

**COMMUNITY-BASED ANIMAL HEALTH WORKERS (CAHWs)
IN PASTORALIST AREAS OF KENYA:
A STUDY ON SELECTION PROCESSES, IMPACT AND SUSTAINABILITY**

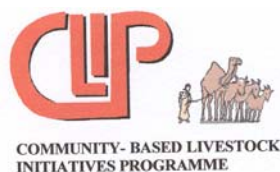
- WEST POKOT, WAJIR AND MARSABIT -

Ana Riviere-Cinnamond¹ and Michael Eregae²

August 2003



African Union/Interafrican
Bureau for Animal Resources



¹ DrPH candidate, London School of Hygiene and Tropical Medicine (LSHTM), Public Health and Policy Department (PHP).
Email: Ana.Riviere-Cinnamond@lshtm.ac.uk

² Department of Veterinary Services, Government of Kenya

Acknowledgements

Many people contributed and facilitated the organisation and performance of this field research. I would like to give special thanks to all the people at the AU/IBAR Community-based Animal Health and Participatory Epidemiology Unit (CAPE Unit), to the team at the Community-based Livestock Initiative Programme (CLIP) and to the FAO-Pro Poor Livestock Policy Facility (PPLPF) staff for their help and contribution at all stages of the field research. Co-funding of the research by the CAPE Unit was made possible by a grant from the Department for International Development (United Kingdom) to AU/IBAR.

I would like to acknowledge the field NGOs WASDA and CIFA which facilitated the work in Wajir and Marsabit respectively and the government veterinary services staff in West Pokot, as well as to give a special thanks to the livestock keepers and policy makers interviewed during the research project.

Special thanks are finally given to the research team.

Table of contents

Acknowledgements	2
Table of contents.....	3
List of tables, maps and figures	4
Acronyms.....	5
Map of Kenya	6
Executive summary	7
Background.....	7
Objectives	7
Methods and study design	7
Results	8
Policy recommendations.....	11
1. Introduction	12
1.1 Background	12
1.2 Justification	12
1.3 Objectives.....	13
1.4 Structure of the report.....	13
2 Methodology.....	14
2.1 Context	14
2.1.1 Livestock keepers (LK) group	14
2.2 Methods.....	21
2.2.1 Aims	21
2.2.2 Data management and analysis	22
2.2.3 Interview process	24
3 Results.....	26
3.1 Descriptive data	26
3.1.1 Livestock keepers group	26
3.1.2 Policy makers group.....	26
3.2 Quality ranking	28
3.2.1 Livestock keepers group	28
3.2.2 Policy makers.....	29
3.3 Semi-structured interviews	30
3.3.1 Livestock keepers.....	30
3.3.2 Policy makers.....	38
3.4 Pearson correlation.....	41
3.4.1 Livestock keepers.....	41
3.4.2 Policy makers.....	43
3.5 Policy makers - districts correlations	43
4 Discussion.....	44
4.1 Qualities.....	44
4.2 Selection process.....	45
4.3 Sustainability.....	47
4.4 Curriculum for CAHWs.....	50
4.5 Weaknesses of the study.....	52
5 Policy recommendations	54
6 References	55
Annex 1.....	59
Annex 2.....	61

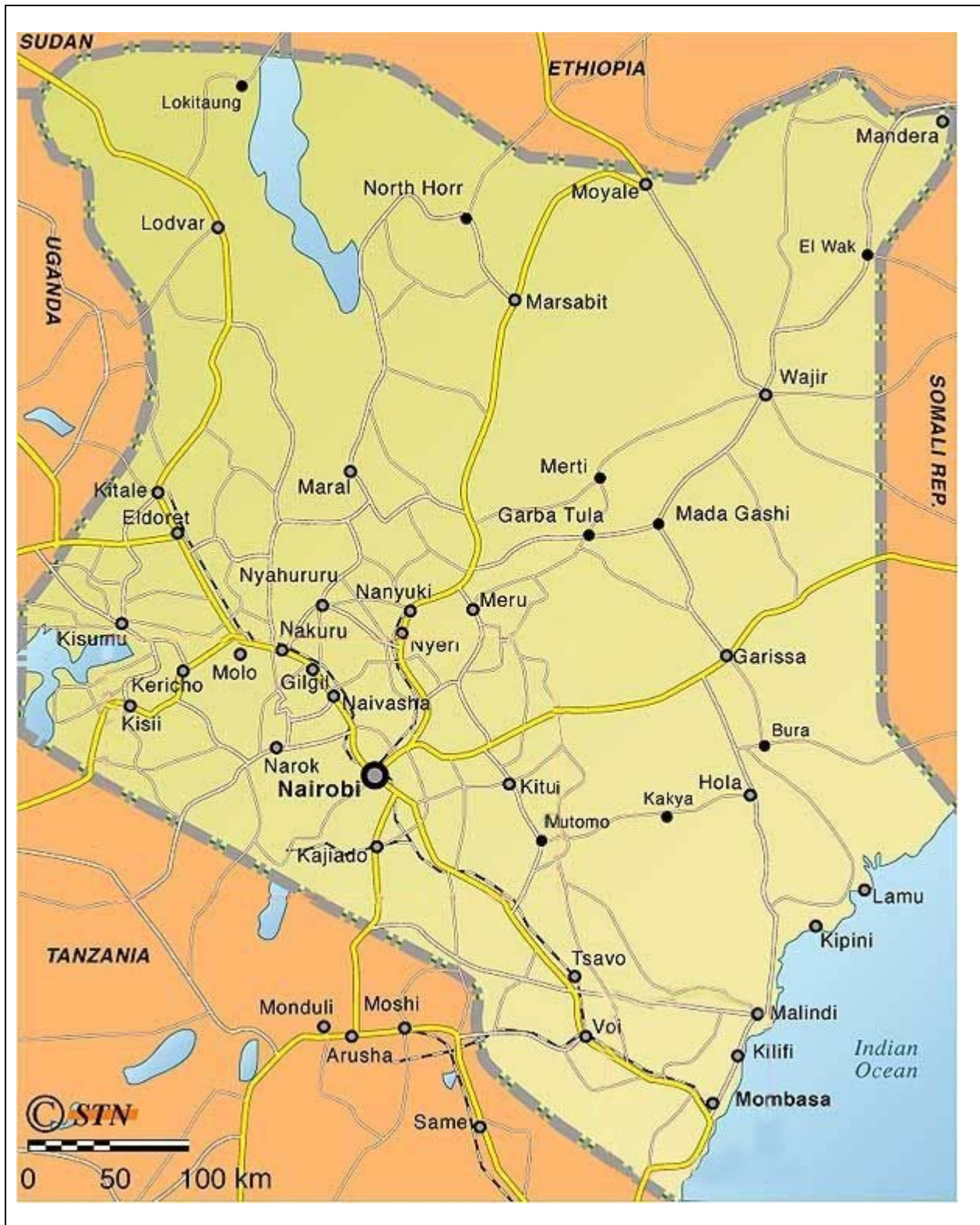
List of tables, maps and figures

Table 1	Differences in “ideal quality” preferences between PMs and LKs groups	8
Table 2	Answers frequency (in %) in relation to the selection process for the LKs group	8
Table 3	PM group experience in relation to the selection of candidates (frequencies in %)	8
Table 4	LKs’ perceptions on the effectiveness and sustainability of CAH systems	9
Table 5	Themes taught to community members by CAHWs - LK group (in %)	9
Table 6	PMs perceived limitations of the CAH system and incentives for CAHWs (in %)	10
Map 1	Locations of West Pokot, Wajir and Marsabit districts	14
Map 2	West Pokot District	16
Map 3	Wajir District	17
Map 4	Marsabit District	19
Table 7	LKs group descriptive data	26
Table 8	Descriptive data for PMs group	27
Figure 1	Post graduate qualification v. group	27
Figure 2	Years of policy involvement v. group	27
Figure 3	Years of field experience v. group	28
Table 9	Ranking of preferred qualities per district	28
Table 10	LKs group “ideal” qualities ranking	29
Table 11	Ranking of the “ideal qualities” in a CAHW for the PMs group	29
Table 12	Reasons why CAH systems are useful - LK group (frequency in %)	31
Table 13	Reasons why the CAH system did not work - LK group perspective	32
Table 14	Incentives for CAHWs - LK group	33
Table 15	Themes taught to community members by CAHWs - LK group	33
Table 16	Frequency in quality mentioning for men and women - LK group	34
Table 17	Male & female answers relating to the selection process of the candidates	35
Table 18	Ideal qualities for literate and illiterate subgroups	36
Table 19	Differences between literate and illiterate respondents in relation to the selection process	36
Table 20	Suggestions for improvement of the system - LK group	37
Table 21	Quality preferences in relation to group belonging- PM group	41
Table 22	Quality preferences in relation to field experience and policy involvement - PM group	41
Table 23	Quality ranks for PM and LK groups	45
Figure 4	Conceptual framework for CHW performance and motivation (adapted from Robinson <i>et.al</i> (1))	50

Acronyms

AHA	Animal Health Assistant
Agrovet	Shop selling veterinary products
ASAL	Arid and Semi-arid Lands
AU/IBAR	African Union/Interafrican Union for Animal Resources
CAH	Community Animal Health
CAHW	Community-based Animal Health Worker
CAPE	Community-based Animal Health and Participatory Epidemiology Unit (AU/IBAR)
CIFA	Community Initiative Facilitation Assistance
CLIP	Community-based Livestock Initiative Programme
Duka	Shop (general)
DVO	District Veterinary Officer
DVS	Department of Veterinary Services
FAO	Food and Agriculture Organisation
HMO	Health Maintenance Organisation
KVA	Kenyan Veterinary Association
KVB	Kenyan Veterinary Board
LK	Livestock Keepers
LSHTM	London School of Hygiene and Tropical Medicine
MA	Marsabit
NGO	Non Governmental Organisation
OIE	Office Internationale des Epizooties
PACE	Pan African Programme for the Control of Epizootics
PARC-VAC	Participatory Community-based Animal Health and Vaccination Project (AU/IBAR)
PH	Public Health
PM	Policy Makers
PPLPI	Pro-Poor Livestock Policy Initiative
PRA	Participatory Rural Appraisal
SAP	Structural Adjustment Policies
VPH	Veterinary Public Health
VSF-B	Vétérinaires Sans Frontières - Belgium
WA	Wajir
WASDA	Wajir South Development Association
WB	World Bank
WP	West Pokot

Map of Kenya



Executive summary

Background

Following the collapse of public services in Kenya in the 1980s, including veterinary services, alternatives have been sought to deliver animal health services in arid and semi-arid areas of Kenya. Several organisations including NGOs started new approaches such as “Community-based Animal Health” (CAH) systems. These programmes have had different levels of success after the organisation pulls out. One of the reasons proposed to explain this is the selection process of the Community-based Animal Health Workers (CAHWs) whose qualities do not always suit communities as they are imposed hierarchically through local authorities. Several studies have been undertaken in the human health field in relation to community workers behavioural patterns and community health programmes’ sustainability. This type of research has, however, never been performed in the animal health field.

Objectives

The objectives of the study were as follows:

1. To identify the ideal qualities of CAHWs as perceived by veterinary policy makers and pastoral livestock keepers.
2. To investigate the relationship between CAHWs selection criteria, selection procedures and the sustainability of CAH systems.
3. To explore possible gender bias in the selection of CAHWs.
4. To make research-based policy recommendations to the appropriate decision makers on the standardisation of CAHW selection, training and supervision procedures with a view of ensuring quality and sustainability of CAH systems.

Methods and study design

The research methodology was adapted from a study on community malaria workers in Latin America and qualitative-quantitative mixed methods were used for the analysis. Semi-structured, in-depth interviews were performed with two main categories of informants viz. livestock keepers (LK) and policy makers (PM). Livestock keepers (n=189) were interviewed in West Pokot (WP), Wajir (WA) and Marsabit (MA) districts whereas PMs (n=28) were interviewed in Nairobi. The research aimed to compare the perceptions of these two informant groups (LKs and PMs) with regards the “ideal” qualities of a CAHW, the selection process, and the sustainability and effectiveness of CAH systems.

Qualitative data was coded and analysed through a systematic and iterative process to highlight recurrent themes. Quantitative data was analysed through SPSS software using statistical tests (Chi Square) to explore heterogeneity in the LKs’ sample and possible effects on informant responses. Descriptive data was used for the same purpose with PMs, as the sample size did not allow the Chi Square test. Overall quality ranking for the first 10 ideal qualities of a CAHW was based on the number of times each quality was mentioned. Pearson correlation analysis was performed to compare the first three ranked qualities between sub-samples and samples. Arrow’s social choice theory was used for rank-ordering and quality weighting. A Borda Count was performed with weights being 1, 0.6 and 0.3 for the first three qualities respectively. The purpose was to highlight significant differences, if any, in the ideal quality prioritisation between LKs and PMs.

Results

Qualities

In relation to the perception of the “ideal” qualities of a CAHW the results showed a significant difference between LK and PM groups. The first three ranked qualities highlighted by PM were “literacy”, “training” and “ethnic to the area”, whereas LK pointed out “trustworthiness”, “commitment” and “responsibility”. Preferences in “ideal-quality” ranking among the LK group were also observed, especially between men and women and between literate and illiterate respondents, as well as between districts.

Table 1: Differences in “ideal quality” preferences between policy makers and livestock keepers groups:

Policy makers	Livestock keepers
literacy	trustworthiness
training	commitment
ethnic to the area	responsibility

Government officials put forward qualities such as “literacy and trust”, academics “literacy and training”, Kenyan Veterinary Association/ Kenyan Veterinary Board (KVA/KVB) members “ethnicity, availability and trust” and private sector respondents “ethnicity and training”.

Selection process

Frequencies in answering (expressed in %) in relation to the selection process were the following:

Table 2: Answers frequency (in %) in relation to the selection process for the Livestock Keepers group

Selection process	West Pokot	Wajir	Marsabit
Community consultation in relation to the selection process	45.5*	76.3	66.6
Involvement of the whole community in the selection	-	50.0	96.5
Selection done by the authorities, elders or opinion leaders	91.7	45.7	-
Lack of awareness of the decisions taken during the process	38.9	41.4	24.1**

* Mostly young men and women

** When aware, the information was transmitted through community or NGO meeting

Suggestions for improvement of the process were only given by West Pokot and Wajir respondents. Most of Marsabit interviewees did not have suggestions. These related to (i) involving black market quacks as CAHWs candidates (especially for WP), (ii) increasing of women’s involvement both in the selection process and as candidates, (iii) making public the selection qualities and criteria, (iv) limiting the involvement of authorities, opinion leaders and elders in the decision process and (v) recognition and accreditation of CAHWs.

PMs’ (with field experience) concept of the role a CAHW should perform related to disease prevention and being an interface or link person (between communities and the government) (94.1%), and as a deliverer of animal health services in pastoral areas (88.2%). In relation to the latter, some suggested their role should be limited to disease surveillance and not involve curative treatments.

Experiences of interviewees in relation to the selection of candidates revealed that (in %):

Table 3: Policy Makers group experience in relation to the selection of candidates (frequencies in %)

PMs with field experience witnessed*	
Selection by authorities	35.5
Selection by elders	41.2
PM without field experience stated (empirically)	
Selection should be done by the whole community	70.0
No contradiction between the private sector and CAHWs	78.6

*They had rarely seen women involved either as candidates or as selection committee members

78.6% of the interviewees said there should be no contradiction between the private sector and CAH systems but raised concerns about the economic viability of the CAH system in such a private setting.

Selection process improvements related to the increase in women's participation and to the need of supervision and training of the workers. Other issues not directly related to the selection process were mentioned such as the need to increase access to markets and slaughterhouses, and the reluctance in relation to black market presence in pastoral areas.

Effectiveness and sustainability

All community members interviewed thought the CAH system was useful. They especially pointed out the treatment of animals, drug availability, and access to services and in Marsabit, extension. Health improvements noticed were the reduction of death rates and animal sickness (due to the decrease of tick and worm infections), increase in body condition and hence productive and reproductive levels.

Other answers related to the effectiveness of the system were the following (in %):

Table 4: Livestock Keepers' perceptions on the effectiveness and sustainability of CAH systems

Effectiveness of the system hindered by	West Pokot (n=72)	Wajir (n=59)	Marsabit (n=58)
Lack of training or supplies	65.3	66.1	53.3
Suggestions for system improvement			
Provision of salary (by government or NGO)	36.1	16.9	34.5
Increase drug availability and variety	34.7	61.0	72.4
Provision of refresher courses	27.7	55.9	43.1
Means of transport (by government or NGO)	33.0	-	46.5
Construction of drugstores	-	-	53.4
Incentives for CAHWs to stay			
Provision of salary (by government or NGO)	75.0	42.0	81.0
Means of transport (by government or NGO)	37.5	6.8	60.3
Supply of drugs at reasonable price	34.7	33.9	67.2
Refresher courses	13.9	22.0	22.4
Supervision/monitoring	9.7	10.2	-
Increase of margin from drug selling	-	16.9	-
Recognition	4.2	13.6	-
Building drugstores	8.3	-	43.1
Frequency of respondents mentioning they had received extension services by CAHWs	65.3	98.3	100

Extension given was mentioned in all districts; however its content differed between districts. Disease prevention in West Pokot was (very) low. In Wajir, although CAHW curriculum encompassed human and animal health, responses did not put forward as many (veterinary) public health issues as in Marsabit, where the curriculum was supposed to exclusively focus on animal health.

Table 5: Themes taught to community members by CAHWs - LK group (in %)

West Pokot (n=72)	Wajir (n=59)	Marsabit (n=58)
Dosages and administration routes 51.1	Dosages and administration routes 96.5	Dosages and administration routes 86.2
Dipping /spraying 29.8	Treatment of specific diseases and early reporting 29.8	Hygiene and public health education 36.2
Treatment of specific diseases and early reporting 21.3	Disease prevention 19.3	Treatment of specific diseases 34.5

All PMs agreed on the usefulness of the system. Their answers in relation to the perceived limitations of the effectiveness and sustainability of the systems were (in %):

Table 6: Policy Makers (n=28) perceived limitations of the CAH system and incentives for CAHWs (in %)

Limitations of the CAH system	
Economic incentives	42.9
Drug availability/kit replenishment	42.9
Donor driven problems*	32.1
Disagreement between CAHWs and communities	32.1
Lack of infrastructure	17.9
Lack of commitment	17.9
Failure in the selection process	10.7
Lack of supervision	10.7
Lack of good training	7.1
Incentives for CAHWs to stay	
Economic	71.4
Recognition of social status	46.4
Enhanced amenities (security, roads, water)	17.8
Competitive advantage of CAHWs	
Availability	53.6
Low prices and payment flexibility	46.2
Perceived competitors of CAHWs	
Black market	64.3
Agrovets/dukas	53.6
Solutions proposed to counteract competition	
Education of communities on “quality services”	28.6
Supervision of CAHWs by veterinarians or animal health assistants (AHAs)	28.6
Creation of a Drug Inspectorate	17.9
Enforcement of the law	14.3
Drug market liberalisation	14.3

* Donor driven problems: mostly referring to the lack of planning of the fund withdrawal and influencing the selection process of the candidates

In 67.9% of the answers, PMs stated that support for CAH system should come from the government (especially training). In 57.1% of the cases, PMs though the private sector should also be involved in the support (especially for supervision and drug supply). In 32.1% of the answer, PM coincided on a structure whereby the CAHW is supervised by a veterinarian or an AHA.

Policy recommendations

Policy recommendations are proposed with reference to the existing CAHW training curriculum and guidelines for Kenya and the draft revised veterinary acts that recognise various cadres of para-veterinary professionals, including CAHWs. Recommendations are linked to the research objectives. They are also organised in relation to the needs perceived by LKs and conclusions obtained from the discussion of the results.

1. Recommendations based on the needs perceived by LKs:

Objective 1: Identify the ideal qualities of CAHWs as perceived by veterinary policy makers and pastoral livestock keepers.

- Requirement, in prospective candidates, of at least the following three qualities: trustworthiness, commitment and responsibility; *these qualities can only be evaluated by community members.*

Objective 2: Investigate the relationship between CAHWs selection criteria, selection procedures and the sustainability of CAH systems.

- Improvement of community awareness of the selection criteria and qualities needed to be eligible as CAHW.

Objective (2 &) 3: Explore possible gender bias in the selection of CAHWs.

- Inclusion of the whole community in the selection process and avoid exclusive involvement of opinion leaders, elders or authorities. Special attention to be drawn to women's involvement in the selection process and as candidates.

2. Policy recommendations based on the discussion of the results:

Objective 4: Make research-based policy recommendations to the appropriate decision makers on the standardisation of CAHW selection, training and supervision procedures with a view of ensuring quality and sustainability of CAH systems.

- The research supports ongoing initiatives by the Government of Kenya and Kenyan Veterinary Board to recognise and accredit CAHWs.
- The study highlights the need to increase transparency and public and community awareness in relation to the procedures to be followed during the CAHW selection process stated in the KVB manual *Minimum standards and guidelines for the training for CAHWs in Kenya.*
- The research supports the need for a standardised CAHW training curriculum in Kenya and emphasises the importance application of the minimum requirement stated in the training manual however enabling enough flexibility within the curriculum to respond to community priorities in different locations. The KVB will need to ensure that such flexibility is understood and adopted during implementation of the standardised curriculum.
- In relation to the integration of the CAHWs in the National Animal Health System, it is suggested that organisational behaviour strategies are further investigated in order to increase motivation and incentives of both players, CAHWs and supervisors, making the integrated system viable and sustainable.
- The results of the research suggested the evaluation of the possibility and viability of training illegal drug sellers as CAHWs.
- Following the analysis, it is suggested that community members' "passive behaviour" in relation to the financial viability of the system be channelled, through education and extension, towards a more "proactive" one.
- The analysis emphasises the importance of increasing current promotion of (veterinary) public health extension messages in the CAHW curriculum. It is suggested they be considered as *minimum requirement* as opposed to their current status of *suggested requirement*.

1. Introduction

1.1 Background

In the 1980s the poor state or virtual lack of veterinary services in a large part of the developing world where livestock are a basic asset (economically and socially) for a significant share of the population caught the attention of various development organisations. From the early 1990s onwards, one of the responses that sought to remedy this situation has been based on a mainly NGO-led proliferation of various community-based animal health care systems.

Community-based approaches to animal health care (CAH), implemented by NGOs or other organisations, are regarded generally as having performed well with substantial positive outcomes for the communities concerned. However, it has been noticed that when these organisations withdraw, the CAH systems do not continue to operate. Although such failures are generally attributed to the withdrawal of funds, issues of participation and policy or legal aspects are also likely to be involved (2).

Particularly in community human health care systems, there is evidence to show that community involvement in selection of primary health workers helps to ensure local acceptance and support for these workers, which enhances the sustainability of health care provision even when organisations pull out (3-11). It is thus hypothesised that addressing the differences in selection criteria between communities and professionals could potentially contribute to an increase in the sustainability of CAH.

This project complements a wider study on the organisation and financing of animal healthcare systems undergone jointly by the Food and Agriculture Organisation of the United Nations (FAO) and the London School of Hygiene and Tropical Medicine (LSHTM).

1.2 Justification

Veterinary policy makers in East Africa are currently reviewing policy and legislation on CAHWs. This process is coordinated by veterinary boards but involves various central-level stakeholders such as State Veterinary Services, veterinary associations, veterinary schools and NGOs. The Community-based Animal Health and Participatory Epidemiology (CAPE) Unit of the African Union/Interafrican Bureau for Animal Resources (AU/IBAR) is currently supporting policy and legislative change in the Horn of Africa region. One aim is to standardise CAHW selection, training and supervision procedures with a view to ensuring quality at national level. Experience to date indicates that draft policies and guidelines tend to prioritise the views of central policy makers above the perceptions and needs of livestock keepers. For example, in the area of CAHW selection it is widely believed by veterinarians that CAHWs must have received some education and be literate. These views tend to contradict field experience and the relatively high drop-out rate of literate as opposed to illiterate workers.

At present, information on community and professional preferences about selection criteria is largely anecdotal. In addition to CAHW selection criteria, the process of CAHW selection is also considered to be important. For example, are the CAHWs selected primarily by professional or project staff, or by the 'community'? Within the community, who makes the decisions concerning CAHW selection (a few powerful individuals or the community as a whole etc.); how are women involved if at all? What would explain the relative high drop-out rate of literate CAHWs? Experience within the CAPE project indicates that CAHW selection is often rushed and driven by project staff with deadlines to meet. This approach can lead to inappropriate selection of CAHW trainees.

Providing research-based evidence to the abovementioned process of political and institutional change on communities' desired qualities in a CAHW and an appropriate CAHW selection systems are thus of primary importance for further development and sustainability of community animal health care systems.

1.3 Objectives

The objective of the study was fourfold:

1. To identify the ideal qualities of CAHWs as perceived by veterinary policy makers and pastoral livestock keepers.
2. To investigate the relationship between CAHWs selection criteria, selection procedures and the sustainability of CAH systems.
3. To explore possible gender bias in the selection of CAHWs.
4. To make research-based policy recommendations to the appropriate decision makers on the standardisation of CAHW selection, training and supervision procedures with a view of ensuring quality and sustainability of CAH systems.

1.4 Structure of the report

The report is organised in four chapters. A first chapter deals with the methodology used for the study (chapter 2), including a description of the context of the study setting and the explanation of the methods used for the analysis. A second chapter describes the results obtained from the quantitative and qualitative data for both groups, livestock keepers and policy makers, as well as the quality ranking and Pearson correlation (chapter 3). Third comes the discussion of the results (chapter 4), followed by the last part of the report which deals with policy recommendations (chapter 5).

2 Methodology

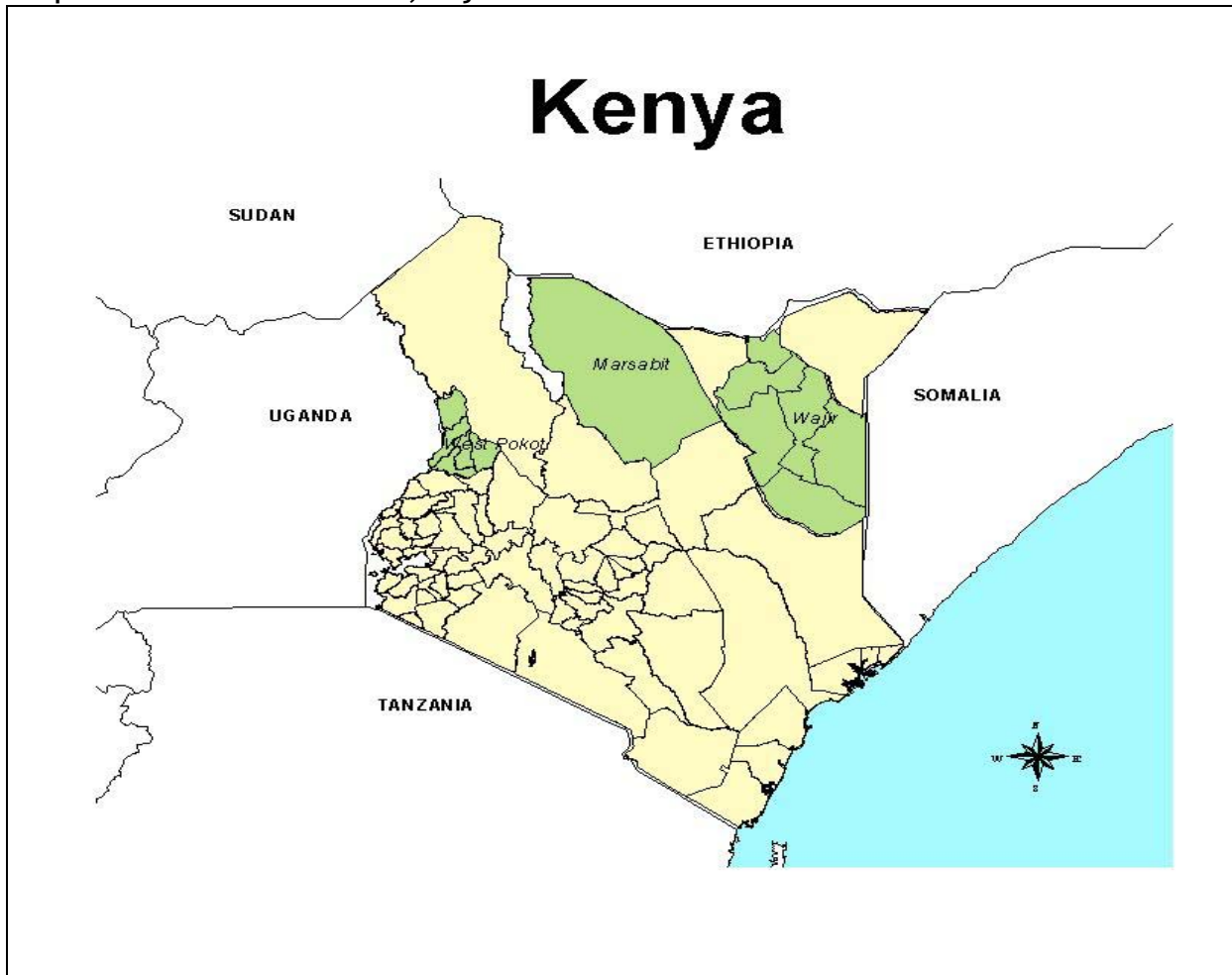
The research protocol includes two interview sets: the first involving livestock keepers and CAHWs (labelled as “Livestock Keepers Group”) and the second involving policy makers, academics, private sector and KVA/KVB members (labelled as “Policy Makers Group”). A brief description of the context (individuals, locations visited and field level contacts) is given, followed by an explanation of the methods used for the analysis of the data collected.

2.1 Context

2.1.1 Livestock keepers (LK) group

Three Districts were selected for the interview process: West Pokot, Wajir and Marsabit. Reasons for selecting these three geographical areas were (i) that the three districts were representative of ASAL areas in Kenya, (ii) the lack of infrastructure and poor service delivery in those areas and (iii) the ongoing CAH programmes run by different NGOs.

Map 1: Locations of West Pokot, Wajir and Marsabit districts



Specific NGOs working in these districts were identified with the help of CLIP (Community-based Livestock Initiative Programme). The criteria for selection were based on (i) the available connections of CLIP with field NGOs and (ii) the perspective taken by the field NGO regarding the implementation of CAH systems. The perspective selected was towards “business oriented” CAH programmes. This choice was made based on criteria of sustainability of CAH systems. Given the current low government funds available for animal health service delivery, business oriented community-based programmes are believed to contribute to the system’s sustainability after the NGO pulls out or available funds for the project are over.

2.1.1.1 West Pokot

West Pokot district is one of the 20 districts of the Kenya's Rift Valley Province. It covers an area of 9100 square kilometres and its limits relate with the Turkana region in the North, the Karamajong cluster in Uganda in the West, Trans Nzoia in the South and Baringo and Marakwet on the East. In 1993 the population of the District was estimated by the Central Bureau of Statistics at 320,000 with an annual growth rate of 4.2%. The predominant religion is Christianity.

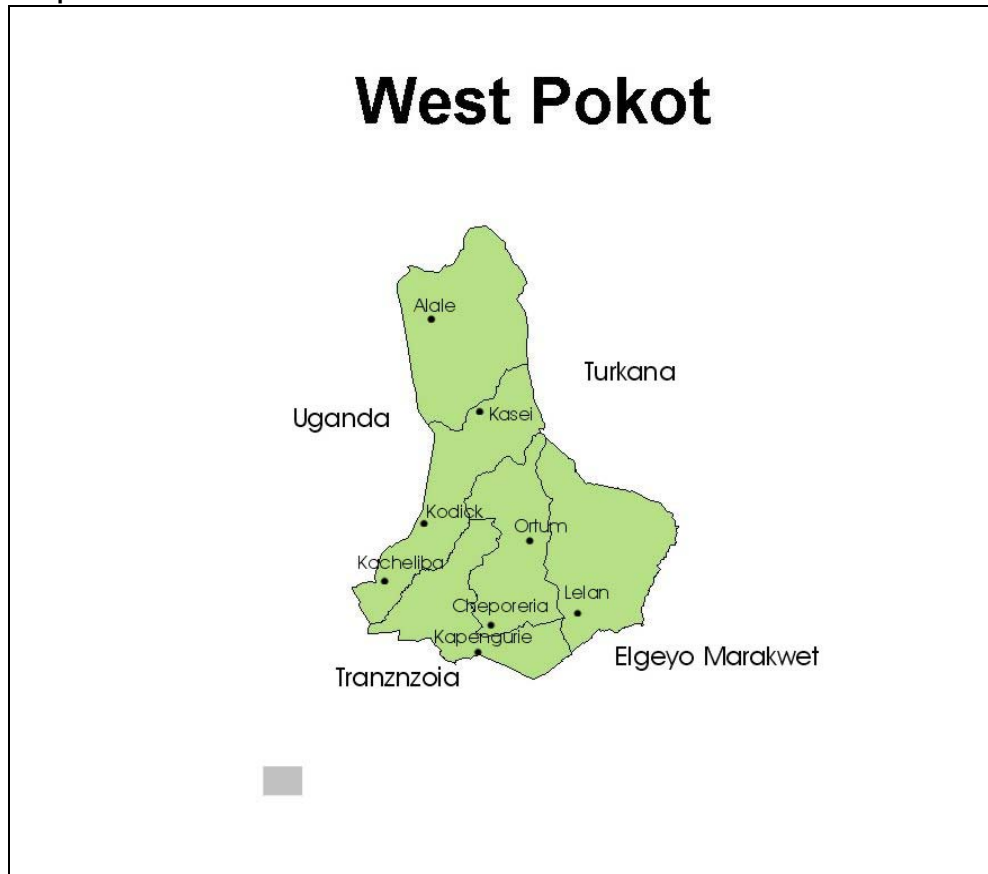
According to the 1997 estimates of the Ministry of Agriculture, Livestock Development and Marketing, West Pokot is mainly constituted by rangeland (44%) and marginal land (28%). 19% of the land is not suitable for agricultural and only 3% and 6% are considered as high potential and medium potential respectively (Southern part).

Annual rainfall is critical to the food production of the district in order to support its population. Rangelands and marginal areas (72%) are the most affected by rainfall variations. Drought appears commonly each 5 - 7 years. Livestock is essential for the subsistence of the Pokot people in the low land areas of the district as almost one third of the residents are characterised predominantly as pastoralists. Herd sizes have greatly varied in recent years. Impact studies indicate that most households own between 2 and 20 head of cattle. But, as in the Pokot tradition it is usual to count cattle in terms of "not many" (below 10), "many" (between 10 and 100) and "very many" (more than 100), it is often difficult to obtain accurate estimates. Moreover, animals lent to relatives under "Tiliantany"³ arrangements are often not included in the count. Their herds are a mixture of cattle, goats and sheep. Donkeys and chicken are common but are not highly valued (donkeys are used for transportation especially of food). To survive in this arid to arid and semi-arid habitat, livestock keepers have to move their animals from place to place accordingly to the availability of grazing lands, shrubs, disease-free area and water.

A local practice which interferes seriously with social and economic life in range areas is cattle rustling. Raiding livestock is characteristic of pastoral economies in many parts of the country. But access to modern weapons has radically altered the custom. Its practice today has degenerated in something that has no resemblance to the original tradition. The presence and history of the Ugandan international frontier on the West side (a part of West Pokot - from Kongelai (Swan River) to Alale - was until 1971 still Ugandan) has also contributed to cross-border raids in recent years. These raids between Pokots and Karamojong (northeastern Uganda) contribute to drive away an important number of heads of cattle and have claimed several human victims as recently reported in the news (12, 13). Cattle rustling has not only effects at economic and human levels, but has also repercussions in access to schooling and health facilities. The most important source of livelihood for these pastoralist families is the sale of livestock. Bulls, goats and sheep are commonly sold to meet household's cash needs such as hospital bills, school fees and food expenses. Selling bulls is men's responsibility but either men or women can sell goats and sheep. Cows are rarely sold except as culls or due to old age, as they are a primary source of milk, the main nutritional element for Pokot population. Bulls are often sold for major needs, goats and sheep for relatively smaller cash needs such as purchase of food, clothes and farm inputs. Livestock prices are lowest in the middle of the wet season when food is scarce and farmers need to sell their animals to buy food. Prices increase during the festive season, which normally coincides with the dry season.

³ *Tiliantany*: is an "insurance system" among pastoralists. Pokot minimise the risk of complete loss of livestock through "loaning" cows to relatives and friends in other parts of the district in exchange of steer. The cow provides milk for the person who receives it, but calves are property of the original owner. Loaning cows to other people gives prestige to the pastoralist and more importantly it gives him the right to claim assistance from his "tiliantany" partners when needed.

Map 2: West Pokot District



The contact person in West Pokot was a private veterinarian (Dr Ripimpoi) who had started an agrovet store in Makutano in 2001 under the privatisation scheme supported by the AU - IBAR CAPE Unit. The background of the project goes back to 1997 when the predecessor to CAPE (called the 'PARC-VAC Project' of AU-IBAR) in collaboration with the district veterinary services, started an initiative on CAH delivery services based in Alale (Northern part of the district). In 1999, SNV, a Swedish NGO, took over the project until 2002. Meanwhile, other NGOs in the district started to implement CAH components in their programmes (as for example WVK, ELCK, Ortum PHCD, Sigor NRM and KEDDA). In 2002, as SNV was not able anymore to sustain financially the project, a collaboration with the AU-IBAR CAPE Unit was made. The objective of the two partners was to enhance the privatisation process of CAH systems under the supervision of a private veterinarian while supplying drugs and giving advice.

Dr Ririmpoi served as a link person who introduced the team to the DVO (Dr Kirui) and the Deputy DVO (Dr Njagi) with whom was laid out the strategy for the interviews and locations to visit. Two routes were identified and suggested to be followed for the interviews. These were East, including Kapenguria, Lelan, Chepareria, Sigor and Ortum, and West which covered Alale, Kasei, Kodich, Konyao, Kacheliba and Kongelai. As West Pokot's local language is Pokot, two translators/note-takers (Mr Philip Kigen and Mr Magal Kashmir) were identified with Dr Ririmpoi's help. Translators were the two Livestock Officers of the region. Reasons for choosing them were that they spoke the local language, had knowledge of the region and about animal health. Contrary to the planned field work concept note, translators suggested the interviewees' answers to be directly transcribed into English. They argued that the process of writing in Pokot language and then translating into English (and back-translate into Pokot) might incur in important biases as the context and set-up of the interview process must also be interpreted while performing the questionnaire. Following this logic, in the two other district studied, translators were also English note-takers.

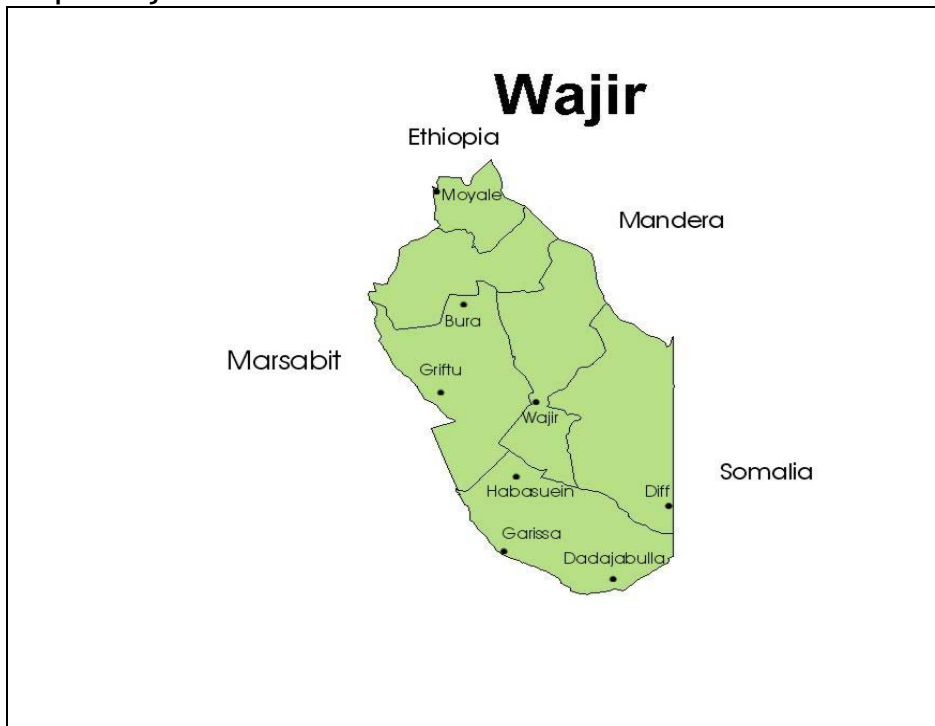
2.1.1.2 Wajir

Wajir district is situated in the North Eastern Province. It covers an area of 56,599 square kilometres and has borders with Ethiopia and Somalia, and the Kenyan districts of Mandera,

Garissa, Isiolo and Marsabit. The population the district, and in the whole Northeastern Province, is predominantly Somali. In Wajir there are clans of Kenyan Somalia: Ajuran, Degodia and Ogaden. Rainfall is unreliable and averages about 200mm per year. Drought is periodic, occurring most recently in 1996-7, 1991-2, and 1984. Pastoralism in the district has been subject to constant changes and adaptation. These processes have been accelerated in the past 50 years due to an increase in the number of water points, settlements and the livestock and population growth. The backbone of the economy in Wajir is nomadic pastoralism. Wajir is based on herding of camels, cattle, sheep and goats. Most of the pastoralists remain nomadic and movement is dictated by the availability of grazing and water.

Since the 1970s there has been a considerable increase in the number of dry season water points, especially boreholes. There has also been a considerable increase in the number of settlements. Together these developments have contributed to the breakdown of distinct wet and dry season grazing areas. Previously livestock were moved in the wet season away from the dry season grazing areas around water points to areas further away. This allowed dry season areas to regenerate. Now, given the increase in water points, large parts of the district are grazed constantly in both dry and wet seasons. At the same time, increase in the number of settlements has had an impact on rangeland because livestock populations are permanently grazed around settlement dwellers. These factors would appear to have influenced the decline of the most palatable fodder species. This in turn has affected livestock health and production in addition to the frequent droughts and insecurity situation in the 1970s.

Map 3: Wajir District



During the colonial period development efforts in the district were limited. Few schools were built and the percentage in of schooling years was much less than in other parts of the country having important implications following independence. Hence most of the civil servants who came to work in Wajir were neither of Somali origin nor from a pastoral setting. There was limited veterinary and medical care in comparison to other areas of the country. Following the independence there was a prolonged period of insecurity. Therefore government's main concern was insecurity and little was invested in other aspects of governance, specially touching areas outside Wajir town. Following the end of the secessionist "shifita" rebellion in the Northern Province of Kenya, government started getting more involved in development. From the 70s onwards there was an expansion in the government provision of services in all fields. However, in relation to pastoral development, two issues need to be highlighted. First is the top down perspective taken by the government in development. There was little

consultation with the communities regarding their own priorities when planning and implementing development initiative. This was related to a lack of understanding of the pastoral setting by government officials. The fact that most of the government officials came from other parts of the country made it more difficult for them to understand the needs and setting of the Somali pastoralists. Second, in addition to the government top down approach, services were mainly directed to settlements. Therefore no attempt was made to reach nomadic pastoralists.

In the 90s however a new approach to pastoral development was taken. There are four main factors underlying this approach. Firstly, reduction of government's role in service provision was a consequence of budgetary problems which were materialised by the introduction of "Structural Adjustment Policies" (SAPs). As a consequence of the government not being able to sustain the previous levels of spending on services cost sharing was introduced in a wide range of fields including health, veterinary services, education and water. User charges for health services, cost recovery for veterinary services and handling management of boreholes to the community emerged as cost-containment measures. The government was not able anymore to play a primary role in service delivery. Second, started "new development" thinking in the sense that communities were empowered and approaches were community-centred. Government, NGOs and donors continued to be highly entrenched in the process. Third, the number of Somali civil servants steadily increased during the 80s so in the 90s a core group of Somali (as well as non-Somali) civil servants who were more concerned with Wajir pastoralist issues was established. Finally, the 1992 drought pushed towards long term focused programmes in the district which included Oxfam's Pastoral Development Programme and the GoK/World Bank Emergency Drought Recovery Programme (later called Arid Lands Resource Management Programme).

In 1991 a shift in the perspective on pastoral development came with the launch of Nomadic Primary Health Care Programme (NPHC). The idea came from a core of local civil servants and UNICEF as a catalyst. The later had the aim to raise child immunisation rates across Kenya but it seemed apparent that they were failing because they did not reach arid areas. It was suggested by the local districts that existing health delivery systems were not adapted for nomadic populations. Hence, local ministries and UNICEF agreed on training pastoralists on the delivery on both human and animal health and as nomadic teachers. The term *Daryelle* was used to refer to the community health worker for both human and animal. This approach was agreed between partners and was a different than in other districts. The term *Hanuniye* was used for describing a nomadic teacher (14).

The field NGO contact was WASDA (Wajir South Development Association). WASDA was created in 1993 by professional and business persons from Wajir South operating within and outside the district. It is a non-profit making organisation, which supplements Kenyan government efforts in development. It aims to support the improvement of livelihoods of pastoral communities in Wajir District and lower Juba in Southern Somalia. WASDA operates in pastoral areas where communities are highly dependent on livestock for their social and economic well being. These areas are highly vulnerable to unpredictable climatic changes and are constantly faced with drought, epidemic diseases in livestock and conflicts (15).

A multidisciplinary board member and staff run the organisation. The board has the role of policy making and the management has the task of implementing. Its mission is the "improvement of quality of life of pastoral communities in Wajir and its environs with respect to livestock, human and water development in an environmental friendly way". Two translators/note-takers were recruited with the assistance of Mr. Abdinoor (WASDA Co-ordinator). One of the translators was a water technician in the Department of Water Resources (Mr Muktar) whereas the other was a newly graduate of the Kenya Medical Training College (Mr Abdi Sheik).

2.1.1.3 Marsabit

Marsabit and Moyale districts are located in the Northern Province of Kenya. They border with Ethiopia, Wajir, Turkana and Samburu. The area covered is of 78,078 square kilometres and has

an approximate population of 175,000 (55,000 in Moyale and 121,000 in Marsabit). There are several ethnic groups in each district including Borana, Gabra, Rendille, Burji, Samburu and Ariaal. Other minority groups included are Somali, Turkana and El molo communities (16). Borana and Gabbra ethnic groups were the most frequented during the field research in Marsabit District.

Borana's economy and lifestyles are organised around cattle, though the formerly taboo camels are becoming more important, and they now herd sheep and goats. Young men do the daily herding while the women do all family nurturing. The homestead groups may be required to move three or four times each year, often as far as 100 km, because of the low rainfall and poor land. Sturdy modular houses, constructed by the women, consist of interwoven branches thatched with grass all the way to the ground. This is in contrast with the Gabbra who weave mats to cover the framework. They settle temporarily in groups of 10 to 30 houses. Their traditional religion is monotheistic with communication through intermediary priests or "Qalla". The traditional name for God is Waq (or Wak). Islam has become influential in Borana society in the last 70 years. Borana people have had only minimal contact with Christianity, due in part to their nomadic life style. Yet an indigenous church exists and about 10% of the Borana are Christian (17). Regarding Gabbra customs, polygamy is accepted but rare. The family is the foundation of society. The Gabbra make round houses of bent pole frames covered with skins and grass mats. Up to 25 houses make up an "olla" (village) of up to 75 people. Ten to 15 families in a village is common. Women do the packing and unpacking of the house at moving time. The men care for the animals. Gabbra religious beliefs are inseparably linked to their herds. Animals are more than food: they are needed for sacrifice to ensure fertility, health and co-operation from spirits. Muslim influence is stronger in some areas than others. They traditionally believe in one God, whom they call Waka. The religious attachment between Boranas and Gabbra is maintained through the qallu or holy men whom they recognise between groups. The lifestyle of Gabbra has limited contact with Christian influences (18).

Map 4: Marsabit District



The area is characterised by a bimodal pattern of rainfall varying between 150 to 800mm per annum. Geographically, the landscape can be divided into the "Ethiopian side" where the Boran Plateau steadily rises towards the Ethiopian Highlands and hilly mountains along the border, and the "Kenyan side" which is composed by dry desert plains (Didigalgallo, Did Golla plains and Chalbi basin). The soil type is volcanic and the main land use is pastoralism with

opportunistic cultivation. Both districts are characterised by long periods of drought, famine, high poverty levels, endemic animal diseases, insecurity and poor infrastructure. These factors contribute to the communities' vulnerability, anxiety and dependency for their livelihood (16).

Land use pattern in Marsabit/Moyale district is predominantly pastoralist and agro-pastoralist with approximately 85% of the population practising nomadic and semi-nomadic pastoralism. Agro-pastoralism is concentrated on 3% of the total land area mainly in the highlands of Mount Marsabit, Mount Kula, Hurri Hills, Sololo Hills and Moyale. As the area is composed mostly by nomadic pastoralist the main occupation is livestock keeping. Alternative economic activities are the sale of livestock and livestock products and petty trade. However the remoteness of the area and the lack of infrastructure hinder the accessibility of services to these communities.

As in other pastoralist communities, formal employment constitutes approximately 1% and formal employment 10-15% of the total population. The dependant population is therefore of around 85%. Most pastoralists in the area depend on food aid supply and have lost their traditional drought coping mechanisms. During the 1999/2001 period the Marsabit/Moyale area was affected by a severe drought. This led to massive livestock deaths worsened by the fact that little public veterinary facilities were available, the absence of private veterinary services in the area and the long distances to agrovets centres in Marsabit and Moyale. The main consequence of the drought was an increase in the poverty index whereby some of the families lost all their cattle in addition due to lack of livestock disease control.

The NGO Community Initiative Facilitation Assistance (CIFA) branch on livestock health and production branch operates in Marsabit, Maikona and Nort Horr while in Moyale district it operates in Obbu, Uran and Central division. After the severe drought of 2001, a PRA (participatory rural appraisal) was conducted in conjunction with the animal health service providers of the area in order to identify the needs of the communities. The objective of the programme was to achieve sustainability through (i) improving the accessibility of services and veterinary drugs in the area, (ii) develop communities' skills in viable business, (iii) establish professional supervised system of CAH programme using state veterinary services, (iv) strengthen animal health provider's forum to enhance harmonisation and (v) implementation approaches and to enhance dialogue with policy organisations and government to influence government policy regarding animal health services" (16).

Having described the context and interview process in the three visited districts we are going to introduce the "Policy Makers Group".

2.1.1.4 Policy makers group

Interviewees in the Policy Makers Group were selected with the help of CLIP and the AU-IBAR CAPE Unit. These two organisations were best positioned to have the knowledge and contacts of influential persons in the field of animal health policy.

The interviewees were selected from four different sub-groups (i) academics and researchers, (ii) government officials, (iii) private sector and (iv) members of the Kenyan Veterinary Board (KVB) and/or the Kenyan Veterinary Association (KVA).

First, academics and researchers were selected from the Faculty of Veterinary Medicine in Nairobi, located at Kabete, and other research institutions related to livestock such as the International Livestock Research Institution (ILRI). Potential interviewees were identified through a meeting between CAPE, CLIP, the research assistant and the principal investigator. The selection of the persons was based on CAPE, CLIP and the research assistant's knowledge of the academic and research staff in Kabete and their involvement in policy related issues regarding community animal health. Once the potential interviewees were listed, they were contacted in person by the research assistant to confirm or not their availability and willingness to participate in the research. Second, government officials were selected from the Veterinary Department situated mostly also in Kabete. Contacts were again given by CAPE and CLIP. The criterion for their inclusion in the interview sample was their involvement in animal health

service delivery in rural areas. This sub-sample was contacted directly by phone through CLIP officials and appointments were set and confirmed. Third, private sector respondents included veterinarians working in pharmaceutical companies. These were selected in relation to their involvement in drug marketing and distribution. Appointments were also set directly by CLIP. Finally, KVA and KVB members were found across the three previous groups and locations but were selected because they are the driving forces of policy changes in relation to veterinary medicine. Therefore KVA and KVB members could be found across academic, private sectors and government officials' sub-groups.

A letter of presentation of the research project was sent for each of the four sub-groups of listed and contacted candidates for the interview. The letter did not explicitly describe the main objectives of the research in order not to bias respondent's answers.

Having described the interview samples we are going to explain the methods used for the analysis.

2.2 Methods

2.2.1 Aims

The aim of the field research project was fourfold. First was to compare the answers of the two groups regarding the ideal qualities of CAHW. The original hypothesis was that there would be concordance within the Livestock Keepers Group and that answers would significantly differ from those of the Policy Makers Group. Second was to investigate the relationship between CAHWs selection criteria, selection procedures and the sustainability of CAH systems. The third objective was to make research-based policy recommendations to the appropriate decision-makers on the standardisation of CAHW selection, training and supervision procedures with a view of ensuring quality and sustainability of CAH systems. Finally, the fourth aim was to highlight possible gender issues in the selection of CAHWs. The interview process and data management and analysis tools used in the study are described below.

The methodology selected for the study was adapted from the research undertaken by Ruebush *et al.* on community malaria workers (19). The main purpose of this study was to find a possible reason why the community residents in the Department of Escuintla (Guatemalan Pacific Coast) did not use the free, available services of malaria prevention offered by the Guatemalan National Malaria Service (NMS). The community residents' opinions were compared to those of the staff of the Guatemalan NMS. The study showed a wide gap between the qualities required by the NMS and the priorities of the community residents. This was highlighted as the main reason why the scheme did not work and residents did not use the free services. Given the timeframe and context of the study area, Ruebush's methodology had to be adapted to the new setting, the aims remaining the same and expanded.

Therefore two sets of semi-structured questionnaires were created for each group: Policy Makers and Livestock Keepers. Given the importance of appropriate phrasing and language to be used in the formulation of questionnaires (20), context and setting of the interview as well as the background of the interviewees were taken into account. On the one hand, the Livestock Keepers group questionnaire included several "cross-checking" questions in order to make sure respondents were telling the "truth". Wording was also important but given that the interview process included the use of translators, attention focused on the type of answers required from the questionnaires (measurable or precise events). Translators were of most importance in the interpretation and performance of the questionnaires (this is discussed later in this chapter). On the other hand, policy makers' interviews tended to be more conceptual. The principal investigator adapted the questionnaire when necessary to each particular interviewee.

The credibility debate underlying studies based exclusively on qualitative methods has been largely discussed among the literature (21). Following Patton, the credibility paradigm is based on three main aspects: (i) methodological rigour in data collection and analysis, (ii) researcher credibility in terms of background and experience and (iii) "the philosophical belief in the value of qualitative inquiry, that is, a fundamental appreciation of naturalistic inquiry,

qualitative methods, inductive analysis, purposeful sampling and holistic thinking” (21). The appropriateness of the used methods for the research purposes is discussed below, followed by the issue of methodological rigour in the data collection and analysis (see 2.2.2). Credibility of the researchers will be debated in the discussion part of the analysis (refer to 4.4 section).

During the interview process, the open ended questionnaires aimed not only at gathering the views of the respondent in relation to the study subject, but also at collecting numerical quantitative data. The underlying reason for that was based on the increase in credibility of the results of the analysis by mixing qualitative and quantitative methods. This “triangulation method” was meant to limit misinterpretations and enhance credibility among policy makers, who tend to be positively biased towards numerical data, as mentioned in the literature (21). During the study, qualitative data was considered the basis of the analysis, while quantitative data was used to complement (confirming or not) the results obtained through qualitative analysis. As mentioned by Patton, “In essence, triangulation of qualitative and quantitative data constitutes a form of comparative analysis”.

However, intellectual and analytical rigour in the collection and interpretation of data is another important factor influencing the credibility which is discussed in the following section.

2.2.2 Data management and analysis

2.2.2.1 Qualitative data

Several softwares have been developed and updated in order to perform qualitative data analysis. Examples of these include NUD*ist, or “Decision Maker” for theory building, “Ethno” for structural analysis and “Ethnograph” for descriptive/ interpretative analysis. These softwares are exclusively a way of “assisting” the analysis, they do not “analyse” the data. The programmes facilitate data storage, coding, retrieval, comparing and linking but, as mentioned by Patton, “human beings do the analysis”. Analysis programmes may speed up the process of locating themes, grouping data together in categories and comparing passages in transcripts. However, the analysis of qualitative data “involves creativity, intellectual discipline and analytical rigour” (21). Programmes are then a tool for facilitating data management during the analysis. Given the sample size of the present study (total n = 217) and the supposedly different perspective in relation to the study subjects (i.e. qualities, selection process, and effectiveness and sustainability), it was suggested that manual coding and analysis would be feasible and help not to miss important links between samples and sub-samples. Thus patterns and themes were obtained through an iterative and systematic process of codification of terms into categories and analysing their frequency of citation by respondents.

Qualitative data obtained from the semi-structured interviews was systematically collected and entered into Word format by clerk assistants provided by CLIP. Semi-structured interviews’ data was analysed manually following an iterative process in order to highlight recurrent themes in respondents’ answers. Similarities and differences in relation to the quantitative variables of each group (see below) were also aimed to be analysed through this systematic process. In relation to the comparative analysis between sub-samples obtained through the quantitative variables gathered, focus was given to the “selection process” part of the semi-structured interviews as it was judged the most susceptible to variations.

2.2.2.2 Quantitative data

Quantitative data gathered for the policy makers group was used to stratify the sample in relation to (i) years of field experience, (ii) years of policy involvement, (iii) gender, (iv) post graduate qualification and (v) group. Livestock keepers’ group was stratified into (i) gender, (ii) age, (iii) literacy and (iv) wealth. These variables were systematically entered into and analysed through SPSS software. Chi Square Test analysis was performed in the livestock keepers’ group to highlight homogeneity or heterogeneity between districts. Descriptive data was used for the policy makers’ group analysis given that the sample size did not allow a Chi Square (22). Results related to variables distribution within samples were used to push forward the comparisons in the qualitative data analysis, as mentioned above.

2.2.2.3 Quality ranking and correlations

Overall rankings for the two groups were obtained by adding the times each quality was mentioned for the two groups. At a sub-group level, comparisons between quality ranking were made by attributing a weight to the qualities ranked as first, second and third (weight being 1, 0.6 and 0.3 respectively).

The choice of this precise rank-ordering weighting technique was based on the majority voting and the voting paradox. The voting paradox, also referred in the literature as “paradox of cyclical voting”, highlights the fact that no clear winner exists in majority voting (23). It has been extensively quoted in the economic literature that the characteristics of the “ideal” political mechanism or set of rules for making social decisions should follow four criteria⁴ (24). However Arrow (1963) showed that such an “ideal” system would not exist as no system would satisfy all these desired characteristics (25). This is referred in the literature as Arrow’s Impossibility Theorem. As mentioned by Stiglitz and others, rank-order voting (where individuals rank the alternatives and each rank is assimilated to a specific coefficient then scores are added together, also known as Borda Count) does not satisfy Arrow’s Impossibility Theorem as it fails the “independence of irrelevant alternatives” criteria. However, the present study was not aiming at making social decisions but to represent the preferences in respondents’ choices in relation to the qualities they desired in community workers fairly. As mentioned by Weller in her study on shared knowledge and knowledge aggregation, “the weighting procedure maximises information, either achieving higher levels of validity for a given sample size or requiring smaller sample sizes for equivalent levels of validity.” (26). Given the nature of the livestock keepers’ questionnaire and the flexibility given to respondents on ranking qualities (as they were the ones to mention the qualities), the failure of attaining Arrow’s criteria would incur in minor biases in ranking. Hence, rank-order voting and weighting in the context of the research study was adequate for the data analysis. Therefore, Weller’s ‘cultural consensus model’, which refers to the above mentioned voting paradox, is the one our study is inspired on.

These rankings were used for the Pearson correlation analysis. Obtained coefficients were used to describe the agreement among priority qualities of sub-samples and between samples. Following Weller, “descriptions of ‘typical’ or ‘average’ beliefs or behavioural patterns can be problematic when intracultural variation is large. The accuracy and validity of aggregated responses is a function of the degree of concordance among respondents and the number of respondents” (26). In her article, Weller examines the relation between concordance, sample size and the validity of aggregating across individuals. Two different models were used: the ‘cultural consensus model’, which is a generalised solution of the Condorcet problem⁵, and the ‘common elements or process model’, which focuses on a single unidimensional concept defined by a set of elements which form the pool of cultural knowledge. The study highlights that the results obtained through the two different models show that the aggregate converges upon the “culturally correct” answers as a function of the concordance among individuals (which in turn is a function of shared knowledge) and sample size. For the two models however, it was found that even with moderate levels of concordance, sample sizes as small as 15 may be adequate to create an accurate aggregate. The validity of an aggregation across people increases as the number of respondents increases as long as the correlations among respondents are positive. “Aggregated responses of more than one informant will be better than a single best informant.” In relation to the standard deviation (Sd) levels, Weller’s study concludes that “Standard deviations of 0.20 in knowledge estimates may be due purely to sampling variability, although we would expect more variability to be due to chance with fewer number of items (<40) and less variability with greater number of items (>40).”

Therefore, given that it is only legitimate to aggregate responses when there is moderate to high agreement in responses (i.e. low intracultural variations), concordance among respondents

⁴ These are (i) transitivity, (ii) non-dictatorial choice, (iii) independence of irrelevant alternatives and (iv) unrestricted domain (for further explanations, see Stiglitz 2000)

⁵ The Condorcet Jury Theorem: The French philosopher of the eighteenth century, le Marquis de Condorcet, stated that “there may not be any majority voting equilibrium” (24), this parallels the aggregation of responses problem and concerns the accuracy of a “majority (voting) rule” and hence relates to the aforementioned “voting paradox”.

was measured prior to aggregating responses. Concordance was measured by the average of correlation coefficients calculated for each subset of respondents. The correlation coefficient was also used to describe the agreement between sub-samples and samples.

2.2.3 Interview process

The two sets of semi-structured interviews were performed in the two groups respectively (see annex 1). The interview process for each of the groups and districts is explained below. It should be however noticed that the process took place right before the parliamentary and country's general election. The existing insecurity situation in the study areas (borders with Uganda, Somalia and Ethiopia) was therefore worsened (27, 28).

2.2.3.1 West Pokot

The study areas were identified on the basis of ongoing CAH projects in the district. The district was divided into two parts based on geographical location i.e. West and East. The semi-structured questionnaire was first pre-tested in Alale whereby changes in the itinerary were made in relation to the appropriateness of the test (i.e., for the questionnaire to be useful the community needed to be familiar with or have had a CAHW) alongside with some minor modifications in the questionnaire. The questionnaire was explained to the translators by going through each of the questions with the research assistant so that no misunderstanding or misinterpretation of the questions could arise.

The areas covered in the West were Kutung, Kacheliba, Kasei, Kamketo, Kodich, Kongelai, Konyao, Alale and Nasal. In the East Kapenguria, Ortum, Chepareria and Sigor areas were visited (see map 2). When arriving to each community the two translators introduced the team and its purpose through a general meeting. Then, generally with the help of the chief or community elder, the respondents were chosen. The criteria used were to sample the candidates was the age, gender, literacy and status (i.e. CAHW or not) so that we could manage to obtain a balanced sample. The interviewees were therefore community members, livestock keepers and CAHWs (total of 72). However, the participation of women in the interviews was low (8) as they were not willing to participate (for cultural reasons).

2.2.3.2 Wajir

The fieldwork started with initial planning in Wajir at the WASDA office where the areas to be visited were selected. Part of planning also involved visits to Government Veterinary Department and other NGOs related to delivery of animal health services in the district so as to have an overview of the system. OXFAM and ALDEF were visited. Other NGOs present in the area (as NPHC, VSF, Arid Lands) were not visited mainly because of the particular period of the year, Ramadan, when the fieldwork was performed, so that it was difficult to find staff during daytime.

In order to have a representative sample of Wajir District, it was divided into North, South and West. Centres with existing CAH delivery systems were targeted during the exercise. Interviews started in the East and the communities covered include Wajirbor, Riba and Kharof-harar. This was followed by a visit to the South where interviews were conducted at Lagbogol, Habasweni, Abakore and Dadajabula. Interviews concluded in the Northwest with questionnaires performed in Hadado, Garsekoftu, Griftu and Buna areas (refer to map 3). The same technique as in West Pokot was used to introduce the team and the purpose of the study. Therefore the two translators went through the chief or village elder to explain the process to be followed. It should also be highlighted the fact that the period of time in Wajir overlapped with parliamentary regional elections. This caused sometimes a first misunderstanding from the communities visited as they thought the research team was made of election campaigners. There was also some tension in the district, especially in the South, as result of unrest that characterises the election process.

Taking into account the particularities of Wajir District, not only livestock keepers, community members and CAHWs were interviewed, but also officials of the Pastoral Associations (total of 59). It should be noted that the participation of Somali women was the lowest in comparison to the other two Districts. Only two women were interviewed in the district.

2.2.3.3 Marsabit

The research team was guided by CIFA's members Mr Adan Wako (Livestock Officer) and Mr George Sembe (Range Management Officer) in the selection of the translators for the last field trip. The planning process with the assistance culminated in the selection of Kalacha and Hurri Hills being CIFA's areas of operation for fieldwork, therefore familiar with CAH systems (although other NGOs as Farm Africa and VSF were working in the same areas as CIFA). One translator was hired at Marsabit and the second at Kalacha centre. Their task was to perform the questionnaire and write the interviewees' answers directly in English in a notebook. The translators were slow in conducting the interviews and this necessitated the hiring of a third translator while in Kalacha centre. Two of the translators were primary teacher trainees and one was a form four leaver. Compared to the other two districts, these translators were less competent and it was therefore expected that the quality of their work may have been compromised. It should also be noted that the translators were much younger than the ones in the two previous districts and more importantly, they had no knowledge on CAH systems.

The research work started at Kalacha area where interviews were conducted at Rage, Dibukutura, Arerite and Elgade villages. Hurri Hills area was covered last and fieldwork was done at Jaldesa, Baqaqa, Ali Boru, Olla Guba, Olla Konso and Olla Darga (see map in annex?). The translators introduced the research team and its purpose in an individual basis generally, as the size of the communities was smaller than in the previous two districts. Livestock keepers, CAHWs and community members were interviewed (sample size of 58). It should also be highlighted that there was marked participation of women in the interviews (18) with a few women CAHWs also involved.

2.2.3.4 Policy makers group

The semi-structured questionnaire for this group was performed on a one-to-one basis with each of the selected candidates by the principal investigator, in presence of the research assistant. The principal investigator introduced herself, mentioned the organisations involved in the research project (FAO-PPLPF, CLIP, AU/IBAR CAPE Unit) and presented the general purpose of the research study trying not to influence the respondent's opinions. The principal investigator was the interviewer and the note-taker.

3 Results

The results of the data collected for the livestock keepers in the different districts and for the policy makers group are stated below. Results of the livestock keepers' group will be presented first, followed by the analysis of the policy makers' group data.

3.1 Descriptive data

3.1.1 Livestock keepers group

Demographic data concerning the LK group is outlined in the table 7. The age mean was of 40.25 years old, ranging from a minimum of 20 to a maximum of 72 years old. Overall literacy levels were of 43.4% varying significantly from district to district. So a 54.2% and 47.2% of literacy could be found in Wajir and West Pokot respectively, whereas Marsabit literacy levels of the interviewed sample were of 27.6%. As previously mentioned, the sample of interviewed women was small as it was not always culturally acceptable or women were not willing to be interviewed as they seemed intimidated or thought they would not have the knowledge to answer the questions. Therefore, in Wajir only a 5.1% of the interviewees were women, 11.1% in West Pokot and 34.5% in Marsabit. Regarding the animals kept by the respondents, species varied in relation to the local culture and beliefs. Hence, Wajir and Marsabit being influenced by Somali and Muslim culture, camels played a more central role (mean of 9.31 with a standard deviation of 15.22 and 5.16 with standard deviation of 4.49 respectively) than in West Pokot (mean of 1.03, standard deviation 6.10). Cattle ownership mean for the 3 districts was of 14.88 (standard deviation of 20.51) however highly varying between locations from 2.91 in Marsabit to 17.80 and 23.12 in West Pokot and Wajir respectively. Sheep and goats numbers are the only ones remaining relatively constant between districts, so we found 37.99 in West Pokot, 41.66 in Wajir and 32.24 in Marsabit. Few donkeys were kept in the districts; however their main value is for transport, especially of food. Neither poultry nor donkeys were very dominant in these areas with the highest value found in Wajir sample (5.09).

Table 7: Livestock Keepers group descriptive data

	West Pokot (n=72)	Wajir (n=59)	Marsabit (n=58)	Total (n=189)
Age	39.15 ± 11.35	41.18 ± 14.20	40.71 ± 12.87	40.25 ± 12.70
Literacy (%)				
▫ literate	47.2	54.2	27.6	43.4
▫ illiterate	52.8	45.8	72.4	56.6
Gender (%)				
▫ male	88.9	94.9	65.5	83.6
▫ female	11.1	5.1	34.5	16.4
Number of Animals				
▫ Cattle	17.80 ± 18.36	23.12 ± 26.60	2.91 ± 4.49	14.88 ± 20.51
▫ Camels	1.03 ± 6.10	9.31 ± 15.22	5.16 ± 5.15	4.90 ± 10.26
▫ Sheep and goats	37.99 ± 40.75	41.66 ± 44.53	32.24 ± 30.54	37.33 ± 39.13
▫ Donkey	2.78 E-02 ± 0.24	0.19 ± 1.45	0	7.41 E-02 ± 0.38
▫ Poultry	0.18 ± 1.54	5.09 E-02 ± 0.29	0.16 ± 0.56	0.13 ± 1.24

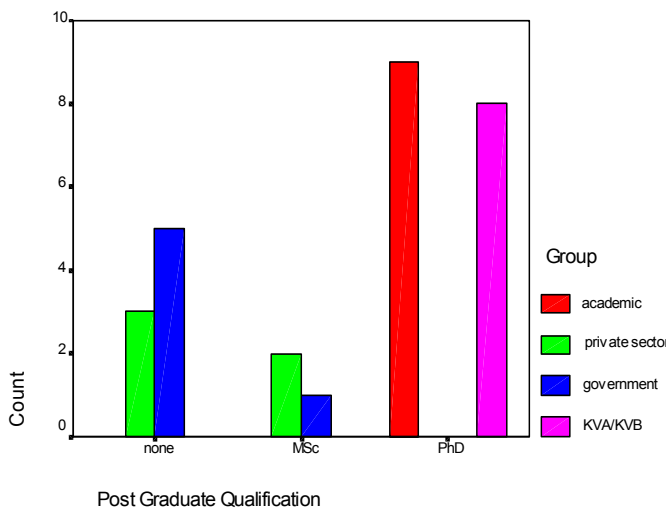
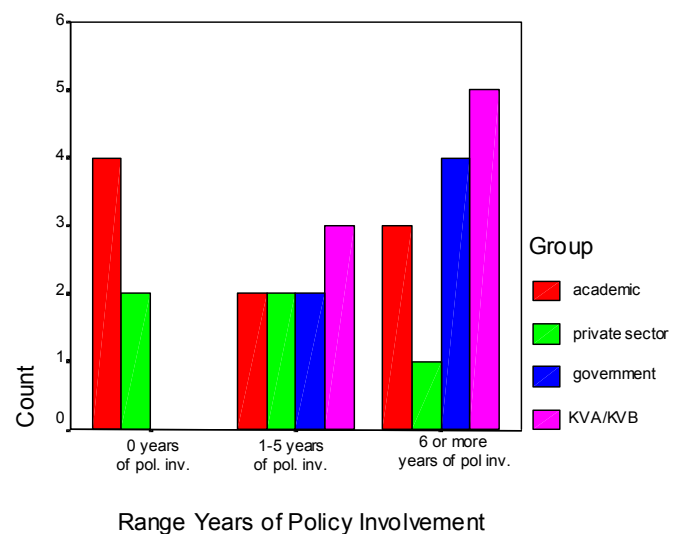
3.1.2 Policy makers group

The policy makers' sample (n=28) was composed of a 32.1% of academics, 17.9% of private sector members, 21.4% of government officials and 28.6% of KVA/KVB members. 60.7% of the respondents had a PhD, all of them being part of the academic and KVA/KVB group (see fig. 1). 10.7% of the interviewees had an MSc, 66.7% of them being on the private sector and 33.3% in the government, and finally 28.6% had no post-graduate qualification, 62.5% of whom were in government and 37.5% in the private sector. It was also difficult to find women involved so gender balance was not equitable, having an 85.7% of males against 14.3% of female (table 8).

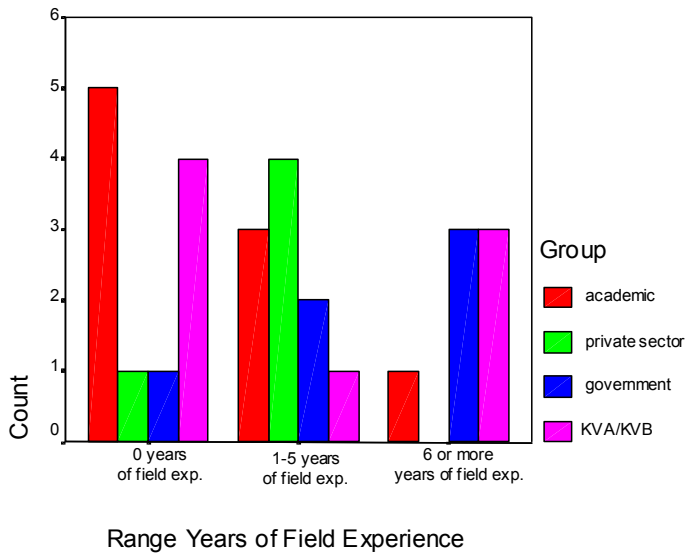
Table 8: Descriptive data for Policy Makers group

Years of field experience	4.34 ± 6.48
Years of involvement in policy	9.18 ± 9.48
Gender (%)	
□ male	85.7
□ female	14.3
Post graduate qualification (%)	
□ none	28.6
□ MSc	10.7
□ PhD	60.7
Group (%)	
□ academic	32.1
□ private sector	17.9
□ government	21.4
□ KVA/KVB	28.6

The mean of years of policy involvement was of 9.18 with a standard deviation of 9.48. However, when divided into groups of 0, 1 to 5, and 6 or more years of policy involvement (see fig. 2) it was highlighted that all government and KVA/KVB members had at least more than 1 year of policy involvement. Respondents in the academic group were the ones with less policy involvement and private sector members had equal percentages in the ranges 0 and 1 to 5 years of policy involvement.

Fig. 1: Post graduate qualification v. group**Fig. 2: Years of policy involvement v. group**

Finally the mean of years of field experience was of 4.34 with a deviation of 6.48. When grouped into categories of 0, 1 to 5 and 6 or more years of field experience (see fig. 3), it was noted that most of the academics had no field experience (55.5%) as well as 50% of the KVA/KVB members. An 80% of the members of the private sector had at least 1 to 5 years of field experience. For the government officials, 83.3% had at least 1 or more years of field involvement, but still 16.6% had none.

Fig. 3: Years of field experience versus group

3.2 Quality ranking

3.2.1 Livestock keepers group

Overall quality ranking of the 10 most mentioned “ideal” qualities for CAHWs for the three districts is stated in table 10. Ranking for these qualities was based on samples as similar as possible for each district: for West Pokot 21 (8 female -all-, 6 male illiterate and 7 male literate), for Wajir 22 (3 female -all-, 9 illiterate male and 10 literate male) and for Marsabit 23 (11 female, 6 illiterate male, 6 literate male). Each quality was defined by a series of characteristics (adjectives and short descriptions) mentioned by livestock keepers, community member and CAHWs as seen in table 10. Question 5 in the Livestock Keepers group questionnaire (“State the reason/s why you have chosen each of these qualities”) was a key question for the quality definition as respondents had to further explain what the meaning of the qualities they stated was. The three most mentioned qualities were “trustworthy”, “committed” and “responsible”. However their position in the ranking varied between districts, as seen in table 9, shows differences in the required selection criteria between districts. This will also be highlighted through the Pearson correlation analysis later in this chapter.

Table 9: Ranking of preferred qualities per district

West Pokot	Wajir	Marsabit
Trustworthy	Trustworthy	Committed
Knowledgeable	Committed - Responsible	Responsible
Social person - Polite - Literate	Available	Trustworthy
Committed	Literate	Social person

Table 10: Livestock Keepers Group “ideal” qualities ranking

Rank	Quality	Terms included in the definition of the quality	Times mentioned
1	Trustworthy	honest	58
2	Committed	committed / hard working / responds to calls/ responds quickly to needs of community / act quickly / obedient/ able to work/ an active person / loyal person/ devoted	40
3	Responsible	responsible / has a family / with children	30
4	Knowledgeable	knowledgeable / experience in AH/ bright/ can grab concepts/ when trained/ pass messages / pass skills to others (advisor) skilful / resourceful/ brave /clever	29
5	Literate	literate / learned	20
6	Mobile	can walk and cover large areas / fit/ young / healthy	19
7	Social person	social person/ good public relations/ accepted by community	18
8	Available	available/ willing to stay in the community/ loves/familiar with local community/ local person	16
9	Owning livestock	being a livestock keeper/owner / familiar with livestock / cares for animals	13
10	Polite	good behaviour / polite/ can listen	10

3.2.2 Policy makers

The ranking of the ideal qualities of the CAHW as seen by the Policy Makers group are shown in table 11. Ranking of the qualities was based on the whole sample of interviewees in the group (n=28) and on the times the quality was mentioned. As in the previous ranking, a definition of the terms considered in each quality is stated, based on the answers of question 3 in the Policy Makers questionnaire (annex 1) “Explain why you have chosen these qualities” as, even if the same quality was stated, the meaning could sometimes differ. As seen in the table, ranking of qualities does not overlap with the livestock keepers’ one. Hence the four most stated qualities in that group are “literate”, “knowledgeable or trainable”, “ethnic to the area” and “trustworthy”. It can be seen from the list that new qualities are mentioned, such as “ethnic to the area”, “qualified”, “trainable”, “ethical”, “interface or link” person.

Table 11 : Ranking of the “ideal qualities” in a CAHW for the Policy Makers Group

Rank	Quality	Terms included in the definition of the quality	Times mentioned
1	Literate	educated / literacy	17
	Trainable/Knowledgeable	basic AH knowledge/ husbandry / handy / skilled / able to be trained / with training	17
2	Ethnic to/ knowledge of the area	knowledge of local culture	13
3	Trustworthy	trusted / accepted by communities honesty/integrity able to diagnose	10
4	Available	available in local areas/ accessible / local person	9
5	Commitment	commitment / responsible/ motivated / hard working	8
6	Owning livestock		7
7	Social person	public relations / friendly accepted as leaders	6
8	Qualified	qualified	5
	Community generated		5
	Mobile	willing to follow (mobile) /live in the communities physically fit / young	5
9	Ethical	ethics	3
	Interface	acting as an interface/ reporting (vet/ government / communities/ market)	3
10	Knowledge on ethnoveterinary medicine		2

3.3 Semi-structured interviews

3.3.1 Livestock keepers

This part of the analysis included all respondents in every district (n=189). Therefore percentages shown are based on the sample “n” if interviewees in each district (i.e. West Pokot n=72, Wajir n=59 and Marsabit n=58).

3.3.1.1 Selection process

Referring to the selection process in the districts, the majority of the interviewees in Wajir and Marsabit were consulted regarding the selection (76.27% and 66.6% respectively). However in West Pokot 55.5% of the respondents were not consulted. These include mainly women and young men and the stated reason was that they were “not allowed” to participate. Candidates were selected by the whole community in Marsabit (96.5%), however in West Pokot elders, opinion leaders or selected members of the community were often the ones choosing the candidates. In Wajir, respondents stated the whole community made the choice in 50% of the cases and selected members of the community in 45.7% of the cases. Nearly all respondents in the 3 districts were familiar with the candidates. In West Pokot and Wajir, the 38.9% and 41.4% of the interviewees respectively were not aware of the decisions taken during the process but were informed of the result by the elders of the community. In Marsabit, community members were only informed of the final decision taken through a community meeting (34.5%) and through a meeting with the NGO (22.4%).

When asked about how to improve the selection process members of the Pokot communities interviewed suggested the involvement of the black market seller and traders (“they should be trained as they deal yet with drugs”). Other suggestions included the increase in the involvement of women in the selection process and as potential candidates to become CAHWs as “they are most of the times with animals - goats, sheep and calves- and they are crucial for the cleanness of cows and cattle and key elements in milking”. It was also highlighted that “they should be able to administer drugs to animals”. Special attention was given to the criteria used in the selection process and to the need of more CAHWs. It was markedly noted that selection criteria should be made public and should be available for all community members. In order to increase fairness to the process, chiefs or authorities should not be involved and an interview should be included during the selection process of the candidates.

The communities in Wajir did also highlight the need for instituting a clear selection process with specific criteria and guidelines. The need to increase participation of women was a recurrent theme, as well as the involvement of the whole community in the selection process, not letting the candidates be selected exclusively by the elders, leaders or Pastoral Association officers. Again, the ideas of including an oral interview of the candidate during the selection process and the need for more CAHWs were brought. Most importantly was the insistence of respondents on the need for recognition and accreditation of the CAHWs. Respondents were also keen on enhancing CAHWs’ training, equipment and monitoring.

Finally, respondents in Marsabit tended to think the selection process was “good” so that there was no need of any improvement. Especially they highlighted they were “very happy” with the fact that they did not have to pay each time they required the CAHWs services as well as by not having to pay for transport to Marsabit to buy drugs. However the majority stated the need and availability for more cheap drugs and on giving refresher courses or retraining of the CAHWs.

3.3.1.2 Effectiveness and sustainability

All respondents in the 3 districts unanimously thought CAHWs “are useful”. Reasons for that slightly varied between locations (table 12). Hence, in West Pokot the main reason, stated by a 54.2% of the respondents, was that “they (the CAHWs) treat the animals which then recover”. In second position came the provision of drugs at reasonable price (37.5%). And third was the availability and accessibility of services in the area (contrary to the government services) (34.7%). In Wajir, drug availability at cheap prices was the main reason (50.7%) followed by the

accessibility of services for the “pastoralists in the bush” (43.5%) and the treatment of animals (30.4%). In Marsabit, the early treatment of sick animals was the first reason (51.4%). Interestingly, second came advice and extension (44.1%) whereas in the 2 previous districts came as the fourth reason. Extension given in Marsabit was mainly on (veterinary) public health such as “when to drink milk or eat meat after treating an animal with drugs” and how to “bury dead bodies of Anthrax cases”. Production extension was also given, especially targeting deworming and tick control. Finally, third came drug availability (35.3%).

Table 12: Reasons why CAH systems are useful - LK group (frequency in %)

West Pokot		Wajir		Marsabit	
Animal treatment	54.2%	Drug availability & price	50.7%	Animal treatment	51.4%
Drug availability	37.5%	Access to services	43.5%	Extension	44.1%
Access to services	34.7%	Animal treatment	30.4%	Drug availability	35.3%

When asked about “health improvements” seen in the community, all districts respondents coincided on the “reduction of death rates and animal sickness” due to CAHWs’ presence. The decrease in disease incidence concentrated mainly on tick-borne infections control and worm control. Hence followed an increase in animals’ body condition and production (milk specially) and reproductive levels. As one of the respondents mentioned, the “health improvements” noticed were an “increase in livestock production, and this has improved our means of survival as livestock is our main source of livelihood”.

All districts agreed that CAHWs could have been more effective had it not been for the lack of training or lack of supplies (65.3% West Pokot, 66.1% Wajir, 53.5% Marsabit). For West Pokot, the main reason was the lack of drugs (85.1%) followed by lack of training or refresher courses (12.5%) (see table 13). It should be noted that respondents thought that CAHWs who had previously been drug sellers performed better in terms of replenishing the drug kit as they had previous knowledge of supply networks. Improvements suggested were mainly “to be paid a salary” by the government or the NGO as it would “make the job more interesting” (36.1%) and to increase drug availability and variety (including human drugs) (34.7%). Increasing means of transport and giving more refresher courses were also stated (33.0% and 27.7% respectively), the two to be funded by the government and/or the NGOs. Regarding refresher courses, it was suggested they focus on animal health and marketing to be performed one week, twice a year. It was also mentioned the training of more CAHWs (19.4%) and the construction of a drugstore nearby so that drugs are more readily available (12.5%), again to be funded by the government and/or the NGO. One suggestion on financing was to engage the CAHW in the financing of the drugstore for involvement in the maintenance. Finally were stated the provision of equipment (11.1%) (especially cooling boxes and dipping facilities) and the supervision of the CAHWs (5.5%). Other suggestions, although there was less consensus, for improving the system were (i) to give more extension to livestock keepers, (ii) the government to provide assistance to CAHWs, (iii) recognition of CAHWs by the government, (iv) the GoK to eliminate black market or quacks and (v) to create a lab in the area, (vi) the supply of drugs free of charge, (vii) the ability to sell small quantities of drugs so that they are affordable for the livestock keeper and finally (viii) the donor to give the first kit on a loan or refund basis.

The same pattern could be drawn for Wajir, with 89.7% agreeing on lack of drugs as the main problem, and shortage of skills or training in 23.1% of the respondents’ answers. Consequently, improvements suggested were the supply of enough and cheap drugs (on a loan basis) (61.0%) and the provision of regular training or refresher courses (55.9%). Providing incentives for the CAHWs to continue working was also highlighted, the incentives being (i) the provision of salaries or wages by the NGO, the government or a combination of both (16.9%), (ii) obtaining some margin from drug selling, (iii) to be given animals, (iv) rewarding CAHWs to encourage competition and (v) the contribution of the community to CAHWs welfare. Other improvement suggestions related to the increase in the means of transport (13.5%) and the regular follow up or monitoring of the workers (11.9%). Provision of accreditation or certification of the CAHWs was also mentioned (10.2%). Other suggestions mentioned fewer times were (i) reviving the Pastoral Association (PA) management (6.7%) by extending membership to all community members and evaluate and monitor the PA progress through regular general meetings, (ii) training of more CAHWs, (iii) provision of more equipment, (iv) creation of a lab in the area,

(v) research on livestock diseases of the area and (vi) reduction of political interference from the chief.

Interestingly, Marsabit respondents mentioned similar levels for lack of drugs (58.1%) and lack of skills or knowledge (54.8%). Therefore improvements suggested by the interviewees were the increase of drug supply (72.4%), the construction of a drug store nearby (53.4%), the provision of means of transport (46.5%) and the provision of refresher courses (43.1%). The salary issue was again mentioned (34.5%) (to be supplied by the NGO and/or the government) as well as the training of more CAHWs (17.2%). Other suggestions, which were given less emphasis, were the provision of equipment and loans for drugs.

Table 13: Reasons why the CAH system did not work - LK group perspective

West Pokot		Wajir		Marsabit	
Lack of drugs	85.1%	Lack of drugs	89.7%	Lack of drugs	58.1%
Lack of training/refresher courses	12.5%	Lack of skills	23.1%	Lack of skills	54.8%

Reasons for leaving the CAHW job were mostly related to the above suggestions. In West Pokot, lack of drugs (16.7%), lack of profits (16.7%), lack of salary (15.3%) and drugs earnings misuse (15.3%) (specially because of drunkenness) were mentioned. Lack of transport (11.1%) and commitment (9.7%) were also highlighted. However other reasons were stated such as insecurity, drought, migration, competition with black market, bad relations with community - especially with elders - and drunkenness. In Wajir reasons for workers to quit were similar to the ones in West Pokot, hence lack of salary (33.9%) and lack of drugs (20.3%) were the two most mentioned reasons, followed by migration (13.6%), lack of incentives or profits (11.7%), travelling distances (6.8%) and finally lack of payment of services by the livestock keepers (6.8%). Other less mentioned reasons were similar to the ones obtained in West Pokot, especially regarding insecurity, black market, political interference and misuse of funds. In Marsabit most of the respondents were not aware why the CAHWs were quitting. However, the main reasons stated were lack of money (12.1%), lack of drugs (8.6%) and that they “found another job” (5.2%). Transport, unwillingness from pastoralists to pay for the drugs, family matters and migration were other stated reasons.

Incentives for CAHWs to continue working were similar across the districts (see table 14), salary or money given being the most suggested (75.0% in West Pokot, 42.4% in Wajir and 81.0% in Marsabit). In second position came availability of cheap drugs for Wajir and Marsabit (33.9% and 67.2% respectively) and provision of means of transport for West Pokot (37.5%). Third positioned was availability of drugs for West Pokot (34.7%), training and refresher courses for Wajir (22.0%) and adequate transport for Marsabit (60.3%). Fourth incentive in West Pokot were refresher courses and advice from professional staff (13.9%), followed by supervision and monitoring from private veterinarians or NGOs, construction of drugstores for drug availability, good relations between community members, livestock keepers and CAHWs, recognition from government and NGOs of CAHWs and creation of co-operatives and associations. Other recurrent themes as prohibition of the black market, increase equipment and materials and loans for drug-buying were also mentioned. For Wajir, fourth came the increase in margin profit from drug selling (16.9%), followed by recognition of CAHW status through certificates (13.6%), enhanced supervision from NGO or government staff (10.2%), provision of transport (6.8%) and the creation of a community contribution for livestock levy (6.8%). Other suggestions considered as incentives in Wajir were the sensitisation of the community to pay for the services they are given, provide CAHWs animals as an incentive to continue working, provide kits and drugstores and create an association of CAHWs. Finally for Marsabit, the fourth incentive mentioned was the construction of drugstores so as for drugs to be readily available to community members when needed (43.1%). As in the previous districts, the provision of refresher courses (22.4%) and equipment (15.5%), training more CAHWs (12.1%) and giving loans for drug buying (5.2%) was highlighted.

Table 14: Incentives for CAHWs - LK group

West Pokot		Wajir		Marsabit	
Salary / economic	75.0%	Salary / economic	42.4%	Salary / economic	81.0%
Provision of means of transport	37.5%	Availability of cheap drugs	33.9%	Availability of cheap drugs	67.2%
Availability of cheap drugs	34.7%	Training and refresher courses	22.0%	Provision of means of transport	60.3%

In all three districts respondents had learnt from CAHWs (table 15) (65.3% in West Pokot, 98.3% in Wajir and 100% in Marsabit). In West Pokot the most common themes been taught to community members were dosages and ways of administration of drugs (51.1%) - including injection-, dipping and spraying (29.8%), treatment of specific disease (21.3%), early reporting of cases of disease (21.3%) to the CAHWs and diagnostic of specific disease symptoms (8.5%). Others were extension on the importance of vaccination, differences between human and animal drugs, animal nutrition, drug storage, usefulness of quarantines and knowing when a drug is expired. Finally were taught basic procedures such as castration and de-horning. In Wajir livestock keepers were taught about drug dosages and ways of administration (96.5%) - including injection-, treatment of specific diseases (29.8%), early disease detection (19.3%), information on disease prevention (19.3%) and of diseases of the area (10.5%). Extension was also given on distinguishing fake and expired drugs (10.5%), on animal husbandry, on the importance of accurate drug-dosing, on the importance of vaccinations, and on disease reporting. Finally in Marsabit community members were also taught on dosages and ways of drug administration (86.2%), hygiene and public health education was an important component (36.2%) which has been rarely mentioned in other districts. This included the “covering of food after cooking” and the hygiene of the house and the animals’ locations. Still in the (veterinary) public health extension, special attention was also given to advising livestock keepers on not drinking milk or eating meat of an animal that has recently been treated, on how to bury the carcasses of animals which died of Anthrax, on not eating dead animals, on burning dirt, on boiling water and on flies and mosquitoes control. Clinical animal treatment was stated in 34.5% of the answers. Other procedures such as castration, tick control and deworming were also part of the extension given as well as highlighting the importance of storage and quality of drugs, disease reporting and preventive medicine such as separating sick from healthy animals.

Table 15: Themes taught to community members by CAHWs - LK group

West Pokot		Wajir		Marsabit	
Dosages and administration routes	51.1%	Dosages and administration routes	96.5%	Dosages and administration routes	86.2%
Dipping /spraying	29.8%	Treatment of specific diseases and early reporting	29.8%	Hygiene and public health education	36.2%
Treatment of specific diseases and early reporting	21.3%	Disease prevention	19.3%	Treatment of specific diseases	34.5%

3.3.1.3 Chi Square

Homogeneity in the Livestock Keeper sample was analysed through a Chi Square analysis. The aim of the analysis was to highlight any differences between districts which could have influenced the semi-structured interviews answers, especially focusing on the quality ranking and selection process part of the interview. Therefore, Pearson Chi Square was calculated for district versus: age, gender, literacy, cattle, camels and sheep and goat. In order to perform the analysis, numerical data for age and wealth (animals) was aggregated into “ranges”. Ranges were set in an arbitrary way. Hence were obtained the following ranges for “age”: 20-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-59 and 60 years old or more. Number of cattle was aggregated in ranges of: 0, 1-4, 5-9, 10-14, 15-20, 21-40, 41 cattle or more. Similar ranges were obtained for the number of camels: 0, 1-3, 4-7, 8-17 and 18 or more camels. Finally the same was done for sheep and goats. The two species were counted together as pastoralists often do not make the difference between them when counting animals therefore in some cases it was not possible to specify how many sheep and how many goats they had. Ranges

obtained were: 0-5, 6-10, 11-19, 20-29, 30-39, 40-55, 56-99 and 100 or more sheep and goats. Results⁶ of the analysis can be found in annex?

Age distribution

The P value obtained for the analysis “district versus age ranges” (P1) was of 0.633. Hence the null hypothesis H_0 was confirmed, so there were no differences in age ranges between districts. When analysing the answers of the semi structured interviews (all 189) in relation to the age ranges, again no significant trend in qualities desired could be highlighted, to the exception of the qualities “mobile” and “polite”, which were most frequently mentioned between respondents older than 40.

Gender distribution

Regarding gender, as previously mentioned there were some difficulties in interviewing women therefore, as expected, H_0 was not confirmed with a P value (P2) of 0.000 and confidence interval of 0.05. Such a low P value highlights that there is a significant difference in gender distribution between districts. The research team encountered difficulties in interviewing women especially in West Pokot and Wajir. The lack of women participation especially in these two districts might have hindered tendencies in responses of this group in relation the “ideal” qualities desired in CAHWs. Women’s answers regarding the selection process and effectiveness and sustainability of the system in the above-mentioned two districts might have also been diluted due to this lack of representation in the sample.

Differences were found between men and women in the desired qualities researched in the community workers as well as in the selection process. The sample used to compare answers in the semi-structured interviews regarding gender was composed of all women (31) and of 30 men (5 literate and 5 illiterate for each district). Regarding the “ideal” qualities, differences in trends of answers between men and women are seen in table 16.

Table 16: Frequency in quality mentioning for men and women - LK group

Quality	Male answer frequency (%)	Female answer frequency (%)
Responsible	36.7	32.3
Owning livestock	23.3	25.8
Available	23.3	32.3
Knowledge of the area	6.7	
Loyal	53.3	64.5
Trusted	63.3	51.6
Knowledgeable	36.6	38.7
Polite	10	25.8
Clean	-	3.2

Even if the first 2 ranked qualities were the same for both sub-groups, special attention should be drawn to women’s desired qualities in a CAHW as they frequently related to behavioural characteristics. Thus “polite” was stated in 25.8% of the answers of the women sample whereas for the men it was a 10%. “Non drinker” was also highlighted mainly in West Pokot by women, and no men in the sample stated the quality. “Respect” was also mentioned more frequently in women’s answers (6.5%) than in men’s (3.3%). Frequency in answering “availability” was also higher for women (32.3%) than for men (23.3%). Marsabit women stressed the desired quality were “knowledgeable” and “responsible” whereas in West Pokot they highlighted “polite”. Finally “clean” was a quality mentioned by women exclusively in Marsabit (3.2%). Men were more focused on “literacy” (33.3%) and “mobility” (40%) than women (9.7% and 19.4% respectively) as well as regarding the knowledge of the area (6.7%).

⁶ Poultry and donkeys were not considered for the analysis due to the small number of respondents mentioning or owning them.

In relation to the overall selection process, the overall majority (for the 3 districts) of men and women were consulted during the selection process (table 17).

Table 17: Male & female answers relating to the selection process of the candidates

Where you consulted?	Male %	Female %	Who chose the candidates?	Male %	Female %
Yes	46.7	58.1	Whole community	70	77.4
No	53.3	41.9	Elders/selected members	20	22.6
Were you familiar with candidate?	Male %	Female %	Authorities	-	-
Yes	86.7	100	Volunteered	10	-
No	13.3	-			

However, important differences exist between districts as it was noted that in West Pokot 6 out of the 8 women (75%) interviewed were not consulted as “women are not allowed” to be consulted, whereas in Marsabit the 65% of the women were consulted. The most participatory district was Wajir where the 3 interviewed women were consulted and the majority of the men were also consulted (however it must be taken into account that it might not be representative of the whole Wajir community). In most of the cases candidate selection involved the whole community for both groups’ answers (table 17). However there was a marked difference between districts as in Marsabit it was the whole community whereas in West Pokot it was mainly done through the elders decisions. This does not appear in the percentages as the samples of women in each district greatly differ. Most men and all the women in the sample were familiar with the candidates (see table 17) and most of them were told of the result of the selection process by a neighbour.

The majority either of men or women were aware of the decisions taken and were mainly told by the elders for the men and through a community meeting (Marsabit) or the neighbours (West Pokot) for the women. However it was in Marsabit were 50% of the sample (mixed for men and women) for this district was not aware of the decisions taken.

Livestock keepers and community members, either men or women seemed to agree that the selection process was “good”. There was no difference in the trend of men and women answers as well as no differences between districts. The only possible trend noticed was that in Marsabit suggestions tended to focus on the supply side of drugs (cheap prices, building drugstores, availability of CAHWs and no or delayed payment). In West Pokot it tended to focus more on the “fairness” of the selection process, stating the improvement of the process through specific guidelines and by not involving the authorities in the process. In Wajir comments were also regarding the “fairness” but also related to the management of the CAH programme and involvement of women in the process.

Literacy distribution

P value of literacy levels (P3) was of 0.01 with a confidence interval of 0.05. There was therefore no significant difference in literacy levels between the districts. According to UNESCO estimates, overall illiteracy levels in Kenya in 2001 for adults over 15 years old were of 17% (29). This contrasts with the comparatively higher illiteracy levels obtained in the descriptive section in relation to the three districts (see table 7), where the mean illiteracy level was of 56.6% (comparable as no interviewee was under 15 years old), ranging from 45.8% in Wajir to 72.4% in Marsabit).

However, differences in trends in the answers of the semi structured interviews could be found in relation to the selection process of the candidates (see table 18). The used sample consisted of 30 literate (10 men for each district) and 30 illiterate (5 men and 5 women illiterate for each district except for Wajir where there are just 3 women illiterate and 7 men illiterate).

On the one hand, literate interviewees put emphasis on qualities such as “literacy” (46.7% versus 23.3% frequency in illiterate respondents), “availability” and “being a livestock owner” (40% versus 23.3% for illiterates). On the other hand, illiterate respondents focused on “trust”

(83.3%), “responsibility” (40%) and “politeness” (23.3%). However, for the two sub-samples, “trust” and “commitment” were remained the most important qualities.

Table 18: Ideal qualities for literate and illiterate subgroups

Quality	Literate %	Illiterate %
Responsible	30	40
Owning livestock	40	23.3
Available	40	23.3
Knowledge of the area	6.6	3.3
Loyal/committed	60	53.3
Trusted	63.3	83.3
Knowledgeable	46.7	46.7
Polite	6.6	23.3
Clean	-	-
Social/PR	20	26.7
Literate	46.7	23.3
Mobile	26.7	30
Respected	6.6	6.6
Non drinker	3.3	-

A trend in the selection process of consulting literate members of the community can be concluded from the answers of the respondents (table 19). 60% of the literate were consulted against 36.7% of the illiterate. Conversely, 63.3% of the illiterate were not consulted during the selection process. However, Wajir was the most participatory district as there were few illiterate not consulted about the process in comparison with Marsabit and West Pokot where levels were similar and higher.

Table 19: Differences between literate and illiterate respondents in relation to the selection process

Consulted?	Literate %	Illiterate %
Yes	60	36.7
No	40	63.3

Familiar with candidate?	Literate %	Illiterate %
Yes	100	86.7
No	-	3.3

Who chose the candidates?	Literate %	Illiterate %
Whole community	40	70
Elders/selected members	36.7	30
Authorities	16.7	-
Volunteered	6.6	-

Aware of the decisions taken?	Literate %	Illiterate %
No	20	33.3
Yes	80	66.7

Perceptions on who was choosing the candidates varied between literate and illiterate respondents. Therefore, 70% of the illiterate stated the whole community was involved, against a 40% of the literate. No illiterate in the sample mentioned the candidates being chosen by the authorities, against 16.7% of the literate. The two groups however mentioned that elders or “selected members of the community” chose the candidates (36.7% for the literate group and 30% for the illiterate). Nearly all respondent were familiar with the CAHWs candidates, mainly because these were village mates or neighbours or in fewer cases because they were themselves the candidates (table 19).

More literate respondents were aware of the decisions taken regarding the selection process (80% against 66.7%) and were mostly told by the elders (or “selected members” of the community). It should however be noted that in Marsabit most of the illiterate respondents were not aware of the decisions taken (8 out of 10). This might have influenced the above results.

Regarding the improvement of the selection process and the effectiveness and sustainability of the CAH system, there were no clear trends in the answers of literate and illiterate respondents. Suggestions are stated in table 20.

Table 20: Suggestions for improvement of the system - LK group

Improving the selection process:
<ul style="list-style-type: none"> ▪ State a clear selection process/ with rules and guidelines/ fairness in the process/ exclude government staff in selection process ▪ Indication of qualities required ▪ Interview the applicants ▪ Train the black market traders ▪ Recognition of CAHWs by government and communities (ID for CAHWs) ▪ Involve more women
Improving the effectiveness and sustainability of the system:
<ul style="list-style-type: none"> ▪ Transport improved ▪ Credit facilities ▪ Drug availability/loan of drugs by NGO ▪ Increase delivery of services in the bush ▪ Refresher courses ▪ Build drug store ▪ Provision of monetary incentives/salary (by NGO or government) ▪ Provision of equipment (pumps, tents, clothes, kits...) ▪ Provision of transport ▪ Training more people ▪ Advisors/monitoring ▪ Community to contribute through a levy/ LK to pay for drugs and services ▪ Penalty to CAHWs for dropping out ▪ Associations of CAHWs ▪ Standard training

Wealth distribution

Cattle and camel distribution P value (P4 and P5 respectively) across districts were of 0.000 (for the two) hence distribution was not similar. Sheep and goat distribution P value (P6) was of 0.011. Po being smaller than P6 there was no significant difference in sheep and goat distribution between districts. Differences in cattle and camel distribution were related to local cultural and religious values as mentioned in the context chapter; hence differences in their distribution could be expected. Sheep and goat distribution was homogeneous across districts as a result from these being the most affordable and less demanding species.

Information related to wealth was compiled during the data collection. The information was intended to help elucidate if wealth status of the respondents had any influence on the answers given in relation to the qualities and selection process. In this respect, it should be highlighted that distribution of wealth or livestock wealth among the pastoralists depends on several factors, specially in relation to the area of occupation, climatic conditions (droughts, floods or successive rainy seasons) and security status (cattle rustling, presence of small arms). Therefore community members are more or less wealthy in a given point in time. There is no standard ranking (i.e. absolute terms of livestock numbers) for wealth ranking in these communities (personal communication, Mpoke).

Given that during the data collection in the communities this information was not gathered, the present study lacked of the necessary information to make this ranking and consequent interpretation of the semi-structured interviews. This is one of the weaknesses of this study.

3.3.2 Policy makers

3.3.2.1 Selection process

As mentioned in the descriptive chapter, 60.7% had field experience of different length. From those having experience, in 82% of the cases it was in Kenya (different districts). Only 2 of them (11.8%) had had field experience exclusively outside Kenya (Sudan and Zimbabwe). Most of the interviewees with field experience had spoken with a CAHW while in the field. However 2 of them, with field experience in Kenya, had never been in contact with a CAHW and 3 (17.6%) had spoken to AHAs or “vet scouts” as an alternative.

As regarding the policy makers’ interpretation of the role of CAHWs, respondents with field experience agreed it was “disease reporting and link person” (94.1%) and “delivering animal health services in ASAL areas where there is no other qualified professional” (including preventive medicine and simple curative treatments) (88.2%). Some of the respondents highlighted however that services given by CAHWs should exclusively focus on epidemiological surveillance and not on curative or clinical services. Other roles suggested were (i) extension (on feed and marketing of products) (17.6%), (ii) record keeping (5.9%), (iii) production improvement (5.9%), and (iv) supplementing government services (5.9%).

Regarding how the selection process was done, 35.3% of the respondents with field experience stated the authorities or the government selected the CAHWs (the “chief of the village” being the authorities, and the DVO being the government). In 41.2% of the cases it was the elders or opinion leaders who appointed the candidate/s. In fewer cases (11.8%) the communities and the NGOs were involved in the process. Only one respondent, although having field experience, did not know how the selection process was done. Strengths of the selection process were only highlighted when the community (with or without NGO presence) was involved. It was stressed that the strength was the “involvement of the community in the selection process”. They mentioned this process would enable communities to select candidates they “trust” (linking with the “ideal” qualities above stated) and who are “motivated to work”. However, when the elders or the authorities selected candidates, only weaknesses were mentioned. These were mainly that the effectiveness of the system was hindered as elders tended to select their relatives. Other reasons included the following: (i) the selected candidates were illiterate, (ii) there were no women candidates, (iii) the selected person was not accepted by the community, (iv) the process was not participatory so the community did not know what the purpose of the project was, (v) mistrust, and (vi) the “business orientation” of the process. When the NGO was involved, the weakness often mentioned was the “dependency syndrome” from the community towards the NGO.

When asking the group of interviewees without field experience (10), 70% of them thought the whole community should be involved in the selection process as opposed to involving exclusively opinion leaders or elders. They mentioned also the importance of integrating field NGOs in the process so that the CAH system would be more likely to be sustainable. However, 2 out of 10 stated it was the role of the authorities to determine the CAHW selection and thought preference should be given to diploma holders (AHA). Only one of the respondents of the group of policy makers without field experience thought the selection should be done in conjunction with elders and NGOs.

Interviewees with field experience had rarely seen women involved either in the selection process or as candidates. However they all generally agreed on that their involvement should be enhanced as they are available most of the time and are in contact with the animals.

When asked about the usefulness of the CAH system, all respondents to the exception of 2 thought it was useful. Reasons mentioned were that CAHWs fill the gap of service delivery in pastoral areas as they are available in the community, can live and work in harsh areas and follow nomadic communities. However, reluctance and scepticism in some of the answers could be noted, mentioning that the best alternative to deliver the services would be the veterinarian. A recurrent theme was the strong need for supervision and control of CAH systems as well as good quality training.

6 out of 28 (21.4%) stated a contradiction existed between the will of the communities and that of private veterinarians in terms of service delivery to poor farmers. Main reasons being that (i) the private veterinarian services are too expensive for poor livestock keepers' affordability, (ii) community members do not differentiate quality services, (iii) literacy in CAHWs being a primary request from private veterinarians is not always fulfilled and finally (iv) the "work of the private veterinarian is taken over by the CAHW". However the rest (78.6%) thought there is a link between the two actors basing their reasoning in the objective of increasing service delivery to dryland areas, and that private veterinarians are interested in profit making. It was also mentioned the concerns regarding the economic viability of the system as workers do not always understand the purpose of profit making and drug kit replenishment.

Finally, suggestions and remarks given by the interviewees varied and did not only cover selection process but also other issues. Therefore livestock keepers' access to markets and slaughterhouses was raised as well as concerns regarding the viability of the system. The latter referred to the presence of black market for drugs where these are found at cheaper price, hence continuing to be of interest for CAHWs. Centring more in the selection process, it was repeatedly mentioned the need for women's involvement and the need for supervision and training of CAHWs. Finally was suggested the suppression of NGOs in ASAL areas as they are "undermining the economic viability of CAH systems". Some respondents also insisted on the veterinarians to be paid by the government to work in those areas.

3.3.2.2 Effectiveness and sustainability

When asked about the main reasons why CAHWs were leaving, 42.9% stated the problem was economic (lack of salary or payment). The same level of attention was given to issues relating to drug kit replenishment and drug availability (42.9%). Disagreements with the community, finding other activities and donor-driven problems were given the same level of importance (32.1%). Other suggested causes were infrastructure (17.9%), lack of commitment (17.9%), failure in the selection process (10.7%), lack of supervision (10.7%), family matters (7.1%), lack of good training (7.1%) and institutional support (3.6%) and finally drunkenness (3.6%).

Incentives, from policy makers' point of view, to encourage CAHWs to continue working were mainly of economic origin (71.4%). Social status or recognition of their work by the community and /or government was also highly ranked (46.4%). Enhanced amenities such as water access, roads and security were mentioned as incentives (17.8%), as well as the availability and regular supply of drugs (17.8%). Finally came refresher courses (10.7%), means of transport and equipment (10.7%) and in kind presents like animals to be given by the community (3.6%).

Most (42.8%) of the policy makers interviewed did not know what CAHWs did after quitting the community work. The remaining however suggested few alternatives, the most popular being returning to be a livestock keeper (46.6%) followed by opening a duka or agrovets (33.3%) and going for further training (26.6%). Other suggestions were turning to the black market becoming an illegal drug seller (20%), migration to towns in search of higher wages, and livestock trade.

Policy makers thought a livestock keeper would be more interested to go to a CAHW instead to another supplier of similar services due mainly to their availability (53.6%) and to the low prices and flexibility of payment methods (46.2%). Other answers were the understanding of the local culture, lack of other alternatives, because of the quality of the drugs, trust, respect and follow up of the animals.

Regarding their perceptions of who these "other suppliers of services" were, the majority (64.3%) stated the black market or illegal drug sellers⁷, followed by (53.6%) agrovets or dukas (shopkeepers). It was however noted these could only be considered competitors in terms of drug selling, as they do not deliver other services. Black market and illegal drug sellers were

⁷ Illegal drug sellers and black market do not include, for the purpose of this study, agrovets and dukas even if it could be argued that they might also be considered as illegal if not supervised by a veterinarian. Illegal drug sellers include quacks and peddlers.

considered as a “threat” in 46.4% of the answers as they sell (bad quality) cheaper drugs, hence increasing drug selling competition. The issue of “bad quality drugs” was linked to the lack of ethics (a desired quality mentioned in the ranking) of drug sellers as opposed to these of veterinarians or AHAs. Black market competition had different origins as reported by respondents. These could either be from the borders (Somalia, Southern Sudan...) or from private veterinarians or government officials buying drugs in Nairobi at cheaper price and re-selling them to the quacks. Relating to agrovets and dukas it was noted their competitive advantage of selling also human drugs so that it “makes it easier for the livestock keeper to buy there”. Government veterinarians (46.4%) - as the government has the infrastructure and facilities - and AHAs (46.4%) were also considered as alternatives to CAHWs. Less mentioned ones were traditional healers (21.4%), livestock keepers and traders themselves (17.8%), and NGOs (14.3%). Interestingly, human medical professionals and chemists were also mentioned (10.7%) as well as pharmaceutical industries (7.1%). Pastoral associations, production industry and church organisations were the least recorded. Statements were made against CAHWs such as “(CAHWs) are also illegal but they will disappear after the new government because it will enforce the law”. Others insisted that “the country can afford health services to livestock and men so that services are available there”. It was also suggested the creation of a drug Inspectorate for law enforcement. However others thought community workers could be a solution to reduce public health concerns regarding drug residues in milk and meat. One mentioned solution was to train these quacks or peddler so as they sell quality drugs. Supervision and good quality training of CAHWs was commonly agreed.

Proposed solutions from policy makers to counteract the competition problem referred mainly to educating communities about the concept of “quality” (28.6%) and on the supervision by veterinarians and/or AHA of CAHWs (28.6%). This was followed by the creation of a drug Inspectorate allowing only veterinarians (private or from the government) to sell drugs (17.9%). Enforcement of the law and enhancing economic or business capacity of CAHWs were given the same importance (14.3%). Liberalisation of the market and training of quacks to become CAHWs were also given the same weight (7.1%). This was followed by other suggestions such as (i) institutional change, (ii) banning government veterinarians from selling drugs, (iii) creation of farmers’ organisations, (iv) accreditation of shops through logos, (v) recognition of CAHWs in the Veterinary Surgeons Act, (vi) registration of dukas by KVB, and (vii) improve infrastructure. Finally it was suggested that private veterinarians should exclusively work on clinical treatments whereas the government officials should exclusively concentrate on surveillance.

When asked about which kind of support should be given to CAH systems, 67.9% mentioned the government and 57.1% the private veterinarians. Government support focused mainly on “training and retraining” (26.3%) as well as institutional support through recognition and certificates (15.8%). Supervision of the workers was stated in 10.5% of the answers related to government support. Other suggestions were lending money to private veterinarians, to the communities and finally to provide drug supply (5.3% each). Regarding private practitioners support, it focused mainly on supervision (25%), on drug supply (18.8%) and on “training and retraining” (12.5%). In 10.7% of the cases it was stated the NGO should be supporting the systems but functions were not specified.

Suggestions for CAH system improvement coincided, in 32.1% of the interviewees answers, in a structure whereby CAHWs would be supervised either directly by the vet or by the AHA (who in turn would be supervised by the vet). Veterinarians would then be supplying drugs and training to CAHWs and AHAs. Further comments on the sustainability and effectiveness of CAH systems were raised and included taking a uniform approach to CAH systems, empowering farmers, improving productivity, enabling access to markets and monitoring of the systems. Few of the interviewees pointed out however concerns regarding CAH systems’ in relation to the OIE (Organisation Internationale des Epizooties) international standards for export of animal and animal products. These referred to the OIE standards being “too high” for developing countries to access international markets and that bilateral agreement between countries could be a possible solution for exporting animals and animal products. Concerns were raised regarding CAHWs roles in that matter.

When relating respondents' groups to the "ideal" qualities of community workers, preferences in qualities could be observed. Hence government officials tended to highlight literacy and trust as the main qualities (83.3% and 52% respectively), whereas academics stated "literate" and "knowledgeable" (77.7% and 66.7% respectively), KVA/B members "ethnicity to the area" with 75%, and availability and trust with 50%, and finally private sector respondents gave more importance to the ethnicity or "knowledge of the area" (60%) and to training (60%). Trends in highlighting qualities for each group were the following:

Table 21: Quality preferences in relation to group belonging- PM group

Government	Academic	KVA/B	Private
Literacy	Literacy	Ethnic to the area	Knowledgeable / Ethics
Trust	Knowledgeable	Knowledgeable	
Knowledgeable	Availability/Commitment	Availability/Trust/Literacy	

Tendencies were also found in relation to groups of field experience and policy involvement. Hence, respondents with field experience (with or without policy involvement) tended to highlight qualities such as "ethnicity to the area", "knowledgeable". Those with policy involvement (either with or without field experience) focused their preferences on "trust", "commitment", and "ethics". The group of respondents most interested in the CAHW being "qualified" (62.5%) was that where respondents had no field experience but were involved in policy related activities (62.5% - 5 out of 8 - of these group being members of KVA/B). "Literacy" and "social" were mentioned in 2 of the groups, namely the two extreme groups: with the two experiences (group made of 35.7% government officials and 28.6% KVA/B members) - 71.4% for "literacy" and 28.6% for "social-, and without experience in either subject (all academics) - 66.7% for each quality. "Knowledgeable/training" and "ethnic to the area" were highly rated in every group.

Table 22: Quality preferences in relation to field experience and policy involvement - PM group

No field experience No policy inv. (n=3)	No field experience Yes policy inv. (n=8)	Yes field experience No policy inv. (n=3)	Yes field experience Yes policy inv. (n=14)
Knowledgeable	Qualified Knowledgeable	Knowledgeable Ethnic of the area	Ethnic of the area
Literate Ethnic of the area Social/PR	Available/ Trustworthy		Knowledgeable
	Literate		Trustworthy/ Committed

3.4 Pearson correlation

Pearson correlation was performed for each group (livestock keepers and policy makers). Correlations and agreement within and between sub-samples for each group were calculated in order to enable the comparison of each district's perceptions of the first three qualities to those stated by policy makers. First was analysed the sample for livestock keepers and second, the policy makers'.

3.4.1 Livestock keepers

Correlation between sub-samples of the livestock keeper respondents was calculated in order to explore significant variations between districts, literate and illiterate respondents and between men and women in relation to the ideal qualities stated. As an alternative to the Ruebush methodology quality ranking correlation were calculated based on the proportional voting theory (24). Hence weights were given to the first 3 qualities mentioned by the interviewees. The first quality coefficient was 1, 0.6 for the second and 0.3 for the third. These coefficients were multiplied to the times each quality was mentioned. Results of the Pearson correlation analysis can be obtained from annex 2.

3.4.1.1 Within districts

The results of the analysis show significant correlation between sub-samples of literate and illiterate respondents in each district (West Pokot, $r = 0.645$; Wajir, $r = 0.761$; and Marsabit, $r = 0.833$, all with $P < 0.01$). The sample was made of 10 literate and 10 illiterate respondents randomly selected, for each district. In West Pokot and Marsabit the illiterate group was made of 5 men and 5 women, in Wajir it was made of 7 men and 3 women, due to the lack of women interviewed in the district. All correlations being significant, aggregation of answers between literate and illiterate male respondents was therefore possible. Concordance, as measured by the average Pearson correlation among respondents in each sub-sample, was however higher within literate (0.573) than within illiterate (0.359) respondents across districts. The lower level of concordance within the illiterate sample might be the reason of obtaining different trends in quality prioritisation, as seen in the semi-structured interview analysis.

Correlation between men and women within a district was statistically significant in Wajir and Marsabit ($r = 0.664$ and $r = 0.744$ with $P < 0.01$). The correlation between men and women subgroups was not statistically significant within West Pokot ($r = 0.399$) district but was sufficiently high to warrant aggregation (0.602) (26). Samples, for men, were made of 10 literate and 10 illiterate randomly selected men for each district. In the case of women, all women in each district were included in the sample. Must be bore in mind the low level of women participation in Wajir, which might have hindered the results. Concordance between men and women within each district was high (0.602), showing no significant variations in the ranking of the first 3 desired qualities. This confirms the results obtained from the semi-structured interviews, where the two first qualities mentioned by both sub-groups were “trust” and “commitment”. However, slight differences in perceptions and prioritisation of the subsequent qualities were found in the semi-structured interview analysis.

3.4.1.2 Between districts

Regarding correlation between men across districts, the study sample was made of 10 literate and 10 illiterate men for each district. Marsabit and West Pokot men and Marsabit and Wajir men were significantly correlated ($r = 0.460$, $P < 0.05$ and $r = 0.617$, $P < 0.01$ respectively). But West Pokot and Wajir men’s correlation was not statistical significance ($r = 0.339$). However, the coefficient was high enough to warrant aggregation between districts, so concordance between men across districts was of 0.492.

Given the low participation of women, especially in Wajir, correlation between them across districts would not have been meaningful.

The correlations between subgroups within each district and across districts have so far been analysed. These correlations have mostly been significant or high enough to warrant aggregation. This made it possible to consider each district as a homogeneous sub-sample. Hence, this enabled us to make calculations of the correlations between districts’ quality preferences. Samples for this analysis were made of 20 respondents per district, these being: 8 women and 12 men for West Pokot, 3 women and 17 men for Wajir and 10 women and 10 men for Marsabit. (Men samples were randomly selected and were equivalent in the number of literate and illiterate men, when possible). Results obtained showed that West Pokot and Wajir were significantly correlated ($r = 0.500$, $P < 0.05$) as well as Marsabit and Wajir ($r = 0.463$, $P < 0.05$). However, correlation between West Pokot and Marsabit was not statistically significant ($r = 0.165$) but, following Weller, high enough to enable aggregation and therefore allowing us to consider the three districts as a single sample. The overall concordance between districts remained however high (0.376).

These results indicate that there was little variation between livestock keepers’ group respondents in terms of preferred ordering of the first three “ideal” qualities of a CAHW. There were no significant variations in the ordering of the first 3 qualities between sub-samples. However, as seen in the analysis of the semi-structured interviews trends could be highlighted between these sub-groups for the subsequent qualities.

3.4.2 Policy makers

Correlation between respondents belonging to different groups can be found in annex 2. As mentioned before the correlation calculations were based on the proportional voting theory. Ranking methods followed the same pattern as for the livestock keepers' group.

In relation to quality ranking preferences between those respondents with and without field experience, correlation was significant ($r = 0.583$) at $P < 0.01$. Little variation could therefore be expected from the quality ranking between these two sub-samples. Hence, field experience did not seem to be an important factor in the quality prioritisation. Differences existed however between interviewees with and without policy involvement. Correlation between these two sub-samples was not statistically significant although relatively high (0.360). More variations could be expected in their ranking priorities. This corroborates the results obtained in the analysis of the semi-structured interviews, where respondents with policy involvement tended to highlight qualities such as "qualified". Those with field experience correlated higher with those having policy involvement (0.910 with significance level of $P < 0.01$) than with those without policy involvement ($r = 0.455$).

Agreement level between academics, private sector members, KVA/KVB members and government officials sub-samples in the policy makers group was higher (0.489) than concordance between livestock keepers' subgroups (0.376). It should be noted the high correlation between the private sector and the KVA/KVB members ($r = 0.625$ with a significance level of $P < 0.01$). This can be explained by the fact that some of the private sector respondents were also KVA/KVB members. It should however be taken into account the small number of members in each "group" sub-sample of Policy Makers.

3.5 Policy makers - districts correlations

As expected, correlation between Policy Makers' group and West Pokot and Marsabit districts was not statistically significant ($r = 0.358$ and $r = 0.074$ respectively) but was however significant with Wajir ($r = 0.760$ with $P < 0.01$). Hence Policy Makers' quality ranking for the first 3 stated qualities of the "ideal" CAHW was not similar to the qualities requested by West Pokot and especially Marsabit members but similar to those of Wajir's. Similarities with the latter case might be due to a greater involvement of chiefs in the interviews which in turn is a result from the translators' choice of respondents. Qualities mentioned and their priorities in Wajir were therefore comparable to government officials' perceptions of "ideal" qualities. In West Pokot and Marsabit study settings, authorities seemed less related to the development of NGO activities than in Wajir as abovementioned in the context section.

Correlations

		Policy Makers Group	West Pokot	Wajir	Marsabit
Policy Makers Group	Pearson Correlation	1.000	.358	.760**	.074
	Sig. (2-tailed)	.	.132	.000	.765
	N	19	19	19	19
West Pokot	Pearson Correlation	.358	1.000	.500*	.165
	Sig. (2-tailed)	.132	.	.029	.499
	N	19	19	19	19
Wajir	Pearson Correlation	.760**	.500*	1.000	.463*
	Sig. (2-tailed)	.000	.029	.	.046
	N	19	19	19	19
Marsabit	Pearson Correlation	.074	.165	.463*	1.000
	Sig. (2-tailed)	.765	.499	.046	.
	N	19	19	19	19

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

4 Discussion

The purpose of this investigation was to evaluate the criteria perceived by policy makers as essential to select CAHWs and compare those criteria with the opinions of the residents of ASAL communities in West Pokot, Wajir and Marsabit about the qualities and characteristics they would prefer in an “ideal” CAHW. It was hoped that this information would help explaining why drop out rates in CAH systems remain relatively high in some areas. The study was also aimed at identifying ways of improving CAH systems, including improving the selection process, making them more attractive to community workers and enhancing their effectiveness and sustainability. Although the study was carried out in community animal health workers, findings may have implications to community health workers in a broader context.

4.1 Qualities

Several studies dealing with selection of community health workers have attempted to correlate demographic characteristics (education, age, gender...) of the workers with their performance (3, 4, 30). While these characteristics have to be considered when selecting candidates, they might not be as important to the success of the worker as their personality. In this study, in-depth interviews with community members and policy makers were used to elicit the qualities and characteristics both groups believed were the most important and then they were asked to rank them in order of importance.

Table 23: Quality ranks for PM and LK groups

Rank	QUALITY - PM GROUP	QUALITY - LK GROUP
1	Literate Trainable/Knowledgeable	Trustworthy
2	Ethnic to/ knowledge of the area	Committed
3	Trustworthy	Responsible
4	Available	Knowledgeable
5	Commitment	Literate
6	Owning livestock	Mobile
7	Social person	Social person
8	Qualified Community generated Mobile	Available
9	Ethical Interface	Owning livestock
10	Knowledge on ethnoveterinary medicine	Polite

Several studies conducted in the human field relating to community health workers have highlighted “trust” as one of the main reasons for the systems to be sustainable (31, 32, 33). In these same lines, the present research study highlights “trust” as the most desired quality in workers by community members. In view of the setting and context of the interviewed communities (i.e. remoteness, insecurity, lack of infrastructure...) it is not difficult to understand why respondents mentioned other qualities such as commitment and responsibility. As seen in table 23, a gap exists between the desires and demands of the ultimate consumers of the services, the livestock keepers in pastoral areas, and the perceptions of the policy makers, being the ones to set the legal framework for the criteria of candidate selection. This gap was also put forward through the Pearson correlation analysis.

Different opinions can be highlighted from the analysis of the semi-structured interviews. Agreement in relation to the “ideal” qualities of CAHWs among policy makers was higher than among districts. Taking into account that the curriculum of CAHWs has recently been debated and drafted by the Kenyan Veterinary Board (KVB) members (34), it seem logical that policy makers tended to have more similar opinions concerning CAHWs qualities. Lower agreement among livestock keepers in the three districts might be due in part to the existing geographical and cultural differences. But special attention should be drawn towards the CAH project organisational plan, which although “business-oriented” in all 3 settings, greatly differed

between districts, hence might have influenced the needs and perceptions of the “ideal” CAHW.

Policy makers highlighted technical qualities whereas livestock keepers valued personal characteristics of the candidates. In the same lines of Ruebush’s findings, although technical qualities are needed to perform the community health work, sustainability of the system might be undermined as the acceptance of workers might not be adequate, livestock keepers’ desired qualities not being taken into account. The organisational perspective taken by the programmes and its effects on sustainability are discussed later in this chapter.

Given the differences in settings between the Ruebush and the present study, it is not difficult to expect the desired qualities to differ. Hence “trust” and “commitment” remained the most desired ones for both men and women, whereas “availability” was ranked 8th (ranked 1st in Ruebush’s). Different priorities were however given by both groups in relation to the subsequent qualities mentioned. As obtained from the analysis, women preferred “personal” qualities in contrast to the more “practical” ones required by men. This brings forward an important issue which relates to the way information is transmitted to community members by CAHWs. Given that women are “with the animals most of the time”, the interaction between CAHWs and women is a key element in the planning of a CAH system. However, women’s low recognition among most of the visited communities, their interaction with (specially) men CAHW might be severely hindered. Hence, this might be one of the reasons why women tend to seek advice from their neighbours or relatives, a finding that has also been pointed out in studies by Heffernan (35).

Policy makers quality preferences related mostly to “literacy”, “knowledge/training on animal health” and on “ethnicity”. These preferences show a wide gap between communities and policy makers wills in terms of qualities. This is of most importance given that they are the ones influencing policy and legislation in relation to community animal health. If CAHWs’ qualities and guidelines for selection are given exclusively following policy makers desires, it will not be surprising to observe a failure in the CAH systems sustainability.

Hence, it is suggested that qualities proposed for the selection of candidates include the community desires and special attention given to women’s qualities perceptions and involvement in the selection process.

4.2 Selection process

Influence of local politics

In relation to the selection process, experiences from policy makers did not differ from the answers of livestock keepers. It was markedly noted that, in most of the cases, elders or opinion leaders and occasionally the authorities were those involved in the selection of the candidates. Their involvement in such process has been largely debated in the human health literature concerning community health workers (CHW). As mentioned by Twumasi, “When a new idea [community-based health systems] is introduced into a local community it should not be taken for granted that the idea will be readily absorbed by the local system. The structure of local politics and interests need to be taken into account. Traditional power holders are concerned with changes occurring in their communities and are naturally concerned whether the new idea will threaten their position or will erode their power” (36). This conclusion was based on his study in Zambia on the selection process of community health workers and referred to the finding that “[...] the councilor [in Luampungu] regarded the CHW’s role as a potentially powerful one and was evident in his attempts to manage and manipulate the initial selection process. Soon after the District PHC [primary health care] Coordinator asked the Luampungu villagers to select people to be trained as CHWs, the councilor subverted the normal community decision process and submitted a list of 12 people who, it was later discovered, were all his close kinsmen.” (36). Other studies in different countries have recorded similar problems in relation to the existing conflict between local politics and the selection of community-based health workers (as for example in Java (37), India (38) and Brazil (39)). The conflict that arose in Twumasi’s study in Zambia resulted in large part from the fact

that the CHW's role was new and had not been properly institutionalized and legitimized by the local power structure. The specific conflict areas centered around three issues, all related to political power, namely the authority to establish a village health [committee], the control of resources (i.e. drugs) and the perceived political threat of the CHW (36).

Most of the aforementioned findings follow the same lines of the situation encountered in the three Kenyan districts studied for this research as stated by livestock keepers' answers. Hence, it is suggested that, in order to improve the selection process and increase its "fairness", opinion leaders and authorities should not be involved.

Improving the selection process

However, a marked gap exists between policy makers and livestock keepers in relation to the concerns and proposals of improvement of the selection process. On the one hand, community members focused on practical issues. Suggestions such as instituting proper guidelines and specifying the needed qualities for candidates' selection were the main worry. Policy makers, on the other hand, were concentrating on wider issues, such as the consequences the selection of CAHW and penalty CAH systems could represent on export markets in relation to OIE standards. Recent statements by the OIE indicate that CAHWs are increasingly regarded as a means to strengthen rather than weaken national veterinary services, particularly in the area of disease surveillance (40).

Policy makers' licit concerns might not be so much applicable to the drylands context. As mentioned in a report by Ashley, Holden and Bazeley on Chief Veterinary Officers' opinions of the role of veterinary services in 1996, "Pursuit of the traditional professional norms in animal health services delivery, based on the requirements of consumer demand in northern countries, may be counterproductive in situations of resource scarcity, as exists in many developing countries. There is an apparent conflict in many developing countries between the desire for high professional standards [...] and the ability realistically to maintain levels of service" (41). Following World Bank estimates, the percentage of population (in 1994) living in rural areas in Kenya living below the poverty line was of 46.4% (42). Most arguably livestock keepers' concerns regard maintaining their livelihood and do not focus on international export markets. An intermediate step might be the creation of bilateral agreements between neighbouring countries. However (as stated by policy makers in their answers to the semi-structured questionnaire) what would be needed is to increase accessibility to markets in these areas, for livestock keepers to sell their animals.

In this respect, policy makers raised concerns about the existence of the black market in these areas considering it a "threat" to CAH systems. This is also a fear in the human health field (43) where the "abundance and easy availability of drugs in the villages constitutes an extremely unsuitable environment for the enhancement of appropriate drug use by consumers". Solutions proposed by policy makers seemed however fairly opposed. On the one hand, it was proposed that the issue could be solved by creating a Drug Inspectorate and by enforcing the law. On the other hand, proposals such as liberalisation of the market to create more competition to enhance the effectiveness of the system were suggested. In the same lines, community members saw a competitive advantage in these quacks or illegal drug sellers. It was suggested they should be trained to become CAHWs as they have a supplier network making the system sustainable. Experiences in other African countries, especially in francophone Africa, corroborate this opinion (44). Arguably, however, free market competition is not always synonymous of enhanced effectiveness (24), especially in relation to the health field, but this discussion is outside the scope of the study.

Findings emphasize the important gap existing within the policy makers group. This relates not only to the proposed solutions for reducing black market presence in those areas, but also to the advantages illegal drug sellers could represent for the system's sustainability (as mentioned by community members).

4.3 Sustainability

Since community animal health systems started in Kenya, concerns regarding their sustainability have been raised. Lately, the new perspectives taken in the planning process have been focusing on the sustainability of the systems as when the NGO pulls out CAHWs tend to leave their work. The analysis shows that both respondent groups mentioned two main reasons for the workers to leave, these being economic (lack of salary or profits) and drug availability. These findings follow the lines of Holden's (45) where improvements and incentives suggested by livestock keepers were related to the above two including the increase in refresher courses and transport.

In order to increase sustainability, a basic structure for CAH systems was proposed by most of the policy makers. This structure is described below.

Basic CAH system structure

Either centred on a private or government veterinarian, policy makers' respondents seemed to largely agree on the same basic structure regarding CAH systems. They argued the system should be improved through a structure whereby the CAHW is linked either directly or indirectly, through an AHA, to the veterinarian. This is the "model" being piloted by the AU/IBAR in West Pokot (as stated in the context section). It was mentioned that support, economic or else, for the establishment of this structure should come from the government and/or the private sector. This "model" might be a way of ensuring supervision, monitoring and supply of quality drugs to CAHWs in ASAL areas where veterinarians are not willing to go. Supervision and monitoring would then ensure quality services (in terms of technical skills and drug supply) and a more accurate knowledge of the disease status of the areas. Whereas effectiveness in relation to death rates reduction has been extensively demonstrated in the literature (2, 34), economic viability of such structure is still under review.

This shows the willingness of policy makers to create a consistent CAH system across the country. Such a structure, in addition to a set of specific selection criteria and guidelines to follow a systematic process could provide the basic structure for a nation wide system of community animal health. This is stated in the recently created curriculum for CAHWs in Kenya (46). We are going now to discuss the implications of integrating CAH systems into a national structure. It will be followed by some aspects concerning the system's organisation.

As mentioned by Berman (47), in order to expand and integrate community-based programmes into a national structure, there should be an enabling institutional context. Where CAHW could become a significant component of the national animal health system as the delivery branch in pastoral areas, they should not threaten any of the existing professionals, as for example the AHAs or veterinarians. Given that CAHWs are seen by some policy makers as a "threat", the institutional context of scaling up CAHW programmes may sometimes work to limit the efficacy of task selection. This was highlighted by the study findings where it was found that policy makers did not seem to agree on the specific tasks a CAHW should cover. These tasks were not clear either during Holden's survey of CVOs in 1997 (45). Some policy makers argued they should only focus on disease surveillance (preventive medicine in general) and reporting, leaving clinical treatments to "qualified personnel" such as AHAs or veterinarians. Hence, clinical treatments are still perceived as the main source of income for the veterinarian. Others included performing basic curative clinical treatments to their preventive role. This debate has also been found in the human health literature at the beginning of the implementation of community-based health programmes in the early 1980s. Findings such as "the paramedical staff kept a distance from the CHW programme" (48) could be obtained from the literature. Conflicting interests of nurses and doctors with the emerging roles of CHWs have also been reported by Nitcher (49) and Chabot *et al.* (50). The lack of referral between nurses and CHWs has been seen as an indicator of this role conflict in the human field.

An important aspect linked to the sustainability and integration of these CAH systems into a national structure relates to livestock keepers' behaviour. Most of the community members and livestock keepers' suggestions on how to improve the system (as seen from the results) related to passive reception of goods or services. They focused specially on the economic aspects of

CAH systems. Respondents tended to rely exclusively on government or NGOs for service delivery financing. This is of most importance in relation to the sustainability of the system, especially for the relatively new “business perspective” of CAH systems. A similar passive behavioural pattern in service recipients can be found in the literature, mostly in relation to transition countries (EEC) (51). Although settings and political contexts greatly differ, the common feature is the fact of relying on the government as an omnipotent structure which will “take care” of the citizens needs. This has led to an increasing passive consumer behaviour that limits or undermines market liberalisation. In order to obtain sustainable business oriented CAH systems, community members should have a proactive behaviour. It has been argued in the literature that a way of obtaining it relates to education (43).

Even if policy makers seemed to agree on the common structure the CAH system should have, some reluctance and fear still remains related to certain issues. However, the acceptance of this structure (as recently done by the KVB) does not automatically result in a viable and sustainable option. The inner organisation and relationships existing between players within this type of structure must therefore be analysed.

Organisational behaviour and CAH systems

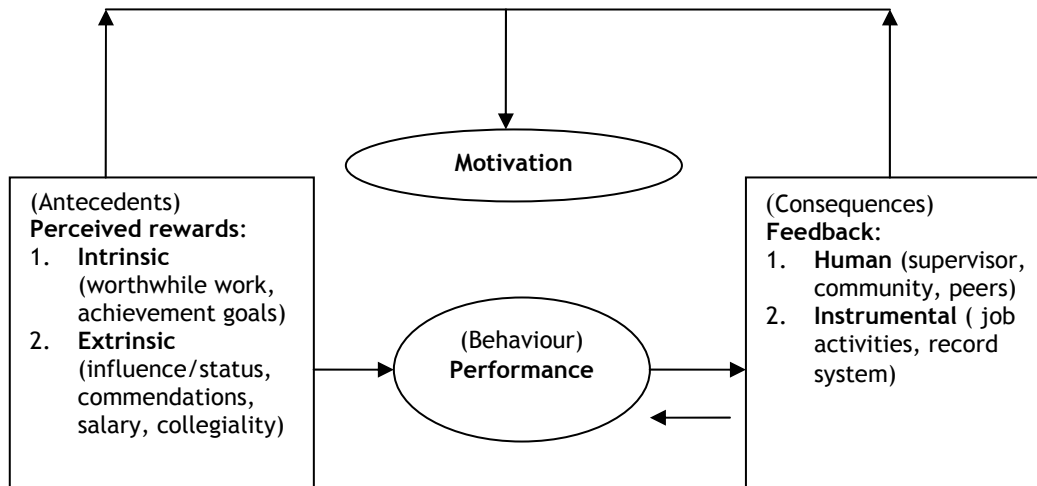
When adapting the existing theory and research on organisational behaviour (1, 52, 53) to the above-mentioned CAH structure, we can see that motivation and work performance in such a setting may be affected by a complex set of factors. These include individual capabilities and skills, the need for growth, rewards and feed back associated and the work environment. In the case of the CAHWs the work environment is the community and not a facility where the worker is in daily contact with the animal health system. Indeed, CAHWs spend almost all their time in the community relating to clients (in their own homes or villages). It seems reasonable to propose that the community, that is, the people to whom the CAHWs provide services, might have a significant impact on CAHWs’ job performance. Following Robinson’s study (1) in the human health field, “[...] high level job performance among CHWs can best be achieved by having a management system which includes regular contact between the CHW and a local supervisor, a method of evaluating CHW performance and a programme of continuing education.” Given the similarities existing between the two fields in terms of location (difficulty in access due to the remoteness of pastoral areas) and agency relationship between players (the implications of the “agency theory” (54) in CAH systems are discussed below), findings obtained in the human health field relating to the sustainability of community-based health systems can apply to the animal healthcare context. Observations in community-based human healthcare (55, 56) such as “poor communication and weak supervision, as well as lack of supplies, are factors which adversely affect CHW job performance” (1) do also apply to the animal health context and have been mentioned in the present analysis by respondents as factors undermining the CAH system sustainability.

Robinson’s conceptual framework for the analysis of organisational behaviour and management in community health systems can therefore be applied to the CAH systems. According to the expectancy-valence theory⁸ (53, 57, 58), workers are motivated to carry out their duties if they perceive that their performance will lead to valued rewards. Performance is also affected by feedback from relevant sources. Thus, behaviour followed by positive feedback (also called reinforcement) is more likely to recur than behaviour followed by negative or no feedback at all. Hence, as mentioned by Robinson, “theory proposes that workers allocate their efforts toward performance according to the mix of consequences they derive from the various sources of reward and feedback” (1). Robinson’s model focused exclusively on variables related to work but other variables may also affect workers’ behaviour. However, her model, based on

⁸ Expectancy-valence theory focuses on a person’s beliefs about the existing relationship between three factors (i) effort, (ii) performance and (iii) rewards for doing the job. The theory was originally expressed as a probability relationship among 3 variables labelled as (i) expectancy (which refers to the probability that an individual believes his/her work effort affects the performance outcome of a task), (ii) instrumentality (relating to the probability that an individual anticipates that an attained level of task performance will have personal consequences) and (iii) valence (indicating the value that a person assigns to the personal consequences that follow work performance) (53).

the influence of perceived rewards (as antecedents of behaviour), and feedback (as consequences of behaviour), could be used to analyse CAHWs performance and motivation (see figure 4)

Fig. 4: Conceptual framework for CHW performance and motivation (adapted from Robinson *et.al* (1))



Data associated to CAHW motivation and performance could then be used by animal health planners to make more informed decisions about the most effective allocation of scarce management resources. This could help maximising CAHW effectiveness within the primary animal healthcare context. More broadly, these data could also stimulate thoughts about new or alternative approaches to management of CAHWs.

Besides analysing such “model” from an organisational behaviour perspective, attention should be drawn to the power relationships existing within the system and how they could affect animal and public health outcomes. It has been extensively analysed in the literature the relation existing between healthcare service providers and the client in the private sector setting whereby the client pays a fee to the private provider for a specific service (Agency theory) (54). In a CAH system oriented towards a business perspective, the private provider is the CAHW and the client is the livestock keeper. Given the information asymmetry existing between the client and the animal healthcare provider, the latter -especially in a private sector setting- is interested in increasing his/her earnings (as it is their source of livelihood). Hence, giving information on preventive medicine to the client (livestock keeper) is contrary to their economic interests as they will have less cases of disease. The fact of hiding information in order to provide excessive treatment is referred in the literature as provider moral hazard (59). However this expenditure on healthcare can be counteracted by several different models of healthcare system design as for example managed care or health maintenance organisations (HMOs) existing in the human field (24). Examples in the animal health field which follow a similar organisational structure include Israel’s HACHAKLAIT (60), New Zealand’s “Veterinary clubs” (61, 62), Kenya’s cooperative societies (62-64), India’s Gujarat state Amul Cooperative and the Kheda and Mahesana district cooperatives (65). It should be highlighted that the present examples of models to counteract private providers’ behaviour exist in settings more economically developed than the Kenyan pastoral areas studied. Additionally, most of the examples in the literature related to community healthcare workers in the human field include, for the great majority, volunteer or government workers.

These aspects should be considered at an early stage of the implementation of the community-based system as it might hinder its effectiveness in terms of, for example, controlling the spread of infectious diseases. Current CAH systems should be studied more in-depth in relation to their organisation and players behaviour.

In addition to the structural and behavioural organisation of the CAH system, a set of criteria should be specified in relation to the themes, tasks and training length of CAHWs. These are specified in the recently published KVB manual for CAHWs (46). However, the data collected in the present study sheds a light over some aspects which are discussed below.

4.4 Curriculum for CAHWs

Both groups agreed CAHWs were “useful” due to the access and availability of animal health services in pastoral areas. This reflects an evolution from the policy makers point of view in the acceptance of the CAH system since the 1996 survey of CVOs opinions (41, 45). Livestock keepers were interested in CAHWs because they were “treating sick animals which then recover”, an evidence that can be found in the literature (34). It should also be highlighted that international organisations dealing with animal health such as the OIE have recently recognised the role played by CAH systems by creating an *ad hoc* committee on CAHWs (66). Following similar lines as the OIE, the KVB has published, as mentioned before, the standard guidelines for training of CAHWs in Kenya. In this manual the tasks CAHWs should perform are specified, the aim being that of having some standard homogeneous knowledge within the CAHW community. These efforts underline the interest CAHWs and CAH systems are creating among the national and international communities.

Given the data obtained from the field research, the discussion is going to be based on the extension messages passed on to livestock keepers. Deriving from the data collected, we observed that what community members learnt in the three districts differed to some extent.

On the one hand, the degree of learning (measured by the frequency of LKs answers) of community members was the lowest in West Pokot. Messages passed concentrated on drug dosages and administration ways, and treatment and reporting of specific diseases. Disease prevention did not play an important role in this district whereas it was mentioned and relatively highly ranked in the two other districts. West Pokot CAH programme seemed to be the most oriented towards economic sustainability, as seen in the semi-structured questionnaire responses (and the description of the setting). The fact that prevention was not mentioned by livestock keepers confirms the above discussion on the behavioural pattern and specially power relationships within business oriented CAH systems. On the other hand, as previously mentioned, WASDA’s training curriculum for community health workers encompassed human and animal health related simple tasks. Marsabit’s health training was labelled as exclusively focusing on animal health. Interestingly, what was obtained from the analysis of semi-structured questionnaires was a greater concentration on (veterinary) public health extension in Marsabit than what should have been expected from its curriculum, especially in comparison to Wajir’s. Hence (veterinary) public health education was given more attention in Marsabit.

One of the first aims of CAH systems is to “contribute to improve animal health and [...] household income” (46). It has recently but largely been debated in the literature that economic growth in developing countries derives partly from improving their population’s health status⁹ (67) (another highly influencing factor relates to female education)¹⁰. In order to obtain the sequence “better animal health - more production - higher household income” animals should not have a negative impact in human health as this will hinder their productivity and therefore their income opportunities. No increase in household income can be obtained if animals adversely affect (directly or indirectly) human health. Therefore Marsabit case raises two important aspects related to public health: antibiotic resistance prevention and zoonotic diseases control.

⁹ For further information refer to the WHO 2001 Commission on Macroeconomics of Health (CMH) chaired by Jeffrey D. Sachs and Gro Harlem Brundtland

¹⁰ See Chapter 1 of Abel-Smith’s debate in relation to McKeown’s and Szterter’s theories on the historical perspective of the fundamental determinants of health (Abel-Smith, B. *An introduction to health: Policy, planning and financing*. London: Prentice Hall, Pearson Education, 1994.)

Before starting to argue the case for enhancing public health extension in the CAHW curriculum, two factors should be mentioned. First, the present research did not allow to gather data on zoonotic disease prevalence in such areas. Thus the following discussion is based on the very limited existing scientific literature on the subject (it will later be argued that CAHWs could be an entry point for increasing the current knowledge status on the subject). Second, many may disagree with public health extension messages being included in CAH systems with business orientation as this public health component is generally labelled as a “public good”¹¹. An alternative way for financing this element will therefore be suggested.

Antibiotic resistance

Marsabit’s extension material highlights an important component of public health: antibiotic resistance. Even if extension messages on drug dosages and ways of administration were ranked in first position throughout the three districts, it was surprising to find through informal conversations with livestock keepers, that some of these antibiotics (especially “eye droplets”)¹² were used in the human context. This misuse might be enhanced by the presence of the black market and raises an important question on community education in relation to drug manipulation. As mentioned by Taylor, “it is their [CAHWs] added potential to reduce the risk of inducing drug resistance that has been poorly considered to date” (68). The specificity of Marsabit (and to some extent of Wajir) was that the extension given pinpointed the importance of avoiding eating meat and drinking milk of treated or infected animals.

Marsabit’s educational component did also underline animal husbandry procedures and food handling hygienic standards, which relates to the next section.

Zoonotic diseases

It has been mentioned in earlier studies that diseases such as tuberculosis, brucellosis, anthrax and trypanosomosis are, among other, common in pastoral areas in Sub-Saharan Africa (69). However, this needs to be adapted to each specific community context, as their prevalence varies in relation to the local conditions. Hence, for example, the main zoonosis in Turkana is hydatid disease, whereas in other districts such as parts of West Pokot, trypanosomosis is more prevalent. It should also be taken into account that indigenous knowledge might influence the prevalence of these diseases, therefore acting as preventive measures. This is the case of Somalis in relation to Anthrax control and in limiting the spread of rabies¹³. Zoonotic disease prevalence seems therefore to vary between settings and levels of local knowledge. However, scarce information exists in that matter. Only few studies have looked into evaluating local knowledge and perceptions about diseases such as tuberculosis (70). Zoonotic diseases are often considered by community members as exclusively affecting animals¹⁴. Fewer studies have attempted to evaluate the disease prevalence in both humans and animals (such as brucellosis in the Sahel region and Sudan (71) and tuberculosis in Ghana (72)). The lack of scientific literature suggests that little knowledge exists among pastoral communities in relation to the degree these diseases can affect humans - it can also be argued that in pastoral settings neither do veterinarians nor physicians because of lack of data. Other common zoonotic diseases in such settings are food-borne diseases incurring in diarrhoeal episodes in humans. These diseases include etiological agents such as *Salmonella spp.* and *Shigella spp.* (73) which are also found in animals. In a recent systematic review, Curtis *et al.* (73) pointed out that hand washing with soap can reduce the risk of diarrhoeal diseases in 42-47% and in the case of the aforementioned bacteria, specially with shigellosis, in 59%. Thornton *et al.* (74) mentioned that these zoonotic diseases appear on the annual reports issued by ministries of health in most developing countries. However, as individual entities they do not feature as priorities in the face of much more important individual human disease problems in these communities (i.e. malaria and HIV). Taking into account the context in poor pastoral communities, “zoonotic diseases assume a completely different role” (74). Thornton *et al.* highlight that “DALY’s

¹¹ Being (veterinary) public health education classified, following the economic theory, as a public good because of its non-rivalry and non-excludability characteristics, it is supposed to be financed by the government

¹² Personal communication (Wilson Chekeruk, Sigor, West Pokot, Kenya)

¹³ Andy Catley, personal communication

¹⁴ Personal communication (Chief, Dadajabulla, Wajir South, Kenya).

[disability-adjusted life years¹⁵] are higher for the zoonoses than for many other human diseases of the developing world, such as malaria. This is because many have a fatal outcome if not diagnosed and treated correctly”.

It is therefore suggested that CAHWs are used as entry points to gather data on (i) local levels of knowledge on and attitudes towards zoonotic diseases and (ii) prevalence of zoonotic diseases both in humans and animals. With this data, further impact assessment and disease burden studies (combining the economic burden in the human and animal fields) could be performed in order to prioritise disease control and adequately allocate (human and economic) resources in the context of each region/district¹⁶. Finally, (iii) it could be envisaged to have CAHWs actively contributing through extension of simple, low cost hygiene procedures and behavioural changes (i.e. hygiene promotion activities) to a significant reduction in diarrhoeal diseases in such communities. CAHWs will then have an impact in saving peoples’ lives in such communities, ultimately enabling them to increase their household income.

One might however argue that these public health issues (not only extension messages but also data collection on zoonotic diseases) do not fit with the business perspective CAH programmes are taking lately. Nevertheless, current economic thinking in the veterinary field should allow for more flexibility. The (human) health policy and health economics literature is full of examples of public goods being co-financed in partnership with the private sector¹⁷ (for example in handwashing/hygiene (77), malaria control (78), ORS (oral rehydration salts)...). However, in order to obtain viable and constructive public-private partnerships (PPPs)¹⁸ there is a strong need of data. Data should be available to highlight the significance (if any) in public health and economic terms of increasing zoonotic disease control.

Having discussed the results of the analysis, it is however important to take into account the factors that might have influenced the research study.

4.5 Weaknesses of the study

Factors influencing the research aroused in the two interviewees settings. In relation to the livestock keepers group and given the nature of the study, which was highly focused on qualitative data, one of the crucial parts of the field research was the choice of translators. As mentioned earlier, these were selected in each of the districts through the contact NGOs who had been previously briefed about the needs of the research team, hence on the appointment of “good” translators. Great attention and time was given to the careful explanation of the questionnaires to translators. Contrary to the theoretical methodology stated in the project proposal, it appeared not to be feasible the translation and back translation of each interview in order to check its accuracy. A part from the accuracy of the local translators while in the community, it is important to highlight both advantages and disadvantages of their backgrounds. In West Pokot and Wajir district, translators were familiar with the CAH system (as seen in the context chapter). This might have positively influenced the study as understanding of the systems would flow, however at the risk of misinterpreting the respondents’ answers. In Marsabit however, only one of the translators was familiar with the CAH system giving them a detached approach when performing the individual interview. It

¹⁵ DALY: Disability-adjusted life years, concept created by Murray and Lopez in 1994 (75, 76). DALYs measure the economic burden associated with the reduction of an individual productive life due to disability caused by a specific health condition. The higher the DALY, the bigger the economic burden due to the health condition studied.

¹⁶ As an example, and independently from the technical difficulties and controversy surrounding performing these type of studies, the economic burden of zoonotic diseases could be measured in relation to (i) the DALYs caused by a specific disease (ii) the related costs for the (human) National Health Service, and finally (iii) the costs due to animal death or decreased (protein) production.

¹⁷ Private sector in this context does not only include non-for-profit and non governmental organisations but also (and specially) private companies such as pharmaceutical companies, soap manufacturers, marketers and/or distributors, chemical and food manufacturers, wholesalers and retailers...

¹⁸ The PPP concept is not exempt from criticisms, which have extensively been discussed and debated in the health policy and economic literature when applied to public health (for further information see K. Buse and A. Waxman (79) and K. Buse and G. Walt (80, 81). However the discussion is outside the scope of this report.

should however be mentioned that the quality of their translations was lower in terms of English language writing, in comparison to the previous two districts.

Another factor to be highlighted was the difficulty in interviewing women in West Pokot and especially Wajir. Given the small number of women in the samples, the analysis of the data might have been biased as a result of the sample of women not being sufficiently representative (special attention to be given to Wajir).

It should also be noted that, in relation to the age and number of animals kept by livestock keeper, numbers were sometimes reduced to estimation or range as livestock keepers were not always able to be precise.

The political climate in all districts was characterised by a certain level of anxiety due to the KANU¹⁹ district parliamentary election (November 21st 2002) and the imminent general election (December 28th 2002). These factors, in turn, increased the insecurity situation in the study areas. The events might have hindered the mobility and availability, as well as perceptions of needs, of the community members interviewed. It should also be noted that the period of study in Wajir - mostly a Muslim area- coincided with Ramadan and that some part of West Pokot respondents were affected by some degree of drunkenness.

In relation to the policy makers group, concerns could arise in relation to the “truth” in mentioning the years of both policy and field experience. Given the nature of the subject studied they might have “inflated” the answers.

Finally, in relation to the data analysis, two factors might have influenced the results obtained. First should be noted that the analysis was performed exclusively by the principal investigator of the research team. Biases might have occurred due to the lack of another analyst opinion. However analysis and calculations were performed twice at least in order to limit this effect. Second, the coding of the qualities and themes was dependent to the author’s interpretation of the answers of the questionnaires. This was hoped to be minimised by the questionnaire structure which contained cross-checking questions as above mentioned.

Taking into account the above influencing factors, the results obtained from the analysis can however lead to point out some possible policy actions which could be recommended to enhance CAH systems.

¹⁹ KANU: Kenya African Nationalist Union.

5 Policy recommendations

Deriving from the above discussion, the following (policy) recommendations could be drawn in order to improve CAH systems selection process and its effectiveness and sustainability. Policy recommendations are proposed with reference to the existing CAHW training curriculum and guidelines for Kenya and the draft revised veterinary acts that recognise various cadres of para-veterinary professionals, including CAHWs.

Recommendations based on the needs perceived by LKs:

- Requirement, in prospective candidates, of at least the following three qualities: trustworthiness, commitment and responsibility; *these qualities can only be evaluated by community members.*
- Inclusion of the whole community in the selection process and avoid exclusive involvement of opinion leaders, elders or authorities. Special attention to be drawn to women's involvement in the selection process and as candidates.
- Improvement of community awareness of the selection criteria and qualities needed to be eligible as CAHW.

Policy recommendations based on the discussion of the obtained results:

- The research supports ongoing initiatives by the Government of Kenya and Kenyan Veterinary Board to recognise and accredit CAHWs.
- The study highlights the need to increase transparency and public and community awareness in relation to the procedures to be followed during the CAHW selection process stated in the KVB manual *Minimum standards and guidelines for the training for CAHWs in Kenya.*
- The research supports the need for a standardised CAHW training curriculum in Kenya and emphasises the importance of flexibility within the curriculum to respond to community priorities in different locations. The KVB will need to ensure that such flexibility is understood and adopted during implementation of the standardised curriculum.
- In relation to the integration of the CAHWs in the National Animal Health System, it is suggested that organisational behaviour strategies are further investigated in order to increase motivation and incentives of both players, CAHWs and supervisors, making the integrated system viable and sustainable.
- The results of the research suggested the evaluation of the possibility and viability of training illegal drug sellers as CAHWs.
- Following the analysis, it is suggested that community members' "passive behaviour" in relation to the financial viability of the system be channelled, through education and extension, towards a more "proactive" one.
- The analysis emphasises the importance of increasing current promotion of (veterinary) public health extension messages in the CAHW curriculum. It is suggested they be considered as *minimum requirement* as opposed to their current status of *suggested requirement*. Further evaluations in relation to the economic impact and burden caused by zoonotic/food borne diseases in pastoral communities should be investigated in order to improve allocation of scarce resources.

6 References

1. Robinson, S.-A., and Larsen, D.-E. "The relative influence of the community and the health system on work performance - a case study of community health workers in Colombia," *Social Science & Medicine* 30 (1990): 1041-1048.
2. Catley, A., Blakeway, S., and Leyland, T. *Community-based animal healthcare. A practical guide to improving primary veterinary services*. London: ITDG Publishing, 2002.
3. Rifkin, S. B. "Primary healthcare in South East Asia: Attitudes about community participation and community health programmes," *Social Science & Medicine* 17 (1983): 1489-1496.
4. Rifkin, S. B., Muller, F., and Bichmann, W. "Primary healthcare: on measuring on participation," *Social Science & Medicine* 26 (1988): 931-940.
5. Bentley, C. "Primary health care in North West Somalia: a case study," *Social Science & Medicine* 28 (1989): 1019-1030.
6. Katararwa, N., Richards, F. J., and Ndyomugenyi, R. "In rural Ugandan communities the traditional kinship/clan system is vital to the success and sustainment of the African Programme for Onchocerciasis Control [Review] [9 refs]," *Annals of Tropical Medicine & Parasitology*. 94 (2000): 485-495.
7. Katararwa, N., Mutabazi, D., and Richards, F. J. "Controlling onchocerciasis by community-directed, ivermectin-treatment programmes in Uganda: why do some communities succeed and others fail?," *Annals of Tropical Medicine & Parasitology* 94 (2000): 343-352.
8. Katararwa, M., Habomugisha, P., and Richards, F. J. "Community views on health programmes in Uganda," *Lancet* 355 (2000): 2167-8.
9. Katararwa, M., and Richards, F. J. "Community-directed health (CDH) workers enhance the performance and sustainability of CDH programmes: experience from ivermectin distribution in Uganda," *Annals of Tropical Medicine & Parasitology* 95 (2001): 275-286.
10. Katararwa, M., Habomugisha, P., Ndyomugenyi, R., and Agunyo, S. "Involvement of women in community-directed treatment with ivermectin for the control of onchocerciasis in Rukungiri district, Uganda: a knowledge, attitude and practice study," *Annals of Tropical Medicine & Parasitology* 95 (2001): 485-494.
11. Katararwa, M., Habomugisha, P., and Richards, F. J. "Implementing community-directed treatment with ivermectin for the control of onchocerciasis in Uganda (1997-2000): an evaluation," *Annals of Tropical Medicine & Parasitology* 96 (2002): 61-73.
12. IRIN. "KENYA-UGANDA: 10 killed by Kenyan cattle rustlers," UN-IRINnews.org, 2003.
13. IRIN. "KENYA-UGANDA: 30 killed in cattle rustling incident," UN-IRINnews.org, 2003.
14. WASDA. "Supporting pastoral association in Wajir. A manual for development practitioners (Draft report)." Wajir, Kenya: The Pastoral Steering Committee, Wajir District, 2000.
15. WASDA. "Wajir South Development Association (WASDA)." Wajir: WASDA, 2002.
16. CIFA. "Sustainable animal health care delivery system in pastoral area of Marsabit/Moyale - Concept Paper Draft." Marsabit, Kenya: CIFA, 2002.
17. Omondi, F., and Jerkins, O. B. "People Profile. The Borana of Ethiopia and Kenya," The virtual research centre, 1996.
18. Jerkins, O. B., and Anonymous. "People Profile. The Gabbra of Kenya and Ethiopia," The virtual research centre, 1996.
19. Ruebush_II, T. K., Weller, S. C., and Klein, R. E. "Qualities of and ideal volunteer community malaria worker: A comparison of the opinions of community residents and national malaria service staff," *Social Science & Medicine* 39 (1994): 123-131.
20. Sapsford, R., and Jupp, V. *Data collection and analysis*: Sage Publications, 1996.
21. Patton, M. Q. *Qualitative research and evaluation methods*: Sage Publications Inc., 2002.
22. Bland, M. *An introduction to medical statistics*: Oxford University Press, 2000.
23. Cullis, J., and Jones, P. *Public finance and public choice*. Great Clarendon Street, Oxford: Oxford University Press, 1998.
24. Stiglitz, J. E. *Economics of the public sector*. London / New York: W.W. Norton and Company, 2000.
25. Arrow, K. *Social choice and individual values*. New York: Wiley, 1963.

26. Weller, S. C. "Shared knowledge: Intracultural variations and knowledge aggregation," *American Behavioural Scientist* 31 (1987): 178-193.
27. IRIN. "KENYA: Violence mars party nominations," UN-IRINnews.org, 2002.
28. IRIN. "KENYA: Government pledges to curb electoral violence," UN-IRINnews.org, 2002.
29. UNESCO. "Kenya at a glance," World Bank and UNESCO, 2002.
30. Gagnon, A. J. "The training and integration of village health workers," *Bulletin of the Panamerican Health Organisation* 25 (1991): 127-138.
31. Walt, G., Perera, M., and Heggenhougen, K. "Are large-scale volunteer community health worker programmes feasible? The case of Sri Lanka," *Social Science & Medicine (UK)* 29(5) (1989): 599-608.
32. Bennett, S., Creese, A., and Monasch, R. "Health insurance schemes for people outside formal sector employment," *World Health Organisation* 16 (1998).
33. Voyle, J. A., and Simmons, D. "Community development through partnership: promoting health in an urban indigenous community in New Zealand," *Social Science & Medicine* 49 (1999): 1035-50.
34. The-IDL-Group. *Community based animal health workers - Threat or opportunity?* PO Box 20, Crewkerne, UK: The IDL Group, 2003.
35. GI-LSP. "Livestock services and the poor. A global initiative. Collecting, coordinating and disseminating experiences." Rome: DANIDA, IFAD and The World Bank, 2003.
36. Twumasi, P. A., and Freund, P. J. "Local politicization of primary health care as an instrument for development: a case study of community health workers in Zambia," *Social Science & Medicine* 20 (1985): 1073-1080.
37. Williams, G., and Satoto, S. "Socio-political constraints on primary health care: a case study from Indonesia.," in Edited by Morley D., R. J. a. W. G., ed., *Practising Health for All*, 1983.
38. Bose, A. "The community health worker scheme: an Indian experiment," in Edited by Morley D., R. J. a. W. G., ed., *Practising Health for All*, 1983.
39. Macedo, G. G., and Vieira, C. A. B. "The fate of primary health care in Brazil," *I.D.S Bulletin* 14 (1983): 17-26.
40. Sones, K., and Catley, A. "Primary animal healthcare in the 21st century: Shaping the rules, policies and institutions," in Sones, K., and Catley, A., eds., *Proceedings of an international conference, 15th-18th October 2002*. Mombasa, Kenya: African Union/Interafrican Bureau for Animal Resources, Nairobi, 2003.
41. Ashley, S., Holden, S., and Bazeley, P. "The changing roles of veterinary services: A report of a survey of Chief Veterinary Officers' opinions." Somerset, UK: Livestock in Development, 1996.
42. World-Bank. "2002 World Development Indicators (WDI)," World Bank, 2002.
43. Sringernyuang, L., Hongvivatana, T., and Pradabmuk, P. "Implications of community health workers distributing drugs. A case study of Thailand." Geneva: World Health Organisation, 1995.
44. Saleh, O. M., and Mamis, D. "Les "Docteurs Choukous": vendeurs ambulants de produits veterinaires au Tchad Oriental." Abeche: Republique du Tchad, Ministere de l'Elevage, Direction Generale, 1999.
45. Holden, S. "Community-based animal health workers: An example of private delivery of animal health services to small-scale farmers in marginal areas." Somerset, UK: Livestock in Development, 1997.
46. KVB. "Minimum standards and guidelines for training of community-based animal health workers in Kenya." Uthiru, Kenya: Kenya Veterinary Board, 2003.
47. Berman, P. A., Gwatkin, D. R., and Burger, S. E. "Community-based health workers: head start or false start towards health for all?," *Social Science & Medicine* 25 (1987): 443-59.
48. Sauerborn, R., Nougara, A., and Diesfeld, H. J. "Low utilization of community health workers: results from a household interview survey in Burkina Faso," *Social Science & Medicine (UK)* 29(10) (1989): 1163-1174.
49. Nichter, M. A. "The primary health center as a social system: PHC, social status, and the issue of team-work in South Asia," *Social Science & Medicine* 23 (1986): 347-355.
50. Chabot, H. T. J., and Bremmers, J. "Government health services versus community: Conflict or harmony," *Social Science & Medicine* 26 (1988): 957-962.

51. Saltman, R. *Critical challenges for health care reform*. Philadelphia: Open University Press, 1998.
52. Steers, R. M., and Porter, L. W. *Motivation and work behaviour*. Toronto: McGraw-Hill, 1983.
53. Cook, C. W., and Hunsaker, P. L. *Management and organizational behavior*. New York: McGraw-Hill Irwin, 2001.
54. Arrow, K. J. "The Economics of Agency," in Pratt J, Zeckhauser R. (1985), *Principals and Agents. The Structure of Business*. Boston: Harvard Business School, 1985.
55. Joseph, S., and Russell, S. "Is primary health care the wave of the future?," *Social Science & Medicine* 14C (1980): 137-144.
56. Simmons, R., Phillips, J. F., and Rahman, M. "Strengthening government health and family planning programs: findings from an action research projection rural Bangladesh," *Studies on Family Planning* 15 (1984): 212-221.
57. Vroom, V. H. *Work and motivation*. New York: Wiley, 1964.
58. Porter, L. W., and Lawler, E. E. *Managerial attitudes and performance*. Homewood, IL: Irwin-Dorsey, 1968.
59. Mossialos, E., Dixon, A., Figueras, J., and Kutzin, J. *Funding health care: Options for Europe*. Buckingham, Philadelphia: Open University Press, 2002.
60. Efron, Y. *HACHAKLAIT: Mutual society for clinical veterinary services and livestock insurance in Israel*. Israel: Hidekel Press, 1997.
61. FAO. "Profile of veterinary services in New Zealand, 1995," in FAO, ed., *FAO electronic conference on principles of for rational delivery of public and private veterinary services*. Rome: FAO, 1997.
62. Smith, L. D. "Reform and decentralization of agricultural services: A policy framework," *FAO Agricultural Policy and Economic Development Series*. Rome: FAO, 2001.
63. deHaan, C., and Bekure, S. *Animal health services in sub-Saharan Africa. Initial experiences with alternative approaches*. Washington DC: The World Bank, 1991.
64. Chema, S., Oruko, L. O., and Heffernan, C. "Livestock services and the poor, Appendix I and II: The Kenya case study and report of consultant's visit," Draft report prepared for IFAD, 2001.
65. Ahuja, V., George, S., McConnel, K. E., Kurup, M. P. G., Gandhi, V., Umali-Deiniger, D., and Haan, C. d. *Agricultural Services and the Poor: Case of Livestock Health and Breeding Services in India, India: Indian Institute of Management*. Ahmedabad; Washington D.C.: The World Bank; Bern, Switzerland: Swiss Agency for Development and Cooperation, 2000.
66. OIE. "The role of private veterinarians and para-professionals in the provision of animal health services," OIE, 2003.
67. Sachs, J. "Macroeconomics and health: Investing in health for economic development." Geneva: WHO, 2001.
68. Taylor, D. "Antimicrobial resistance and community based animal health," in The-IDL-Group, ed., *Community-based animal health workers: threat or opportunity?* PO Box 20, Crewkerne, UK: The-IDL-Group, 2003.
69. Abdikarim Sheik, M., and Velema, J. P. "Where health care has no access: the nomadic populations of sub-Saharan Africa," *Tropical Medicine and International Health* 4 (1999): 695-707.
70. Bonsu, O. A., Laing, E., and Akanmori, B. D. "Prevalence of tuberculosis in cattle in the Dagme-West district of Ghana, public health implications," *Acta Tropica* 76 (2000): 9-14.
71. Seifert, S. H. "Humanhygienische und wirtschaftliche Bedeutung der Brucellose in der Tierhaltung des Sahel," in Seifert, H. S. H., Vlek, P. L. G., and Widelt, H.-J., eds., *Tierhaltung im Sahel. Symposium 26-17 Oktober 1989. Gottinger Beitrage zur Land-und Forstwirtschaft in den Tropen und Subtropen, Heft 51. Forschungs- und Studienzentrum der Agrar-und Forstwissenschaften der Tropen und Subtropen*. Georg-August-Universitat: Gottingen, Germany, 1990.
72. Wastling, J. M., Akanmori, B. d., and Williams, D. J. L. "Zoonoses in West Africa: Impact and Control," *Parasitology Today* 15 (1999): 309-311.
73. Curtis, V., and Cairncross, S. "Effect of washing hands with soap on diarrhoea risk in the community: a systematic review," *Lancet Infectious Diseases* 3 (2003): 275-281.

74. Thornton, K., Kruska, R. L., Henninger, N., Kristjanson, P. M., Reid, R. S., Atieno, F., Odero, A. N., and Ndegwa, T. "Mapping poverty and livestock in the developing world." PO Box 30709, Nairobi, Kenya: International Livestock Research Institute, 2002.
75. Murray, C. J. L. "Quantifying the burden of disease: The technical basis for disability-adjusted life years," *Bulletin of the World Health Organization*. 72 (1994): 429-445.
76. Murray, C. J. L., and Lopez, A. D. *The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020*. Cambridge: Published by the Harvard School of Public Health on behalf of the World Health Organization and the World Bank ; Distributed by Harvard University Press, 1996.
77. The-Global-Public-Private-Partnership-for-Handwashing-with-Soap. "Health in your hands," The World Bank, the Water and Sanitation Program, the London School of Hygiene and Tropical Medicine, the Academy for Educational Development and the private sector, in collaboration with USAID, UNICEF, and the Bank-Netherlands Water Partnership, 2001.
78. Lang, T., and Greenwood, B. "The development of Lapdap, an affordable new treatment for malaria," *Lancet Infectious Diseases* 3 (2003): 162-167.
79. Buse, K., and Waxman, A. "Public-private health partnerships: a strategy fro WHO," *Bulletin of the World Health Organization* 79 (2001): 748-754.
80. Buse, K., and Walt, G. "Global public-private health partnerships: Part II - what are the issues for global governance?," *Bulletin of the World Health Organization* 78 (2000): 699-709.
81. Buse, K., and Walt, G. "The World Health Organization and public private health partnerships: in search of "good global health governance"," in Reich, M., ed., *Public private partnerships for health*. Boston, MA: Harvard University Press, 2001.

Annex 1

LIVESTOCK KEEPERS GROUP QUESTIONNAIRE

Key questions regarding the selection process

1. Who was the last person to be eligible to be a CAHW?
2. What were the criteria needed for his or her selection?
3. In your point of view, identify as many qualities as you can that you would like to see in a CAHW.
4. Rank the qualities in order of importance.
5. State the reason why you have chosen these qualities.
6. Were you consulted about the selection?
7. Who chose the candidates? *The whole community, selected members of the community, the authorities, others?*
8. Were the candidates appointed by the authorities and presented to you/ the community?
9. Did you know/were you familiar with the candidates?
10. Were you aware of the decisions taken? *If yes, how did you know/ who told you?*
11. How do you think the selection process could be improved?
12. How the last appointment was made?
13. Is there anything else you would like to say about the process?

Key questions regarding the effectiveness and sustainability of CAH systems

1. Do you think CAHW are useful?
Please explain how and give illustrations of cases in which they have helped.
2. Are there any examples in which they were not able to contribute because of lack of training, skills or supplies?
3. Have you noticed an improvement in the animals' health?
If yes, in what way?
4. What improvements could be made to the system?
Explain with examples
5. How many have left in past XX years?
6. How long on average do they stay?
7. Why do you think they leave?
8. Do you know why the last person left?
9. What could encourage them to stay? What are the incentives that could be used for encouraging CAHW to stay?
Give examples
10. Have they passed on their skills to others? What has the community learnt from the CAHWs? *Give examples*

POLICY MAKERS GROUP QUESTIONNAIRE**Key questions regarding the selection process**

1. As a veterinarian in your current position, what would be the qualities you would like to see in a CAHW? Please identify up to 11 qualities (or as many as you can) that you would like to see in a CAHW.
2. Please rank the qualities you have stated in terms of importance.
3. Explain why you have chosen these qualities (for the first 5).
4. Do you have field experience with CAH systems?
 - *If 'yes',*
 - a. For how long?
 - b. Where?
 - c. While in the community, did you spoke with any CAHW?
 - d. In your point of view, what the role of a CAHW should be?
 - e. In the community you were involved, how was the selection process done?
 - f. What were the strengths and weaknesses of the process?
 - g. Was the whole community involved?
 - h. Were there women involved?
 - If no, do you know why?
 - If yes, how were they involved/ what was their role?
 - *If 'no', explanation of the selection process of CAHW =>*
CAHW can be selected by the whole community, selected members of the community or the authorities. Who do you think would theoretically be more suitable for the selection process?
5. Do you think CAH systems are good/ useful? (yes/no)
Why?
6. With this study we are trying to see if a link between CAH systems and the private (veterinary) sector could exist.
Do you think there is any contradiction between what the communities want and what the private sector wants?
7. Is there anything else you would like to say about the process?

Key questions regarding the effectiveness and sustainability of CAH systems

To date several CAH systems have been implemented. However, after the initial financial help pulls out, some of these systems are not anymore sustainable as CAHWs might drop out. The fact is that different projects have different CAHWs drop out rates.

1. Why do you think CAHWs leave?
2. What do you think is the incentive for a CAHW to continue working as a CAHW?
(*For example: social status, recognition among the community, financial, others...*)
3. Do you know what they do after leaving? If 'yes', what?
4. Why do you think a livestock keeper would go to a CAHW instead of other suppliers?
5. Who are these other possible suppliers of services for the livestock keeper?
(*For example: traditional healers, black market, dukas, drug stores, others?*)
6. Why do you think they are competitors of the CAHWs?
7. How do you think this could be solved?
8. Should there be any support from the government or private vets for the CAH system?
Why?
9. How do you think CAH systems could be improved?
10. Is there anything else you would like to add regarding the effectiveness and sustainability of CAH systems?

Annex 2

SPSS - Pearson Correlation Coefficients

LIVESTOCK KEEPERS SUB-GROUPS CORRELATIONS

Correlations

Variables	Statistics	Variables2											
		West Pokot	Wajir	Marsabit	West Pokot male literate	West Pokot male illiterate	Wajir male literate	Wajir male illiterate	Marsabit male literate	Marsabit male illiterate	West Pokot women	Wajir women	Marsabit women
West Pok	Pearson Correlation	1.000	.399	.460*	.880**	.906**	.554*	.195	.338	.144	.386	.664**	.177
	Sig. (2-tailed)	.	.090	.048	.000	.000	.014	.423	.157	.557	.102	.002	.469
	N	19	19	19	19	19	19	19	19	19	19	19	19
Wajir	Pearson Correlation	.399	1.000	.617**	.514*	.429	.939**	.938**	.754**	.557*	.351	.845**	.593*
	Sig. (2-tailed)	.090	.	.005	.024	.067	.000	.000	.000	.013	.141	.000	.007
	N	19	19	19	19	19	19	19	19	19	19	19	19
Marsabit	Pearson Correlation	.460*	.617**	1.000	.365	.509*	.592**	.567*	.845**	.570*	.318	.591**	.744*
	Sig. (2-tailed)	.048	.005	.	.124	.026	.008	.011	.000	.011	.184	.008	.000
	N	19	19	19	19	19	19	19	19	19	19	19	19
West Pok male literate	Pearson Correlation	.880**	.514*	.365	1.000	.645**	.713**	.251	.321	.091	.465*	.659**	.153
	Sig. (2-tailed)	.000	.024	.124	.	.003	.001	.301	.180	.710	.045	.002	.532
	N	19	19	19	19	19	19	19	19	19	19	19	19
West Pok male illiterate	Pearson Correlation	.906**	.429	.509*	.645**	1.000	.484*	.321	.353	.159	.337	.727**	.202
	Sig. (2-tailed)	.000	.067	.026	.003	.	.036	.181	.138	.515	.158	.000	.408
	N	19	19	19	19	19	19	19	19	19	19	19	19
Wajir male literate	Pearson Correlation	.554*	.939**	.592**	.713**	.484*	1.000	.761**	.682**	.446	.522*	.841**	.452
	Sig. (2-tailed)	.014	.000	.008	.001	.036	.	.000	.001	.055	.022	.000	.052
	N	19	19	19	19	19	19	19	19	19	19	19	19
Wajir male illiterate	Pearson Correlation	.195	.938**	.567*	.251	.321	.761**	1.000	.733**	.598**	.137	.745**	.661**
	Sig. (2-tailed)	.423	.000	.011	.301	.181	.000	.	.000	.007	.577	.000	.002
	N	19	19	19	19	19	19	19	19	19	19	19	19
Marsabit male literate	Pearson Correlation	.338	.754**	.845**	.321	.353	.682**	.733**	1.000	.833**	.239	.600**	.850*
	Sig. (2-tailed)	.157	.000	.000	.180	.138	.001	.000	.	.000	.324	.007	.000
	N	19	19	19	19	19	19	19	19	19	19	19	19
Marsabit male illiterate	Pearson Correlation	.144	.557*	.570*	.091	.159	.446	.598**	.833**	1.000	.039	.304	.800*
	Sig. (2-tailed)	.557	.013	.011	.710	.515	.055	.007	.000	.	.875	.205	.000
	N	19	19	19	19	19	19	19	19	19	19	19	19
West Pok women	Pearson Correlation	.386	.351	.318	.465*	.337	.522*	.137	.239	.039	1.000	.317	.035
	Sig. (2-tailed)	.102	.141	.184	.045	.158	.022	.577	.324	.875	.	.186	.888
	N	19	19	19	19	19	19	19	19	19	19	19	19
Wajir women	Pearson Correlation	.664**	.845**	.591**	.659**	.727**	.841**	.745**	.600**	.304	.317	1.000	.365
	Sig. (2-tailed)	.002	.000	.008	.002	.000	.000	.000	.007	.205	.186	.	.124
	N	19	19	19	19	19	19	19	19	19	19	19	19
Marsabit women	Pearson Correlation	.177	.593**	.744**	.153	.202	.452	.661**	.850**	.800**	.035	.365	1.000
	Sig. (2-tailed)	.469	.007	.000	.532	.408	.052	.002	.000	.000	.888	.124	.
	N	19	19	19	19	19	19	19	19	19	19	19	19

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Correlations

		West Pokot	Wajir	Marsabit	West Pokot men	Wajir men	Marsabit men	West Pokot women	Wajir women	Marsabit women
West Pokot	Pearson Correla	1.000	.500*	.165	.846**	.425	.335	.702**	.608**	.059
	Sig. (2-tailed)	.	.029	.499	.000	.070	.161	.001	.006	.778
	N	19	19	19	19	19	19	19	19	19
Wajir	Pearson Correla	.500*	1.000	.463*	.454	.964**	.626**	.439	.876**	.526*
	Sig. (2-tailed)	.029	.	.046	.051	.000	.004	.060	.000	.021
	N	19	19	19	19	19	19	19	19	19
Marsabit	Pearson Correla	.165	.463*	1.000	.208	.544*	.774**	.138	.344	.950**
	Sig. (2-tailed)	.499	.046	.	.393	.016	.000	.574	.149	.000
	N	19	19	19	19	19	19	19	19	19
West Pokot me	Pearson Correla	.846**	.454	.208	1.000	.399	.460*	.386	.664**	.177
	Sig. (2-tailed)	.000	.051	.393	.	.090	.048	.102	.002	.459
	N	19	19	19	19	19	19	19	19	19
Wajir men	Pearson Correla	.425	.964**	.544*	.399	1.000	.617**	.351	.845**	.593**
	Sig. (2-tailed)	.070	.000	.016	.090	.	.005	.141	.000	.007
	N	19	19	19	19	19	19	19	19	19
Marsabit men	Pearson Correla	.335	.626**	.774**	.460*	.617**	1.000	.318	.591**	.744*
	Sig. (2-tailed)	.161	.004	.000	.048	.005	.	.184	.008	.000
	N	19	19	19	19	19	19	19	19	19
West Pokot wor	Pearson Correla	.702**	.439	.138	.386	.351	.318	1.000	.317	.035
	Sig. (2-tailed)	.001	.060	.574	.102	.141	.184	.	.186	.888
	N	19	19	19	19	19	19	19	19	19
Wajir women	Pearson Correla	.608**	.876**	.344	.664**	.845**	.591**	.317	1.000	.355
	Sig. (2-tailed)	.006	.000	.149	.002	.000	.008	.186	.	.124
	N	19	19	19	19	19	19	19	19	19
Marsabit wome	Pearson Correla	.069	.526*	.960**	.177	.593**	.744**	.035	.365	1.000
	Sig. (2-tailed)	.778	.021	.000	.469	.007	.000	.888	.124	.
	N	19	19	19	19	19	19	19	19	19

*.Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

POLICY MAKERS SUB-GROUPS CORRELATIONS**Correlations**

		Government	Private Sector	KVA KVB	Academic	Field Experience	No Field Experience	Policy Involvement	No Policy Involvement
Government	Pearson Correlation	1.000	.267	.443	.568*	.901**	.429	.817**	.224
	Sig. (2-tailed)	.	.270	.058	.011	.000	.067	.000	.357
	N	19	19	19	19	19	19	19	19
Private Sector	Pearson Correlation	.267	1.000	.625**	.339	.485*	.583**	.548*	.449
	Sig. (2-tailed)	.270	.	.004	.156	.035	.009	.015	.054
	N	19	19	19	19	19	19	19	19
KVA KVB	Pearson Correlation	.443	.625**	1.000	.694**	.637**	.921**	.860**	.338
	Sig. (2-tailed)	.058	.004	.	.001	.003	.000	.000	.101
	N	19	19	19	19	19	19	19	19
Academic	Pearson Correlation	.568*	.339	.694**	1.000	.771**	.776**	.777**	.744**
	Sig. (2-tailed)	.011	.156	.001	.	.000	.000	.000	.000
	N	19	19	19	19	19	19	19	19
Field Experience	Pearson Correlation	.901**	.485*	.637**	.771**	1.000	.583**	.910**	.455
	Sig. (2-tailed)	.000	.035	.003	.000	.	.009	.000	.050
	N	19	19	19	19	19	19	19	19
No Field Experience	Pearson Correlation	.429	.583**	.921**	.776**	.583**	1.000	.811**	.555*
	Sig. (2-tailed)	.067	.009	.000	.000	.009	.	.000	.014
	N	19	19	19	19	19	19	19	19
Policy Involvement	Pearson Correlation	.817**	.548*	.860**	.777**	.910**	.811**	1.000	.360
	Sig. (2-tailed)	.000	.015	.000	.000	.000	.000	.	.130
	N	19	19	19	19	19	19	19	19
No Policy Involvement	Pearson Correlation	.224	.449	.388	.744**	.455	.555*	.360	1.000
	Sig. (2-tailed)	.357	.054	.101	.000	.050	.014	.130	.
	N	19	19	19	19	19	19	19	19

* .Correlation is significant at the 0.05 level (2-tailed).

** .Correlation is significant at the 0.01 level (2-tailed).