The ceremony involves *'copacha'*, which refers to linkages with the ancestors, as one respondent described 'I use goats for larger ceremonies like *'copacha'* to invoke spirits. By sacrificing and eating a goat the ancestors will know that we are thinking about them' (Resp 3). In the historical timeline exercise, key informants in all communities mentioned this as an important ceremony in which goats are needed and which was practiced before as well as after the civil war. Five interview respondents mentioned that they had used a goat for this ceremony. The exact frequency is difficult to estimate: the ancestors have to ask for it, or it can be done on the date the ancestor passed away (e.g. five or 10 years afterwards). Some respondents mentioned that they performed the ceremony themselves, whereas others mentioned that a *curandeiro* helped with the rituals. Two respondents mentioned that they had used goats in funeral ceremonies.

A few respondents mentioned that goats were also used in rituals to remove evil spirits, which could be part of sorcery. A female respondent mentioned that she had demons in her house for which she needed two chickens every year to remove them. The role of goats and other livestock in sorcery in Inhassoro district has not been further explored in the current study, but a very thorough study of West (2005) showed that sorcery can involve livestock and consists of highly complex relationships between the living as well as the dead, which still plays a very important role in Mozambican life, particularly in rural areas. Other studies have also shown that goats can play important roles in removing evil spirits and in creating and maintaining linkages among the living and the dead (e.g. Lebbie, 2004; Rumosa Gwaze et al., 2009).

'*Lobolo*' (bride wealth) is the price that needs to be paid to the father of the bride by the family of the husband-to-be. *Lobolo* is often paid with livestock. Two respondents mentioned that they had used a goat to pay *lobolo* when their son married, as a female respondent explained: 'When my son married last year, I gave one goat. This had to be a female goat, because it was given for a woman.' (Resp 16). Another male respondent mentioned that it was very important to have sufficient goats when the occasion arises, not only for *lobolo*, but also for the consumption of goat meat during wedding: 'You need 10 goats per wedding. It depends on the ceremony what the goats are used for; they can be eaten or stay with the family' (Resp 5). The historical timeline exercise showed that in two communities *lobolo* was an important reason for goat keeping before, as well as after the civil war, whereas one community mentioned this as an important reason only after the civil war. The payment of *lobolo* is still common in many regions in Mozambique which are characterized by a patriarchal family system (Gotschi et al., 2009). Traditionally, *lobolo* is often paid in cattle (Kachika, 2009). However, quantitative baseline findings of the current study showed that only 8% of the households kept cattle. The small cattle population might explain the relative importance of goats in *lobolo* payment in Inhassoro district.

Only three respondents mentioned that social status due to a large goat herd was important for them. Other respondents did not keep goats for status, either because it was not important in their community or because they did not have enough goats. In two of the six communities, key informants mentioned that status was important before the civil war, but it changed after the civil war as goats had become more important to sell in times of need. A young female producer gave an additional explanation: 'It does not represent prestige for me, maybe people from outside may respect a producer with many goats, but the owners don't often manage to transform these goats into benefits, to sell, for example to construct a house.' (Resp 18). The status of livestock is related to the presence or absence of other means of displaying wealth (Moll et al., 2007; FAO, 2012). It seems that nowadays there are alternative forms of displaying wealth in Inhassoro district, such as a house or a shop, instead of a large goat herd. In another community, goats still represented prestige, but there was some discussion around the required herd size for status, ranging from 20 to 200 goats. Interestingly, the discussion about social status and herd size brought another concern to the front, about social conflicts: 'I don't want many goats, because these goats may enter the *machamba* of the neighbours and create problems' (Resp 7). Given the central position of *machambas* and food production in the community, one can imagine the severity of social conflicts when goats destroy part of the crop production.

The ranking exercise showed that reasons surrounding 'social life' were more important than goat consumption, but less important than household needs "If you've overcome all this [illness, hunger, building a house] you can help your family to start goat keeping" (Resp 18). Of the 'social life' reasons, mutual assistance to the family was considered most important: 'You should help your family first before eating the goats. If you lose goats (e.g. through floods), then you can return to your family and ask for goats' (Resp 1). Ranking results showed variation among respondents; some respondents ranked helping family higher than others. Similarly, ceremonies for the ancestors showed variation in ranking; for some it was one of the least important reasons, whereas two respondents ranked this highest, explaining 'In case you haven't thanked your ancestors, you may not find work because of bad spirits' (Resp 5). Weddings were ranked relatively low, as one respondent explained "You do this [use goat for a wedding] when you are in a state of happiness" (Resp 4), just as social status 'It doesn't help to have many goats if you don't help your family with those goats' (Resp 6).

## Consumption of goat meat

About 83% (n=15) of the interviewees consumed goat meat (Table 1), which is in line with quantitative baseline survey findings where 76% (n=63) of the respondents consumed goat meat in their household. It was however not consumed frequently, about once or twice per year for special occasions such as: national festivity days, special visitors, ceremonies like wedding or a funeral, birthdays, child naming, which will be briefly described below. Some key informants explained that as part of daily diet not goat, but chicken or fish was eaten more frequently.

Twelve respondents mentioned consuming goat meat at national festivity days, especially at the end of the year on the 25th and 31st of December. According to the key informants these days were celebrated, before as well as after the civil war, whereas after the civil war Mozambique's national Independence Day on the 25th of June became more important. Another important occasion to consume goat meat in the family was the visit of special or respected family members like grandparents, children or a brother who live far away e.g. Maputo or South Africa. According to the key informants this practice existed before as well as after the civil war. Six interview respondents had slaughtered a goat for special visitors and as one male respondent explained, the return of family members often coincided with festivity days in December: 'I have six children, of which three are in South Africa. I slaughter a goat in December when my children come back from South Africa, like last year' (Resp 4). Key informants in one community and three interview respondents mentioned that goat meat was also consumed to celebrate birthdays. Similarly, a goat could be slaughtered for a naming ceremony of a child, at a wedding or a funeral. It is widely known that ceremonies and important social occasions are often celebrated with the consumption of livestock products (e.g. Budisatria et al., 2008; FAO, 2012; Kunene and Fossey, 2006; Rumosa Gwaze et al., 2009).

Six respondents said they used their own goats for consumption, whereas three respondents explicitly stated not consuming their own goats, like this female respondent: 'I love goat meat, but do not eat my own goats. I consume goat meat when I am invited for festivities or a wedding. And I will buy goat meat when someone slaughters a goat.' (Resp 8). Reasons for not slaughtering people's own goats were a relatively small herd 'If I don't have enough goats, that means six or less, I buy a goat to consume' (Resp 9) and the fact that goats are needed for other purposes, like emergencies: "I don't slaughter my own goats, because it's an '*animal de ajuda*' [animal of help]" (Resp 2).

The ranking exercise showed that goat meat consumption was considered the least important function (ranked last or next-to-last), even though it was the most frequently mentioned reason (by 15 of the 18 respondents). Respondents' motivations—as explained above—referred to the fact that goat meat is mainly consumed at times of festivities and after other challenges have been overcome.

## 6. Discussion

The present study aimed to identify the multiple functions of goats for smallholders in Mozambique based on social constructivism. That means, identifying the meanings and importance smallholders themselves ascribe to goats and their use of goats. Given this specific geographical focus of the current study (one district in Mozambique), the present study should be seen as an explorative study in Mozambique and one should be careful with generalizing conclusions. However, we believe that the findings give valuable insights for the broader debate on the multi-functionality of goats in development contexts, as will be discussed in the following sections.

### Goats as financial saving and insurance

Findings showed that crop production was people's main occupation, whereas goat keeping was mainly a side-activity. Despite being a side-activity, goats fulfilled important roles in people's lives, particularly to manage risks. Results showed that, for many respondents, the most important reason to keep goats was to sell in times of need. Respondents referred to these situations as 'emergencies'. 'Emergency' was a broadly defined category, which included sales for food and human health, but it could also refer to more regular household needs, like school costs (Table 2). Such sales represent at least two financial functions of goats: firstly, goats function as financial insurance as they can be sold in times of need, i.e. when the household faces cash requirements. Hence, goats are used as a way to manage risks. Secondly, goats can function as savings. Both functions are of particular importance in situations where financial and insurance institutions are absent or inaccessible (Bosman et al., 1997; FAO, 2012; Herrero et al., 2013; Kosgey et al., 2008; Moll and Dietvorst, 1999; Moll et al., 2007).

### Goats as contributors to food security

The results of current study showed three pathways through which goats can contribute to food security: (i) consumption of goat meat (rather unimportant reason), (ii) sale of goats in times of food shortage to buy food (important reason), and (iii) exchange of a goat for agricultural labour on the crop fields (middle important reason).

Goat meat consumption was considered the least important function of goats. This relative unimportance of goat meat consumption is also found in other studies among subsistence goat keepers (e.g. Dossa et al., 2007); for many smallholders consuming goat meat would entail consuming your savings for times of need. The relatively low priority of this pathway is very different from results of other southern African countries like Zimbabwe and South Africa where goat meat consumption is ranked as most important reason for goat keeping (Rumosa Gwaze et al., 2010).

The first two pathways are well-known (e.g. FAO, 2012; Herrero et al., 2013; Smith et al., 2013), whereas the third pathway has been mentioned less frequently. Given the fact that for many people in the rural areas of Inhassoro district crop production is their main occupation and source of food production, the exchange of goats for agricultural labour could contribute to increased food production, and potentially lead to increased food security.

Another well-known pathway to increased food security is increased crop production by exploiting synergies between crops and livestock, e.g. through the use of manure and conversion of crop by-products by livestock (e.g. Bosman et al., 1997; Budisatria et al., 2008; De Vries, 2008; FAO, 2012; Herrero et al. 2013; Kosgey et al., 2008; Lebbie, 2004; Smith et al. 2013; Udo et al., 2011). Surprisingly, smallholders in Inhassoro district hardly mentioned the use of goat manure to increase crop production and feeding of crop residues, despite the central role of the *machambas* in their lives. In such a context, food security could probably be increased by improving crop-livestock integration.

## Goats as contributors to social capital

Findings showed that goats fulfill important roles in people's social life. These roles were of 'middle importance' as they were ranked in-between the other two categories—more important than consumption, but less important than sales for emergencies—like mutual assistance (helping family), honouring ancestors, and using *currandeiro's* services.

Some of these roles may be 'invisible' at first sight. 'Invisibility' in this case is broader than intangible benefits like insurance (e.g. Kosgey et al., 2008; Moll et al., 2007). It means that these functions can easily be overlooked as they are 'non-material', e.g. maintaining relationships and networks through mutual assistance, compared to more 'material' roles like sales or exchange for a concrete product. Results showed several 'non-material' functions of goats in Inhassoro district, for example by creating and maintaining linkages with ancestors through ceremonies. The importance of this function should not be underestimated, in a society—like Mozambique—where social relationships stretch beyond the living and also include deceased family members and where 'The concept of 'being' includes the dead, the living, and those yet to be born, and constitutes the basis of human existence' (UNDP, 2001: p29).

In addition, results showed that many respondents used goats 'to help family' by offering one or more goats. As such, goats play an important role in mutual assistance in times of crisis within and between families and community members. For example, mutual assistance between and within families played a large role in the restocking process, particularly in the second decade after the civil war. Marsh (2003) described that social norms of solidarity and reciprocity lay behind such practices in the sense that a family should help other families in need and likewise that family expects help from others in times of crisis. Despite the fact that Mozambique has been characterized by large changes in social and local structures over the past decades, traditional principles of reciprocity and mutual assistance still exist and form an important part of social life in rural areas in Mozambique (Gotschi et al., 2009; Mash, 2003; UNDP, 2001).

To summarize, goats are used to maintain social networks through which risks are managed. As such, one can say that people use goats to build and maintain social capital, which can be defined as 'A set of social resources or assets that yields a certain stream of benefit' (Long, 2001: p116). The reliance on social networks and importance of social capital should not be underestimated in a rural context which is prone to food shortage and natural disasters, like Mozambique (FAO, 2012; Gotschi et al., 2009; Mash, 2003; UNDP, 2001).

## Goats as commercial production commodities

Over the past years, development workers, policy makers and researchers have shown an increasing interest in linking smallholders to markets (e.g. Vorley et al., 2012). It is generally based on the idea to increase smallholders' access to markets in order to (more) frequently and regularly sell livestock, resulting in increased incomes and possibly leading to increased food security (e.g. Delgado et al., 2001; FAO, 2012). On the one hand, it seems a perfect opportunity for smallholders to gain increased incomes if they would become more commercially oriented and make goat keeping the primary focus of their livelihood strategy. Given that many smallholders sell goats in order to buy food, increased sales might contribute to increased food security. On the other hand, such approaches tend to emphasize one function of goats—as commercial production commodities—and might lose attention to other functions of goats, which also contribute to food security and risk mitigation. As such, goat commercialization projects raise a few fundamental questions in relation to multi-functionality, which will be discussed below.

The current study was based on the idea that functions of goats are socially and culturally constructed, which can change over time. Findings showed that goat functions in Inhassoro district have gradually changed over time: in colonial times—the pre-civil war period—goats were mainly kept for ceremonies, mutual assistance, and exchange for services and products, and although after the civil war many of these functions remained, another function became most important: goat sales in times of emergencies. The current study showed that smallholder goat keepers in Inhassoro district are not commercially oriented but tend to keep goats 'For family needs, rather than purely as an economic enterprise' (Kosgey et al., 2008: p20). Though over time functions of goats can change and even the definition of 'emergencies' can change; such changes usually take time and are often defined by larger social, political, and infrastructural changes (Moll and Dietvorst, 1999) and the economic developments of other (non) agricultural sectors. Hence, an interesting question remains what factors—e.g. market opportunities, improved infrastructure, other saving and insurance options or changing policies—drive a change in smallholders' perspectives towards goats—i.e. become more commercially oriented—and to what extent these factors can be influenced through development interventions.

Moreover, the possible trade-offs between increased commercialization and other—'material' as well as 'non-material'—roles of goats are unknown (Moll et al., 2007; Udo et al., 2011). Apart from the frequently mentioned trade-off between sale and home-consumption of livestock (Herrero et al., 2013), additional possible trade-offs can be identified based on the current study, for example between sale of a goat for cash and using a goat to invest in social capital. Devendra and Chantalakhana (2002:p168) for example noted that 'For rural farmers, family security is often more important than food and income'. It is also unclear if and how existing social structures of mutual assistance between and within families change if goat keeping becomes more commercially oriented.

In addition, the potential of goat commercialization for smallholders is highly context-specific, because goat functions vary by agro-ecological zone, production system and socio-cultural context (e.g. FAO, 2012; Kosgey et al., 2008). A profound understanding of the local historical and socio-cultural context is therefore a prerequisite to avoid 'naive assumptions about the aims and outcomes of their project' (Black and Watson, 2006: p279). In the specific context of Inhassoro district Mozambique, goat keeping is side-activity and goats fulfill many (other) important roles for smallholders. In such a context an interesting question is: which smallholders—and under what conditions—are able to make goat keeping the primary focus of their livelihood strategy. It might be a suitable pathway for only a minority of the goat keepers (Udo et al., 2011; Vorley et al., 2013).

Building on the latter point, smallholders cannot be considered as a homogenous group, but smallholders and their livelihoods are diverse (e.g. Dorward, 2009; Long, 2001; Vorley et al., 2013). Results of the current study showed some variation in smallholders' priority of goat keeping objectives, but due to the qualitative character of the current study it is impossible to robustly explain differences between respondents. There is a need to better understand the heterogeneity among smallholders and the roles of goats in their lives, for example by looking at gender and wealth differences. It would therefore be highly relevant to conduct a more quantitative study to better understand heterogeneity among smallholders and their goat keeping objectives. Such a study could be a first step for goat development projects to take heterogeneity into account and include different perspectives (Dorward, 2009), i.e. by explicitly identifying and subsequently targeting smallholders who are interested in more commercially oriented goat keeping.

## 7. Conclusions

The current study demonstrated that goats in rural Mozambique have multiple, intertwined roles. Although it is widely recognized that there are multiple ways in which goats can contribute to improved livelihoods, the different functions of goats are not always used to their full potential, particularly in developing communities (FAO, 2012; Lebbie, 2004). We argue that it is of utmost importance for any goat development project to recognize and understand the multi-functionality of goats for at least four reasons.

Firstly, functions of goats are highly context specific, which require a profound understanding of the local historical and socio-cultural context in order to avoid building on naive project assumptions. It requires an understanding of the meanings and importance smallholders themselves ascribe to goats and their use of goats. Though these meanings can change over time, the timeframe for such changes can be many years—if not decades—and is linked to larger social, political, infrastructural and economic changes. Secondly, some functions of goats can be ‘invisible’ at first sight, but form a crucial part of people’s social life, i.e. by building and maintaining social capital. Thirdly, the various, complex and intertwined functions of goats strongly influence development outcomes like increased food security and incomes, which unavoidably entail (unknown) trade-offs between functions. Fourthly, smallholders are no homogenous group and a better understanding is needed of heterogeneity among smallholders and their goat keeping objectives. This diversity can then be taken in to account and used more effectively to reach development outcomes.

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