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Situational analysis of smallholder goat production and marketing in Central Tanzania point towards the establishment of farmers' groups

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Small East African (SEA) goats form the largest part of the small ruminant population in Tanzania. In the view of increasing productivity of goats and improving welfare of goat keepers in the country, a participatory study was carried out to examine SEA goat keeping in two districts of Central Tanzania. The results obtained show that productivity was constrained by seasonal fluctuations of feed supplies, prevalence of diseases such as contagious caprine pleuropneumonia (CCPP), lumpy skin disease and foot-rot, and various ecto- and endo-parasites. Investment and farm income was constrained by fluctuating prices [TSh. 20,000.00 to 68,000.00 (US\$ 13 to 45) per goat]. These problems prevailed because of inadequate farmers' knowledge on improved feeding, nutritional and disease-control strategies, lack of market information and lack of power to negotiate price returns. The contribution of SEA goats to the socio-economic well-being of smallholders would be improved by strengthening local farmers' groups to facilitate the delivery of appropriate techniques of feeding, breeding and disease control.

Key words: Tanzania, goat, participatory, marketing, farmers' groups.

INTRODUCTION

Sheep and goats are important components of pastoral and agro-pastoral production systems in sub-Saharan Africa. In the mixed production systems of Tanzania local goats, comprising mostly of the Small East African (SEA) breed, play a significant role in ensuring sustainable food security for rural and urban dwellers (Chenyambuga et al., 2006). They are equally important in providing cash so as to meet various household needs, manure for healthy cropping systems and socially, goats are important in exchanges of gifts, in paying bride prices and are used for sacrifices in religious and other communal obligations (Komwihangilo et al., 2005a). The by-products

of goats such as hair and skins are also vital for livelihoods of goat keepers and other smallholder farmers. Meanwhile, the productivity of local goats is constrained by breeds and breeding practices and feeding and nutritional management issues largely emanating from inadequate knowledge of improved husbandry practices among goat farmers due to extension insufficient services and (Komwihangilo et al., 2005a). However, research institutions in Tanzania such as Sokoine University of Agriculture and the National Livestock Research Institute Mpwapwa are striving to develop appropriate feeding and disease management packages that can be passed to farmers through extension service systems that operate under governmental and private institutions including the non-governmental organizations (URT, 2006).

Under current situations where the extension services

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are challenged with shortages of financial and human resources to reach all farmers, new approaches for moving the improved crop or livestock technologies from on-station to the field are proposed (Munisi et al., 2004; Serupinda and Tavesure, 2009). These include the formation and promotion of viable farmers' groups through which extension packages related to better husbandry practices (input supplies, feeding, housing and disease management) are delivered to participating farmers (Serupinda and Tavesure, 2009). Munisi et al. (2004) have, for example, acknowledged that well organized groups such as Savings and Credit Cooperative Societies (SACCOS) are avenues for input supplies and for better price negotiations between farmers and buyers. Therefore it is good to encourage farmers to establish local goat keepers' groups/associations. where none currently exists. Through such groups farmers could get better rewards from local goats. However, for the success of these endeavors, it is important to examine prevailing situation in goat keeping for future and successful interventions. The purpose of this study was to unveil the prevailing situation related to husbandry practices of local goats kept in two districts of central Tanzania and to propose areas of intervention in order to improve productivity and incomes of goat keepers in the respective areas.

The paper discusses the importance of adhering to proper husbandry techniques and also emphasizes on the need for formation of strong goat farmers' groups or associations. These organizations could become strong avenues for facilitating technical and socio-economic interventions for improved management, for increased productivity and marketing of goats and goat products.

MATERIALS AND METHODS

Study sites and field surveys

The study was carried out in two regions of central Tanzania (Singida and Dodoma) which are the homes for good populations of sheep, goats and cattle and major producers of sorghum, millet and oilseeds (sunflower, groundnuts and simsim). Informal and formal surveys were conducted in Mpwapwa district in Dodoma region and in Manyoni district in Singida region from 21st to 25th April 2009 and from 24th May to 1st June 2010, respectively (Figure 1). The surveys were conducted to identify factors influencing both productivity of local goats (SEA) and coping mechanisms by smallholder goat farmers. Five villages in Mpwapwa district (Chunyu, Kisokwe, Lukole, Iyenge and Chamtumile) and six villages in Manyoni district (Itigi Mjini, Sanjaranda, Kitopeni, Chikuyu, Mwiboo and Mbwasa) were involved in the study. The villages were selected with the assistance of the extension workers based on presence of larger populations of goats, ease of access by roads and anticipated cooperation of participating farmers.

Group discussions

A total of 68 farmers including 51 males and 17 females participated in focused group discussion held in the selected villages (47 Mpwapwa and 21 Manyoni). These farmers were

selected by the local village leaders and the village extension workers on purposeful-random approach based on the fact that they were also responsible in keeping the local goats. The groups were composed of between 8 and 13 members with a group chairperson selected amongst the participating farmers. A member of the research team facilitated the discussion in which various aspects of local goat husbandry such as feeding, housing, disease control and marketing of the animals were discussed. Major points were noted on flip charts and contents analyzed later on.

Formal interviews

A structured questionnaire was used for formal interviews during which 167 randomly selected goat-farmers were involved including 146 males and 21 females (Table 1). The questionnaire contained questions on the purposes and benefits of keeping goats, problems and challenges in goat management and marketing, and whether there were any farmers' groups that dealt with goat keeping or any other economic ventures such as crop production. Training of the enumerators and pre-testing of the questionnaire were earlier done before the administration of the questionnaire to the larger target group.

Secondary information and observation

Secondary data on numbers of livestock available were collected from the village governments and from the District Agricultural and Livestock Development Offices (DALDOs) in the respective districts. The 'participant observation method' (Komwihangilo et al., 2007) was also used to assess the existing management practices of goats especially the housing, cleanliness, animal health and feeding that could not be captured in the questionnaire or during group discussions.

Data analysis

Using the computerized Statistical Package for Social Sciences (IBM SPSS Version 19), one hundred and sixty five questionnaires were used for analysis of data that were collected during formal interviews. However, for informal interviews and discussion instant methods were used for both collection of data and analysis.

RESULTS

Available local goats

On average, goats represented about 40% of the total ruminant population in all districts or 48.7 and 32.1 of the total ruminant population in Mpwapwa and Manyoni districts respectively (Table 2). Similarly, there were more goats than sheep in all the villages visited whereby goats varied from 67.6 to 86.4% and from 72.6 and 93.2% of the total small ruminants in the surveyed villages in Mpwapwa and Manyoni districts respectively. However, there were more cattle compared to the number of sheep and goats in all the villages. Meanwhile, the responses in relation to numbers of goats owned indicated that about 36% of the respondents owned 10 goats or less whereas 12.1% owned more than 46 goats (Table 3). Whereas, the mean value of number of goats owned in the survey

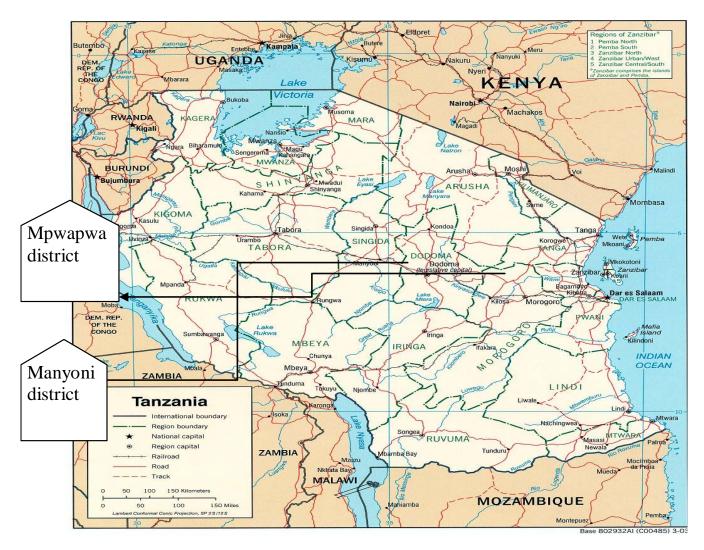


Figure 1. Map of Tanzania showing Mpwapwa and Manyoni districts.

villages was 22.47 ± 1.72 and the maximum number 140 goats, the numbers of goats reported to be owned were significantly different (P < 0.01) between male and female respondents.

Reasons for keeping local goats

There are several socio-economic reasons for keeping local goats in Central Tanzania. These included keeping the goats as buffer for food and other household requirements (such as medical supplies and clothing), cash income, manure and payment of dowry which accounted to 33, 29, 22 and 12% respectively of all the responses (Table 4).

Problems affecting goat husbandry

Problems affecting productivity of goats included

seasonal supplies of feeds whereby abundant feeds supplies were experienced during the wet season and little in the dry season. There were also rampant diseases [foot rot, lumpy skin disease and contagious caprine pleuropneumonia (CCPP)] and parasites such as ticks, lice and intestinal worms (Table 5). These challenges have resulted in coping strategies such as sending animals away from the village where they could be adequately fed or watered during the dry season. Discussion among groups and interpretation led into the identification of gaps and challenges that could be addressed when designing options for intervention. These include bridging the knowledge gap, infrastructure, costs of inputs and supplies and market information strategies (Table 5). Meanwhile, sales of goats were indicated to be very low throughout the survey areas such that about 6 goats per household were sold in 2009/2010. On the other hand, 47 and 4% of the respondents sold between 1 and 4 goats and 21 goats

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District		Мрwарwа			Many	Tatal	
Ward		Chunyu	Mazae	Kibakwe	Sanjaranda	Chikuyu	Total
Sex	Male	34	18	49	24	21	146
	Female	1	12	6	1	1	21
	Total	35	30	55	25	22	167

Source: Survey data (2009/2010).

Table 2. Number of ruminant livestock and the relative importance of goats kept in selected villages in Mpwapwa and Manyoni districts.

District	Village	Cattle	Goat	Sheep	Total ruminant population	Total small ruminants (SR)	% of goat to total ruminant population	% of goats to total SR population
	Chunyu	3,152	1,608	608	5,368	2,216	30	72.6
	Kisokwe	1,219	1,948	513	3,680	2,461	52.9	79.2
	Lukole	1,470	1,006	260	2,736	1,266	36.8	79.5
Mpwapwa	lyenge	2,330	5,137	372	7,839	5,509	65.5	93.2
	Chamtumile	687	415	45	1,147	460	36.2	90.2
	Summary of Mpwapwa District	8,858	10,114	1,798	20,770	11,912	48.7	84.9
	Itigi Mjini	3,110	717	216	4,043	933	17.7	76.8
	Sanjaranda	4,014	1,741	273	6,028	2,014	28.9	86.4
	Kitopeni	2,025	1,097	265	3,387	1,362	32.4	80.5
Manyoni	Chikuyu	808	848	481	2,137	1,329	39.7	63.8
iviariyorii	Mwiboo	2,477	1,468	702	4,647	2,170	31.6	67.6
	Mbwasa	2,055	2,120	490	4,665	2,610	45.4	81.2
	Summary of Manyoni District	14,489	7,991	2,427	24,907	10,418	32.1	76.7
	Summary of all Districts	23,347	18,105	4,225	45,677	22,330	39.6	81.1

Source: District Agricultural Development Offices (Manyoni and Mpwapwa, 2009, 2010).

and above respectively in the corresponding season (Table 6). Likewise, there were reported unstable farm gate and market prices that varied from TSh 20,000.00 to 68,000.00 per goat (US \$ 13 to 45) in surveyed areas (Table 7).

In Mpwapwa villages, farm gate prices were

lower than prices in the open market as opposed to the cases in Manyoni villages where farm gate prices were higher than prices in the open

Table 3. Responses (%) on ranges of goats owned by male and female respondents in Mpwapwa and Manyoni districts (2009/2010).

Ranges of goats owned*						Total		
	0 - 5	6 - 10	11 - 15	16 - 25	26 - 35	36 - 45	> 46	- Total
Male	12 (7.6)	32 (20.4)	14 (8.9)	39 (24.8)	15 (9.6)	5 (3.2)	19 (12.1)	136 (86.6)
Female	7 (4.5)	5 (3.2)	4 (2.5)	3 (1.9)	1 (0.6)	1 (0.6)	0	21 (13.4)
Total	19 (12.1)	37 (23.6)	18 (11.5)	42 (26.8)	16 (10.2)	6 (3.8)	19 (12.1)	157 (100.0)

^{*}Mean = 22.47; Std. error = 1.72; maximum = 140; Pearson Chi-Square value = 15.35; significance level = 0.018; Source: Survey data (2009, 2010).

Table 4. Major reasons for keeping local goats in Central Tanzania.

Major reasons of keeping goats	Percent responses (n = 165)
Cash income*	29.0
Milk	4.0
Manure	12.0
Dowry	22.0
Others (for example, food security)	33.0
Total	100.0

^{*}Sales of live goats are done within or outside the village where the goat keeper stays. Goats are then slaughtered for meat that is sold to local or other buyers. Source: Survey data (2009, 2010).

Table 5. Problems in goat production and coping strategies for increased productivity under smallholder conditions of Central Tanzania.

Major problem	Coping strategies	Further comments/interpretation*		
Seasonal supplies of feeds:	Feed to whatever is (little) available.	Little knowledge on protein, energy or mineral supplementation.		
Abundant feeds during the wet season, little in the dry season.	Shift animals to distant places	Inadequate knowledge in feed management. Little or no feed conservation practices.		
	Consult veterinary practitioners	Little knowledge on appropriate housing structures.		
Diseases and parasites: Foot rot,	Use conventional veterinary drugs	Poor diseases control strategies		
lumpy skin disease, CCPP, lice, intestinal worms.	Use of local herbs.	Lack of infrastructure (for example, dips). High cost of veterinary supplies. Little attention put in treatment and control of diseases: (knowledge).		
Breed - configuration: Small sized goats are born.	Selection of parent stock: Exchange of bigger bucks with neighbours. Request for bigger breeds.	Uncontrolled breeding: Poor selection of breeding stock. In breeding.		
Marketing: Low prices paid when selling goats.	Sell when there is a pressing need at home (for example pay for school fees, treatment of sick family members).	Lack of market information. Lack of negotiation powers.		

^{*}Some of the comments and interpretation were based on researchers' analysis of the problems discussed with farmers. However, these are based on observations made in the field and on related literature. Source: Survey data (2009, 2010).

markets. Generally, both farm gate and market prices were considered by many respondents to be too low to

allow farmers to meet many of their household obligations that require finances.

Table 6. Numbers and percentage of goats sold by individual farmers in survey villages on 2009/2010.

Number of goats	Percent (%)
1 - 4	46.8
5 – 9	31.0
10 – 14	14.3
15 – 20	4.0
21 and above	4.0
Total	100
Average number of goats per household	6.38
Total number of households	126

Source: Survey data (2009, 2010).

Table 7. Indicative prices (TShs) for sales of goats sold in Mpwapwa and Manyoni districts.

District	Village	Farm gate price TSh ('000)*	Market price TSh **('000)
Mpwapwa			
	Chunyu	38 - 65	45 – 68
	Kisokwe	40 – 55	42 – 65
	Lukole	40 – 60	45 – 65
	lyenge	40 - 58	45 – 65
	Chamtumile	30 – 60	35 – 65
Manyoni			
	Itigi Mjini	35 – 50	30 – 45
	Sanjaranda	25 – 50	20 – 50
	Kitopeni	30 – 50	20 – 35
	Chikuyu	35 – 50	30 – 35
	Mwiboo	25 – 50	20 – 35
	Mbwasa	25 – 50	20 – 45

^{*}Prices if goats are sold at home within the village; 1 US\$ = TSh 1540; **Prices if goats are sold in open markets within or outside the village. Note: The prices vary depending on size of goats and seasons of selling with relatively better prices offered during the dry season as opposed to the wet season. Source: Survey data (2009, 2010).

DISCUSSION

The importance of goats in Mpwapwa and Manyoni districts as reflected through the population of other ruminant species indicates that local goats are more important than sheep though lesser than cattle and goats play multiple socio-economic roles. This observation is in agreement with other studies conducted in Morogoro which indicated that meat, milk and manure are important in the goat production systems (Safari et al., 2008). Meanwhile, the differences in response between males and females on numbers of goats owned was an indication of the differences in gender roles played in many rural communities whereby larger and small ruminants belong to males. Likewise, the difference could be due to the tendency of many wives not to be ready to expose to strangers or visitors the exact numbers and types of assets owned in case a spouse is not around. The little number of goats sold could be attributed by the multiple roles of goats in the household as cash earning is not a primary objective of goat keeping but there are other intertwining socio-economic reasons (Komwihangilo et al., 2005a). However, sales were constrained by unstable prices in local auctions. The unpredictability of prices for goat were partly due to the fact that sales are often done to solve problems or emergencies that outcrop in the family such as shortage of food, or illnesses or when there is no other alternative of getting cash to solve these socio-economic problems. Similarly, the prices required or offered per goat sold did not consider any cost of inputs or services incurred in production (and farmers were not used to recording inputs incurred and gains accrued from goats and other farm enterprises). However, the farm gate prices reported in Mpwapwa districts were lower than that of market prices while in Manyoni it was vice versa.

Farmers in Manyoni district stated that they managed to fetch higher prices at homes because the buyers were the ones who needed the animals; thus the farmer is compelled to state the price they wanted unlike at the open markets where the seller has to compete with other sellers. In many agropastoral communities such as those of central Tanzania, it was a norm to sell animals to the open market when there was a need for solving a specific problem in the household. Thus, Mary and Majule (2009) and Monela and Abdallah (2007) advised that apart from traditional livestock keeping, diversification of income generating activities such as market oriented crop production, poultry and bee keeping enterprises was necessary. These ventures could allow farmers to meet most of the financial obligations without selling their goats at lower prices. Meanwhile, there is a need for addressing prevailing problems of seasonal feed fluctuations, prevalence of ecto- and endo-parasites and frequent disease outbreaks so as to make sure that productivity of local goat and that of other livestock types improves. Most of these problems, however, are mostly due to inadequate knowledge in improved animal husbandry practices (Komwihangilo et al., 2005a). Thus, there is a need of organizing formal and informal farmers' training sessions on proper feeding that include feed formulation for proper protein, energy and mineral supplementations. It is also essential to address issues of pasture and fodder development so as to have adequate feeds for improved production. Similarly, the promotion of the use of conventional and non conventional feed sources such as trees and shrubs, grain and legume crop residues and other locally available feed resources is equally essential. These will minimize problems of scarcity of feeds that is often encountered during the dry season and improve availability of nutrients supply to the animals that is deficient in the naturally available supplies (Doto et al., 2004; Komwihangilo et al., 2005b).

Approaches associated with farmers' training can be conducted through local goat farmers' groups which are non existent in central and other parts of Tanzania. Groups such as those involving Livestock Farmers' Field Schools (LFFS) can be initiated in construction of good housing structures, conservation and formulations of supplementary rations and in disease control. The LFFS have been tried and proved to be successful in Vietnam (Dalsgaard et al., 2005). On the other hand, Serupinda and Tavesure (2009) reported that mobilization and training on entrepreneurship issues among goat farmers' groups in Zimbabwe allowed participants to fetch good prices at goat auctions. Generally, farmers' groups are the major channel for development of skills, knowledge and information dissemination on production, marketing, financial literacy and investment (Liheta, 2005).

Conclusion

The keeping of local goats among smallholder farmers in

Central Tanzania is constrained by seasonal availability of feeds associated with poor feeding and nutritional management, prevalence of preventable diseases and inappropriate breeding practices. There also exist poor marketing structures that normally force the farmers to dispose their animals at lower and unattractive prices. Meanwhile, more organized husbandry practices and market oriented goat management practices need to be advocated through farmers' education and extension services that is delivered by government and other change agents. In such initiatives, formations of strong farmers groups or associations are also appropriate as these will be excellent avenues for availing appropriate extension packages that will improve feeding, breeding and disease control strategies. The farmers' groups will also be opportunities for better price negotiations through which goats and goat products will be sold at attractive and more rewarding prices. However, the impact of all these plans that will be initiated in the study or similar areas need also to be evaluated before more conclusive remarks on such approaches are given.

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Prod. 31:27-31. Safari J, Mtenga LA, Eik LO, Sundstøl F, Johnsen FH (2008). Analysis of three goat production systems and their contribution to food security in semiarid areas of Morogoro, Tanzania. Liv. Res. For. Rural Dev., 20(5). Serupinda D. Tavesure F (2009). Goat auctions opening market opportunities for smallholder farmers in Western Zimbabwe. URT (2006). United Republic of Tanzania. National Livestock Policy. Ministry of Livestock Development, Dar es Salaam. pp 53 - 58.	 To generate income. For meat production. For milk. For manure. To be able to pay dowry. Others (specify) Are you (or a member of your household) a member or any group involved in these activities? 			
Appendix 1: Questionnaire used in the study: Strengthening organizational capacity and bargaining				
power of goat farmers in Central Tanzania	1 = Yes: in crop production; 2 = Yes: in livestock production; 3 = No			
CROSS-SECTIONAL SURVEYS: INDIVIDUALS	4.1) If yes, please elaborate			
Date 1) Enumerator's name	4.2) If yes, is it registered? 1 = Yes; 2 = No			
2) Decreadant's name	4.2.1) If yes, how many members are there in the group?			
2) Respondent's name	Men 2 Womer			
3) Sex:	or			
4) Region 1 = Dodoma; 2 = Singida.	4.2.2) What are other conditions for membership?			
5) District 1= Mpwapwa; 2 = Manyoni.				
6) VillageWard	4.2.3) If yes, what specific activities does the group do?1)			
A) GENERAL	2)			
1) Position in the house hold;	3)			
1) Household head.				
2) Head of spouse. 3) Brother.	4)			
4) Sister.				
5) Son. 6) Daughter.	4.2.4) Is there any advantage of working in a group?			
7) Others (specify).				
2) What kind (and number) of livestock do you keep? (How many)	4.2.5) What are the problems/challenges that you face as a group/association?			

1)

1 = Goats2 = Sheep3 = Cattle 4 = Pigs

2)	7) How many goats did you sell last year? (March 2008 to March 2009)
3)	8) Did you get any problem in selling goats? 1 = Yes; 2 = No.
B) PROBLEMS IN GOAT KEEPING	9) If yes, what problems did you face
5) As an individual farmers/livestock keeper, do you get any problem in managing your goats? 1 = Yes; 2 = No.	10) What are your views towards alleviating such problems?
6) If yes, what kind of problems do you face? 1)	NB: To the enumerator:
2)	 Please thank the respondent for his time and cooperation. Make sure that all the questions are answered.

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(If there is any disease, please specify the kind of diseases encountered)

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