

## ROLE OF GOATS IN FOOD SECURITY, POVERTY ALLEVIATION AND PROSPERITY WITH SPECIAL REFERENCE TO SUB-SAHARAN AFRICA : A REVIEW

J.W. Ngambi, O.J. Alabi and D. Norris

Department of Agricultural Economics and Animal Production,  
University of Limpopo, Private Bag X1106, Sovenga, 072, South Africa

Received: 15-05-2012

Accepted: 16-10-2012

### ABSTRACT

The paper focuses on the potential for goats to reduce poverty in Sub-Saharan Africa. It offers information on the present status of goat populations and their productivity. The current systems of production are described. The social and economic roles played by goats in food security and income generation are considered. The potential of goats in food production is discussed in terms of productivity, economic importance and potential for increasing food production in Sub-Saharan Africa. The rising demand for animal products from increasingly wealthy urban elites also offers a tremendous opportunity for goat farmers to share in the growing wealth of urban centres.

**Key words:** Breed, Goat production, Role of goats, Sub-Saharan Africa.

Goats have been economically, nutritionally and culturally very important to mankind for over 7000 years (Aziz, 2010). While goats were originally domesticated in southwest Asia however they moved quickly into Africa and now can be found in every environment on the continent. Goats are deeply embedded in almost every African culture and are true friends to the rural people of Sub-Saharan Africa in particular (Peacock, 1996). The size of goats makes them ideal animals for families with little capital investment in building and other materials required for their upkeep. Also, space and maintenance requirements are low. They have short generation interval and high reproductive efficiency; therefore of considerable economic importance, particularly for resource-poor farmers and women, who often own and manage them (ILRI/ILAD, 2001). However, while the widespread cultural acceptance of goats and goat products forms a sound basis for development there are many physical, economic, social and political constraints to development of goat rearing in Sub-Saharan Africa. This paper focuses on the unique role and potential of goats in Sub-Saharan Africa to improve the livelihood of the people.

### Goat breeds and their uses in sub-saharan Africa

There are a number of goat breeds in Sub-Saharan Africa. These can be grouped into meat,

milk and hair goats (Table 1). Goats are generally kept for their milk, meat, hair (mohair, cashmere) and skins. However, goats provide their owners with a broad range of products and socio-economic services and have played an important role in the social life of African people, in terms of being used as gifts, dowry and offered as sacrifice in religious rituals and rites (Peacock, 1996). Goats may also be used for controlling bush encroachment. There is, also, a potential for obtaining additional income by value-adding operations including the manufacture of goat leather products such as handbags, slippers and key chains and goat meat products such as spiced meat cuts, and milk products such as yoghurt, cheese and sour milk (FARM-Africa, 2004; Peacock, 1996).

### Goat production statistics

Accurate statistics are required to determine the future outlook of the goat populations and their productivity. They are also needed before any improvement policies can be planned on a realistic basis and implemented with confidence. However, in many Sub-Saharan countries there are no accurate goat statistics in terms of numbers and production values. This is particularly so in rural areas of these countries where goats and their products are consumed within the households and hence not recorded. Table 2 presents numbers of

TABLE 1: Some common goat breeds in Sub-Saharan Africa (Peacock, 1996).

Breed name	Characteristics	Main function
Alpine	From Swit-zerland	Mainly for milk pro-duction
Saanen	From Swit-zerland	Mainly milk production
Toggenburg	From Swit-zerland	Mainly milk production
Boer	From South Africa	Mainly meat production
Galla	From Kenya	Mainly meat production
Angora	Origin: Ankara in Turkey	Mainly Mohair production
Pedi goat	From South Africa	Mainly meat production
Pygmy goat	From DR Congo	Mainly meat production

goat populations in different parts of the world (FAO, 2011). The world total number of goats was 861.9 million. There are tremendous variations among the different parts of the world regarding the number of goats. The largest number of goats is observed in Asia, followed by Africa, representing about 59.7% and 33.8% of the total number of the world, respectively. The top ten countries have approximately 65.7% of the world total number. Seven countries of this list are in Asia, and the rest are in Africa. The largest number of goats in the world is in China, followed by India, Pakistan and Bangladesh, all of them are in Asia. The number of goats in these four countries constitutes about 45% of the world total. The number of goats in the world has been increasing since 1990 by about 1 to 4% each year (FAO, 2011).

Dairy goats produce about 15.2 million metric tons of milk per year, accounting for about 2% of the world total amount of milk produced by livestock species. The developing countries produce approximately 83% of the total amount. In Europe, goat breeding is strongly oriented towards milk production, with only 3% of the world goat population producing about 15% of the world's goat milk, which is mostly used for cheese production

TABLE 2: Goat numbers in the top ten countries of the world (FAO, 2011).

Country	Number (millions)
China	149.4
India	125.7
Pakistan	56.7
Bangladesh	56.4
Nigeria	53.8
Sudan	43.1
Iran	25.3
Ethiopia	21.8
Mongolia	20.0
Indonesia	15.8
World total	861.9

(FAO, 2011). Table 3 shows the amount of goat milk produced by the top ten countries in the world, along with the total number of dairy does and the average milk produced per doe (FAO, 2011). The largest amount of goat milk is produced in India, followed by Bangladesh and Sudan. There are three European countries in the list producing a considerable amount of goat milk: Spain, France and Greece. These three countries produce similar amounts of goat milk. In France, interest in dairy goats has led to the establishment of organized programs for selection, processing and commercialization of goat milk, which is produced mainly from Saanen and Alpine breeds of goats. France leads the list in terms of the annual milk production per dairy doe, while Iran reports the lowest milk production per dairy doe. China has the largest total number of goats in the world, but they are mainly kept for meat production. Milk production per dairy doe ranks third, behind France and Spain. China officially reports 1.4 million dairy goats producing 0.3 million metric tonnes of milk (FAO, 2011). The dairy goat industry has great potential for further growth. It has grown partly because of a trend towards self-sufficiency by rural people, especially in developing countries, where goat milk can help to improve the nutrition of millions of people. In developing countries, much of the milk produced by goats is for family consumption, but goat milk can also be further processed into a variety of marketable products. In Sub-Saharan Africa marketing of goat milk and its products is still in its infancy. Less than 5% of the total milk produced by goats is marketed (Aziz, 2010; FAO, 2011).

Goat meat is widely consumed in the developing countries. According to FAO (2011), total meat inventory is about 280 million metric tonnes. Goat meat represents only 2% of this total. The total amount of goat meat produced in 2008 was 4.9

**TABLE 3:** The number of dairy goats and amount of milk produced in the top ten countries of the world (Aziz, 2010).

Country	Number of dairy goats (million)	Goat Milk production (million ton/year)	Milk produced/dairy doe (kg)
India	30.2	4.0	132.5
Bangladesh	27.1	2.2	80.0
Sudan	-	1.5	-
Pakistan	4.9	0.7	141.9
Spain	1.4	0.6	422.3
France	0.8	0.6	703.8
Greece	4.1	0.5	123.9
Iran	13.7	0.4	29.9
Somalia	6.6	0.4	59.7
China	1.4	0.3	194.8

million metric tonnes. The developing countries produced approximately 97% of this amount, reflecting the importance of goat meat in feeding millions of people in these countries. The top ten countries producing goat meat are presented in Table 4. China leads the world in producing goat meat, accounting for 38% of the world total goat meat produced. The top ten countries producing goat meat are all from Asia and Africa, indicating the importance of goat meat to the people living in these areas. Goat meat production has been increasing from 2.65 million metric tonnes in 1990 to 4.93 million metric tonnes in 2008. The major part of this amount is not traded as other major types of meat, like beef, mutton, etc. It is usually produced and consumed within the households or locally among the communities in the developing countries (ILCA, 1980; Peacock, 1996). There are several challenges associated with increasing goat meat production including poor consumer education, poor goat husbandry skills, lack of slaughter houses and processing plants and lack of organized breeding programs, markets and marketing channels (Aziz,

2010; ILCA, 1980). A profitable goat meat business can be ensured by proper knowledge of goat husbandry, budgeting and marketing techniques. There are several challenges associated with increasing meat production including consumer education, producer education, lack of slaughter and processing plants and lack of organized breeding programs and markets and marketing channels (Aziz, 2010; ILCA, 1980).

Records show that a number of southern African countries have sizable population goats (Table 5). Tanzania has the largest number of goats, followed by South Africa and Mozambique. It is only in South Africa where goat production is highly commercialized (FAO, 2011).

### Goat production systems and current trends

Goats are kept in a wide range of agro-ecological zones and management systems in Sub-Saharan Africa (Peacock, 1996). These systems are never static but are constantly evolving with changing internal and external circumstances. The major goat production systems are as stated below.

**TABLE 4:** The number of goats slaughtered, total meat and average meat produced per animal by the top ten countries of the world (Aziz, 2010).

Country	Number of animals slaughtered (million)	Total meat (million ton)	Average meat produced per animal (kg)
China	133.3	1.8	13.7
India	47.8	0.5	10.0
Nigeria	21.3	0.3	12.7
Pakistan	15.4	0.3	17.0
Bangladesh	30.0	0.2	7.0
Sudan	14.5	0.2	13.0
Iran	7.6	0.1	14.0
Indonesia	6.6	0.1	10.0
Ethiopia	7.6	0.1	8.5
Niger	4.4	0.1	12.0

TABLE 5: Goat statistics in some southern African countries (FAO, 2011).

Country	Year			
	2006	2007	2008	2009
Angola	2,250,000	2,432,160	2,477,631	2,500,000
Botswana	1,950,000	1,960,000	1,980,000	-
Lesotho	879,278	879,278	916,673	1,009,297
Malawi	2,301,349	2,720,126	3,106,271	-
Mozambique	4,254,896	4,394,628	4,324,761	-
Namibia	2,061,403	2,100,000	2,100,000	2,100,000
South Africa	6,399,859	6,265,380	6,529,328	6,357,838
Tanzania	12,550,000	12,550,000	12,550,000	-
Zambia	1,950,000	2,000,000	2,000,000	-
Zimbabwe	3,120,000	3,320,000	3,100,000	-

### i.) Pastoral systems (arid and semi-arid areas) and agro-pastoral systems (semi-arid)

Goats are kept by nearly all pastoralists in Africa, often in mixed flocks with sheep. Children normally herd goats, while their day-to-day management and the care of young stock usually fall to women. Droughts appear to be increasing in frequency and many pastoralists are moving away from keeping cattle to keeping camels, e.g. the Samburu in Kenya. There is also a trend towards keeping more small ruminants as a proportion of livestock holdings than large ruminants, e.g. the Masai in Kenya and Afar in Ethiopia. There are many reasons for this. Goats are relatively cheap to acquire and reproduce quickly enabling pastoralists to use them as a means to acquire other animals like cattle. With increasing frequency of droughts, pastoral families are unable to keep large animals. Thus, pastoralists are increasingly realizing that they need to rely more on goats.

### ii.) Mixed farming (humid, sub-humid and highlands)

Goats are kept in small herds on mixed farms all over Sub-Saharan Africa, from the humid coastal

zones in West Africa to the highlands of Ethiopia. They may be allowed to graze freely during the day on communal pastures, or seasonally on fallow cropland. However, the increasing population pressure is limiting free grazing and goats are being tethered, or housed, more and more. As a result feeding and fodder production is becoming more important (Peacock, 1996; Silanikove, 2000). The widespread decline in support services previously supplied by government extension systems, e.g. veterinary services and AI, is encouraging farmers to move away from keeping a small number of large ruminants to a larger number of less risky goats. This switch from large to small ruminants is also driven by the decreasing farm size with each generation inheriting land (Aziz, 2010; Peacock, 1996).

### iii.) Commercial systems

There are very few large-scale commercial goat farms in Africa with the majority of them found in South Africa. Several countries, e.g. Kenya, have a small number of commercial dairy goat farms supplying urban markets, or goat ranches, e.g.

TABLE 6: Mean goat production parameters of pastoral systems in sub-Saharan Africa by agro-ecological zone (Aziz, 2010)

Parameter	Arid		Semi-arid	
Kid mortality risk (%)	27.4	(12) <sup>1</sup>	33.1	(8)
Female replacement mortality risk (%)	11.7	(3)	15.0	(1)
Male replacement mortality risk (%)	10.0	(2)	15.0	(1)
Doe mortality risk (%)	16.2	(5)	12.4	(5)
Age at first kidding (months)	15.9	(2)	16.6	(9)
Kidding rate (%)	106.5	(5)	111.0	(9)
Prolificacy	1.22	(5)	1.22	(7)
Off take rate (%)	30.2	(2)	17.2	(2)
Weight of mature does (kg)	26.9	(4)	27.4	(5)
Weight of mature bucks (kg)	36.1	(4)	35.9	(6)

<sup>1</sup> Numbers in brackets represent number of studies.

TABLE 7: Mean goat production parameters in mixed systems of Sub-Saharan Africa by agro-ecological zone (Aziz, 2010)

Parameter	Semi-arid		Sub-Humid		Humid		Highland	
Kid mortality risk (%)	28.3	(21) <sup>1</sup>	28.0	(17)	28.6	(12)	19.3	(7)
Female replacement mortality risk (%)	10.8	(7)	12.8	(4)	17.2	(4)	9.3	(2)
Male replacement mortality risk (%)	10.8	(7)	12.3	(3)	22.4	(4)	10.3	(2)
Doe mortality risk (%)	10.0	(9)	13.6	(6)	13.8	(9)	6.5	(4)
Age at first kidding (months)	17.5	(19)	15.5	(6)	13.5	(4)	14.5	(2)
Kidding rate (%)	126.2	(11)	121.3	(9)	133.6	(9)	120.1	(5)
Prolificacy (kids/doe)	1.26	(25)	1.38	(12)	1.52	(16)	1.34	(7)
Off take rate (%)	16.7	(6)	20.1	(4)	26.5	(5)	-	-
Weight of mature does (kg)	29.7	(14)	25.6	(14)	25.0	(3)	31.8	(4)
Weight of mature bucks (kg)	30.4	(5)	29.2	(10)	30.0	(1)	30.0	(1)

<sup>1</sup> Numbers in brackets represent number of studies.

Uganda, supplying the meat market (Aziz, 2010; ILCA, 1980; Peacock, 1996).

### Goat production parameters in sub-saharan Africa

The production parameters of goats in the traditional system are presented in Tables 6 and 7 (Aziz, 2010). Traditional goat production systems in Sub-Saharan Africa are characterized by high mortality risks, especially for kids with a mean of 29 % and a very wide range of reported values from 2.5 to 53.2 %. The mean kid mortality risks in pastoral systems (29.7 %) and in mixed systems (27.2 %) systems are not only high but also similar. The median kid mortality risks range from 15.6 percent in highland mixed systems to 34 percent in the semi-arid pastoral systems. Although kid mortality risks are similar across different systems, within East Africa they are different between pastoral systems

(29.3 %) and mixed systems (21.9 %). The mortality risks for replacement stock in the traditional systems are high, 12.6 and 13.6 percent for female and male replacement goats, respectively. Adult mortality risks are also high, with a median of 12 percent and a wide range of 5 to 33.0 percent. It is worth noting that in general the mortality risks are similar between pastoral and mixed systems, with the exception of East Africa, where female replacement and doe mortality risks are significantly lower in mixed than in pastoral systems - i.e. 8.8 percent versus 15 percent for female replacements and 7.6 percent versus 15.3 percent for does. The age at first kidding in pastoral systems is 16.5 months, which is essentially the same as that in mixed systems (16.4 months). The mean reported kidding rate in traditional systems is 121.1 percent, with a median of 116.2 percent and a wide range of 73.3 to 208 percent. Mean kidding rate in pastoral systems (109.4 percent) is lower than in mixed systems (126 percent). Mean prolificacy is

TABLE 8: Ranges of products and socio-economic services from goats (Peacock, 1996).

List of Products	List of Services
Meat (raw, cooked, blood, soup)	Cash income
Milk (fresh, sour, yoghurt, butter, cheese)	Security
Skins (clothes, water/grain containers, tents, thongs, etc.)	Gifts
Hair (cashmere, mohair, coarse hair tents, wigs, fish lures)	Loans
Horns	Religious rituals
Bones	Judicial role
Manure (crops, fish)	Pleasure
	Pack transport
	Draught power
	Medicine
	Control of bush encroachment
	Guiding sheep

1.34, ranging from 1.02 to 1.83. Reported prolificacy of goats in pastoral systems (1.22) is significantly lower than in mixed systems (1.36). The means of the reported weights of does and bucks are 27.8 kg (median 27.2 kg and range of 17.2 kg to 43.7 kg) and 32.0 kg (median 30.0 kg and range of 19.4 kg to 47.0 kg), respectively. The mean weights of does in pastoral systems (27.1 kg) and in mixed systems (27.8 kg) are similar, while the mean weights of bucks reported in pastoral systems (36.9 kg) are higher than in mixed systems (29.5 kg). The mean off-take rate for goats is 21.4 percent, with wide range of 13.4 to 34 percent. The mean off-take rate for goats in pastoral systems (23.7 percent) is slightly higher than in mixed systems (21.9 percent).

### **Constraints limiting goat production**

One difficulty related to goat development programmes is the association of goat production with poverty. It was Gandhi who is reputed to have called the goat 'the poor woman's cow'. In general, people do not want to be associated with poverty. Many people will not admit that their goats are milked, believing it to be a sign of poverty and something to be ashamed of (Peacock, 1996). Studies on goats have been less numerous than on cattle, and hence major production constraints are less well known. However, nutritional problems in goats appear to be less acute than in cattle (Aziz, 2010). Theft, predation and poor hygiene appear to be the most important problems limiting goat production. Lack of understanding of economic and social values of goats by developers and scientists undoubtedly restrict goat production, and educational programs to overcome this could be of great benefit to goat farmers. In some mixed farm areas, goats are confined in the homesteads as a protection from predators and theft. This decreases the use of fallow lands several kilometres away from the farm and imposes heavy pressure on the feed resources produced in the immediate vicinity (Aziz, 2010). Sizeable areas of grazing lands in Africa are not used for the production of goats (Peacock, 1996).

In order to improve production, it is important that goat producers have access to reliable and affordable support services offering them access to knowledge and inputs, including credit and other financial services. Historically, in many developing countries, government extension and veterinary

departments had provided services to livestock farmers. These services were frequently subsidized, to some extent, and were often concentrated in the higher potential districts, leaving marginalized livestock farmers, such as pastoralists or the landless, under-served. The public sector reforms of the 1990s have led many of these public services to be cut back and in some cases withdrawn altogether. While the private sector has emerged, in some countries, to fill the gap they typically provide services to wealthier livestock farmers, such as dairy farmers, commercial poultry and pig farmers, leaving the poor even more marginalized from these vital services (Peacock, 1996; FARM-Africa, 2004).

Goat production is mainly found in the subsistence sector in most of Sub-Saharan Africa. In this sector feed availability and quality are of major constraint to livestock production because of their almost complete dependency on rain-fed natural range. Browse is, thus an important feed resource as it maintains a high nutritive value throughout the year. However, some browse species may contain anti-nutritional factors that reduce intake and digestibility and may be toxic (Silanikove *et al.*, 1997).

The majority goats in the Sub-Saharan Africa are based in communal lands. It is difficult to develop or improve communal rangelands. Thus, goat development in these areas is hampered by the system of land tenure (Aziz, 2010; Peacock, 1996)

### **Preference of goats over other livestock**

Being relatively tolerant to drought, goats can survive on woody browse and infrequent watering. Their fast reproduction rate enables their owners to recover quickly, following a drought. Goats, being small, can be carried or moved easily if a family is forced to flee their home. For example, many goats were trekked to safety during the fighting in Rwanda and goats were saved on makeshift floats during the floods in Mozambique (Aziz, 2010). Silanikove (2000) reported the adaptability of goat to harsh agro-ecological zones under desert and tropical environments. Goats have wide adaptation to harsh environments through several unique attributes such as the ability to eat diets composed of tree leaves and shrubs, high digestive efficiency for coarse roughages, water metabolism and relative disease resistance (Peacock, 1996; Silanikove *et al.*, 1997).

They also provide for food security and survival, thus making a significant but underestimated socio-economic contribution (Anteneh *et al.*, 1998).

Substituting goats for cows in milk production can increase the goat contribution to animal production, particularly with the small-scale subsistence farmers. Better use can be made of scarce resources in developing areas because of potential higher fertility of goats and higher feed conversion in relation to body mass for meat and milk production (Peacock, 1996). Compared to cattle, goats produce more milk on less food and are not adversely affected by declining veld conditions (Silanikove, 2000). Dairy goats are more appropriate to the needs of subsistence production and their use would be in harmony with the concept of the household economy (Aziz, 2010). Goats are cheaper, require less food, produce appropriate quantities of milk, breed at a young age, have multiple births and are more easily handled than dairy cattle (Aziz, 2010; FARM-Africa, 2004). Overgrazing, resulting in loss of grass cover and invasion by bushy species, also makes rangelands increasingly suitable for browsing animal species like goats (Silanikove *et al.*, 1997).

### **Criticisms of goat production**

False perceptions (environmental degradation, desertification, etc.) are the major beliefs of people to rule against goat production. In some African countries for example Zambia, there is an official biasness against goats as destroyers of vegetation. Because of this prejudice, efforts to exploit the full potential of this animal have been generally minimal compared to efforts in sheep and cattle (Aziz, 2010; FARM-Africa, 2004). Nonetheless, the criticism of goat against overgrazing and natural resource degradation it is pertinent to note that research in continuous and rotational grazing, stocking rate and animal ratio under rangeland conditions concluded that stocking rate had more effect on production and that sheep had greater potential for range degradation than cattle or goat (Peacock, 1996)

### **Socio-economic importance of goats in sub-saharan Africa**

The contribution of goats to the national economy is universally underestimated because of the largely informal, mostly untaxed, nature of most

goat and goat product marketing (Peacock, 1996). However, it is universally recognized that goats play important socio-economic roles among the people of Sub-Saharan Africa, particularly those in rural areas (FAO, 2011)

#### **i.) The social and economic roles of goats in Sub-Saharan Africa**

Goats provide their owners with a broad range of products and socio-economic services, which are summarised in Table 8. The economic and nutritional importance of each of the products varies between regions in Sub-Saharan Africa. Thus, goats play important roles in the social life of many Sub-Saharan African people (Peacock, 1996). Thus, the social and economic importance of goats to communal farmers makes them vehicles of rural development in Sub-Saharan Africa.

#### **ii.) Role of goats in food security**

Goats play multiple roles in communities' livelihoods. They provide immediate benefits in the form of milk and meat, fibre, hide and skins and cash (Peacock, 1996). They also improve farm productivity through their manure and draught power (Seré, 2004). In addition, there is no religion that prohibits the consumption of goat meat (Neumann *et al.*, 2003). Thus, goats play a vital role in ensuring the food security of a household often being the only asset possessed by a resource-poor household (Seré, 2004). Animal protein is essential in human nutrition. Neumann *et al.* (2003) observed that the addition of small amounts of meat or milk to a typical diet of primary school children in Kenya improved their performance in school, improved results of their cognitive ability tests and activity levels. It, also, reduced the problem of stunted growth. Goats have also taken on a more prominent role in storing food in the form of meat and moving across space and through seasons (Nori *et al.*, 2000). Goats, thus, convert unconventional feedstuffs unsuitable for human beings into high-value nutritious human food. In times of trouble, such as crop failure or family illness, goats can be sold and food or medicine purchased. This is a vital role in ensuring the security of family members (Aziz, 2010). It is now well known the vital role small quantities of animal products can play in healthy child development as well as in adult health (Engh *et al.*, 2000). Thus, goat development programmes can

have a very positive impact on certain key micronutrient deficiencies among a population (Peacock, 1996).

### iii.) Role of goats in times of crises

Crises can take many forms in Sub-Saharan Africa. Droughts are common and even floods can also devastate lives as can civil wars. Families frequently have to face their own crises due to accident or illness, increasingly from HIV/AIDS, without the benefit of a formal welfare system. Goats play vital roles in supporting families through all these situations (Engh *et al.*, 2000).

### iv.) Importance of goats in HIV/AIDS affected households

The impact of HIV/AIDS is now widely felt all over Africa and has reduced the active workforce in all sectors, including goat farming. It has also been reported that the remaining population's ability to work has been curtailed by attendance at funerals and necessary mourning rituals; in some cases by as much as 25% of their time (Engh *et al.*, 2000). Goats have an important role in supporting families through the crisis of HIV/AIDS and have been used to pay hospital bills, funerals and other related costs. Goat's milk has been found to be highly beneficial to HIV/AIDS-affected patients (Engh *et al.*, 2000).

### v.) Potential for specialization

As crop yields plateau and the price of many cash crops stagnate or fall, the intensification of livestock production is a viable option to increase household incomes. New more specialized systems of goat production are developing in response to increased market opportunities. The growing demand for goat meat from city residents presents an opportunity for goat fattening systems, as well as improved marketing from pastoral flocks. Niche markets for goat milk and milk products also exist in many Sub-Saharan African countries. The potential for goat meat export, particularly to Middle Eastern markets remains under-exploited (FARM -Africa, 2004).

A paper at the International Conference on goats in 1992 described how the leather industry had been developed in India to become the fourth largest export industry within a period of about 10 years. Most of the skins used were from goats and

had been previously thrown away (Peacock, 1996). Although Sub-Saharan Africa has fewer goats than India, the potential for developing small-scale leatherwork is very great. Goats are readily slaughtered in the informal sector and it is here that large quantities of skins are still going to waste probably more than a million a year. Attention needs to be given to the promotion of correct skinning, preservation and storage of skins as well as an effective collection system.

**Potential for increased goat production:** Several historical perceptions, marketing systems and institutions that governed the goat industry in the past and constrained its development are of little consequence today. There are several goat development strategies that can be adopted. These include increasing ownership of goats through credit programmes (FARM-Africa, 2004). It also includes increasing productivity through management and breeding improvements and adding value to goat products. Links to domestic and international markets must be improved. Very often there must be provision of credit to acquire goats or new breeds of goats resulting in a change of some kind and appropriate services (breeding, feeding, forage seeds, veterinary services milk processing etc.) must be available (ILCA, 1980). An increasingly developed market orientation including adding value through processing must be available and there must be farmer participation, representation and organizations. Government must play an effective facilitating role with supportive legislation and investment in rural infrastructure by increasing involvement of the private sector. Developing goat potential will require a coordinated and multi-functional approach where subject matter specialists work together as a team.

## CONCLUSION

Goats are economically, nutritionally and culturally very important in Sub-Saharan Africa. The rising demand for animal products, from increasingly wealthy urban elites, offers a tremendous opportunity for goat farmers to share in the growing wealth of urban centres. The potential for this is there. It requires Governments of the areas to exploit.



## REFERENCES

- Anteneh, A., Sandford, S. and Anteneh, B. (1998). Policy, finance and technology in livestock development in sub-Saharan Africa: Some critical issues. *ILCA Bulletin* 31:2-13. [ILCA (International Livestock Centre for Africa)], Addis Ababa, Ethiopia
- Aziz, M.A. (2010). Present status of the world goat populations and their productivity. *Lohmann Information* **45**(2): 42-52.
- Engh, I., Stloukal, L. and DeGuerny, L. (2000). HIV/AIDS in Namibia: The Impact on the Livestock Sector. FAO, Rome.
- FAO (2011). Online Statistical Database. Food and Agriculture Organization of the United Nations (FAO), Rome.
- FARM-Africa (2004). Reaching the Poor: A Call to Action Investment in Smallholder Agriculture in Sub-Saharan Africa. FARM-Africa, London.
- ILCA (1980). Economic Trends: Small Ruminants. *ILCA Bulletin* 7. ILCA, Addis Ababa, Ethiopia.
- ILRI/ILAD (2001). Assessment of the diversity of sheep and goat generic resources of Sub-Saharan Africa. In: Search Research Database Project Record. NRE 9800 832633/003.
- Nori M., Taylor M. and Sensi A. (2008). Browsing on fences: pastoral land rights, livelihoods and adaptation of climate change. *HED Drylands Series #148*, London. <http://www.iiied.org/pubs/display.php?o=12543IIED>.
- Neumann C.G., Bwibo N.O., Murphy S.P., Sigman M., Whaley S., Allen L.H., Guthrie D., Weiss R.E. and Demment M.W. (2003). Animal source food improves dietary quality, micronutrient status, growth and cognitive function of Kenyan school children: Background, study, design and baseline findings. Supplement: Animal Source Foods to Improve Micronutrient Nutrition in Developing Countries. *Journal of Nutrition* **133**:3941S-3949S
- Peacock, C.P. (1996). Improving Goat Production in the Tropics. A Manual for Development Workers. FARM-Africa/Oxfam, Oxford.
- Seré C. (2004). Raising livestock production in Africa. In: Implementing Action in Key Areas: Raising Agricultural Productivity, Assuring Food and Nutrition Security in Africa by 2020: Prioritizing Action, Strengthening Actors, and Facilitating Partnerships. April 1.3, 2004, Kampala, Uganda.
- Silanikove, N. (2000). The physiological basis of adaptation in goats to harsh environment. *Small Ruminant Res.* **35**: 181-193.
- Silanikove, N., Gilbao, A., Nitsan, Z and Perevolotsky, A. (1997). Effect of foliage-tannins on feeding in goats. *Options Mediterraneennes* **34**: 43-45.