

LOCAL KNOWLEDGE AND GENDER ROLES IN DIFFERENT LIVESTOCK PRODUCTION SYSTEMS IN TANZANIA.

¹Maeda-Machang'u, A. D., ²Mutayoba, S., ²Laswai, G.H., ³Mwaseba, D., ²Kimambo, E. and ⁴Lazaro, E.

¹Department of Veterinary Microbiology and Parasitology, Faculty of Veterinary Medicine, Sokoine University of Agriculture, P. O. Box 3016 Morogoro.

²Department of Animal Science and Production, Faculty of Agriculture, Sokoine University of Agriculture, P. O. Box 3016 Morogoro.

³Department of Agricultural Education and Extension, Faculty of Agriculture, Sokoine University of Agriculture, P. O. Box 3002 Morogoro.

⁴Department of Agricultural Economics and Agribusiness, Faculty of Agriculture, Sokoine University of Agriculture, P. O. Box 3007 Morogoro.

ABSTRACT

Women and men participation in the development of the livestock industry in Tanzania is determined by socio-cultural patterns, the livestock production system, local knowledge systems, existing agricultural policies, the educational system and economic and the political situations prevailing in the community. It is difficult to generalise the gender roles in all the livestock production systems, but similar patterns and trends have been unfolding as found out from several studies carried out by the authors. The main points investigated are who owns the animals, who is responsible for their care and how is work divided up and shared out (feeding, watering, milking, stable cleaning and hygienic measures). Other aspects of interest are decision-making, treating and caring of the sick animals, processing and marketing of animal products, the control of family income and assets and access to services such as veterinary, extension, co-operatives and credit facilities. The livestock production studies were conducted in Morogoro, Tanga, Iringa, Mwanza, Mbeya, Mara and Kilimanjaro regions. Districts in these regions were purposely chosen to represent one type production system such as pastoralism, agro-pastoralism and intensive specialized production. The general trend deduced from literature and studies carried out by the authors is that men in all livestock production systems own and are responsible for large animals such as cattle, donkey, sheep, pigs and goats whereas, women are responsible for small ones such as poultry, rabbits and ducks. However, in some systems women feed the large animals and calves, and are called to assist in their health-related issues. Poultry production although very important for women as a source of food and cash, has a very low status in the society and extension services rendered. The pastoralists and agro-pastoralists are still practicing traditional animal husbandry. Intensive livestock farmers have specialized into keeping a few high milk-yielding dairy animals mainly pure-breeds or crossbreeds at zero grazing. Despite advances in veterinary medicines and services, traditional and local methods of tackling health problems and diseases of livestock were still practised by almost all production systems studied. It was noted that livestock played an important link in the household food security as a source of food and cash for buying other needed food products. This paper will discuss local knowledge systems in the different livestock production systems and its contribution to food security. Analysis will also be made of the quantitative and qualitative participation of men and women in different animal husbandry practices and on other productive, reproductive, socio-cultural activities and access and control over resources. A list of local herbs used for treatment of various animal health problems and diseases will also be discussed.

INTRODUCTION

Tanzania has a large livestock population of about 13 million cattle; 3.7 million sheep; 6.4 million goats; 275,00 pigs and over 22 million chicken (1984 Census). The ruminant population is mainly concentrated in Northern zone (Arusha), Central Zone (Dodoma and Singida); Western zone (Shinyanga and Tabora) and Lake zone (Mwanza and Mara)(Table 1 & 2). This distribution has an important implication in terms of production, marketing and resource use pattern (particularly land resource). Livestock production in Tanzania is organised under two main sectors; the commercial and the traditional sectors. The commercial sector was once dominated by a few para-statal dairy farms and beef ranches, which have recently been privatised. This sector also include a thriving urban and peri-urban private commercial poultry and small-scale dairy farms and accounts for about 15% of the total livestock population in the country. The traditional sector accounts for about 99% of the country's cattle herd and 85% of the chicken. Under this sector animal kept are mainly indigenous breeds like Tanzania shorthorn zebu (TSZ)(98%) while pure beef and dairy breeds constitute 0.8% and 1% respectively (Shayo and Mlay 1986, Mtenga et al.1992).

Table 1: Cattle Numbers by Region

REGION	Indigenous cattle	The Total of Tanzania	Total of Exotic +
Region	Number	cattle population	indigenous
		Percentage	Total
Morogoro	469.622	4.0	480.410
Iringa	315.669	2.5	332.663
Mwanza	1.353.024	10.8	1.357.535
Arusha	1.812.348	14.8	1.866.699
Coast	79.905	0.7	87.891
DSM	4.277	0.0	6.158
Dodoma	986.260	8.0	1.000.184
Kagera	349.066	3.0	364.380
Kigoma	61.909	0.5	62.298
K'njaro	338.188	2.7	410.050
Lindi	4.675	0.0	6.217
Mara	963.188	7.8	969.766
Mbeya	896.137	7.2	900.799
Mtwara	13.300	0.1	15.046
Rukwa	389.963	3.1	392.234
Ruvuma	36.969	0.3	39.010
Shinyanga	1.887.327	15.1	1.890.187
Singida	938.584	7.5	939.821
Tabora	925.816	7.4	928.719
Tanga	442.118	3.5	472.909

Source: Ministry of Agriculture and Livestock Development (1986).

Table 2: Small Ruminants and Pigs by Region

Region	Sheep Numbers	Sheep %	Goats Numbers	Goats %	Pigs Numbers	Pigs %
Morogoro	53,274	1.7	139,948	2.2	10,775	3.9
Iringa	91,635	3.0	197,110	3.1	51,130	18.6
Mwanza	249,943	8.1	570,142	8.9	954	0.4
Arusha	758,476	24.6	1,231,014	19.1	29,603	10.8
Coast	4,938	0.2	18,682	0.3	1,341	0.5
DSM	1,449	0.1	9,524	0.2	11,303	4.1
Dodoma	169,779	5.5	939,648	8.4	5,661	2.1
Kagera	53,784	1.8	344,262	5.3	2,427	0.9
Kigoma	36,428	1.2	167,348	2.6	808	0.3
K'njaro	221,059	7.2	431,757	6.7	29,233	10.6
Lindi	8,582	0.3	13,205	0.2	2,428	0.9
Mara	215,558	7.0	394,444	6.1	1,528	0.6
Mbeya	101,365	3.3	171,486	2.7	67,881	24.7
Mtwara	14,519	0.5	84,864	1.3	5,567	2.0
Rukwa	21,115	0.7	75,319	1.2	1,813	2.8
Ruvuma	19,716	0.6	139,435	2.2	41,918	15.2
Shinyanga	486,798	15.8	871,826	13.5	197	0.1
Singida	280,349	9.1	476,532	7.4	711	0.3
Tabora	174,540	5.7	309,836	4.8	1,913	0.7
Tanga	116,840	3.8	258,284	4.0	2,054	0.8
Total	3,080,147	100	6,443,666	100	275,239	100

Source: Ministry of Agriculture and Livestock Development (1986).

Table 3: Tanzania Ruminant Population Versus Human Population

Region	Human Pop '92	Cattle Owners: (Herd size)	Cattle Indig.	Cattle Dairy	Cattle beef	Cattle Total	Sheep numbers '92	Goats numbers '92
Morogoro	1.360.870		317.214	5.373	13.274	334.861	53.449	153.424
Iringa	1.346.009	3.487(96)	472.909	10.184	2.526	485.619	91.937	216.091
Mwanza	2.090.380)	1.363.495	3.472	165	1.366.132	250.767	625.045
Arusha	1.521.658	29.371(1	1.825.034	33.033	16.823	1.874.890	760.978	1.349.56 0
Coast	706.364	6)	80.464	2.754	5.805	89.023	4.954	20.480
DSM	1.547.508	67.127(2	4.306	2.186	118	6.610	170.338	10.439
Dodoma	1.374.627	0)	1.006.971	2.700	11.828	1.021.490	1.453	591.615
Kagera	1.477.307	31.254	351.509	14.915	11.553	341.977	53.961	377.414
Kigoma	952.509	1.336	62.342	482	0	62.824	36.548	183.462
K'njaro	1.226.824	30.013	341.079	18.494	8.503	368.074	223.958	480.274
Lindi	715.252	24.379	5.009	885	533	6.427	8.610	14.475
Mara	1.083.873	10.718	969.930	3.934	3.476	977.340	216.269	465.313
Mbeya	1.651.017	82.431	902.409	5.537	138	908.084	215.795	1.174.66 9
Mtwara	977.991	372	13.393	1.267	124	14.784	14.534	93.035
Rukwa	786.492	37.306	392.692	1.449	110	394.251	21.183	82.570
Ruvuma	877.861	50.414	37.227	1.718	674	39.619	19.780	985.753
Shi'nga	1.978.398	1.497	1.900.548	3.299	203	1.904.050	488.403	955.781
Singida	880.443	14.043	945.154	727	665	946.536	281.273	522.420
Tabora	1.150.243	7.161	931.793	379	2.083	934.255	175.114	339.672
Tanga	1.421.364	72.902	425.073	6.231	22.374	453.678	117.225	283.155
		46.313						
		27.049						
		27.655						
Total	25,126,99 0	564.828	12.347.55 1	119.019	99.965	12.530.53 0	3.206.529	8.924.64 7

Source: Bureau of Statistics-1993.

The livestock industry is part of agricultural systems of Tanzania where agriculture is the backbone of its economy and plays an important role in food security of its people. Its importance is numerous and multipurpose. This industry provides men and women not only with food (milk, meat, and blood) but also draught power, employment and fertilizers for their crops (Lamosai & Crees 1992). In some situation they serve as a means of capital accumulation (banking system & insurance) apart from supplying manure, providing hides, skins, wool hair and numerous other products (Shayo and Turuka, 1987).

The traditional sector of this industry is divided into several indistinct production systems. (Mtenga *et al.* 1992). These production systems have arisen from the socio-cultural importance given to livestock in the society, the ecological zone of the area, the ethnic group, animal ecotypes and the farming system practised by the community. The three main livestock production systems identified are pastoralism, agro-pastoralism and small-scale intensive specialised system. Pastoralism is a form of livestock production system, which is migratory and does not involve permanent settlement. The pastoral groups keep a mixed herd owning about 20% of all the cattle, sheep and goats in the country. Their cultural and social heritage is bound in livestock with utmost importance attached to ownership; large numbers attesting to wealth and a high social standing. Agro-pastoralism is a farming system where crop and animal production is combined. It is the most common mixed farming system in

Tanzania. This can be extensive or intensive depending on the land availability. The agro-pastoralists keep about 50% of the cattle, sheep and goats in this country and some poultry. They grow maize, sorghum and millet as food crops and coffee and cotton as cash crops. (Mtenga *et al.* 1992). The Small-scale intensive and specialized production system is mainly a crop based production system in which animal component plays a complementary and essential role. In the densely populated areas small holders mainly for supplying manure for the crops and milk keep cattle and goats. These animals are prevented from damaging crops by stall-feeding. There is a recent trend of specialization in dairy production in which the farmers have been encouraged to form co-operatives, which collect and market their milk.

Despite the numerous technologies available and a good number of trained personnel with diploma or degree, their impact on the traditional livestock production systems seems to be negligible and gender blind. In this country, 51% of the human population is women and contribute about 75% of the labour force in agriculture with varying degree of involvement in livestock keeping, crop production and wage earners on top of their other roles as mothers and unpaid household managers. ILO estimates that about 98% of rural women classified as economically active are engaged in agriculture at commercial and subsistence levels including livestock and fishing, as casual labourer and unpaid family workers (FAO facts sheet, 1994).

Modern technologies have been introduced over a number of years in trying to increase the output from the farm animals with minimal success. The probable cause for such outcomes might be due to the techniques used which in most cases disregard the farmer's experiences and local knowledge. Rutatora (1990) stated that the knowledge, skills and survival strategies of farmers operating with low inputs have been ignored and eroded by outsiders promoting modern technology which are often costly or require a lot of inputs. Traditional livestock keepers have means of handling adverse situations and managing resources at their disposal efficiently. They minimise risks and seldom take chances that may lead to hunger, or starvation or loss of crops or their livestock. But policy makers and we researchers have not made enough effort to record or understand the variability in their cultures according to gender, age, class or occupational role. Identification and modification of the existing knowledge, which has persisted for several years in the society, can assist in the adoption of innovations. Dickman (1994) noted that farmers accepted innovation when its development involved step by step integrated with existing farming system and local knowledge.

Several studies have been conducted by the authors with an aim of analysing the gender roles and local knowledge, skills, practices and beliefs pertaining to animal health and production techniques in different livestock production systems. Data gathered from the studies is crucial and useful for increasing beneficial exchange between local community, animal health care providers, the formal animal health and production practitioners and the national policy makers and international agencies active in this field. It will be useful also for the authorities involved in the country's food security.

RESEARCH METHODOLOGY

The Study Area

The studies were conducted in several regions namely Kilimanjaro, Mara, Mwanza, Morogoro, Iringa, Tanga and Mbeya. These regions were selected because of their

contrasting livestock keeping systems. In Kilimanjaro, the intensive livestock keeping system is dominant whereas in Mwanza and Mara, livestock are largely kept under extensive agro-pastoral system, while in Tanga and Morogoro there are semi-nomadic pastoral production system and in Mbeya and Iringa, the intensive agro-pastoral system. In some of the regions both crop and livestock production are practised while for the pastoralists of Handeni and Morogoro crop farming is minimal.

Data Collection

The main methods of data collection used included:

- a) Group interviews
- b) Individual or face to face interviews
- c) Observations
- d) Intensive discussion.
- e) Collection and identification of local herbs used for medicinal purposes.

Group's interviews were conducted in order to get an overview and opinion of the communities in general. Aspects such as gender division of labour in the household, indigenous knowledge in livestock pests and diseases, control and treatment of livestock diseases were covered during interviews. Checklist was used to guide discussions during the interviews. Based on the results of the preliminary survey individual interviews were designed for the purpose of quantifying and clarifying important aspects in the respective systems. Data was collected from face to face interviews using a structured questionnaire. The unit of investigation in this research was the household. Throughout the study, physical observations, the identification of local herbs used by farmers for various purposes in livestock production was done. Samples of identified herbs were collected and dried for further taxonomy using experts in Department of Forest Biology. The observations and discussion were also recorded through photography, video and flip charts.

Sampling Procedure

The selection of villages in identified regions was based on the representatives of the dominant livestock keeping system in the area. The choice was based on preliminary findings. A sample of key informants was selected from each village to take part in-group interviews. Two groups, one of women only and the other for both men and women of 5-10 people were interviewed in each village. The farmers were selected based on their experience and knowledge in livestock keeping. For the individual or face to face interviews, a random sample of 30 households was selected with the assistance of the extension officers and village leaders in that particular village. In selecting the households, purposive sampling was used to select the households that kept livestock

RESULTS AND DISCUSSION

Study Areas and Demographic Information.

The study locations differ greatly in terms of topography, traditional groups, land tenure, rainfall pattern, minimum and maximum temperatures, vegetation and soils. These factors attributed to evolvement of different production systems. Tribes found in these areas also differ and are the Maasai, Wahehe, Wakurya, Waluo, Wasongo, Wamalila and Wasukuma

dominate pastoral system and agro-pastoral systems whilst the Chagga are found in Kilimanjaro intensive production system. Different tribes in Tanzania have different cultures and customs. Mainly the type of staple food, farming practices, livestock production system and roles performed by men and women usually reflects this.

Majority of the respondents in Iringa, Mwanza, Kilimanjaro and Mara have had primary education therefore are able to read and write, unlike pastoralists in Morogoro and Tanga where about 83% did not have any formal education. Most men are married and polygyny is a common feature particularly among the pastoralists and the agro-pastoralists in Iringa. A large number of children (about 8/family) are also a common feature to all the pastoral and agro-pastoral systems. In the intensive systems where monogyny is common and have about four members per family.

Residence period in the area for the respondents is variable. The agro-pastoralists of Mwanza, Mbeya, Iringa and Mara have stayed in the area for more than 30 years that is 35.25 ± 21.3 and 37.75 ± 20.0 years respectively while the pastoral groups in Morogoro and Tanga have only lived in the areas for 10.3 ± 10.6 years.

Livestock Species Breed and Numbers

Cattle are the dominant and most important livestock species in all production systems studied. Cattle are acquired through purchase, inheritance, present and dowry. The main reasons for keeping cattle are prestige or sign of wealth, income, social security, dowry, draught power, milk, meat and manure. However, there is a variation in animal numbers, large herds of cattle up to 200 are found in the pastoral system while only an average of about 7 - 15 in the agro-pastoral system in Iringa Mara and Mwanza and an average of four dairy cows in the intensive system. This is in agreement with the general feature of pastoralists whereby large numbers of cattle are kept. The breeds kept by the pastoralists are the local indigenous dual purposes cattle mainly Tanzania short horn zebu (TSZ). During the present study, the respondents have revealed that there is a progressive decline in the number of calves resulting from tick-borne diseases probably due to a halt in vector control. Other species kept apart from cattle are sheep, goats, poultry, pigs, donkeys, cats and dogs.

In the intensive system the economy is based on the cash crop -coffee, animals play the important role of supplying manure and milk. Animals kept are few (24) improved dairy breeds, milk goats and few chicken. But currently due to fall of coffee production, milk is increasingly becoming an important source of household income.

Livestock Health, Husbandry and Management.

Local knowledge systems

The management techniques and practices have been developed traditionally and passed on from generation to generation. Livestock are kept extensively in the pastoral and agro-pastoral systems studied. The pastoralists have a migratory type of husbandry because they stay in the semi-arid areas where rainfall is unreliable although it can reach 400mm-600mm. These people have very good knowledge of the various vegetation where they graze their animals- i.e. all fodder plants are known in local names. They have also an efficient flow of information about new areas for the grazing. They are capable and skilful in tending their animals. Pastoralists operate with mixed herd (cattle, sheep and goats) making intensive use

of these animals and taking advantage of their different reproduction rate and feeding habit. Thus production of the animal protein per hectare is twice as high as the ranches being they do it without external resources. In addition, pastoralists interact with wetter areas where they can purchase grain to supplement their milk diet and the crop residues after harvesting are used for grazing their animals. Despite some squabbles with crop farmers, many places have seen a symbiotic relationship develop between the arable farmers and the pastoralists. No sensible pastoralists destroy grazing resources so rarely do they lit fires to burn pastures.

During the study, it was apparent that majority of the respondents had substantial knowledge of diseases and health problems of their animals. Ill health as a result of diseases transmitted by ticks, tsetse flies and worms was high in all the areas studied. Diseases seemed to be the main constraint in livestock industry due to lack of drugs, increasing prices of veterinary drugs and services, non-functioning dips and lack of adequate extension services. The study revealed that pastoralists, agro-pastoralists and intensive farmers use all options they have including local herbs and modern veterinary drugs to tackle health problems that confront their livestock. However, where the animal is valuable the farmer sought veterinary help immediately. A list of local herbs used has been compiled (Table 7). We hope, in the near future, funds permitting, these herbs will be analysed chemically.

In the pastoral and agro-pastoral systems, the animals are housed during the night in enclosures that are not roofed. These enclosures are known as kraals or bomas built within the homestead from materials readily available from the locality such as thorny bushes or bamboo trees (Iringa). The young calves are normally kept in special houses constructed out of wooden poles and thatched with grasses or stay in the same house with family (Maasai). Sheep and goats in some areas are kept in small kraal or housed. The knowledge of how to build animal enclosures is learnt from the elders. In the intensive system, most of the farmers are elite having had an education or training in how to keep dairy animals thus build modern houses of concrete and mortar, roofed with iron sheet. Small biogas units have also been built by some of these farmers using the animal dung.

Animals in the pastoral and agro-pastoral systems are grazed in open areas for 6-11 hours everyday. The grazing areas are selected depending on the availability of pasture and water, thus the distance from home to the field varies depending on the season. Supplementation is rarely done except after crop harvesting when the animals are left to feed on crop residues in the fields. Agro-pastoralists have shortest time (6 hours) coinciding with the peak of agricultural work when they have to work in the crop fields first before herding the animals. The pastoralist's pattern of herding a combination of the ruminant species with different foraging habits and reproductive rates indicates an overall optimisation of resources. Both systems of production have evolved several skills, which enable them to feed their livestock during the dry and wet season and also allows the animals to survive in the face of high challenge of diseases such as tick-borne diseases. Forage is plenty during the wet season and animals gain weight and milk-yield is high. However, during the dry season the grass is dry, scarce and of low nutritive value thus the animals tend to be unproductive. Animals are watered in natural rivers or water holes or dams. No supplementation if the animal diet is given although some farmers give their animals minerals either naturally occurring or bought. In the intensive system, animals are stall-fed, whereby the owners have transport and collect hay from fields far from home. Some preserve crop residues such as maize straw or rice straw for dry season feeding. The farmers also grow fodder grasses such as elephant grass and siratro on the slopes and borders to use as feed. In addition, the animals are given supplements such as cereal bran, mineral licks and molasses.

The pastoralists have controlled breeding whereby they select the best bull, breed with the best cow for size, shape, colour and milk-yield. However, some of the agro-pastoralists mate their animal randomly with the aim of getting more bull calves so that they can use them for power. The growth rate being slow, the age of first mating vary between 3 to 5 years and calving interval is 1.5-2 years. The dairy farmers either use artificial insemination (AI) or borrow graded bulls from neighbours for breeding.

Milking is normally done in the mornings and in the evening's everyday for all systems but only once a day (in the evenings) for the poor milkers. Instruments used for milking are gourds or wooden cup (nunda) or plastic containers. Milk is consumed fresh in most of the households and some made into yorghut. Excess milk is sold either fresh or as yorghut. Ghee and butter is prepared locally is used for home and excess sold. Animals are rarely slaughtered unless they are too old and unproductive or there is a special occasion. Often the Islamic rites are observed during slaughter since the meat might be sold to both Christians and Muslims. In many cases, just small amount of meat is taken for the family and the rest is sold for cash or bartered for grains. Animal dung is used as manure for fertilising crops in the field. In some household it is dried for fuel or building. Few households in Iringa did not use the manure as fertiliser because they believed it dispersed weed seeds in the farms. Skins and hides are often sold to shoe factory or middle men who transport them to shoe factories. Urine is normally used for cleaning gourds and for treating FMD cases or treating hay to make it more nutritive and palatable for the animal. Some of the skins and hides are used for making skirts, water bags, sitting mats or donkey bags. Thus under the pastoral system there is nothing from the animal which is wasted.

Crops and livestock interaction

An important link exists between crop and livestock production in the agro-pastoral and intensive production systems. Directly the crop residues and crop by-products are used as animal feeds while manure and draught power are used for crop cultivation. Indirectly, cash from the sale of surplus crop or cash crops is saved by buying more livestock which act as a buffer to secure food supply in lean years or in case of crop failure.

Gender Analysis in Livestock Production System

Gender analysis was carried out to enable us to recognise the different issues and interest women, men, girls and boys have on the livestock production system. A variation in the interests, issues and roles for men, women, male children and female children within a household was observed between the systems. In the pastoral system, the gender division of labour is rigid becoming more flexible in the agro-pastoral and intensive systems. The gender analysis is discussed in detail under each system.

Gender Analysis in the Pastoral Production System

In this system of livestock production 98% of the respondents said the cattle belong to the men. Children and women mostly own the smaller stock such as poultry and rabbits. Analysis of gender issues in the pastoral societies studies indicate that ownership and control of cattle, sheep, goats is tightly vested in male heads of the household. Women have limited rights. They control the milk of certain cows allocated to her by the husband. The male heads of the pastoral society are so conservative that they even control the religious and traditional rituals of their women-folk. This is so because the ritual leader (laibon) and the age-set spokesman

(laigwonak) must be a man. All the family resources and assets are controlled the male head. Even children born to the woman outside marriage belong to the husband.

The pastoral groups of Morogoro and Tanga are irregularly transhuman moving the herd and part or all of their settlements to areas where the herds will be certain to survive during particularly extremely long dry seasons. The daily work of attending them is assigned to the uncircumcised boys (ilaiyoni) missing out on formal education. They are helped by ilmuran if the pastures are a long distance from the settlements or sending the animals to dips or water points. Murrans are also given the tasks of buying and selling stocks at the auctions, medical treatment of the sick animals, the branding of animals as well as any service which the elders might demand of them from time to time i.e. transmission of messages). They also build the kraals or bomas and palisades for small animals. Calves are tended by children both boys and girls (Table 4).

Table 4: Gender roles (%) in the Pastoral system in Morogoro

	Adult		Children		All family All	Hired labour	Others
	Male	female	male	female			
Ownership of cattle	98.1	1.9	-	-	-	-	-
Construction of Bomas	51.7	-	11.7	-	5.0	5.0	23.3
Cattle herding	33.3	1.7	21.7	3.3	26.7	3.4	3.3
Calf rearing	-	10.2	20.3	3.4	55.9	3.4	1.7
Goat herding	-	-	20.3	5.1	57.6	3.4	1.7
Sheep herding	-	6.9	20.7	5.2	56.9	3.4	1.7
Watering the livestock	93.2	-	3.4	1.7	-	1.7	-
Livestock selection	91.8	-	-	-	-	4.1	-
Livestock Identification							
-mating/heat	70.7	-	-	-	-	23.6	1.7
-pregnancy	70.0	1.7	-	-	-	25.0	1.7
-sick	65.5	-	8.6	1.7	-	20.7	-
Milking	3.3	81.7	-	13.3	-	-	-
Milk marketing	3.3	95.0	-	1.7	-	-	-
Slaughtering	70.7	5.2	-	-	-	-	24.1
Livestock advice	77.8	22.2	-	-	-	-	-

The life of women and girls in the pastoral society is shaped by the livestock-economic system. With marriage which is sanctioned by a transaction of 815 heads of cattle from husband to father of the bride, the wife is assigned a number of milk cows and small stock. Studies revealed that 81.7 and 95.0 percent of the women in the households are involved in milking and marketing of milk and milk products such as ghee and butter which they prepare. Other household chores such as fetching water, firewood collection and the daily cleaning and repair of living houses is carried out by women.

Despite their considerable labour input in the care and maintenance of the herd, women are excluded from major decision making. Cultural laws and traditions rationalise this exclusion, maintaining that conflict between men and women is inevitable because women give first

priority to satisfying the milk needs of their children while men put the needs of the herd first. The discrimination in gender roles is also noted where there is labour shortage. In such cases women can and do perform male tasks such as herding and watering animals but men seldom perform female tasks except in those tasks which are associated with increasing control over assets which are gaining in value.

Gender Analysis in Agro-Pastoral Production System

Livestock ownership particularly cattle is mainly confined to men being 66.7, 76.7 and 75 percent for Iringa, Mwanza and Mara, respectively (Table 5). A wife can own some animals through inheritance or purchase with money obtained from the sale of surplus food crops or any other fund-generating activities. Children are also entitled to animals which they may be given as presents by a relative or inherited. In case of female headed households, women own the family livestock and make decision concerning their sale or slaughter or exchange. Women also do not own the land but have access to it through the husband or their families. Husbands allocate small plots to each wife and in this plot the woman will grow food crops for the family. The produce from this plot belongs to the woman and she can always sell the excess but with the husband's permission. Thus it is common for women to command the food crops and poultry which are consumed by the family, whereas men are responsible for cash crops and livestock production, with the output being at their own disposal.

The most time-consuming activity in livestock keeping is herding and this is done by boys who have left school or children on vacation (Table 5). In some cases male head of the household will graze his animals or use hired labour. Watering the animals is done usually by men, male children and other family members may help. During the dry season when water is in short supply the male head has to dig a well at a bottom of a river or ferry water from permanent wells using an oxen carts. Construction of kraals is mostly a man's job assisted by his sons or hired labour or neighbour's gesture (*ujamaa*). Similarly, the building of special houses for calves and small ruminants and chicken is the responsibility of the men.

Caring for the young stock is done mainly by children but wife and husband can also help. Milking by tradition is done by women mostly girls. Milk processing to ghee is a woman's job. Marketing of fresh milk, skimmed milk and ghee is done by women. There is an exception though, in the Sukuma tradition milking is done by men but the milk is passed on to the wife for distribution as required.

Identification of livestock when on heat, pregnant, or sick is done by male head assisted by other members of the family especially those who have been herding the animals. Similarly selection of the best animals and decisions with regards to livestock are taken by the head of the household. (Table 5). Other farming activities are distributed among the family members. These include cultivation of the land, sowing, transport of inputs and outputs, harvesting and processing and marketing of the produce. Domestic/household and agriculture/livestock production are closely integrated so that there are conflicting demands for labour and other resources within a household.

A wife cannot decide to sale or slaughter her animals without consulting the husband but she can decide to use her money from sale of surplus food crop to buy livestock. Even children cannot decide on their own. On the other hand, they can dispose of chicken without seeking permission

Table 5: Gender roles in the Agro-pastoral system in Mwanza.

Activity/ Role	Adults		Children			Family	Hired labour	Others
	male	female	male	female	All			
Ownership of cattle	76.7	13.3	1.7	-	-	8.4	-	-
Construction of Bomas	41.4	-	15.5	-	8.6	1.7	10.3	22.4
Cattle herding	6.9	-	5.2	1.7	25.9	-	41.4	18.8
Calf rearing	4.3	4.3	6.4	-	63.8	2.1	6.4	6.4
Goat herding	2.5	-	7.5	-	47.5	5.0	17.5	20.0
Sheep herding	11.1	-	11.1	-	33.3	-	11.1	33.3
Watering the livestock	15.0	3.3	6.7	6.7	25.0	1.7	18.3	23.3
Livestock selection	78.7	10.6	2.1	-	-	8.5	-	-
Livestock Identification								
-mating/heat	68.4	8.8	-	-	-	14.0	1.8	5.3
-pregnancy	55.0	11.7	-	-	3.3	26.7	-	3.3
-sick	43.3	5.0	20.0	3.3	-	5.0	-	11.7
Milking	16.9	-	22.0	5.1	22.0	6.8	10.2	15.3
Milk marketing	27.1	27.1	4.2	4.2	12.5	14.4	4.2	6.3
Slaughtering	83.7	-	9.3	-	4.7	-	2.3	-
Livestock advice	15.8	61.4	-	-	-	1.8	21.1	-

Gender Analysis in Intensive Livestock Production System

In the intensive system, less than 50% of the respondents said the livestock is owned by men (cattle, 23.3%; goats 33.3% & sheep 22.3%). However, 40% of the respondents said the main ownership of the family assets including livestock is the whole family (Table 6). Land, though belongs to men (or his clan) who has full control over it thus he can dispose it as he wish. Chicken are mainly owned and controlled by women (33.3%) and children. In case of the man's death, the elder son takes over the control of the land, livestock and other assets or the assets are divided up if the man had many sons. The wife can care for the assets on behalf of her sons if they are still young with deceased male relatives acting as advisors. Coffee which is a cash crop is controlled by men. Food crops such as bananas, maize and beans are controlled by women but once they gain in commercial value the man takes over. Milk was formally controlled by women but nowadays is controlled by both men and women because it is now the main source of household income. The women have access to the income but she has no full control over it. This is because women are the ones collecting cash from the sales of milk as opposed to coffee.

The activities are distributed among the family members by gender. These activities include domestic/household and crop /livestock production which are closely integrated so that there are no conflicting demands for labour and resources within the household. The women concentrate more on the activities related to food crop production while men are responsible for the cash crops and taking the cow to a bull (48.3%). Crop farming activities such as weeding of the coffee and banana farms is undertaken by whole family and labourer. Pruning

of the coffee is mainly done by men, picking and processing of the coffee is done by whole family with the help of labourer. In most cases, men are more involved in the processing of coffee. Ferrying coffee to sale centres is done by women with the help of children. Collecting of cash from sales is men's activity. Men are engaged in clearing maize fields before they can start ploughing. Hand hoe or tractors are then used for ploughing a job done by both men and women. Almost all the fields of maize and leguminous crops are sown by hand. This is mainly done by whole family and casual labourers. Few farmers use tractors for planting if so the work is supervised by men.

Women work for 15-17 hours a day (105-117 hours a week) during peak season of activity i.e. sowing maize or beans, harvesting maize, picking and processing coffee. Men in these rural areas work hard between 40-75 hours per week but only on productive work, rarely do they contribute to housework and child-care.

Women's access to money is dependent on their opportunities for earning money in the village and surrounding areas. Besides the opportunity for earning money, married women's access to money is dependent on the attitude of the husband and the resources available. In case of Wari Women keeping dairy cattle has enabled women to have a limited control over it. Crop production is organised at the household level. The head of the household and his wife, or the female head of the household decide which crops to be grown and how the produce should be used. Slaughtering of cattle, goat and sheep is rarely done nowadays only when a special need arises the head of the household who in most cases is the husband makes decision on slaughtering in consultation with the wife. Slaughtering of chicken and ducks is decided by the wife without seeking permission from the husband. Sometimes children are consulted, as they own some of them. Both the husband makes decision on the addition of livestock and wife, money for adding livestock is mainly from the sale of milk.

Table 6: Gender roles in the Intensive System in Kilimanjaro

Activity/ Role	Adult		Children		All family	Hired Labour
	male	female	Male	Female		
Ownership of cattle	-	6.7	-	-	40.0	-
Shoats	23.3	-	6.7	-	40.0	-
Chicken	33.3	33.3	-	8.3	37.5	-
Construct houses	41.4	-	3.4	-	-	10.3
Cleaning	3.3	16.7	-	6.7	-	3.3
Cattle feeding	6.7	93.3	-	6.7	30.0	26.7
Calf rearing	6.7	93.3	-	6.7	30.0	6.4
Goat herding	2.5	-	7.5	-	-	17.5
Sheep herding	11.1	-	11.1	-	-	11.1
Watering livestock	6.7	93.3	6.7	6.7	30.0	6.7
Livestock selection	78.7	10.6	2.1	-	8.5	-
Livestock Identification						
Heat	10.3	31.0	-	-	3.4	6.7
Pregnancy	29.2	50.0	-	--	-	6.7
-sick	10.3	31.0	-	-	-	6.7
bull	48.3	6.9	-	-	-	3.4
Milking	-	100.0	-	5.1	6.8	10.2
Milk marketing	27.1	27.1	4.2	4.2	14.4	4.2
Slaughtering	83.7	-	9.3	-	-	2.3
Livestock advice	15.8	61.4	-	-	1.8	21.1

Table 7: Herbs collected used as medicines

No	Vernacular (chaga)	Scientific Name	Family	Uses
1	Mratune; Isale lya njofu	<i>Aloe volkensii</i>	Aloeaceae	oxytotic effect; wound treatment
2	Msenefu	<i>Olea chrysophylla</i>	Oleaceae	antihelmthic
3	Iwinu	<i>Cassia didymobotrya</i>	Caesalpiniaceae	anaplasmosis
4	Mfifina (bark)	<i>Commiphora zimmermannii</i>	Bursaceae	anaplasmosis
5	Antihe	<i>Asplenium spp</i>	Aspeniaceae	
6	Mfurufuru; Ifurufuru	<i>Croton macrostachysis</i>	Euphorbiaceae	antihelmthic; laxative
7	Mwarie Iwarie	<i>Bridelia micrantha</i>	Euphorbiaceae	anaplasmosis
8	Kilulu Mwulu	<i>Albizia versicolor</i>	Mimosaceae	diarrhoea
9.	Moseraka	<i>Pentas</i>		antihelmthics;laxati ve
10	Msesewe	<i>Rawolfia caffra</i>		laxative;wound, infertility
11	ipera, mpera	<i>Psidium guajava</i>		leaves, antidiarrhoea dysentery, hyperacidity
12	Mnyara	<i>Euphobia tirucalli</i>	Euphobiaceae	pneumonia, cough
13	Nduo	<i>Salanum incanum</i>		
14	Mringaringa	<i>Cordia africana</i>		wound
15	Matolo	<i>Plectranthus barbatus</i>		cough
16	Ikengera	<i>Commelina benghalensis</i>		poor milk yield
17		<i>Fruerstia africana</i>		poor milk
18	Kitolo	<i>Coleus spp.</i>		Constipation- impaction
19	Ngentsi	<i>Embelia schimperi</i>		tapeworms
20	Mriri	<i>Erythrina abyssinica</i>		
21	Iwonu	<i>Ricinus communis</i>		laxative
22	Mbatu	<i>Nicotiana tabacum</i>		mites, mange, ticks, eye
23	Mosereka	<i>Pentas spp.</i>		Leaves-laxative
24	mring'onu	<i>Alangium chinese</i>		anaplasmosis
25	kidamu, mriri	<i>Erythrina abyssinica</i>	Papilionaceae	mastitis
26	mfumu	<i>Ficus thonningii</i>		heat production
28	mring'onu	<i>Alangium chinese</i>		anaplasmosis
29	Misonabari	<i>Eucalyptus spp</i>		all poultry diseases
30	pilipili kichaa	<i>Capsicum fruitenscen Capsicum annum</i>		all poultry diseases
31	Mnyaa	<i>Euphorbia candelabrum</i>		all poultry diseases ND

Table 7: Maasai herbs

	Vernacular(Maasai)	Scientific name	Uses
1	Ol sugukututi	<i>Cissus quadrangularis</i>	kukohoa
2	Lbukoi	<i>Monordica spinosa</i>	kuharisha tumbo
3	Olsuki	<i>Faraga chalybea</i>	vidonda kusafishia kibuyu (magome) mkaa wake kuhifadhi maziwa,
4	ol girigiri	<i>Acacia pennata</i> <i>Acacia brevispica</i>	worms,
5	eluai	<i>Acacia drepanolobiu</i>	babesiosis
6	ol mukutan	<i>Albizia anthelmintica</i>	bark-mastitis, diarrhoea, worms
7	ol suguroi	<i>Aloe volke nsii</i>	retained placenta, wounds
8	ol beresinjugi	<i>Andropogan ischaemum</i>	non-infectious diseases
9	ol sagarami	<i>Bauhimia thonningii</i>	eye
10	ol amuriake	<i>Carissa edulis</i>	worms,
11	ol senetoi	<i>Cassia didymobotrya</i>	leaf, constipation,diarrhoe
12	ol matasia	<i>Clausena anisata</i>	leaf- worms
13	ekirikiri	<i>Erythrina abyssinica</i>	flower-eye infection
14	ol pongoni	<i>Euphorbia candelabrum</i>	wounds, sores, ulces
15	ol mangulai (mkwaju)	<i>Ficus sycomonus</i>	
16	ol engerianthus	<i>Galium aparinoides</i>	fruit-throat cancer
17	ol orien	<i>Olea africana</i>	leaf-eye, babesiosis
18	ol dule, ol onyonyong'i	<i>Ricinus communis</i>	mites , mange, diarrhoea, retained placenta,
19	endelemet	<i>Sesamum angustifolium</i>	
20	ol ojongalami	<i>Serbania aegyptiaca</i>	diarrhoea
21	ndulele	<i>Solanum incanum</i>	fruit-constipation root- worms
22	ol masamburai	<i>Tamarindus indica</i>	
23	ol gelai	<i>Teclea simplifolia</i>	
24	ganyamda	<i>Balenites aegyptiaca</i>	mites, mange, worms,
25	ol ama	<i>Ximenia americana</i>	root-diarrhoea, wounds
26	ol oilale		
27	ol kiperelekina		retained placenta
28	igumu	<i>Tephrosia vogelii</i>	minyoo, mites, mange, ticks
29	ole kyasa		malaria
30	ol kolobobiti		ECF-UTOMVU
31	olkunonoi		otitis

CONCLUSIONS

From this study there are pointers showing that the animals serve several diverse purposes in the economy and food security of each system but primarily to satisfy the basic needs of the family rather than to meet the demands of the market. During the present study it has been

found that subsistence farmers dominated the rural areas regardless of the livestock production system and they all keep a variety of different species of livestock.

Secondly, rural women and men work hard in all production systems with a workload of 14-17 hours a day compared to that of men 6-8 hours. However, women do both productive and reproductive work while men do only the productive work. This means women are not only bearing children, housekeeping and child care but also earning income, growing food crops and ensuring family food security. In addition, the migration of the young and energetic members of the households to cities to seek wage labour is putting the fabrics of the families at stake and increasing the workload of the pastoral and agro-pastoral women.

Thirdly, in the pastoral system, there is no interaction between crop farming and livestock and that cultural attitudes and taboos are more ingrained and often have a negative impact. Although, there is no concrete data on household consumption or nutritional status from these studies, it is clear that those livestock holdings and milk yields have dropped to a level which is unable to sustain the majority of the households. In absence of alternate source of income to supplement the livestock economy and re-invest in livestock, poverty is increasing in the livestock base economies. This implies that local knowledge or traditional production no longer suffices the food needs of the household. There is need for new interventions

However, in the agro-pastoral and intensive systems there is a strong interdependence between crops and livestock. In period of drought livestock provide a buffer against low crop yields or crop failure, but over the long term neither sub-sector is abandoned in favour of the other. An increasing dependence on grain though, is pushing households into crop cultivation to reduce the need to sell livestock to purchase grain but in the end reducing grazing land. Moreover, the productivity of most of the stock is still very low and most farmers have a lot of uncertainties.

But in all systems of production, men and women have developed different expertise and knowledge regarding the local environment, plants, animal species, their products and uses. The gender differentiated local knowledge is highly sophisticated, traditionally shared and plays an important role in the conservation, management and improvement of genetic resources for livestock and crop. For example women's and men's knowledge of wild plants has been used as food in times of needs and as medicines and source of income. Furthermore, through experience, innovation and experimentation, sustainable practices have evolved to protect soil, water, and natural vegetation.

Thus as women hold half the universe/sky (Chinese proverb) and sustain more than half the agriculture, if progress in empowerment of rural women and increase their participation in development is to be sustained and advanced, then major changes in attitudes must come from the people who hold up the other half of the sky, the men. 'It takes two to tango'. More research is needed to find out the impact of the changes taking place in the households of the study areas and how it affects the food security. The studies should be carried out over a specified period for conclusive data to be collected.

CONCLUSION

This paper has tried to point out that livestock plays an important role in the life of many rural women and men, therefore livestock productive ventures should ensure that the

potential and needs of both women and men are taken into account e.g. the questions of ownership and rights to resources, distribution of work load and their management and use of biological resources.

REFERENCES

Dickmann, N. (1994). The integration of Social and gender issues in smallholder dairy production. In: *Int. Workshop on Feeding of Ruminants on Fibrous Crop Residues. Kamal, India. pp 23-33.*

Ellis, F. (1988) Peasant Economics for Agricultural development. *Cambridge, England.*

FAO (1982) The state of Food and Agriculture "World review of Livestock Production" A World perspective. *FAO publication. Rome*

FAO (1994) Fact sheets

Gillings S.I (1992) Women & Men in Agricultural Development the case of the Women in irrigated Agriculture Project in the Southern Highlands of Tanzania *Proceedings of Conference on Agricultural Research Training & Technology Transfer in Southern highlands of Tanzania Past achievement & Future prospects. 5-9 October 1992 Mbeya, Tanzania. pg. 477-484*

Joekes S.& Pointing J. (1991) Women in Pastoral societies in East & West Africa IIED No *International Institute for Environment and Development paper. No. 2828.*

Lamosai A. & Crees J. (1992) The contribution of Livestock to national economy. *Proceeding of DANIDA workshop on the role of veterinary Profession 27-33*

Maeda, N.K. (1988)"The development of the Livestock Industry in Tanzania 1984_1988." *Paper presented in the 6th TVA Scientific Conference hold from 6-8th Dec. 1988, Arusha.*

Ministry of Agriculture (1993) Review of Ruminant Livestock Industry Printed by Marketing Development Bureau. *Govt. Printers. DSM 1993.*

Ministry of Agriculture and Livestock Development Animal Reports (1950-1988).

Ministry of Community development, Culture, Youth and Sport_(1988) Situation of Women in Tanzania." *Printed by Govt. Printers_ DSM_ Tanzania.*

Ministry of Community Development Women Affairs & child care (1995) Tanzania Women"-Country Report of 4th World Conference on Women Beijing . Govt. Printers DSM.

Mtenga L.A, A. Katule & Kitilyi A.J. (1992) Development of Livestock Production system in Tanzania. *Proceeding of DANIDA workshop on the role of Veterinary Profession. pg. 160-169.*

Ole Lengisugi (1994) The Indigenous knowledge and sustainable development; Livestock Health care for Maasai pastoralists. *A paper Presented at a conference a Indigenous knowledge and sustainable development, Morogoro Tanzania.*

Orskov E.R. (1993) Reality in rural development Aid with emphasis on Livestock. *Published by Rowett Research Services ltd. Aberdeen.*

Rutatora (1990) *A paper Presented at a conference a Indigenous knowledge and sustainable development, Morogoro Tanzania.*

Sempeho G. & Rusholaza V.G (1985) The Impact of Improved technological in the traditional Livestock sub- sector of Tanzania. *Proceed of TSAP 12:55-68.*

Shayo S.A & Turuka F.M (1987) The role of the traditional Livestock sector in national economy. *Proceeding of TSAP conference VOL. 14:112.*

Shayo S.A. & Mlay G.I (1986) The performance of the Livestock Industry in Tanzania 1972-1980's. *Proceeding of 4th TVA scientific conference 4:25.*

Smith A.J. and Magembe S.R. (1986) Factors limiting animal production in the tropics. *Proceed. 4th TVA scientific conference. 4: 8-24.*

Tanzania Maktaba Takwimu ."Population Census" Bureau of Statistics Ministry of Planning and Economics Affairs. *Gov't. Printers 1993.*

Task Force of National Agricultural Policy (1983) The Tanzania National Agricultural Policy. *Govt. Printers DSM 1983.*