FACTORS INFLUENCING HOUSEHOLD DECISION MAKING IN THE CONTROL OF TICKS IN TRANS NZOIA DISTRICT

BY

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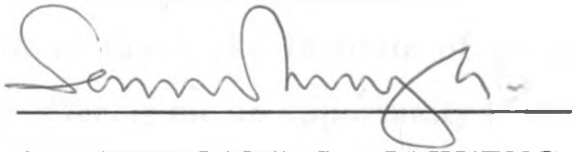
DECLARATION

This thesis is my original work and has not been presented for a degree in any other university

Candidate:



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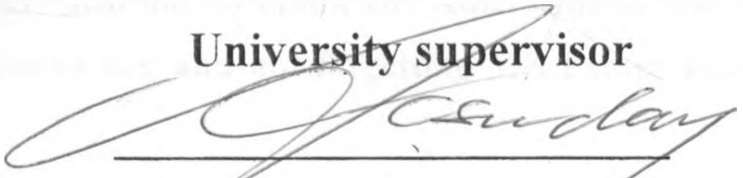
This thesis has been submitted with my approval as a University supervisor



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ABSTRACT

This anthropological study explores the factors influencing decision making process on the control of ticks at the farm level. It describes the present system of tick control management at the household level and sought to identify and discuss the new techniques currently being used to control ticks and manage tick-borne diseases in Trans-Nzoia District.

Samples for the study were purposively selected from livestock farmers in Trans-Nzoia. Questionnaires were administered to forty five farmers (45). Other information were obtained from three focus groups(3) and four(4) key informants who were the District tick control officer and three extensionists. Standard questionnaire and Secondary Sources of data were also used.

The major findings of the study are: Smaller herd sizes in small-holder households may mean better control of tick-borne diseases, and traditional methods coupled with modern technology could effectively control ticks.

It is recommended that extension officers should teach the farmers on systems used to control ticks, and animal healthcare professionals should pay particular attention to establish good support with women.

CHAPTER ONE

1.0 INTRODUCTION

The control of tick-borne diseases is a complex and long-term task. Livestock disease is a major constraint to the improvement of food production in sub-saharan Africa. For over two decades, the inability of populations throughout the continent to meet the food requirement of their increasing population with present production systems has resulted in declining food production, increasing food imports and foreign debt, environmental degradation and persistently high rates of malnutrition and infant mortality. It is estimated that this "complex crisis in African food systems" will produce by the end of the 20th century shortfalls in staple foods of about 47 million tons and gaps between the supply and demand of meat and milk of about 2-5 million tons and 10-15 million tons respectively (de Haan and Bekure; 1991, Huss-Ashmore, 1989; Paulino; 1987. Livestock will be expected to play a key role in resolving this crisis as part of "a sustained process of technological change in production" which will include the introduction or intensification of crop-livestock interactions in small-holder farming systems (McIntire et al; 1992, Winrock International; 1992, Delgado et al; 1987, p.7). In these transformed land-use systems, producers will rely upon livestock to enhance and sustain the entire system through increased draft power and manure for crop production, as well as to provide larger amounts of foods of animal origin which supply high quality protein and other essential nutrients often in short supply in many African diets.

Losses from livestock diseases are significant barriers to improvement of crop and livestock production due to the decrease of manure and proteins, in many parts of Africa, and are estimated to be in excess of U.S. $2 billion annually (de Haan and Nissen; 1985, de Haan and Bekure; 1991, Jahnke; 1982, Winrock international, 1992). A major constraint to livestock disease control in Africa is the deteriorating quality of animal health care delivery systems, a result of attempts by governments to meet an increasing demand from farmers and pastoralists for veterinary services with a dwindling set of resources. Policy reforms have included privatization of aspects of the delivery system, particularly curative services. Village-level delivery of animal health care by private non professionals is being tested in numerous countries throughout the continent and is expected to provide, "a viable alternative to poorly functioning public systems" (de Haan and Bekure, 1991).

Concurrent with the move towards privatization will be the need for livestock producers to assume, in areas where it is feasible, more responsibility for the healthcare of their own animals, factors influencing decision making process on the control of ticks at farm level, household level and their management and control be addressed . Therefore, this will require that farmers and herders be given the means through education and training to fulfill new roles as active participants in these new animal health care delivery systems rather than remain passive "end users" of improved veterinary technologies. In this new environment of animal health care providers at the farm level will become important to the success of these programmes.

1.1 PROBLEM STATEMENT

The majority of small-holder farmers are faced with various risks. Animal diseases, especially tick-borne diseases, are among the problems facing cattle rearing. This is so especially when the animals which are paddocked, mix with other animals who may be carrying ticks and other contagious diseases especially during periods of dipping, grazing and watering patterns. The main diseases are East Coast Fever, Anaplasmosis, and Babesiosis . The causes are improper tick control and exposure to risk outside the farm which may lead to high mortality rates consequently leading to decrease in milk and meat production leading to poor nutrition. Therefore, these prompt the question as to what the farmers do to control ticks and tick borne diseases, and how these have led to the control of the mortality rates of the animals (Livestock). The problem is to find out the methods which the farmers use to control ticks and tick borne diseases and the decision making process at the household level which eventually leads to the type of tick control strategy used. The other part of the problem deals with the appropriateness of their choices of tick control strategies. And this is seen as a major part of the management process at the farm level.

1.2 Research Questions

1. What are the factors influencing decision making on tick control management at the house-hold level?
2. What are the existing tick management practices at the house-hold level?

3. What are the new techniques currently being used by farmers in the control of ticks and management of tick-borne diseases at the household level?

1.3 OBJECTIVES OF THE STUDY

The overall objective of the study is to investigate factors influencing the decision making process on the control of ticks and to assess disease management through improved tick control measures at the household level.

1.3.1 Specific Objectives

1. To identify the factors influencing the decision making process on the control of ticks at the farm level.
2. To describe the present system of tick control management at the household level, and
3. To suggest new management techniques that may be used to control ticks.

1.4 JUSTIFICATION OF THE STUDY

The district has a high agricultural potential agricultural zone due to the favourable climatic and soil condition. More than 80% of the land in the district is suitable for arable farming. Previously, agriculture was dominated by maize production but now the district has diversified into mixed farming. Since the opening of the farmer "White Highlands" after Kenya's independence, there are now both large and small scale farms in Trans-Nzoia District. In large farms where the level of commercialization is high, maize product and dairy farming is/are dominant activities. However, wheat, coffee and sunflower are also grown in Trans-Nzoia. Pyrethrum and tea are produced also on small scale. Seed maize is grown on contractual

basis for Kenya seed company. Other food crops in this sector include beans, finger millet, sorghum, potatoes (sweet and Irish); and livestock is also reared.

However, no study has explicitly focused on identifying factors influencing the decision-making process on the control of livestock ticks in Kenya from an anthropological standpoint, even though studies have been drawn from the perspective of other disciplines. The study seeks to contribute to a better understanding of the tick control problem in Trans Nzoia and elsewhere by providing the Socio-cultural context in which small-holder tick control strategies are decided. The following map of Kenya is showing the location of Trans-Nzoia district.

1.5 Study Site

Trans Nzoia is one of the seventeen districts in the Rift valley province. It is bordered by the republic of Uganda to the west, Bungoma and Kakamega District to the South West, Bungoma and Kakamega District to the North, Marakwet District to the east and Uasin Gishu District to the South-east. See map No. 1 below.

LOCATION OF THE DISTRICT

Map No. 1

The district lies approximately between latitudes 0° 52' and 1°, 18' North of the equators and longitudes 34°, 38' and 35° 23' East. District covers an area of 2,467 sq. Km which represents 0.42% of Rift Valley province. The largest division in the district is Kwanza and the smallest is Central. The following table gives the area of the district by divisions.

Table 1.1.a Area of the Districts by Division (sq km) in Trans-Nzoia District

Division	*Area*
Kwanza	767
Saboti	364
Cherangani	621
Central	130
Kiminini	288
Kapkoi	297
Total	2,467

Source: Trans-Nzoia District Development Plan - 1997-2001

CHAPTER TWO

2.0 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 SMALL-HOLDER DAIRY PRODUCTION SYSTEMS IN KENYA.

The high agricultural potential areas of Kenya are defined as those areas that lie between 1500 and 2500 metres above sea level with high and fairly reliable rainfall of between 1200 and 2000 mm per annum (Abate et al., 1990; Morgan, 1995). There are both large scale and small scale dairy production in these areas. These areas include the fertile central Kenya highlands, Rift Valley and parts of Western Province. Due to their high agricultural productivity, they hold the bulk of the country's population. The majority of this population are small-holders who practice land parcels of four hectares or less (Buren, 1995). These farmers are reported to constitute between 75 and 90% of the total milk produced in the country (Mbogoh, 1984 a,b, Goldson and Ndeda, 1985).

Livestock play various roles in African societies, providing food, draft power for ploughing, transport, hides, wool, and manure for both fertilizer and household fuel, paying bride-wealth at the time of marriage, source of milk and a major source of meat for both household consumption and for sale Animals are frequently seen as an investment and continue to be idiom, if not the actual currency, in which marriages in many groups are contacted (Obler 1985; Fleuret 1992; Suda 1986). Both livestock products and livestock sales are used to even out the seasonality inherent in crop production. Livestock development projects have targeted a number of these functions, including animal traction but have concentrated primarily on increasing productivity of meat, milk, and wool (ILCA, 1987). Dairy

increasing productivity of meat, milk, and wool (ILCA, 1987). Dairy production has received special emphasis, in that demand for dairy products is high, and the nutrition and income effects of commercial production appear positive (Launonen et al. 1985; Leegwater et al, 1990).

While uncertain rainfall and storage conditions limit livestock production over much of Sub-Saharan Africa, disease remains a major constraint (de Haan and Nissen. 1985). Infectious disease, particularly vector-borne disease, has regularly decimated indigenous livestock herds and has limited the viability of introduced breeds. Much of the current effect to increase livestock production therefore has a disease – control component. These components include breeding for disease resistance, animal management strategies that avoid disease exposure and improved veterinary services and technology (de Haan and Bekure, 1991).

For African livestock producers, successful disease control should result in increased livestock survival, improved animal growth and enhanced reproductive and lactational performance. Impacts on the human population should be felt through changes in economic factors such as income and labour requirements and through biological factors such as income and labour requirements and through biological factors such as nutrient intake and pathogen exposure.

To date, gender issues in livestock development have received little attention, and most of the information available concerns pastoral households. Dahl (1987) points out that commercialization affects women in two ways, eroding their control over livestock and their products, and transforming women into labourers in commodity production, Talle (1987),

for example, shows the change in property rights that has accompanied commercialization for the Maasai of Kenya. However, Ensminger (1987) and Little (1987) argue that the impacts of economic change on pastoral women vary by class and with the scale of operations, such that elite women may benefit more from market. Jawkar (1992), suggests that commercial meat production has an adverse effect on pastoral women, by shifting milk from family consumption and sales by women, to consumption by beef calves for sale by men.

The gender impact of commercial dairying are less clear. Where markets are close and the scale of operations are small, women appear to benefit from dairy sales. This is so because, the men are not interested in meagre income therefore, they leave such income to women, as they (men) think that (the income from such) is insignificant. Obler (1985) for instance, writing on the Nandi of Kenya, notes the ability of men to co-opt women's agricultural enterprises once the income from these becomes significant. She argues that commercial dairying and the attendant commodization of cattle have the potential to erode women's traditional control of daily resources.

Among the Kalenjin speakers such as the Nandi, cattle are part of the traditional "house property" or family wealth (Gluckman, 1950; Obler, 1985). For these groups, men traditionally inherited and controlled livestock, in that these were the household's most valuable resource. Women gained access to the products of livestock by virtue of their position as managers of the household and their obligation to provide food for the members. Upon marriage, a woman would have cattle assigned to her "house", to provide milk for her and her children. While men might unilaterally dispose of cattle that they had gained by purchase or by raiding, house "cattle" were not to be alienated without consulting women users of the products that resulted. They could involve indirectly over such as issue.

Milk from the household herd was divided according to sex, and seriously, men and initiated boys received the morning milk, while women and children received the evening milk. Evening milk was wholly for consumption except for special cases where the women could sell the same to purchase substitutes e.g. vegetables or meat while morning milk was exclusively for sale.

Livestock production

Livestock production in Trans-Nzoia District involves keeping of dairy and beef cattle, poultry, sheep, goats and to lesser extent bees. The major breeds among the exotic animals consist of Arshires, Friesians, Jerseys and Guernseys.

The table below shows the livestock and livestock products by Division and its approximate land carrying capacity. Please note that all households have been sub-divided and have their independent land holdings (title deeds).

Table 2.1.a Livestock Production Per Division

Division	Area Ha	H.H.* No.	Main livestock	Livestock products	Land carrying capacity/ Livestock /Ha
Kwanza	20,240	15,807	Cattle, sheep, goats & poultry	Milk, meat, eggs, hides & skins	97
Cherengani	31,820	10.176	cattle, sheep, goats	Milk, meat, eggs, hides and skins.	193
Saboti	6.924	4,034	Cattle, sheep. goat	Milk, meat, eggs	238

Kapkoi	14,597	4,326	cattle, sheep, goat & poultry	Milk, meat, hides, skin & eggs	224
Kiminini	5,985	2,962	Cattle, sheep, goats, & poultry	milk, meat, eggs, hides & skins	249
Central	5,985	2,962	Cattle, sheep, goat, & poultry	Milk, meat, eggs, hides and skins	512

Source: Trans-Nzoia District Development plan - 1997-2001

H.H. is household.

From the table above, it can be noted that Cherengani division has the highest area under livestock production. However, the number of households involved in livestock keeping are fewer compared with Kwanza Division. In the central division, land carrying capacity is approximately 512 livestock per hectare. Kwanza division has the lowest carrying capacity of approximately per ha 97 animals. This is partly because of cattle rustling in the area as it is neighbouring towards West Pokot, a zone which carries who believe that all cattle belong to them and partly due to animal/livestock diseases.

2.2 THEORETICAL FRAMEWORK

The theory used in this study is gender analysis. Gender analysis begins with the recognition that the household is not undifferentiated grouping of people with a common production and consumption function, that it is with shared and equal access to resources for production. Rather, households are themselves systems of resources allocation (Guyer 1980). The pattern of decision making varies from one place or culture to another. In some places, households fit the standard model of a single decision maker or benevolent dictator. In other areas, household decisions are shared, consultation takes

place between particular members or all members. In some areas, households are hardly units in any sense of the word. Men, women and children have wholly separate spheres of decision making affecting production, income, and expenditures. And in other places the degree of participation of some household members in enterprises controlled by others results from internal bargaining (Jones 1984).

As discussed, efforts to transform animal health care delivery systems in sub-Saharan Africa have underscored the importance of understanding the roles different household members play in providing animal health care at the farm level. Similarly, practitioners of farming systems research began to realize nearly a decade ago the necessity of understanding social processes within farm households in order to develop improved agricultural technology that will be adopted and effectively used by resource-limited small-holder farmers (Moock, 1986). In her critique of household decision-making studies, Guyer (1986, p. 94) has observed that, in most rural areas of Africa, individual access to productive resources and consumption goods is often determined by a person's activating a hierarchy of rights and responsibilities which he or she acquires as a member of different production, consumption, and accumulative or investment groups. These groups, furthermore, may overlap with, or be "nested" in, one another. Such complexities, she argues, are best seen as *gender relations*, and are important for understanding long term processes of agricultural change. Moreover, such processes as agricultural intensification and increasing commodization may well form the context in which the use of agricultural technology occurs. For, as Guyer points out:

"If the central problem (of the analysis of agricultural change) is taken to be longer-term processes . . as distinct from short-term decisions about technology adoption, then such factors as the gender division of

labour and household structure become potentially clarifying explanatory factors and not the awkwardly obfuscating issues they appear to be. Understanding these processes is an important parallel endeavor to research on short-term technical bottlenecks. (1986, p. 99).

Gender analysis, therefore, constitutes a broader program of research than merely the comparison of farm assets and production constraints between male and female-headed households. Feldstein and Poats (1989) consider the analysis of gender and intrahousehold relations to be an integral part of farming systems research. They argue that:

Gender analysis has become the commonly accepted term for analyzing gender roles and intra- and interhousehold dynamics within farming systems and applying that analysis to decisions about agricultural research and development activities. That households can be disaggregated in several ways, by age, status, gender, can complicate the methods for identifying constraints and problems for farmers . Of these, gender has proved to be the most useful category to disagrregate the farm household and analyze intrahousehold behavior..... It is also a point of entry into understanding intrahousehold relations and decision making and to recognizing where interhousehold relationships have an important bearing on farmer decisions and activities. (1989, pp. 9-10).

The conceptual framework for gender (intrahousehold) analysis presented here is based on three major premises (Feldstein and Poats, 1989, pp. 10-11). First, household members are seen as belonging to a category of individuals defined by gender, age, position, or seniority. These categories frequently carry with them rights of access to and control over household resources. Second, within a community, there may be different kinds of household structures. These emerge as responses to different stages in the domestic life cycle, population movements, differences in resource holdings, etc. Third, individuals or households belong to other corporate groupings such as lineages, wards, churches, etc, within and beyond the local community. To this could also be added individual affiliation with non-corporate groups of the sort described by Guyer (1986) in her analysis.

Based on these three premises, the conceptual framework for gender analysis developed by Feldstein and Poats contains four principal areas of

investigation. These are: (1) Labor or activities, or who does what; (2) Resources, or who controls what; (3) Benefits and incentives, or, who has access to and control over the production outputs; and; (4) Inclusion, or who is included in various steps of the project process (Feldstein and Poats, 1989, pp. 16-21).

Finding out who does what, who controls what, and who decides what within, rather than for, the household should be important for animal health care providers as well. Therefore, gender analysis theory is better placed in discussing duties discharged by animal health care providers in Trans-Nzoia district.

2.3 Research Hypotheses

1. Household income levels significantly affect the decision making process on tick control.
2. Decisions on tick management control are based on patterns of gender roles and relations at the household level.
3. New management methods could be used to control ticks.

2.4 Operational definitions.

Operational definitions are "the indicators of the key concepts" (de Vaus, 1986;19..). As terms can have different meanings and cannotations depending on the context in which they are used, it is important for the purpose of this study that the variables used are explicitly defined so as to preclude any confusion that might otherwise arise. As many have a number of different aspects of dimensions, it is helpful to distinguish between these dimensions (de Vaus, 1986; 19..). It is helpful that while doing this (distinguish), the terms are defined.

- **Income levels (wealth)**

  Wealth shapes up strategies on farmers' control of ticks. Different households with various income levels control ticks in various ways; which effectively affects management levels. How does one determine on spraying or dipping or using herbs?

- **Gender**

  Different households have different social arrangements, roles and responsibilities that the society has ascribed to males and females. These roles and responsibilities are cultural and are reinforced through various agents of specialization. Therefore, decision making on who should do what on livestock largely depends on these.

- **Control of ticks**

  This is the management and reduction of ticks on livestock.

- **Decision making process**

  Refers to who does what, who controls what, who has access to and control over what and who is included on what in animal health production.

- **Relations at the household level**

  Who is responsible with what and where is this person placed at the household level.

CHAPTER THREE

METHODOLOGY

3.0 INTRODUCTION

Data in this thesis are to illustrate the gender analysis framework taken from an interview conducted in Trans-Nzoia district on decision making process on tick control.

The data collected on gender is specific data on local knowledge of livestock disease between January and March, 1999, as part of the prevalence study of tick-borne diseases. I asked the households in charge of the cattle to recall all livestock (especially cattle) disease syndromes with which he or she was familiar with. In addition to the name of each syndrome and the language to which it belongs, I noted informants responses as to the frequency with which it occurred on farm and the degree of severity of the constraints it represented. From each informant's list of lexical items, I selected a few items for more detailed interviews concerning, animals affected, seasonality of infection and decisions taken for preventive and curative measures/methods. In this manner, a total of 49 informants were interviewed and three group discussions were formed and interviewed. Of the 49 informants, 15 were from each of the three clusters, Tumaini, Sinoko and Kiminini,one extension officer from each cluster and the District tick control officer.

Tumaini farm lies 5 Km North West of Kipsaina market approximately 20 km North of Kitale municipality. The farm encompasses part of the previously European owner farms of Aruba and Neville. The number of

household is approximately 500. Tumaini presently is administered by the newly formed division of Kaptamai. The farm operates with two village heads.

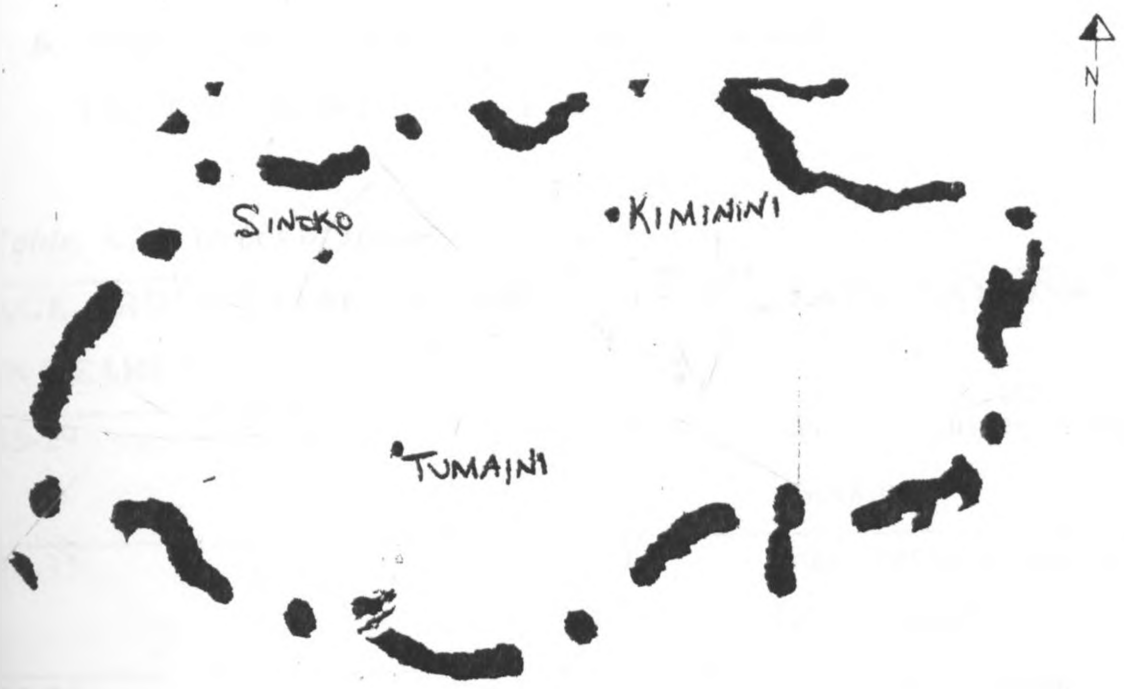
Tumaini farm is in agro-ecological zone upper midland 4 (UM4) with an average rainfall of 1000-1200 mm, in two seasons. The soils are fewrasols. The Nzoia and the Kapenguria rivers form the boundaries to the south west and North East, respectively, and provide an important source of water for livestock and irrigation as well as domestic use.

The land holdings range in size from 0.1 acre to 40 acres with the smaller holdings being situated towards Kapenguria river. Most farms are not fenced. The land is sloping and soil conservation measures, such as grass strips are common. The most frequent land use is dairy production, maize and tea. Bananas and vegetables are grown by a few farmers on small plots near the rivers. Further from the rivers than the vegetable plots, on the higher ground, more natural pastures are found.

Sinoko farm occupies 1050 acres of land, approximately 15km SE from Kitale municipality, within Cherangani Division of Trans-Nzoia District. Within the farm there are six villages each with a village head, one of whom is the senior head. The farm lies within agro-ecological zone upper midland 4, characterised by 1000-1200 mm rainfall, in two seasons. The market centre is small, with a few businesses, a mill and a communal borehole.

Kiminini farm is situated about 6 km from Kitale town in Trans-Nzoia district. The farm lies in the UM_4 agro-ecological zone at an altitude of 6000 ft, and receives an average rainfall of 1200mm per year. The major soil types are sandy loams. Due to clearing of the land for cultivation, the

natural vegetation of the area has almost been, destroyed except for a few scattered Acacia trees. (See map 2)



Map No. 2 LOCATION OF TUMAINI, SINOKO AND KIMININI

A single interview was conducted in six categories. Head of households,

1. Female headed households,
2. Female headed households with husbands away at work,
3. Female headed households with deceased husbands
4. Male headed households
5. Male headed households with deceased wives, and
6. Male headed households with wives away at work,

(see table 3 below)

Table: 3.1.a Heads of Households

AGE GROUPS IN YEARS	FEMALE	MALE	TOTAL	EXPLANATIONS
25-29	5	-	5	away in urban centres working
30-35	11	-	11	male not interested in daily chores
36-39	5	-	5	deceased husband
40-44		1	1	wife away at work
45-50	-	18	18	male in charge
60 and above	3	2	5	interviewed with the assistance of their sons.
TOTAL	**24**	**21**	**45**	

3.1 Topography and Climate

There are three important topographical features in the district; Mt. Elgon, Cherangani Hills and the Nzoia River. Most of the district has an elevation averaging 1,800 M above sea level. However, the Cherengani Hills reach an elevation of 3,371m above sea level while Mt. Elgon reaches an elevation of 4,313m above sea level making it the second highest mountain in Kenya. The altitude drops fairly rapidly to 1,400m above sea level to the north.

Because of the hilly nature of the north western and the eastern parts of the district, communication is difficult especially during the rainy seasons, when the roads are impassable practically.

The district is drained by Nzoia River with its major tributaries ewaso, rongai, koitobus and nogamet rivers. These rivers flow to Lake Victoria through the Nzoia river, while suam flows to Lake Turkana.

The farming activities take place between 1800m to 2400m above sea level with the amount of the arable land decreasing as land becomes drier towards the north and bordering West Pokot. This is attributed to the rain shadow effect of Mt. Elgon and Cherangani Hills. The district has a highland equatorial type of climate. The rainfall is fairly well distributed throughout the year. The average annual precipitation is 1296.1mm. The slopes of Mt Elgon in the west and Cherangani in the north, east, receive the lowest.

The district experiences a biomodal rainfall pattern. The long rains fall from the month of April to June while the short rains fall between the month of July and October. The mean temperature in the district is 18.6°C. However, temperatures vary between 10 to 37°C. The district has favorable climate for both agriculture and livestock production.

Upper highland zone.

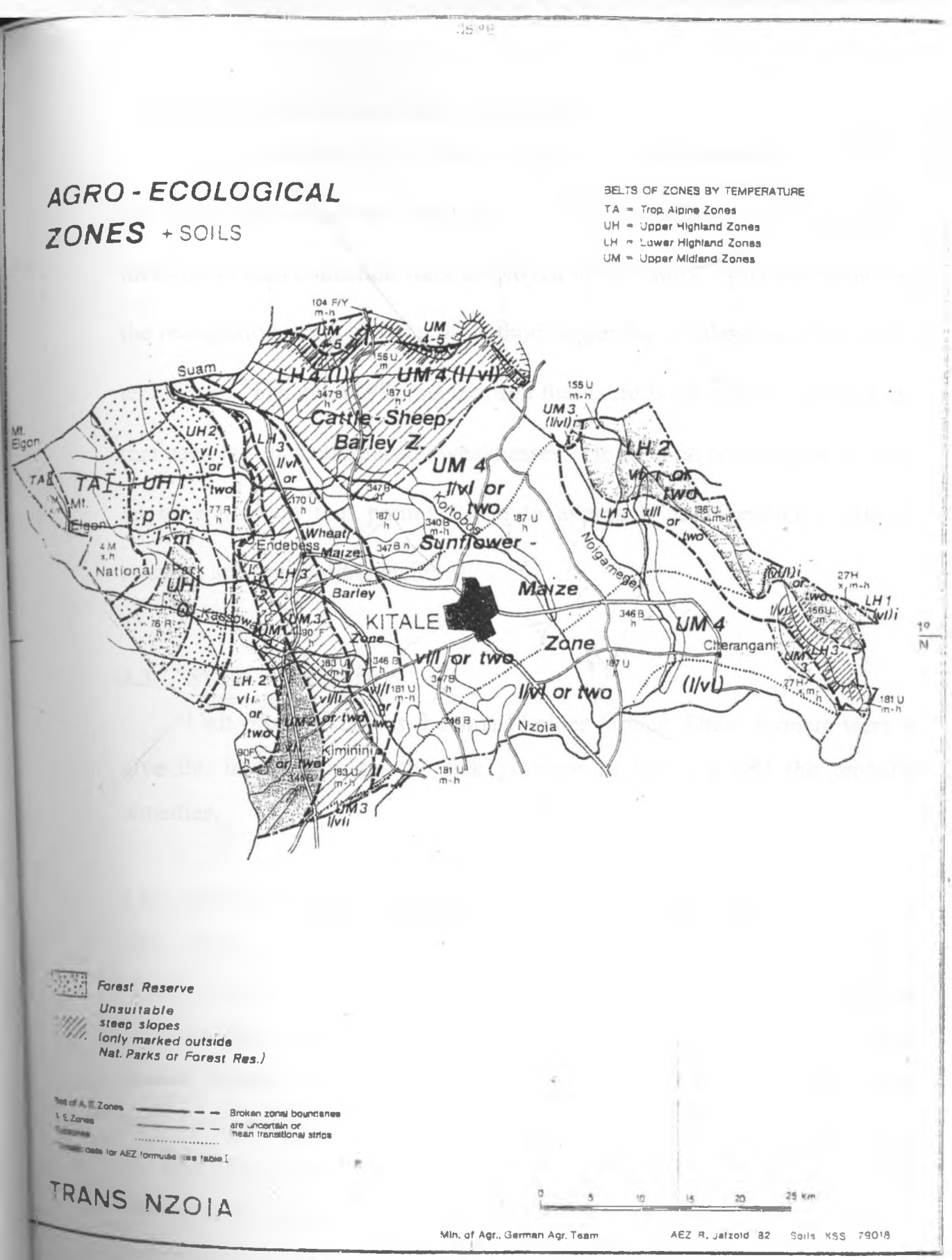
This zone covers the hills and steep slopes of Mt. Elgon, Cherangani and the boundary zone towards West Pokot District. It lies between altitude 2,400 and 4,313 meters above sea level. There are some shallow stony soils with rocky outcrops in this zone.

Lower highland zone:

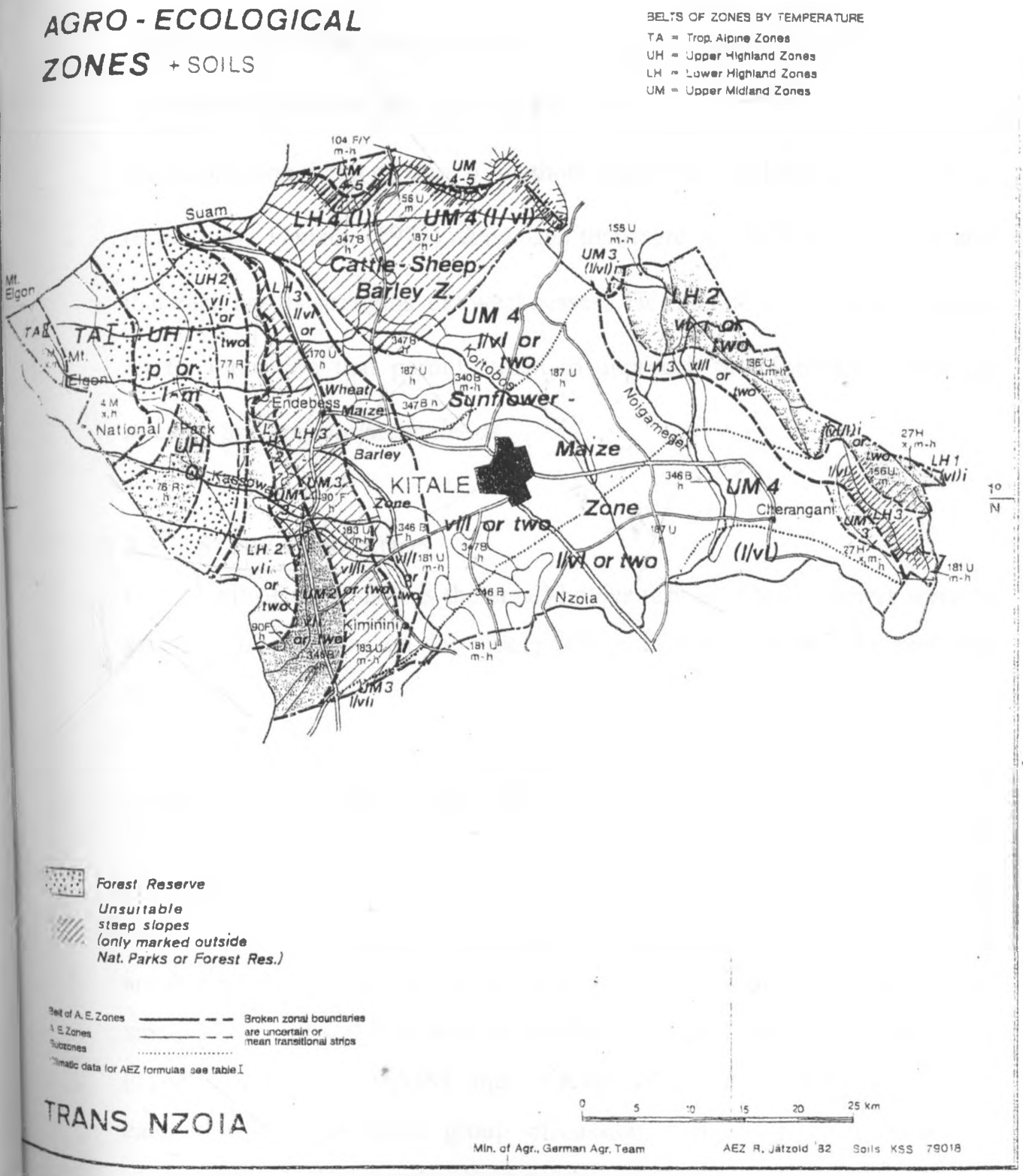
The lower highland zone covers the slopes of Mt. Elgon and Cherangani Hills with an altitude between 1800-2400m above sea level. This is a transitional zone with a high potential for cultivation of pyrethrum, wheat, tea, maize, barley, sunflower, coffee and horticulture and the rearing of cattle and sheep.

Upper Midland zone:

This zone lies between altitudes 1700m-2000m above sea level with a mean annual rainfall of about 1200mm. See map 3 for the Agro-ecological zones. (AEZ[5]).



Map No. 3 AGRO-ECOLOGICAL ZONES



Map No. 3 AGRO-ECOLOGICAL ZONES

3.2 Research methodology and design

In this section the research design and methodology as well as sampling techniques are discussed. Both quantitative and qualitative methods of data collection were employed in this study. This was done with the recognition that a mixture of methodologies has a balancing effect on the techniques. Denzin, (1970) recognised that there is no superior method and that each has its strengths and weaknesses. He calls on sociologists to move on to a position that permits them to approach their problems with all relevant and appropriate methods.

3.3 Study Population

Unit of analysis was the small-holder farmer. These farmers were to give the information on the tick problem in the area and the probable remedies.

3.4 Sampling Strategy and data collection methods

This study used cluster sampling because there were already existing clusters which had been set up for other researches in the area. Therefore, the researcher used the three existing clusters which had been set up by another research to carry out this research. The researcher picked fifteen small-holder farmers from each of the three clusters. The three clusters were (1) SINOKO, (2) TUMAINI, and (3) KIMININI. Fifteen respondents from each cluster, three focus group discussions, one from each three key informants and one from the District tick control officer.

3.4.1 Documentary sources

This was the first phase of this study; it lasted for about two months, beginning December 1998 to February 1999. It involved consulting books, and seminar papers for literature relevant to tick control strategies and particularly those strategies used today (modern). Official reports and statistics provided a wealth of valuable information and it is from this that a theoretical framework and hypothesis of this study have been derived.

3.4.2 Standard Questionnaire

In this study, the act of interviewing the respondents was meant to be accomplished through planned administered questionnaires. The questionnaire was to provide general information which was used to design focus group discussions.

3.5 Focus Group Discussion

There were three focus group discussions with at least over six people of each on each group. These were for in-depth information

3.5.1 Key Informant Interviews

Key informants who were interviewed were the village elders, extension workers who also happened to be animal health assistants. These assisted in getting any information that had not been wholly addressed to; by the farmer.

3.6 Data Analysis

Qualitative techniques were use and became essential since the study was on people, and in the study of people, it is just to know how the people define

the situation in which they find themselves in. According to Thomas (1949: 301, quoted in Marshall and Rossman 1989:46), "If men define situations as real, they are real in their consequences". While quantitative technique was to interpret qualitative data into tables for quick understanding.

The researcher sampled people in groups of the following when collecting data, female headed households, female headed households with husbands away at work, female headed households with deceased husbands, male headed households, male headed households with deceased wives, and male headed households with wives at work. All these fell in the age groups of between twenty-five years old and sixty years old and above.

CHAPTER FOUR

PRESENTATION OF FIELD DATA AND DISCUSSION

4.0 DATA ANALYSIS

The researcher established the social status of the informants, e.g., age and marital status. It was difficult for some of the informants to know their exact age because dates of birth were not recorded. In order to make a fair and realistic guess of their ages, famous occurrences on the course of their lives and those of the community such as war, disease epidemics, famine, intrusion by European settlers, and circumcision age sets, were all used as markers or indicators of times of birth. This in particular applied to informants who were over sixty years old. For younger informants time of joining and completing or dropping out of formal education were used to determine the age.

The use of age in data collection was to enlighten the researcher on what kind of age groups were involved in decision making. In all the three sub-locations, the age bracket of the informants ranged between twenty one years old and over sixty years old. See table 3:1.a

Of all the forty-five informants interviewed, 24 female headed households were found to be most. This could have been because, the husbands could be away at work in urban centres, or deceased, or husbands who have had no interests in family up-bringing in any decisions made.

Most of the women whose husbands had no interest in the rearing of livestock were 11, and in their late 30s or early forties, while those with husbands away at work and who were at their late 20's and early thirties was 5(five). And two male and three female were over sixty years old.

Consequently, of the 21 male headed households, 18 were between the ages of 40-50. The group had self assertive qualities that easily marked

them out to be picked for interviews. At the same time the aged category 60 years and above felt rather incompetent, therefore three (3) females had their sons' assistance in the interpretation of the questionnaire. They claimed that their sons were also conversant with livestock and livestock diseases, therefore could assist appropriately I the interpretation of certain areas in the questionnaire.

The aged group, 60-70 years of age, comprised of 5 informants, -2 male, and 3 female. This was the second least group of informants, whilst the least one was the male headed house hold with wife away at work which comprised of one (1) informant (See table 3.1.a).

Any informant who was widowed, divorced, separated or unmarried, but with children of their own and perhaps other additional members of the extended family to support, qualified to have the status of "head of household". However, there is a class of unwed mothers that were excluded from the category of head of household. For instance some young school drop outs or leavers with one or more children, but who continue to live under the same roof with their parents or single mothers, were not in a position of authority to make decisions on issues affecting the household. Either the mother or the father had the authority on livestock issues.

The first question to be posed to the informants, after their social status and ages were established sought to know the types of livestock diseases each farmer experienced and how they controlled them.

Some farmers gave names of the diseases in their local names and the researcher could have the extension officer interpret them into a language of comprehension, thus scientific name. See table 4.1.a next page.

Table 4.1.a Important Livestock diseases in Tumaini, Sinoko & Kiminini clusters **(The following tables show the diseases that are dominant in the three areas and their interpretations) Thus how they are recognised**

Table of TUMAINI

Description of the disease in English	Disease names	Signs and symptoms
Scientific	Description of the disease in local language	
Retained placenta	Biero (Luo) Lisamuna (Buk*) Thigira (Kik**)*	Retained placenta
Eye problems	Chindesi (Buk)	
Pneumonia	Sikhale (Buk)	Laboured breathing
Food and mouth disease	Kamalenge (Buk)	Limping
Swelling of parotid glands (calves)	Kamabumba (Buk) Ekebera (Kisii)*	Swelling of parotid glands and face.
Tick infestation		Presence of ticks
Bloat	Khusimbwa (Buk) Kuhohita(Kik)	Swollen stomach
East Coast Fever	Ngaet(Kik) Khaoya (Buk)	Swollen lymph nodes. mucous. tears. laboured breathing.

Table of SINOKO

Description of the disease in English	Disease-local name (local)	Symptoms	Comments
	upofu wa ngombe	Blindness	Cattle
Ephermeral fever (3 day sickness)	Waluse(Kibukusu	fever. lowlessness. immobile. recovers	Cattle
(ECF) East Coast fever	Ugonjwa wa kupe		Cattle
	Kutetemeka kwa ngombe	Shivering. fever	Cattle
foot and mouth disease	Ugonjwa wa miguu na midomo		Cattle
	Omuliko (maragoli)	retained placenta	Cattle
	Kukatika kwa matiti	blisters on udders. small cuts on udders	Cattle
	Kufura kwa shingo	bottle jaw	Sheep
Weakness (weight loss)		Does not eat	Cattle

Table of KIMININI

Description of the disease in	Disease local name	symptoms	Comment
ECF	Kamabomba (Buk)		Cattle
Red dotted ticks	Zingua (Buk)		Cattle
White dotted ticks	Endohi (Buk)		Cattle
Brown ear ticks	Ebisemo bimbwe (Buk)		Cattle
Red ear ticks	Bitarus (Buk)		Cattle
Diarrhoea	Kuhara damu (Kis)		Cattle

*- Bukusu **- Kikuyu Kis.(Kiswahili).

Treatments for ECF

FMD-omobeno

Ephermeral fever-Egekuguche

Diarrhoea – Omwatekania

Bloat

Weight loss

4.1 Cultural role of livestock

Besides what Suda 1986 reports to be cultural roles of livestock is also reported in Trans-Nzoia to be the source of dung which is used in the smearing of residential houses, the same dung was also used as manure in gardening; and the hides from livestock are used as sleeping equipment (beds). Milk from the livestock provide a balanced diet to the households.

A small percentage of households believed that dry cow dung could be used to ward away cattle rustlers. Quote;

"I put dry cow-dung in sour milk, so that when I sell it at the market, I am able to guard my animals against whoever may be intending to come to my boma to steal my animals". End of quote. This was so because the farmer said that such dry dung acted as medicine to whoever had intentions to go to the bomas to steal the same animals they had used their milk (animal milk). Therefore, any time they could be laying down plans to steal these animals, their plans could fizzle out as they automatically felt uneasy to carry out such plans. This belief was expressed by a female member of a male headed household.

Goats were slaughtered for household consumption as well as for exchange. They are regarded as ritual animals that are used for ceremonial purposes as during births, weddings and funerals. (Suda 1986 pg. 133-134).

Donkeys in Trans-Nzoia are kept for traction, and three farmers reported donkey milk to be medicinal. They said that donkey milk cured Tuberculosis (TB) at its early stages in human beings.

The major problems reported in the area during the interview period were livestock diseases. When the farmers were asked to tell of the most prevalent diseases, they cited ticks and tick-borne diseases, some said during rainy season, some during dry spells, some said that in both seasons, they experienced ticks a lot. Those who said during rainy season attributed it

with the rains washing away the acaricides soon after they have been applied on the animal. This was because they said they were not able to prevent or protect the animals from down pour as they did not have houses for their shelter. Some said that during the rainy season, the vegetation changed making it habitable for their ticks hideouts. They said that this is the time shrubs, bushes and grass grew faster; therefore when the animals went out to graze, they could pick up the ticks from the tall grasses especially with their tails; as tails were said to be touching the grass and then use the same tail to blow away flies then having the animal quickly acquire the ticks.

4.2 SEASONALITY OF TICK PROBLEM

In the dry spells, the informants said that the animals always lacked enough feed. For that reason they had to walk long distances to eat maize stalks after the harvest period and at the same time to be able to get water. This therefore was said to be the period when ticks were most prevalent.

This was so because, about 50% of the farmers reported that this were periods when ticks also went out to look for feeds as maize stalks were said to be damp and wet, and as a result could get the animals at the stalk feeding stations whereby they could be able to suck their blood(animal) as the animals could continue to eat stalks (especially the maize stalks). It was further noted that this tick problem was being experienced because animals which had been sprayed mixed with those which had not been sprayed-during grazing periods, Consequently, those that had not been sprayed, transferred ticks to those that had been sprayed. The transfer was when ticks fell off from the animals that were infested with them (ticks).

Table 4.1.b Methods used to control ticks and tick-borne diseases.

Station/sublocation	Number of households	Dipping		Personal spraying		Hired spraying		Spot ON		Traditional healing	
		n	%	n	%	N	%	n	%	n	%
Sinoko	15	3	0.45	7	1.05	-	-	4	0.6	1	0.15
Tumaini	15	10	1.5	2	0.3	-	-	2	0.3	1	0.15
Masaba/Kiminin	15	3	0.45	9	0.45	3	0.45	-		-	-
TOTAL	**45**	**16**	**2.40**	**18**	**1.80**	**3**	**0.45**	**6**	**0.9**	**2**	**0.30**

Dipping was more dominant in Tumaini because the informants said that it was more convenient as it never required more than one person to take the animals to the dipping centres, which, was interpreted to be time saving. They further said that what was required to keep the dip in good service was water, acaricide and good management; which they had although they complained that water distance was a problem especially during dry season when they had to walk long distances to fetch water to bring to the dipping centres. The walking of long distances carrying water for dipping purposes was why two informants opted for spot on and personal spraying which required minimal water.

Sinoko and Kiminini were carrying out personal spraying because they (farmers) said that this kind of spraying was more effective on their animals as they said that they were able to monitor ticks on their animals, they never mixed with other animals as they were afraid that other animals may be carrying contagious diseases, they also said that if ;they sprayed their animals personally, they were able to determine the strength of the acaricide in their mix, they said that walking long distances to the dipping centres made their animals tired and therefore at the end of the day could not yield enough milk from the animals.

Three households in Kiminini were using private personal spraying because they said they had limited help to help in spraying or dipping their animals as all the children were away in boarding schools and they never trusted their helpers to do the spraying. The reasons cited for not trusting the workers were, that the workers may not use the right measure to each animal as they may want to keep a little for their own use on their animals later, or the helpers may do the spraying in a hurry to be able to go elsewhere to do other animals in order to increase their level of income for that day. When a commercial private sprayer was interviewed, he said that in the beginning he had about 12 households as customers, but as days went by, he lost nine (9) and he has three left. He (the private sprayer) cited reasons of having a functional dip nearby and having day school going kids during the dip days.

When the researcher observed the animals both the ones that were sprayed personally and the ones that were sprayed privately, the researcher noted that those animals that were privately sprayed had ticks while those animals that were either personally sprayed or dipped had no ticks. The researcher tried to find out the reason for this. The researcher learnt from the private sprayer that, the acaricide used by the same private sprayer was diluted beyond the normal mix therefore, could not effectively kill stubborn ticks.

In all the three cites when the informants were asked as to where they seeked treatment for their animals, they said that they consulted veterinary officers except for two, - one from Sinoko and Tumaini respectively each of who said they used ethnoveterinary knowledge to heal their sick animals on whatever disease they were suffering from. When the researcher inquired how they administered their drugs, they said that they waited for twelve to twenty four hours before they administered the next dose which was usually given through the mouth - but in very special cases, they said that they could

combine those medications with those of veterinary officers. When inquiry was made as to why they could not use the veterinary officers alone, they cited lack of funds to be a major constraint.

In Trans-nzoia, ticks have been a major problem to livestock owners, and coping up with the ticks and their resultant diseases has been a nightmare to many farmers. The research that was carried out showed that most farmers or households used various methods in curbing tick-borne diseases. They tried various acaricides, cleared bushes especially areas they thought to be hideouts for ticks, they paddocked their animals thus semi-zero grazing. The major problems that were reported by forty informants thus over ninety percent, were that they (ticks) sucked animal blood; leading to infections, due to this suck of blood, the animals looked thin and frail; tick made the animal skin unpleasant, therefore, the animal could not be attractive to the buyers if it had to be sold, or if sold, the hide could not fetch as much money as it could have had if it had been tick free. Due to ticks, the informants from the three sub-locations cited reduction in milk production on their animals. When asked the reason for the milk reduction, they said that the animals spent a lot of time scratching and therefore, did not have enough time to feed for themselves to yield high milk production. Another reason that was given was that, the animals were very uncomfortable with ticks, therefore could not yield a good amount of milk.

Since, the question of who makes decisions in livestock management was of crucial importance to this research, it became necessary to seek the opinion of the extension officers. These are the personnel who interact most often and directly with the farmer. This became possible when the researcher was invited to a meeting of extension officers which was held usually once every month to review progress in the district. At this meeting two issues were raised by the author. First was to know who, according to

the extension officers assessment, made decisions on livestock disease management issues and second, who did the extension officers interact with most, between men and women farmers, during their field visits.

4.3 Gender division of labour in livestock management

Small-holder cattle are mostly crossbred animals kept primarily for dairy. Herds are small, usually three to five animals. On farms of all sizes, cows are milked twice daily: The morning milk is sold to the local people for use in hotels, in and around Kitale town; while the afternoon milk is usually reserved for household consumption and use. About half of the smallholder areas reported relying upon rivers and other open water sources for watering livestock. The rest use wells or boreholes. Smallholder feeding regimes use primarily on-farm unimproved pasture, either paddocked (fenced) or unpaddocked. Some grow fodder or forage crops such as nappier grass (*pennisetum purpureum*) as supplements and very few farmers stall feed their animals with either forage crops or commercial feeds. As with crops, labour for livestock production and disease control comes primarily from the household or farm family. While men are often reported as owning the family cattle; women, older men and children contribute most of the labour to their maintenance (Huss - Ashmore and Curry, 1992).

Forty-two households in the district reported mortalities due to ticks. They said that ticks brought many diseases to their animals. They cited ECF, Anaplasmosis, and pneumonia.

Table 4.1.c Household Division of labour on tick management

	MALE		FEMALE	
ACTIVITY	n	%	n	%
DIPPING	11	4.95	3	1.35
SPRAYING	7	3.15	5	2.25
TRADITIONAL HERBS OR SPOT ON	3	1.35	17	7.65

Males and females of various households have various primary responsibilities. For tasks associated with controlling ticks and tick-borne diseases in cattle, the most common control method used in Trans-Nzoia District is taking animals to weekly communal dips. Spraying animals on-farm as an addition to, or substitute for, communal dipping is also common. Nearly 8.1% of men dip or spray cattle weekly and 1.35% do neither. Some farmers used spot on to control ticks and traditional herbs were used to heal wounds which have been brought about by ticks. The healers squeezed juice from a plant called *omobeno* to the affected part of the animal. This was administered three times a day until the animal recovered fully (see table 4.1.c). Women helped with the dipping or spraying less frequently. However, despite less frequent participation in dipping and, spraying of livestock, these household members have considerable knowledge about livestock health and patterns of disease. They opted for traditional herbs as they happened to have more knowledge in the usage and could access the herbs easily and quickly.

4.4 Decision making on livestock management

The response to the first issue was that women made decisions on livestock management issues. Women, in the absence of men when animals got sick, went to the Veterinary Officers to seek medical attention. Women also consulted with herbalists to treat sick animals in the absence of cash. In cases where they were unable to reach Veterinary Officers or herbalists due to distance or insufficient cash, they did the healing/treatment themselves by administering herbal medicine. On second issue, it was said that extension officers interacted more with female than male farmers. This was true even from the visits that the researcher had paid to the farmers at their homes. Most of the times, the researcher held interviews with female farmers. This seemed to contradict the popularly held notion that extension officers interacted more with male and not female farmers (Barnes, 1978; Uma, 1975).

With these facts in mind, together with the information yielded by the extension officers, it is reasonable to argue that in the research area livestock management decisions are influenced or determined by the availability of and control of or access to resources or inputs. "Resources Analysis", provides an outline for disaggregating by gender and age who has access to and control of critical resources, *control*, meaning the power to decide how a resource is used and how it is to be allocated. By *access*, meaning the freedom or permission to use the resource, perhaps with some decision making once access can be obtained.

In the three sub-locations, Sinoko, Kiminini and Tumaini, where men had control of livestock for traction, their wives and female relatives obtained traction services from them(animals). Women had access to traction, but men had control of it. Where women kept the cash and made

decisions about expenditure, women had control of cash and men had access to it.(cash).

After looking at who made decisions in livestock disease management, the researcher had to prove the null hypothesis that this research set out to test. That,

1. The higher the income level, the greater the chance of tick control.
2. Men will rather do the tick control at home than women.
3. The nearer the distance to dips and its effectiveness the more likely a house-hold will control ticks.

4.5 THE MANAGEMENT OF CALVES WITH TICKS.

It was learnt that calves with ticks were sprayed when they were at least one month old or hand picked them(ticks) when they (calves) had not attained the spraying period of one month and above.

Consequently, it was learnt from the interviews that when calves or animals died, the farmers said that they slaughtered them, removed the skins and ate the meat. But they said that meat from an animal that had been subjected to modern treatment whether calf or adult was dangerous for consumption as it may have been given drugs that could be poisonous to human lives.

4.6 HOUSEHOLD DECISION MAKING IN THE USE OF CATTLE AND CATTLE PRODUCTS

The farmers said that morning milk which was collected locally was weighed and sold to the hoteliers and the money given to them (farmers) directly, which was in turn used (money) to buy uniforms for the school going children and some of it used for domestic purposes. The afternoon milk was consumed within the household very little was sold to obtain cash

to buy missing essential items like salt or sugar. It (the milk) was also the major source of proteins in the household.

Table 4.1.d Household decision-making in the use of milk in Trans-Nzoia District

	Gender				
	Male who decide on a.m./p.m. sales		Female who decide on a.m./p.m. sales		Total
No. of Households	20		25		45
A.M.	15		22		*37*
P.M.	4		0		*4*
Decides A.M. %	80% male A.M.	0% fem. P.M.	90%fem. Sold A.M. milk	4% Male sold P.M. milk	*41*
Keeps Cash Male H/H head A.M.	20		-		20
Keeps Cash Female H/H head P.M	4		16		20
Both male and female who kept cash in A.M. and P.M.	4		-		4
Total % Keeps cash A.M. and P.M.	100% Male A.M.	0% female A.M.	80% female P.M.	10% Male P.M.	44

Table 4.1.d shows that about 80% of the male headed households (15HH) sold morning milk while less than 10% (4HH) sold afternoon milk. In over half of the male-headed households, decisions regarding sales of morning milk were made by the males, who were equally likely to keep the cash from these sales. In about one-quarter of the male-headed households, women participated in sales decisions as either a partner in joint decisions or as the person responsible. However, as would be expected, nearly all the female-headed households reported that the female head was responsible for sales decisions as management of milk revenues.

In contrast to morning milk, decisions about evening milk use were more likely to be made by women than by men. Cash from evening milk sales was also more likely to go to the wife or the female head than to the male head. Female heads wanted evening milk to be retained at home because they were reportedly used as vegetables, together with green vegetables (see table 4.1.a).

4.7 KNOWLEDGE OF LIVESTOCK DISEASES BY GENDER

Analysis of ethnoveterinary recall data collected during the research period reveal that men and women cattle keepers in the district share an extensive body of knowledge of livestock disease. As earlier noted, 20 males and 25 females were interviewed. Experience with cattle was extensive and comparable: average number of years keeping cattle was 20 for men and 11 for women. The farmers gave a total of 33 different terms or syndromes that described animal ill health. (See Table 4.1.e)

4.8 INDIGENOUS KNOWLEDGE

The role of indigenous knowledge has been important in livestock disease management in Trans-Nzoia especially to small scale cattle keepers. This (knowledge) has enabled these farmers to cure their animals using herbs which have worked out to be money savings. This has been to certain animal diseases which have/are common in the area. However, in some cases, some diseases have not responded to this treatments. For example, a large number of farmers said that East Coast fever could not be treated locally. While a disease that could be treated locally was ***(Ekebera)*** ephermeral fever, by the use of ***'egekuguche'*** a certain tree stick which has formed a substance at the end of it. (They cut the stick and try to sniff it to the animal). They also use a hot object on the place where the animal has swollen. They also used a moderately hot/warm metal bar to correct the animals stiff/swollen neck. *Egekuguche* was used to heal ephemeral fever by sniffing it. The wounds were cured by squeezing juice from *omobeno* and dispensed on the animal's wounds.

Table: 4.1.e Livestock diseases in Trans-Nzoia

Disease category	Exclusively Male	Exclusively Female	Total
Tick-borne diseases esp. East Coast Fever (ECF)	10	7	17
Foot and Mouth disease	1	0	1
Fevers (esp. ephermeral)	2	1	3
Diarrhoea/alimentary	1	1	2
Weakness (Weight loss)	1	0	1
Bloat	1	0	1
TOTAL	**16**	**9**	**25**

The number of syndromes given by both men and women are reported by disease category in Table 4.1.e and Table for all the terms and their treatments. The tick borne disease category contains the largest number of syndromes (17 terms). The next largest category is actually an eclectic assortment of "other" mostly unrelated, diseases (9 terms) which includes eye problems, retained placenta and swelling of parotid glands. Foot and mouth disease, fevers, diarrhea, weakness and weight loss and bloat contained, 1, 3, 2, 1 and 1 terms respectively.

Out of the 25 unique syndromes given, nearly half of these are known to both male and female respondents. About one-quarter were given by women only and slightly over one-quarter by males only. Women respondents were familiar with terms that connote disease almost in every category. From the table, one can conclude that women's knowledge of

local disease terms is comparable to that of men, in terms of the number of syndromes identified and the range of probable diseases these local terms cover.

The disease lexicon provided by respondents was particularly rich in terms which probably connoted tick-borne diseases. Both men and women recognised terms. In the tick-borne disease category the most volunteered terms were the Bukusu words, *Khaoya* (15 respondents) and *ebisemo-biembwe* (10 respondents).

Farmers stated that in Trans-Nzoia ebisemo-biembwe (Bukusu) refers specifically to the brown ear tick (Rhipicephalus appendiculatus), the vector for Theileria parva, the parasite which causes East Coast fever (Norval et al; 1991).

In depth interviews for the characteristics of ebisemo-biembwe were conducted with 18 men and 12 women, see table 4.1.f on summary of the following information. Most men and women stated that cattle of all ages can be affected. Men stated that cattle were most likely to get the disease from grazing in swampy areas, (7 responses), and to a lesser extent, by river banks (four), in green grassy areas (three) open grazing - (two) and at dips (two). Women on the other hand, stated that the disease is contracted in open grazing areas (six responses), at river banks (six), and swamps (two).

Table 4.1.f Grazing areas where ticks are most common in Trans-nzoia district.

	GRAZING IN SWAMP AREAS	%	BY RIVER BANKS	%	GREEN GRASSY	%	OPEN GRAZING	%	AT DIPS	%	TOTAL
MEN	7	1.26	4 6	0.72	3	0.54	2	0.36	2	2	18
WOMEN	2	0.36	10	1.08	-	-	6	1.08	-	-	14
TOTAL	**9**	**1.62**		**1.8**	**3**	**0.54**	**8**	**1.44**	**2**	**2**	**32**

% - percentage

Various reasons were given by various groups of people why diseases were dominant in those areas. Men said that animals grazing in swampy areas were likely to pick-up the ticks from their animals. This was said to be because swampy areas had attraction for ticks due to the smell around the areas; as such smell was conducive and favourable to ticks and also these areas never had any external disturbances; like clearing of the forests or the grasses. Most of the time the male farmers stated that these areas had enough feed (grass) for their animals especially during dry spells as the same grass was always near the waters and therefore, never dried up at such periods (dry spells). This notion of good green grass in swampy areas was also reported to be the reason also of grazing by river banks.

More male farmers preferred grazing around swampy areas than women farmers. Women farmers gave their reasoning that these were hideout areas for poisonous snakes, therefore, they preferred grazing along the river banks which also was said to be place for animals to pick ticks. They said (farmers) that river banks like swampy areas, had ticks washed down from other areas which could have been dominant or had ticks and brought them (ticks) to areas where there were no ticks. Therefore, it can be said that rivers, transported ticks from one area to the other and ticks easily

crawled out of the rivers to dry land and into the grasses nearby. Inside these grasses they could now wait for the animals as they come to graze and get onto their tails (animal), therefore ending up on the animal itself.

Open grazing areas were reported to be tick areas. Farmers said that these areas were the areas where other animals passed to and from the markets and dropping ticks on their way after sales, and to and from various places where they may have been working. An example was that of bulls. Bulls could go work somewhere and come back with ticks. And also these open grazing areas were areas where animals came through to other places or areas for inoculations for example the East Coast fever and other diseases, therefore, posing danger to the grazing of animals of that area.

A few farmers said that their animals picked ticks at dips. They gave reason that the animals were subjected to long distances from dips, therefore, on their way back home from the dips, they could stop here and there to feed, therefore, picking up ticks on their way home (See Table 4.1.f).

Clinical signs most frequently recognized by men were appetite loss (four responses), staring coat (three), weakness (two), foaming at the mouth (two) ears shaking (three) coughing (two), weight loss (two) and swollen glands (two). For women respondents the most frequently recognized clinical signs were appetite loss (six responses), staring coat (five), weakness (three), foaming at the mouth (three), coughing (three), ears dropping (two) and weight loss (one). (See table 4.1.g)

Table 4.1.9 Clinical signs for livestock diseases

	APPETITE LOSS	STARING COAT	SWOLLEN GLANDS	WEAK-NESS	WEIGHT LOSS	FORMING AT THE MOUTH	EARS SHAK-ING	COUGH -ING	TOTAL
MEN	4	3	2	2	2	2	3	2	20
WOMEN	6	5	-	3	1	3	EARS DROPPING 2	3	23
TOTAL	10	8	2	5	3	5	5	5	43

However, there were clinical signs depicted by farmers. Many of these clinical signs which were cited by farmers were similar to clinical signs of tick-borne diseases recognized by veterinarians and found in the regions, that is, East Coast fever (theileriosis, babesiosis, and anaplasmosis). The clinical signs for the acute foam of ECF as described by Mugera et al. 1979, include: swelling of the lymph nodes, a sharp rise in body temperature, fall in milk yield, gradual loss of appetite, a staring coat, and cessation of rumination, swelling of eyes, ears and lymph nodes, a rapid pulse and general weakness, difficulty breathing, accompanied by coughing, diarrhoea, often containing blood or mucous, emaciation, recumbency, and death from asphyxiation, often accompanied by froth from the nostrils (Mugera et al., 1979). The cerebral form of ECF, also called turning sickness, is fatal in acute cases and is characterised by violent circling or turning movements of affected animals to the point of dizziness and collapse. In less acute cases, movements may be less violent and the animal may stand up with its head pushed against a tree (Mugera et al., 1979).

Two other tick-borne diseases that are described by ***ebisemo-biembwe*** are *babesiosis and anaplasmosis*. The clinical signs for babesiosis include a

sharp rise in temperature (to 41-42°C) ; anorexia, and a slowing down or cessation of ruminal movement, restlessness, saliva dropping from the mouth, excessive lachrymation, loss of coat luster and the muzzle becoming warn and dry, constipation or diarrhoea with yellow feaces, rapid development of anemia, often resulting in jaundice, rapid respiration, and a loud heartbeat. In the cerebral foam which is usually fatal, the animal may exhibit nervous signs, the visible mucosae and skin may be either pale or jaundiced, and hemoglobinuria turns the urine to a port-wine red colour (Mugera et al; 1979). Anaplasmosis is described by Blood and Radostits (1989) as primarily an anemia, the severity of which may vary in young cattle but is always severe in adult animals (Blood and Radostits, 1989). The clinical signs include: gradual rise in temperature (to above 40.5°C), anorexia, impaired fertility with pregnant cows aborting and mucuos membranes jaundiced, showing marked pallor. In peracute cases, there is a sudden onset of high fever, anemia jaundice, and difficulty in breathing, with death often occurring within 24 h. Affected animals are often hyperexcitable and may attack attendants just before death (Blood and Radostits, 1989).

Clinical signs for each of these cattle diseases can be found in the list of signs given for ***ebisemo-biembwe*** and ***Khaoya*** by farmers. Staring coat, coughing, weakness, recumbency, weight loss, and swollen lymph glands are signs that might indicate that East Coast fever is the closest English equivalent name for these two syndromes. However, the fact that male and female farmers recognise lachrymation as a sign for either syndrome would suggest that they are referring to babesiosis at least occasionally. Foaming at the mouth, appetite loss and difficulty breathing could refer to ECF.

babesiosis, or anaplasmosis. It should be pointed out, however, that the difficulty of distinguishing ECF from babesiosis and anaplasmosis in the field by means of clinical signs is not restricted to farmers. Anyhow, diagnosis between babesiosis and anaplasmosis often requires microscopic examination of blood, and diagnosis of ECF may require demonstration of schizonts in smears from lymph nodes and endoglobular parasites in blood smears (Mugera et al., 1979). From the analysis of information on ***ebisemo-biembwe*** and ***Khaoya*** collected from informants, it can easily be seen that the two terms are somehow interchangeable and can be used equally by both men and women to cattle keepers to mean acute forms of tick-borne disease in cattle.

4.9 Treatment of animal ill-health

In the naming and diagnosing forms of cattle ill health, the local knowledge base contains some information on treatment, both traditional and modern. Some of the older men interviewed were herbalists, and were quite knowledgeable concerning traditional remedies using medicinal plants. Moreover, of the 25 female respondents, 12, volunteered knowledge of at least one traditional remedy for cattle diseases during in depth disease knowledge interviews. Remedies offered were locally available plants directly applied or squeezed the juice from the plants and given to the animals orally. Often these remedies were for treatment of symptoms that could be associated with less severe conditions such as ephemeral fever (Mugera et al., 1979), rather than more severe conditions such as ECF. In the case of more serious diseases, both male and female informants said that, rather than relying on traditional remedies; they preferred to summon the

animal health assistant or a veterinarian to diagnose and treat sick animals. The farmers said that prevention was better than cure, therefore they preferred or used methods such as, isolating animals which fell sick from the rest of the herd as soon as possible and give the animals urgent attention of giving the relevant herbs as many diseases could be cured if treated at the early stage. The farmers were aware that there were certain diseases which could only be adequately controlled by vaccination after their herbal remedies failed, this occurred after waiting for twenty-four hours and the animal was not showing improvement towards recovering. They could recognize that the animal was recovering if it started chewing the cud.

One farmers' animals were to be isolated as far as possible from contact with other animals as these could be a source of disease. Visitors are/should not be allowed close to the stock as they may carry disease on their boots or clothes.

INFORMATION AND DISCUSSIONS

A village elder said that in the absence of proper veterinary attention due to lack of finance/money to carry out services on sick animals, farmers could opt to use indigenous knowledge to cure their animals.

The farmers said that in most cases, they did not have enough cash to summon veterinary officers to come and administer/give veterinary attention to their animals.

Extension officers said that some farmers, even if they were in a position to afford veterinary services still believed that herbal medicine could cure certain diseases on animal ill-health. Therefore, they still had difficulties convincing such farmers. The information that was fully discussed during data collection from farmers due to lack of knowledge was

why farmers had a strong believe in their treatment of sick animals by use of various methods, for example a ephemeral fevers and stiffness of the neck. The groups argued that since time immemorial they had used *~egekuguche* to heal the animal and this kind of healing had worked, and was also inexpensive although time consuming since one had to go to some forest to look for it. The healing of the stiffness of the neck became quite interesting when even the tick control officer acknowledged that the remedy worked. The group said that the hot object was quite reliable because it relieved off the pain from the neck of the animal.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSION

This study has provided a number of findings that are relevant for improving livestock health care delivery in Trans-Nzoia district in Kenya. Female headed households in the sample have a smaller average household than male headed households. This is because female headed households tend to work on their own without the help of their husbands as the husbands always tend to ignore the responsibility. Such households, therefore, have a smaller household labour force which in the absence of their husbands, may be insufficient for accomplishing productive tasks, especially livestock disease control see Table 4.1.c. Smaller herd sizes like in these small-holder households may mean better control of tick-borne diseases for the few animals they possess as they can use hand sprays or washes of acaricides, instead of relying on poorly managed dips.

Now, one can be able to know who is in the best position to observe clinical signs signaling animal health problems. For Trans-Nzoia district, adult women are seen to be having daily responsibility for all major cattle maintenance tasks except for a certain percentage of older male and adult male who take some responsibility in dipping and spraying of the animals in special cases. It would therefore seem that, due to their considerable and frequent contact with cattle, adult women and older men, in addition to adult men, should be the target for veterinary officers for activities to improve diagnostic capabilities on-farm.

In trying to know "who knows what", the researcher found out that both male and female respondents possessed knowledge on livestock

diseases especially tick-borne diseases. Some older men, because of their long experience with animal husbandry, may have had more specialized knowledge of indigenous disease categories and traditional remedies, than do younger household members.

5.2 Recommendations to researchers

Disease management through improved tick control use of low cost alternatives offered through indigenous technical knowledge (ethnoveterinary knowledge) and education could be key to improving disease management.

Animal health care professionals should pay particular attention to establish good support with women, as these are the people who are always with the animals) in order to build upon their skills and knowledge. However, McCorkle and Mathias -Munday (1992) 0bserve that there are a number of limitations to medical systems based on indigenous knowledge. These include difficulties associated with the collection, preparation, and distribution of traditional medicines. Extension efforts to improve the knowledge base and diagnostic skills of both men and women cattle keepers in the district will help to improve the efficiency of diagnosis and treatment of animals and to minimise delays in treatment, delays which are often fatal in the case of diseases like East Coast fever or trypanosomiasis.

The issue of differential control by gender extends to control over livestock products as well as the animals themselves. By knowing "who controls what", one should identify other persons in the household who must be incorporated into the treatment process, since their permission may be needed to treat the animals and/or their income will be needed to purchase

drugs for disease prevention and treatment. Thus, it is often the case that those who are in a position to diagnose and perhaps treat illness may not be empowered to effect or authorise treatment. In an empowered delivery system, it will be necessary either to empower those who care for cattle to also treat them, or to establish more effective communication between those who own cattle and those who care for them. Men are often, but not always, responsible for tick control. Training and evaluation of tick control technologies must involve the relevant household members.

Women in this case should be treated as the ones who care for livestock based on the data collected. Then, a long term process of making the necessary resources accessible to them should be incorporated into law or government policy. Empowerment of women should be seen as a development issue rather than a deterioration of development of environmental and economic conditions.

Action should be taken against altering the basic norms that exclude women. Both men and women should be made to understand the need to change their traditional belief systems by showing the effects of female subordination and marginalisation on the family and the nation. The first step is to create awareness to the public on the importance of women's organizations to enlighten the public about discrimination of women in all forms or call for reforms of some laws that deny equal rights based on either class or gender.

5.3 Recommendations to extension officers

Extension officers should teach the farmers on what systems should be used to control ticks. For dipping, the bath should be roofed to prevent

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5.3 Recommendations to extension officers

Extension officers should teach the farmers on what systems should be used to control ticks. For dipping, the bath should be roofed to prevent

dilution of the *ixodicide by rain or evaporation during hot weather. Also, the full dip-tank volume should be accurately measured. This should be done at the time of filling by for example, the number of 1000 litre drum-fuls of water it takes to fill the dip-tank. About twenty (20) cattle should be passed through the dip at the beginning of dipping to mix it, after which they should be passed through the dip again for effectiveness; each animal should be totally submerged at least once in the dip tank. Ear fringes and tail brushes must be dipped once every six (6) weeks. A sample of the dip wash should be taken for analysis once a month to verify it's strength and this should be done immediately after the last animal has been dipped. The dip tank should be emptied and cleaned once a year. Calves should be dipped after the adult animals have been dipped. This is so because the acaricide may have lost some strength, therefore, may not be injurious.

(b) Spraying

The spray race/pump should be checked before any animals are treated to ensure that sufficient pressure is being released and that the nozzles are clear and are spraying correctly and accurately. The spray race should be built across a slight slope and at right angles to the prevailing winds. The sump housing should be cleaned out between treatments. The prepared spray wash should be allowed to circulate for about five (5) minutes through the entire prepared spray race system before spraying commences, (this is so for a proper mix). The sprayed animals should be

* ixodicides - The chemicals used to control cattle ticks.

allowed to drain for about three minutes, before being released to the grazing grounds, so that they (animals) do not mix the acaricide with their feed. Calves of under one month of age should be sprayed with due care and attention and should have a half mix of the acaricide of the adult animals. For example, if the acaricide is one cupful to four gallons of water on the adult animal, then for the calves it should be half a cupful of acaricide to four gallons of water, to ensure that the mix is not very strong.

Source: Small-holder Farming Handbook for Self-employment 1997.

Extension officers should always be available to listen to the farmers' problems that they (farmers) encounter and advice them(farmers) on how to go about in solving their livestock problems. They should inform farmers on new or alternative inexpensive tick control technologies. They should be friendly to farmers to be able to gather information affecting them (farmers).

Tick control officers in collaboration with extension officers should advice farmers to spend most of the resources accrued from livestock on the same livestock to ensure animal good health; if not used on the livestock immediately, then the same resources should be accounted for and used on the livestock when need arises, for example, when an animal falls sick.

In conclusion awareness of animal ill-health can help health care professionals incorporate the relevant segments of farm households into processes of prevention, diagnosis, and treatment of livestock disease. Veterinarians should make sure that improved veterinary technology and knowledge is transmitted to those members of the household responsible for animal production and healthcare. These are people who will first see

symptoms of disease and therefore, need to be able to recognise ill health and to initiate appropriate treatment. Implementers of these improved livestock disease control programmes should recognise and acknowledge the store of traditional veterinary knowledge of different household members and should attempt to incorporate indigenous knowledge into veterinary extension activities. Local terms should be used wherever possible to translate target diseases into locally -recognised concepts (Curry et al; 1992). This may well require tapping the traditional store of livestock disease knowledge of older men and adult women modern to establish a modern local lexicon of disease terms. Consequently a more interactive rather than reactive, mode of health, care between provider and client should more easily emerge, resulting in improvements in animal health increases in livestock production, and enhancement of the well-being of those who keep animals as part of their mode of production.

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APPENDIX A

INTERVIEW GUIDE FOR TRANS-NZOIA

Name:

Division:

Sub-location:

Marital status:

Level of Education:

1. (a) Do you experience livestock diseases around here? Yes No
   (b)How long do have you experienced livestock diseases?

2. When do you experience a tick problem?

3. (a) What methods do you use in killing ticks?

   (b) What are the alternatives of tick control?

4. Where else do you seek treatment for your animals that have ticks?

5. Do you call vet officers to treat and advice you on sick animals?

6. How do you cope with livestock ticks?

7. I) Which types of ticks do you have here?
   a).

   b)

   c)

Local names

II) For a)

b)

c)

8. Why do you consider ticks to be a problem to livestock?

9. Are there any mortalities because of ticks?

10 What do you do with calves that have ticks?

11. a) What happened to animals that have died due to ticks? Are you able to sell the hides?

c) What is/do people look for in the hides for them to accept them?

12. Who is responsible for production on task? E.g. animal husbandry, and disease control?

13. Who controls resources in the household?

14. Who benefits from the control of livestock diseases, and the resulting productive outcomes?

15. Who takes the animals for dipping and spraying? And who controls the dipping and spraying? (If the control is done by somebody else and responsibilities by somebody else; then who are they?)

16. Who is responsible for the state of health of livestock in this household?

17. Who controls income and other resources that could be used in improving animal health?

Who has access to the control of improved livestock disease control technology?

19 (a) If your animal has a disease for which there is a reliably traditional medicine and a modern treatment, which one would you choose?

b) If ethnoveterinary knowledge, how is the decision made to use ethnoveterinary knowledge?

c) Why?

d) When do you use the herbs?

e) How long do you wait for herbal remedies to take/show progress?

(f) What are the social and cultural role of livestock?

ACARICIDES

20. Do you use private dip tanks or communal? Or both?

21. Why do you use what you have said?

22.. How do you determine the amount of acaricide to use?

23. Are you happy with the private dip tanks or communal?

24. (a) Which dip tanks do you prefer?

(b) Why?

25. how often do you dip?

26. Who takes the animals to the dips?

27. (a) How do you organize those who take the animals to the dips?

(b) When is the dip day?

(c) What if the dip day is in the middle of the week and not a weekend?

28. Do you have sharing responsibilities around here? E.g. pulling resources together, borrowing kinsmen to carry out some duties? etc.

29. (a) Which one of the two do you prefer, spraying vs. Dipping?

(b) Why?

30. Is the sprayer communally owned?

31. How do you acquire the sprayers?

32. Please can I have a look at the sprayer?

33. Recently, dip tanks have been put up here. Please tell me about them. Once they are in operational, will you shift from spraying to dipping or will you continue with the spraying, or you will do both spraying and dipping?

34. Why have you picked on that

(a) Spraying or (b) both

I understand there is somebody who does the spraying around here. How does he go about spraying animals?

HIRED SPRAYER

1. I have been told that you do private spraying of animals around here. How did you get into this business?

2. How often do you go around spraying the animals?

3. Where do you get your chemicals?

4. Where do you buy your equipment?

5. How often do you replace your equipment?

6. How far a field do you operate or carry out this services

7. Who do you consider or have as customers?

CUSTOMERS TO HIRED SPRAYER

1. Why do you use private services to kill ticks on your animals?

2. How often does this person come around to spray your animals?

3. Is he punctual?

4. What do you do when he does not come around?

5. How much do you pay for his services?

6. Will you turn to the communal dip now that there will be one soon?

7. If the answer is no, why?

NON CUSTOMERS TO HIRED SPRAYER

1. Why don't you use private services to spray your animals?

2. Do you know about these services?

3. Where do you get your services on tick control?

4. How do you carry out this?

FOCUS GROUP DISCUSSION GUIDE

1. When do you use herbs to treat sick animals?

2. What happens when the animals do not respond to the herbs?

3. Which diseases do you think can be cured by herbal medicine effectively?

4. When do you consider summoning veterinary officers to attend and cure your animals?

APPENDIX B

Local Name	English Name
Biero (Luo) Lisamuna(Buk)	Retained placenta.
Thigira (Kik)	
Chindesi (Buk)	Eye problems
Sikhale (Buk)	Preneumonia
Kamamimba (Buk) Ekebera (Kisii)	Swelling of parotid glands.
Khusimbwa (Buk) Kuhohita (Kik)	Bloat
Ngae (Kik) Khaoya (Buk)	East Coast fever
Upofu wa Ngombe (Kis)	Blindness
Waluse (Buk)	Ephermal fever
Ugonjwa wa Kupe (Kis)	East Coast fever
Kutetemeka kwa ngombe (Kis)	fever, shivering
Omuliko (Maragoli)	Retained placenta
Kukatika kwa matiti (Kis)	Blisters on udders
Kufura kwa shingo (Kis)	Bottle jaw
Zingua (Buk)	White dotted ticks
Ebisemo biembwe (Buk)	Brown ear ticks
Egekuguche (Kisii)	-
Omobeno (Kisii)	-
Bitarus (Buk)	Red ear ticks
Kuhara damu (Kis)	Diarrhoea