

**VETERINARIOS  
SIN FRONTERAS**



**Participatory Impact Assessment of the  
Veterinarios Sin Fronteras (VSF – Spain)  
Community-based Animal Health Workers  
(CAHW's) in Ongino and Malera (Kumi District),  
Uganda**



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**Veterinarios Sin Fronteras**

## List of Abbreviations

CAHW	Community-based Animal Health Worker
CAPE	Community-based Animal Health and Participatory Epidemiology Unit
CBPP	Contagious bovine pleuropneumonia
CCPP	Contagious caprine pleuropneumonia
CoU-TEDDO	Church of Uganda – Teso Dioceses Planning and Development Office
ECF	East Coast Fever
SPSS	Statistical Package for Social Scientists
VSF	Veterinarios Sin Fronteras

## 1. Summary

This report describes a participatory impact assessment of a community-based animal health project implemented by Veterinarios Sin Fronteras (VSF) and Church of Uganda – Teso Dioceses Development Office (CoU-TEDDO) in Malera and Ongino Sub Counties (in Kumi District), in Eastern Uganda.

This was a pilot project designed to improve primary veterinary services in the region. The impact assessment focused on the effects of Community-based Animal Health Workers (CAHWs) on the incidence of livestock diseases and the activities of CAHWs as compared to other animal health service providers.

The Veterinarios Sin Fronteras funded project trained a total of 32 CAHWs, two per parish (since both Ongino and Malera have eight parishes each). The study sampled 32 different villages, where one paravet was trained, and used participatory methods such as semi structured interviews, “Before and After” proportional pilling, mappings, quality ranking and matrix scoring.

### ***Community perception of CAHWs as service providers***

Despite sharing a common boundary, the reality is quite different in the two sub counties. In Ongino, the most valued animal health service provider is the Veterinary Officer (VO). The communities valued easy accessibility and the quality of his knowledge and drugs. But in affordability and trust, CAWHs are the best service providers. The perception of rest of the veterinary agents is next to nothing, since they fall far behind these two.

In Malera, the VO is too far to offer adequate service. There is also a private veterinarian who is well respected. However, it is the CAHWs who are by far the most preferred agents by the inhabitants of the Sub County. Not only is their service more accessible due to the close proximity, but also livestock keepers were able to rapidly respond to disease outbreaks and the recovery rate was perceived to be high. However, CAHWs as compared to the Animal Husbandry Officer and Veterinary officer were unable to treat all the entire spectrum of diseases.

### ***Impact on livelihood***

In the impact assessment area, we can find two type of different disease, epizootic and endemic. In the epizootic diseases, veterinary services have direct consequences with the number of ill animals, as opposed to endemic diseases, where the number of sick animals can remain the same despite improving veterinary services (although the number of deaths will decrease). Therefore, as this study reflects the pattern of diseases affecting animals (disease incidence), we should expect changes in the epizootic diseases, but not in the endemic ones.

In the case of cattle, in both areas, we find an important reduction in the number of animals affected by CBPP (epizootic disease) as a result of work done by the veterinary services (mainly by the VO in Ongino and CAHWs in Malera) and a moderate increase of worms and ECF (endemic disease) in areas where we do not have information on the evolution of the animal death rate.

The same does not apply in the case of goats. The unequal evolution of different epizootic diseases will not allow us to draw conclusions about the direct effect of the CAHWs' work.

But in general, the impact of the CAHWs services have been visibly perceived by the beneficiaries in the improvement in the health of their animals and this has resulted in increased income opportunity (prevention is cheaper than treatment).

## 2. Introduction

The Participatory Impact Assessment of CAHWs was carried out between the months of February and October 2004, in the Sub counties of Malera and Ongino in Kumi District. The aim of this study was to evaluate the impact of CAHWs in the communities of those Sub Counties. The exercise was carried out by the local organization Church of Uganda Teso Dioceses Development Office (CoU-TEDDO) and Veterinarios Sin Fronteras (VSF), a Spanish NGO. While both organisations provided the field officers to carry out the study and the data compilation, the analysis and final report production was done by the latter (VSF).

VSF has been working in the Teso sub-region, of which Kumi District is part of, for the last 10 years. It has been implementing a Restocking Programme in the sub-region, through the provision of animals on credit and through the improvement of the animal management techniques of the communities (all of this through local partner organisations), inside the animal management component, VSF has been training CAHWs in the different Sub Counties. It has done this through local partners and with the consent of the local veterinary authorities like the District Veterinary Officers (DVO). The follow-up of the CAHWs activities has been constant, both by the local partners and VSF, but there has never been a study carried out on the impact of the CAHWs on the communities they serve.

The incursion of Lord's Resistance Army (L.R.A.) in the north of the Teso Region affected Kaberamaido District, where VSF had been training its first CAHWs in 1998. The study would have been more relevant there, since a long-term perspective on CAHW work would have given a better picture of their impact. But due to this instability, the study was moved to safer areas in Kumi District. In February 2002, VSF started funding part of the Food Security Programme of CoU-TEDDO. One of the activities funded was training of CAHWs in the four Sub Counties of the Programme, two of which were Malera and Ongino in Kumi District.

Similarly, since CoU-TEDDO has a large number of field officers, compared with other VSF local partners, the study could be carried out in two Sub Counties, which had a population of 54,268<sup>1</sup> in 2002.

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<sup>1</sup> Ugandan 2002 Population and Housing Census

## Study area

As mentioned earlier the areas of study were the Sub Counties of Malera and Ongino on the north-eastern part of Kumi District, bordering the Karamoja region. The district forms part of the Teso-Lango Farming System, with a combination of crop and livestock activities. It is situated in the eastern part of Uganda close to the Kenyan border (see figure 2). The traditional ethnic group of the area are the Iteso, of a pastoralist Nilotic origin, who settled in the area around 400 years ago, and adopted agriculture.

Figure 1: Map of Kumi District (Ongino and Malera Sub Counties are highlighted)



The neighboring of Malera and Ongino are very similar in appearance. They have the same number of parishes (eight), similar populations around 27,000, and similar population densities. But there are some **significant** results of this study.

- **Ongino:** is the most northern Sub County of the two, it is limited by Katakwi District on the north, Nakapiripit District (formerly part of Moroto District) in the east, Kumi and Atutur Sub Counties in the west and Malera Sub County in the south. It is also close to the district headquarters, Kumi town (pop. 8,367) which has the local government offices, including the District Veterinary Office, and the drug veterinary shops. Moreover, communications

between Kumi town and Ongino are quite fluid since the district hospital is located in the latter, a mere 16 kilometres from the town centre.

- **Malera:** is limited by Ongino Sub County in the north, Nakapiripit and Sironko Districts in the east, Kolir and Bukedea Sub Counties on the south and Atatur Sub County in the west. In Malera Trading Centre (see figure 1), where the Sub County offices are, there is an important cattle market. Since Kumi town is far, a private veterinarian has set up an office within the sub county.

Figure 2: Map of Uganda (Kumi District is highlighted)

### Community-based

#### Animal Health Workers

A total of 32 CAHWs were trained in Malera and Ongino during the period VSF funded CoU-TEDDO's Food Security Programme. The explanation behind the number of CAHWs comes from the experience of their training organisations in the Teso sub-region (Christian Veterinary Mission, VSF,...), of having two CAHWs per parish. Since both Ongino and Malera have eight parishes each, this gave the total number of 32.

These CAHWs were trained during four training sessions of one week each, the first in September 2002 and the last in February 2004, just before this study started. However, as the initial date for the study was very close to the last two weeks of training it was difficult to appreciate any effect or impact of the incidence of these diseases due to the CAHWs work's. For this reason we think that it is important to



list all the illness with the month of the training to clarify any possible doubts. The following table will show the summary of this information:

<b>Disease</b>	<b>Animal</b>	<b>Training session</b>
Worms	Cattle / Goat	September 2002
ECF	Cattle	September 2002
CBPP	Cattle	January 2004
Heart water	Cattle	January 2004
Trypanosomiasis	Cattle	August 2003
Mastitis	Cattle	August 2003
Ringworm	Cattle	September 2002
Bloat	Goat	September 2002
Anaplasmosis	Goat	August 2003
ORF	Goat	January 2004
Abortion	Goat	September 2002
Mange	Goat	August 2003
CCPP	Goat	January 2004

The selection of candidates was carried out by the communities. This was to ensure that the CAHWs were trusted and accepted by the people in each community. The only prerequisites established by CoU-TEDDO were that they should be able to read and write in English and that women were to be encouraged to apply. The first prerequisite was so that they would be able to read the labels on the drug bottles, thus avoiding any misdosage. Furthermore these CAHWs would be expected to hand in reports of every service they carried out, and that these should be done in English. As for the second prerequisite, communities finally only chose men. From all the candidates presented for training CoU-TEDDO accepted them all.

### 3. Methodology.

Before this study started, a three day workshop was organised at the Medical Centre Training Facility in Soroti town. The aim of the workshop was to get all the participant involved in this study acquainted with each other and to establish how this study would be carried out. At the end of the workshop, the study was structured into four parts

- **Personal interviews:** With the university or college trained Animal Health Workers operating in the area to know their opinion on the existence of trained CAHWs and of the quality and necessity of the work they were doing.
- **Mappings:** To determine the distribution of the different veterinary services available in the communities, their distance to the area, and the price of their services (not only the services, but also the cost of getting to them).
- **Matrix scoring:** To have a comparative evaluation by the communities in the area on a series of issues, such as quality, access to the service, etc, for each one of the animal health service providers working in the area. Similarly a ranking stating the relevance of these items was made, to find out, for the future, which should be the characteristics of future trainings of existing CAHWs or future CAHWs operating in the area.
- **Proportional pilling:** To look at the incidence of animal diseases for the two types of animals kept in the study areas (namely, cattle and goats), between the time that CAHWs were not present and the time they were fully operational. The aim of this analysis was to look at the influence of different factors on this evolution (one of the factors being the arrival of trained CAHWs).

There are a total of 32 communities in two Sub Counties, 15 in Ongino and 17 in Malera (see annex 1: List of communities in the study) and they were all taken into the study.

During the workshop the **sample study** and the number of times to be made for each Participatory Rural Appraisal, tools to collect information, were also determined (see table 1: Summary of the Methodology).

Also those diseases, which more commonly affected cattle and goats, were listed to be used in the proportional pilling. Similarly it was important to check which animal health

professionals worked in the district and the list of qualitative items that would determine the quality of their service.

In a subsequent meeting held in March this year, the lists made during the workshop were compared with the reality on the field, and a series of definitive lists were made. During this meeting, the field officers were also retrained on the PRA methods they would implement in the field.

Table1: Summary of the Methodology.

<b>Information required</b>	<b>Method</b>	<b>Type of informant</b>	<b>Number of repetitions</b>
Project definition	Workshop	Project Staff	1
Definition of the required items and methods to use	Workshop	Project Staff	1
Previous information of illness to evaluate	Interview	Groups of between 3 and 7 people	15 for testing
Previous information on existing veterinary agents	Mapping	Groups of between 3 and 7 people	3 for testing
Information on the area and the subjective evaluation of the veterinary agents	Personal interview	All veterinary agents	10
Analysis of the location, costs and waiting time for all the veterinary agents	Mappings	Groups of between 3 and 7 people	29 (12 in Ongino and 17 in Malera)
Relevance ranking of a list of qualitative items	Ranking	Groups of between 3 and 7 people	87 (36 in Ongino and 51 in Malera)
Association of the qualitative items for each veterinary agent	Matrix scoring	Groups of between 3 and 7 people	87 (36 in Ongino and 51 in Malera)
Analysis of the evaluation of the principal illnesses affecting the animals, and which factors have influenced it	Before and after. Proportional pilling	Groups of between 3 and 7 people	145 (60 in Ongino and 85 in Malera)

To determine the list of diseases for the study and to check the degree of implementation of the skills learned by the field officers in the workshop, a trial run was carried out in three randomly chosen communities. With the analysis of this information, it was decided that the following information would be used:

- List of diseases for cattle and goats:

<b>Cows</b>	<b>Goats</b>
Worms	Worms
ECF	Bloat
CBPP	Anaplasmosis
Heartwater	ORF
Trypanosomiasis	Abortion
Mastitis	Mange
Ringworm	CCPP

- Qualitative aspects focused on the study:

Accessibility	Animal health advice
Drugs available	Can treat all the animal problems
Drug quality	Affordability
Recovery after the visit	Trustworthy
Support of these services in the communities	

- Type of animal health service provider:

Private veterinarian	Government veterinarian
Traditional Healer	Quack
Community-based Animal Health Worker	

- Factors which influence disease evolutions on cattle and goats:

Water	Pastures
Other vet. care	Instability
Community-based Animal Health Worker	

- Revision of the test questionnaires done and correction of the methodological errors.

Once all the processes had finished, a workplan to visit the communities was developed (see annex 1: Communities work plan)

Problems with some parishes.

When the data was analyzed, it was discovered that in two of the communities, no Community-based Animal Health Worker had ever worked there (these were Kakori (in

Malera) and Kongura (in Ongino)). This means that the CAHWs trained for those communities never took on the job. Faced with this situation, three alternatives for data analysis were available. The three options were:

- A comparative analysis between those communities, which had operating CAHWs and those, that did not.
- Analysis without these two communities.
- To carry out the analysis with all the 29 communities studied (although the total number of communities is 32, 3 of them were used for testing).

The first alternative was almost immediately discarded, because the sample of communities without a CAHW was far too small, to extract any conclusions. Moreover this was not the aim of the initial study, and it would suppose an increase in the sample, with its time and budgetary implications.

Having discarded one, there were still two possibilities remaining. But taking into account that the overall objective of the present study was to analyse the effects of *Community-based Animal Health Workers*, the two communities were finally removed from the analysis, and the remaining 27 communities would be those analysed.

Similarly a second set of options appeared before the analysts, which was whether to study both Sub Counties together or separately. Because of the reasons presented in the introduction of this report (in 1.2 Study area), and after seeing the data results on the Matrix Scoring (high differences between the two Sub Counties), it was finally decided to study both Sub Counties separately, Ongino with eleven communities and Malera with sixteen (see annex 3: Joint analysis of the Matrix Scoring).

## 4. Results

### 4.1 Mapping analysis

To understand the reality of the communities when they are evaluating the veterinary services used, it is essential to understand the situation of these in the community, in terms of distance, cost and waiting (often this is crucial depending on the type of disease the animals have).

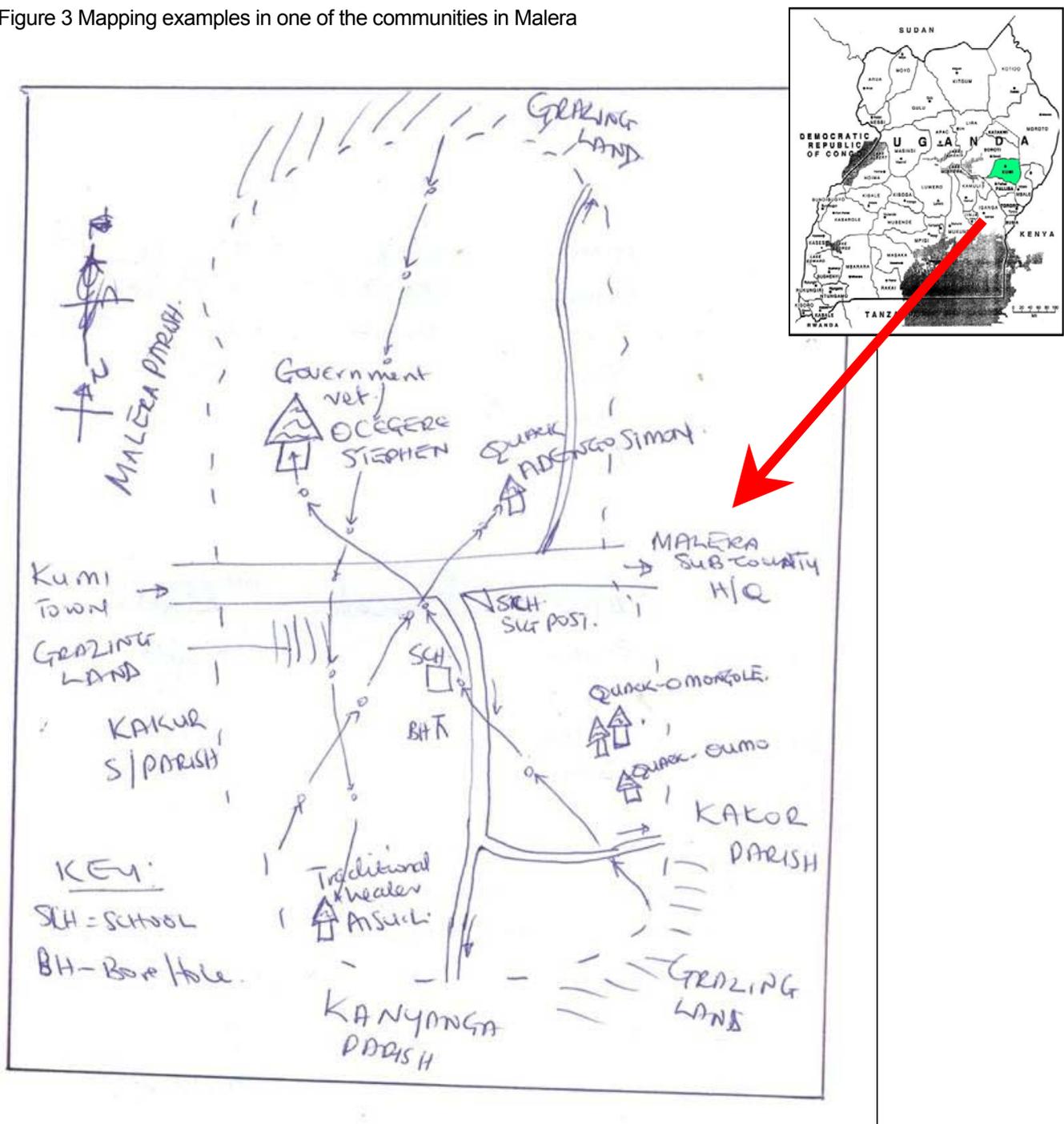
In the case of Ongino Sub County, the local service providers (Quacks, CAHWs and traditional healers) are the closest to the communities and their distance and travel costs are cheaper (see table 2: Information on the situation of veterinary services in the Sub Counties). But if you compare them with the government veterinarian, the difference is minimal, since it only takes them 10 minutes to reach his office. The negative point for the trained CAHWs, the consequences of which will be analysed later, is the time the livestock keeper must wait for this person to arrive, on average seven hours, while the government veterinarian only takes three hours. At the same time, the price difference is not very high, this is why the livestock keepers consider the second one more affordable (see next section).

Table 2: Information on the situation of veterinary services in the Sub Counties<sup>2</sup>.

<b>Ongino Sub County</b>	Quack	CAHW	Trad. Healer	Govern. Vet.	Private vet.
Distance (km) for community	2	3	1,5	4,5	
Time (hours) for community	25 min	35 min	20 min	45 min	
Cost (US\$) for community	550	750	450	850	
Time (hours) for service provider to reach the community	1,25	7	4,5	3	
Cost (US\$) for service provider to reach the community	1700	1600	1400	3200	
<b>Malera Sub County</b>					
Distance (km) for community	2	2,2	1,5	6,5	6,5
Time (hours) for community	35 min	50 min	35 min	6,5 hours	3,5 hours
Cost (US\$) for community	850	1100	825	2500	2000
Time (hours) for service provider to reach the community	13	1,25	7	9,25	13
Cost (US\$) for service provider to reach the community	1300	1600	1900	3400	2500

In the case of Malera, the situation is completely different. Although the CAHWs are further away than the quacks or traditional healers, they still offer faster service, taking only one hour to reach the client, while the rest take on average between seven and thirteen hours to arrive. (see table 2: Information on the situation of veterinary services in the Sub Counties). Similarly, although the travel costs are higher, the cost of the actual service is the second lowest of all the service providers, with a great gap between those service providers with higher education. This is why, as it shall be seen later, that the CAHWs are very well valued by the livestock keepers in the area (see next section).

Figure 3 Mapping examples in one of the communities in Malera



## 4. 2 Matrix Scoring Analysis

When the communities made the selection of veterinary service providers in the pilot test done in three communities, it was thought that it would be interesting to carry out two types of comparisons with the CAHWs.

On one side, the comparison could be made with the veterinary service providers with tertiary education, both public and private, with a degree or a diploma and on the other, with the traditional local veterinary service providers, such as quacks or traditional healers.

For this reason in the section 3.3.2 *Matrix Scoring Analysis in Ongino Sub County* and 3.3.3 *Matrix Scoring Analysis in Malera Sub County*, a double focus was carried out: first, the overall situation of all the veterinary service providers in the Sub Counties; and secondly a comparison between the CAHWs and the remaining service providers in the two groups mentioned above.

### 4. 2. 1.Rank Analysis

In spite of the decision taken on the analysis methodology just mentioned, in the case of the rank analysis of the characteristics, the analysis has been done in both Sub Counties separately and as a whole. The reason for this is that these characteristics do not depend directly on the veterinary services available in the area, and it was good to have a global picture of the whole study area.

The results, as predicted, did not differ greatly between the Sub Counties, as it can be seen on Table 3: *Ranking of the characteristics per Sub County and as a whole*, but there are still some differences. In both cases the most important characteristic is accessibility, referring to the proximity to the veterinary service. It must be noted that the communication systems in the area were quite poor and limited, with little chance of movement if unless by bicycle or on foot.

Where we start to note differences is with the second characteristic, and this is demonstrated in the total ranking. There is a draw in the relative importance of a service provider having the drugs to treat the animals, or that these are of good quality.

It is also important to highlight the importance in the recovering of the animal after the visit from the service provider, as well as the advice that he/she can give to the livestock keepers on the health of their animals.

The characteristics which are not very relevant are: the trust that the service providers inspire, their affordability, and the amount of knowledge that they have on animal health issues.

In a brief summary, the communities are looking for someone with easy accessibility and who can offer council regarding on animal health and, if necessary, for them to be available whenever a visit is necessary and to dispense the necessary treatment to do emergent “house calls” and dispense treatment when needed.

Table 3: Ranking of the characteristics per Sub County and as a whole

<b>Characteristics</b>	<b>Ongino</b>	<b>Malera</b>	<b>Total</b>
Accessibility	1st	1st	1st
Drugs available	4th	2nd	2nd
Drug quality	2nd	3rd	2nd
Recovery after the visit	3rd	5th	4th
Support of these services in the communities	5th	7th	6th
Animal health advice	5th	4th	5th
Can treat all the animal problems	8th	6th	7th
Affordability	7th	8th	8th
Trustworthy	9th	9th	9th
<i>Kendall Coefficient</i>	<i>0.695***</i>	<i>0.593***</i>	<i>0.597***</i>

The number of participating groups is 27 (16 in Malera Sub County and 11 in Ongino Sub County); the Kendall coefficient of concordance (\* p<0.1; \*\* p<0.01; \*\*\* p<0.001) with values between 0 and 1 (the higher the value, the closer the opinions are between the groups).

#### 4. 2. 2 Ongino Matrix Scoring

Looking at the results shown on table 4: *Summary of the Matrix Scoring in Ongino*, the most valued veterinary service provider in the Sub County is the District Veterinary Officer, followed closely by the CAHWs and the other traditional service providers. Since there are no private veterinarians in the Sub County, the closest being that one of Malera, the value given to this type of service provider is almost nonexistent.

Moving deeper into the data analysis, we can see that the most accessible services (the characteristic with the highest priority) are the traditional service providers (including the CAHWs) and not the DVO. A similar result appears when looking at the affordability of these service providers; which in turn coincides with the data extracted from the mapping analysis, where in Ongino Sub County, the traditional service providers charge an average of 1,500 UShs per service while a service from the district official is more than twice the

price (3,300 UShs) <sup>3</sup>. When the government veterinarian is compared with the trained CAHWs, it is seen that if the two previously mentioned characteristics are removed, the latter has a comparatively better image at community level, except for the level of trust which is the same for both. These differences are important and the CAHWs have a long way to go to gain the same value as the DVO.

Despite this, the position of the CAHWs, in comparison with the rest of the traditional service providers, is good. The CAHWs are the agents who inspire more trust in the cattle keepers, and have access to better quality drugs. They also give out better advice and the results of their visits are positive and valued.

Table4: Summary of the Matrix Scoring in Ongino

	Private vet.	Government vet.	Traditional healer	CAHW	Quack
'Which of these services is nearest from you?' (W= 0.249**)	• (0 – 3)	••• (1 – 5)	••••• • (2 – 8)	•••• (2 – 10)	••••• • (5 – 10)
'Which of these services has always drugs available?' (W= 0.141*)	• (0 – 4)	••••• •• (2 – 10)	•••• (3 – 6)	•••• (2 – 9)	••••• (2 – 10)
'Are there differences in the quality of the drugs in these service providers?' (W= 0.264**)	• (0 – 3)	••••• ••••• • (4 – 13)	••• (2 – 5)	••••• (3 – 9)	•••• (2 – 4)
'How does your animal reach the recovery after used these different services?' (W= 0.244**)	• (0 – 7)	••••• •••• (5 – 13)	••• (2 – 5)	•••• (2 – 8)	••• (1 – 3)
'Do you get any advice from these service providers?' (W= 0.317***)	••• (0 – 9)	••••• ••••• (6 – 12)	••• (1 – 4)	••••• (2 – 8)	••• (0 – 6)
'Which service can treat all your animal healthy problems?' (W= 0.564***)	• (0 – 6)	••••• ••••• •• (11 – 14)	• (1 – 3)	••••• (1 – 8)	•• (0 – 4)
'Which of these services is affordable for you?' (W= 0.253**)	• (0 – 3)	••• (2 – 5)	••••• (4 – 9)	••••• • (3 – 10)	••• (2 – 10)
'Which service do you trust more?' (W= 0.244**)	• (0 – 4)	••••• • (2 – 9)	••• (2 – 6)	••••• • (3 – 10)	••••• (2 – 7)

	Private vet.	Government vet.	Traditional healer	CAHW	Quack
'What is the support of these services from the community?' (W= 0.303***)	• (0 – 4)	••••• ••• (3 -10)	•• (1 – 6)	••••• (3 -11)	••• (2 – 7)
<p>The total number of participating groups is 11; W is the Kendall Coefficient of concordance (* p&lt;0.1; ** p&lt;0.01; *** p&lt;0.001) with values ranging from 0 to 1 (the higher the value, the closer the opinions are between the groups). The number of spots represents the median (the bigger the number of spots, the stronger the relationship between the item and the specific service provider; therefore a low number of spots represents a weak relationship).</p>					

#### 4. 2. 3 Malera Matrix Scoring

The reality in Malera Sub County is completely different from that of Ongino, and it is not only due to its strategic and geographic location with its obvious consequences on the accessibility of the government veterinary official as mentioned earlier, but also on the opinion the communities have of their CAHWs.

With great contrast these are very highly valued by the cattle keepers, followed by the private veterinarian in the Sub County, and finally at a great distance, by the remaining traditional service providers.

As for the characteristics needed, the CAHWs are more valued in all of them except for the capacity to treat all illnesses and in the access and distribution of good quality drugs, aspects in which the private veterinarian obtains a better mark (see table 5: *Summary of the Matrix Scoring in Malera*)

The main difference between the CAHWs and the private veterinarian, is that the first are community-based and community conscious, therefore being more accessible and more affordable. As for the more theoretical aspects, it is true that the trained CAHWs lack knowledge and are therefore not able to treat all diseases. But at the level of the community, these differences are not large, thus signifying that the CAHWs are performing their duties well and meeting their expectations.

When comparing the CAHWs with the rest of the traditional service providers, the cattle keepers have a better opinion of them. Even when it is a more expensive service (by 500 shillings), the affordability is still better valued with CAHWs since they provide a better ratio between quality and price.

Table 5: Summary of the Matrix Scoring in Malera

	Private vet.	Government vet.	Traditional healer	CAHW	Quack
'Which of these services is nearest from you?' (W= 0.372 <sup>***</sup> )	•• (1 -6.25)		•••• (2 – 5)	••••• ••••• • (5.50-15.75)	•••• (2 – 7)
'Which of these services has always drugs available?' (W= 0.188 <sup>**</sup> )	••••• (3 – 10)		••• (1 – 4)	••••• ••••• (1 – 13)	•••• (1 – 7)
'Are there differences in the quality of the drugs in these service providers?' (W= 0.243 <sup>**</sup> )	••••• •••• (3 – 16)		•• (1 – 3)	••••• •• (1 – 10)	•• (0 – 5)
'How does your animal reach the recovery after used these different services?' (W= 0.328 <sup>***</sup> )	••••• •• (3 – 12)		•• (1 – 3)	••••• ••••• (3 – 13)	•• (1 – 6)
'Do you get any advice from these service providers?' (W= 0.357 <sup>***</sup> )	••••• •• (4 – 12)		•• (1 – 2)	••••• ••••• • (3 – 14)	• (1 – 5)
'Which service can treat all your animal healthy problems?' (W= 0.256 <sup>*</sup> )	••••• ••• (5 – 16)	••••• • (0 – 10)	• (0 – 2)	••••• (1 – 11)	• (0 – 5)
'Which of these services is affordable for you?' (W= 0.266 <sup>**</sup> )	••••• (1 – 8)		••• (2 – 6)	••••• ••••• •• (1 – 16)	•••• (1 – 8)
'Which service do you trust more?' (W= 0.283 <sup>***</sup> )	••••• (2 – 8)		•• (1 – 3)	••••• ••••• ••• (2 -16)	••• (0 – 9)
'What is the support of these services from the community?' (W= )	•••• (2 – 10)		• (1 – 3)	••••• ••••• ••• (2 – 18)	••• (1 – 9)

The total number of participating groups is 11; W is the Kendall Coefficient of concordance (\* p<0.1; \*\* p<0.01; \*\*\* p<0.001) with values ranging from 0 to 1 (the higher the value, the closer the opinions are between the groups). The number of spots represents the median (the bigger the number of spots, the stronger the relationship between the item and the specific service provider; therefore a low number of spots represents a weak relationship).

### 4.3 Proportional Pilling Analysis

Following the study plan, it has been done around 150 PRA (Participatory Rural Appaisal) in both Sub Counties (85 in Malera and 60 in Ongino) with the objective of analysing the pattern of animals becoming ill (disease incidence) by cattle and goats due to the fact that they are the main animal production.

There are two factors that have been mentioned because they can and have affected the disease evolution:

Type of diseases: we can classify the list of the studied diseases in two different groups:

- Epizootic diseases: they are pathological processes which frequency is not constant through the time in the animal population. In them the enviromental factors have effects but mainly a good veterinary services (vaccination, isolation of sick animals, trainings to the owners on well animal management and health problems detection) can reduce the number of sick animals and at the same time reduce the impact, and therefore, the number of cattle deaths.
- Endemic diseases: these diseases effect the flock in the areas constantly on the time, with a similar number of the impacted animals and they depend mainly on environmental factors and for this reason the work of the veterinary services will not reduce the number of sick animals although their work will reduce the impact (good deworming, good alimetation,...) and therefore, the number of cattle deaths.

The main objective of the study is not the analysis of the increase or decrease of the animal death rate, but on the impact of the diseases two years ago and at the begining of 2004 in every kind of species. Theoretically we should only see reductions in those which are epizootic diseases, because it depends directly on the service of the veterinary agents in the region.

The classification of the diseases not only depends of the nature of it, but also on environmental factors and the location of the animals population. For example in the case of Trypanosomiasis, usually considered epizootic, the study's area should be considered endemic because Lake Bissinia and its swamps bordering with the two Sub Counties.

It is therefore important to distinguish all the diseases analysed as endemic or epizootic:

Disease	Animal	Type of disease
Worms	Cattle / Goat	Endemic
ECF	Cattle	Endemic
CBPP	Cattle	Epizootic
Heart water	Cattle	Endemic
trypanosomiasis	Cattle	Endemic
Mastitis	Cattle	Endemic
Ringworm	Cattle	Endemic
Bloat	Goat	Epizootic
Anaplasmosis	Goat	Epizootic
ORF	Goat	Epizootic
Abortion	Goat	Epizootic
Mange	Goat	Epizootic
CCPP	Goat	Epizootic

Training calendar: as we have mentioned in the introduction of, the training session were carried out during the months of September 2002, February 2003 and January 2004. Since the last training was carried out barely two months before the study, this little time-frame does not allow us to study the effects of CAHWs on the diseases explained during that session (January 2004).

The results between the two Sub Counties do not vary much, but the work carried out by the CAHWs has been markedly different in these two areas.

Figure 4 : Example of Before – After Proportional Pilling



#### 4.3.1 Cattle Proportional Pilling in Ongino.

There are three diseases which have had great variations during the study time period, as we can see on *Graph 1: Evolution of cattle diseases in Ongino Sub County*; the others maintain themselves or suffer little variations.

On the positive side it can be seen that Contagious bovine pleuropneumonia (CBPP) has diminished considerably (by over 40%). The government action and the Veterinary Officer of Ongino have been the main cause of this evolution. At the same time, the CAHWS' contribution has been important, and despite the fact that they cannot treat, their quick tips to governmental organizations have allowed them to head off some spurts of this disease (see *Table 6: Causes in the evolution of cattle diseases in Ongino Sub County*).

On the negative side, we can see that both Worms and East Coast Fever (ECF) have increased by 33%. In the case of worms, different environmental factors have influenced this evolution i.e., overexploitation of the pasture, bad quality of the water sources used and bad rotation of the pasture areas. But there is one important factor which had a decisive impact on this disease: the existence of Liver Fluke, an internal parasite which transmit the illness only to the cattle and which "live" in larvae stage in a host in the swamps near the lake, where a large percentage of the animals of the area go to drink. Due to this reason, plus a real lack of drinkable water for the animals the control of this disease became very complicated. Finally, another reason was the bad rotation of the kraals, which has an important influence on the transmission of worms. The peasants do not clean them and the internal parasites survive on the dung, facilitating the transmission.

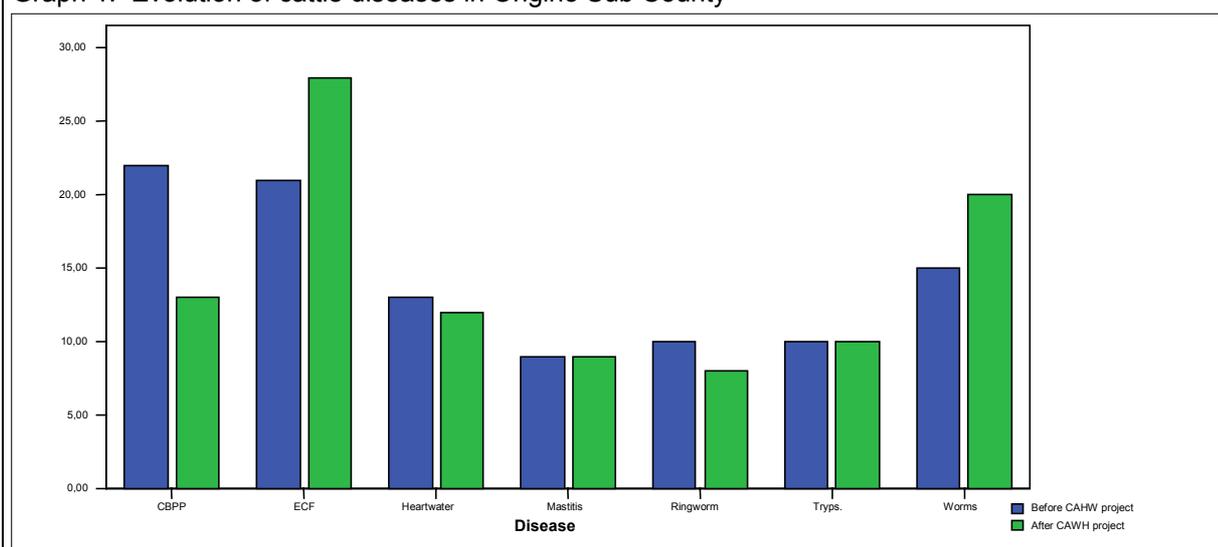
In the case of ECF, the bad quality of the pastures plus their poor rotation meant that the vector (ticks) survived longer and continued to affect the animals.

Another reason that help to explain this increase, is that two years ago, the peasants set fire to the pastures during the dry season, eliminating all the ticks and worms existing on it and therefore eliminating the risk factors of infection. But since 2003, the Ugandan Government forbade this practice making it illegal. Therefore, one of the traditional systems of diseases control was eliminated.

Despite that the fact these two diseases are endemics, and will be always there, the veterinary services have an important role in the control and prevention of them. They have to advise and train the farmers about the consequences of the bad kraal rotation and the bad quality of the swamp water and their effects. At the same time, some preventive treatments (deworming every three months, external desparasitation,...) should be practiced.

Finally, in the case of Ringworm, the action of the veterinary service, although poor and limited, has been essential in the reduction of the impact of this disease. Two years ago, there was no campaign of dissemination or eradication of it, but now they have started to identify, diagnose and treat. Hopefully in the following years, if the veterinary services continue with this program there will be a marked reduction in Ringworm.

Graph 1: Evolution of cattle diseases in Ongino Sub County



Note: these results are from the study of 5 groups of people (between 3 and 7 members) in the 11 communities of the Sub County.

Table 6: Causes in the evolution of cattle diseases in Ongino Sub County.

	Water	Pasture	Other Vet	CAHW
Worms	41%	18%	21%	19%
ECF	6%	28%	44%	22%
CBPP	9%	6%	67%	18%
Heartwater	4%	17%	56%	23%
Tryps.	6%	17%	54%	23%
Mastitis	1%	14%	62%	23%
Ringworm	2%	4%	68%	25%

#### 4.3.2 Cattle Proportional Pilling in Malera.

The evolution of the diseases in this Sub County is slightly more balanced than in Ongino Sub County; but even here it is seen that the diseases that have evolved the most, are still the same three (CBPP, ECF and worms). We can see this on *Graph 2: Evolution of cattle diseases in Malera Sub County*.

In the case of reductions, we can find CBPP, with a decrease of 30%. The factors of this evolution are exactly the same as that in Ongino. The role played by the veterinary services, mainly the private veterinarian (for reasons of accessibility to vaccines), has been important to this reduction. It hoped that the CAHWs' role will be decisive in the maintenance of this reduction in the following years. With experience and time to act (we cannot forget that they received the training on January 2004), their quick tips to the veterinary services with diplomas will allow time to head off spurts of these diseases.

On the negative side, we can see that both ECF and worms have had a more moderate increase than neighbouring Sub County (26% and 11% respectively). The reason are exactly the same as that in the bordering Sub County, but in Malera, the role of the veterinary services, and especially the CAHWs have been decisive in controlling the incidence of ECF and Worms (see *table 7: Causes in the evolution of cattle diseases in Malera Sub County*).

It is important to emphasize the work done by the CAHWs in the Sub County, because beneficiaries attributed to them, on average, more than 25% of the causes (a majority of them, positive ones).

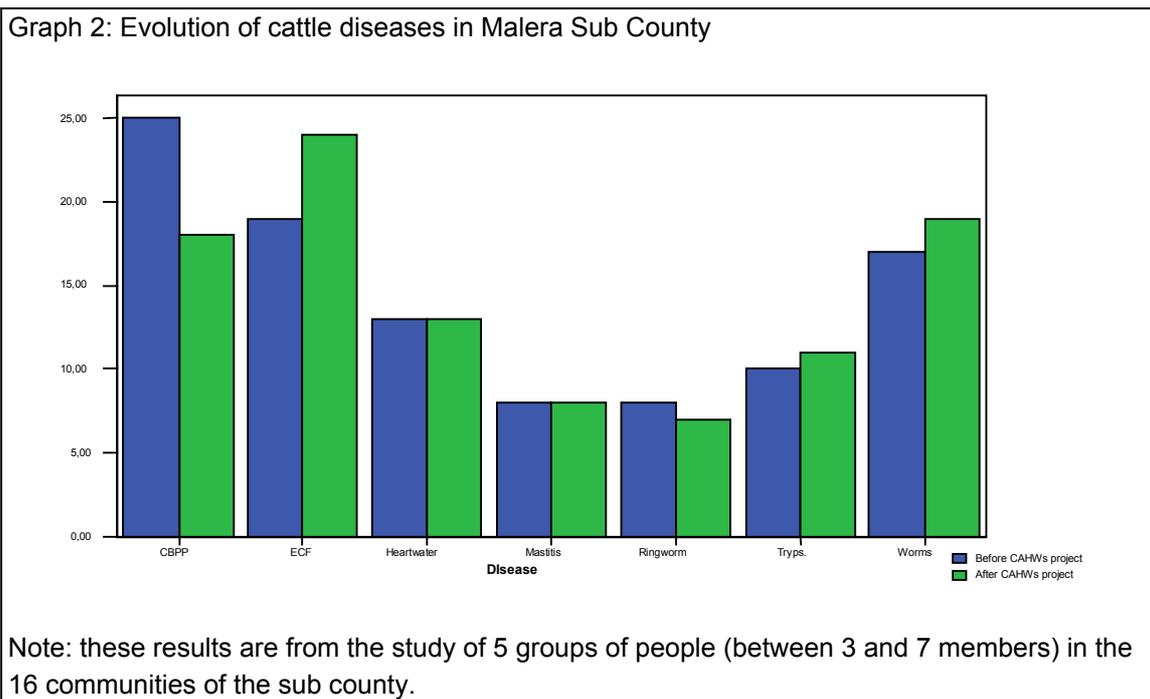


Table 7: Causes in the evolution of cattle diseases in Malera Sub County

	Water	Pasture	Other Vet	CAHW
Worms	35%	15%	23%	27%
ECF	2%	21%	52%	25%
CBPP	14%	6%	59%	21%
Heartwater	2%	14%	57%	27%
Tryps.	13%	26%	39%	21%
Mastitis	0%	11%	62%	27%
Ringworm	3%	5%	63%	28%

#### 4.3.3 Goat Proportional Pilling in Ongino.

The degree of incidence of diseases relating to goats in Ongino Sub County is practically constant in time (see *Graph 3: Evolution of goat diseases in Ongino Sub County*). It can be seen that there are small increases in abortions, Anaplasmosis, CCPP and Worms, but the most important result is the fall in the incidence of Mange and ORF (by 38% and 33% respectively).

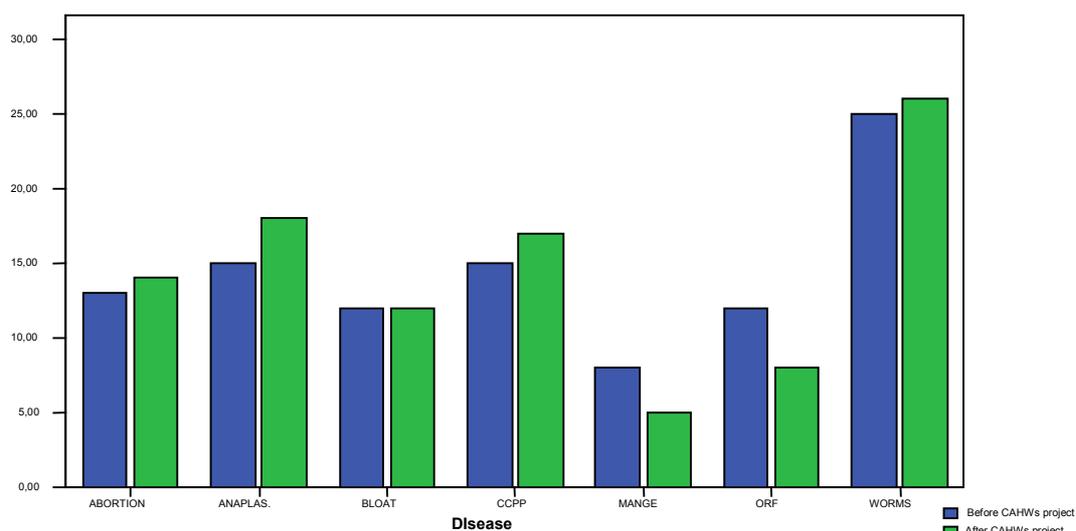
Mange is a disease caused by external parasites, usually ticks. All the veterinary services in the region have worked to controlled this through antiparasite treatments and as a consequence Mange has been reduced. In the case of ORF, again the role of the veterinary agents is important for the reduction. However, the most basic and important role is played by the farmers who need to identify the diseases, start palliative treatment, and then contact with a veterinary agent for further management. For this reason, the farmers should receive training in how identify these diseases and at the same time the CAHWs and other agents need to be available for consultations.

In the case of Contagious Caprine Pleuropneumonia (CCPP), the life cycle of this is close to Contagious Bovine Pleuropneumonia (CBPP), and for this reason the role of the veterinary agents is very important. The main difference between the cows and goats, is that a vaccine exists for the cows to prevent the disease but not for goats. As a consequence of this gap, it is very complicated to control the CCPP, and the quick detection and isolation of the sick animal is paramount to control the epidemic spurts.

Finally, abortion in the caprine livestock is produced by a bacterium called *Brucella Mellitensis*. Usually the abortion occurs in the last third of the gestation. It is a disease of infectious character and very common in rural areas like Ongino and Malera. The

small increase in incidence is due to the inability of veterinary service to control the transmission (venereal) and to eliminate the old and infected reproducers. For this reason it is very important that the CAHWs and the other veterinary agents of the area, train and advice the farmers about the best reproductive practices.

Graph 3: Evolution of goat diseases in Ongino Sub County



Note: these results are from the study of 5 groups of people (between 3 and 7 members) in the 11 communities of the Sub County.

Table 8: Causes in the evolution of goat diseases in Ongino Sub County

	Water	Pasture	Other Vet	CAHW
WORMS	27%	17%	33%	23%
BLOAT	14%	28%	38%	20%
ANAPLAS.	3%	10%	55%	31%
ORF	9%	13%	61%	18%
ABORTION	4%	7%	55%	35%
MANGE	0%	0%	71%	29%
CCPP	12%	8%	58%	22%

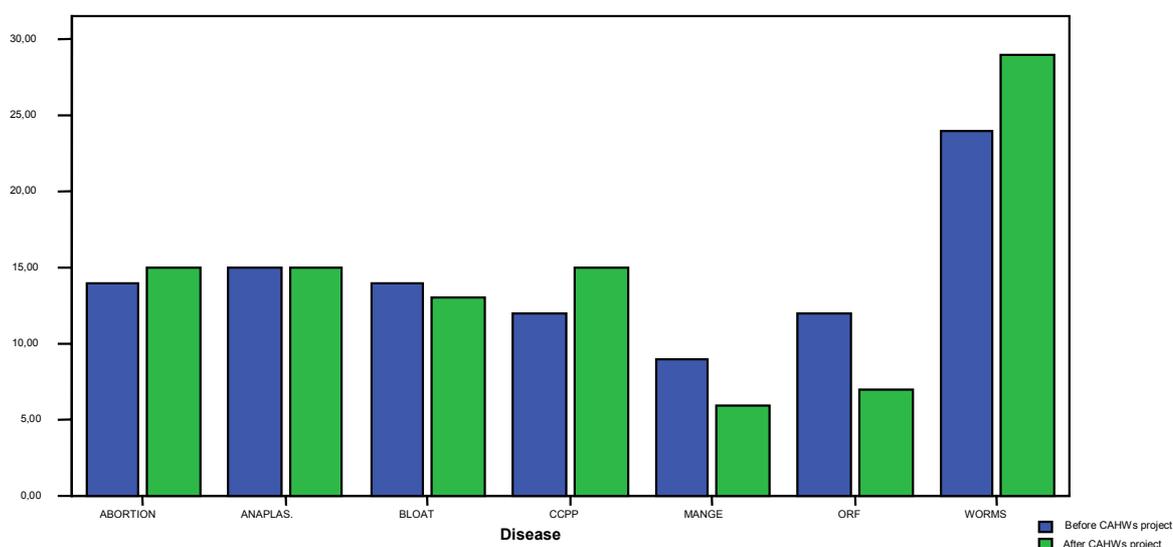
#### 4.3.4 Goat Proportional Pilling in Malera.

A similar set of results can be found here, in reference to the evolution in the incidence of goat diseases (see *Graph 4: Evolution of goat diseases in Malera Sub County*). We can observe that there is a greater fall in the same two diseases, Mange and ORF (42% and 43% respectively); similarly the increases follow the same trend, both CCPP and worms have an increase which is superior to that one of Ongino (25% and 32% respectively, compared to 13% and 20%).

The influencing factors are exactly the same, and the explanation of the situation of caprine livestock in Ongino should serve to understand the behavior of the evolution of the diseases in Malera.

For this reason, we expect that the work of the Community Animal Health Workers, in the following years, with a bit more experience and contact with the community, will play an important role in the eradication of the all types of diseases and their environmental impact.

Graph 4: Evolution of goat diseases in Malera Sub County



Note: these results are from the study of 5 groups of people (between 3 and 7 members) in the 16 communities of the Sub County.

Table 9: Causes in the evolution of goat diseases in Malera Sub County

	Water	Pasture	Other Vet	CAHW
WORMS	28%	22%	32%	18%
BLOAT	8%	29%	40%	23%
ANAPLAS.	3%	19%	53%	26%
ORF	2%	15%	63%	20%
ABORTION	4%	8%	62%	26%
MENGE	1%	3%	76%	21%
CCPP	14%	5%	63%	18%

## 5 Conclusions and recommendation

The Veterinarios Sin Fronteras (VSF) Community-based Animal Health Project has registered an appreciable result in the reduction of livestock disease incidence, and the beneficiaries not only are happy with the project but they feel that CAHWs are helping them to take care of their animals more efficiently and carefully.

Having examined the project, the assessment team would like to recommend the following:

- The service provided by the CAHWs is well considered, and the community people have trust in them. And at the same time, is the service more accessible and they have the support of the beneficiaries.
- CAHWs should receive more training, especially in the diseases which they lack knowledge (the capacity of treatment of all the diseases is the worst point in their evaluation).
- It is important to remember that the role of all the veterinary agents is not only to operate in the rural villages as a clinic way, but also they have to train and advise the farmers with all of the facts of the diseases in the area, so that they will be able to identify and treat sick animals which will lead to increase and improve production.
- There is a need to work hard to establish a sustainable monitoring and supervision mechanism by the District Veterinary Office.
- It has to be considered the CAHWs can fit into the current Government privatization system (p.e. NAADS privatization process)
- **In the pastoralist areas where the District Veterinary Officer (DVO) is far away or where the number of cattle is so high for only one professional (for example Malera), other veterinary services, like CAHWs, should be legalized.**

**Annex 1: Visits Work Plan**

County	Subcounty	Parish	Village	Field Visit
Kumi	Ongino			
		Akide	Akide	12/02/2004
		Kacelakweny	Kacelakweny	29/04/2004
		Obotia	Totolim	18/06/2004
			Obotia	18/03/2004
		Kanapa	Oduoro	29/05/2004
		Ongino	Ongino	07/04/2004
		Kapasak	Kapasak	31/05/2004
		Oseera	Oseera Ceele	26/02/2004
		Ceele	Ceele Nyakoi	27/02/2004
		Aakum	Kabwangasi	30/04/2004
			Aakum	24/04/2004
			Morio	23/04/2004
		Kongura	Kongura	28/05/2004
		Tisai	Tisai/ Kacherede	19/06/2004
		Kacaboi	Kacaboi	01/05/2004
Bukedea	Malera			
		Malera	Kanyanga	21/05/2004
		Kachonga	Kokwechi	21/06/2004
			Kachonga	28/09/2004
		Kakutot	Kakutot	07/08/2004
			Kakurau	14/08/2004
		Kobaale	Aparis	21/08/2004
			Kobaale	26/06/2004
		Kachede	Kachede	18/09/2004
		Kalou	Kalou	30/09/2004
		Kabarwa	Kabarwa	17/04/2004
			Tokor	24/09/2004
		Kakori	Kakori	15/05/2004
		Kacoc	Kacoc	14/05/2004
		Okouba	Okouba	06/04/2004
		Koreng	Omosoga	14/04/2004
			Kaleu	25/09/2004
		Kotiokot	Kamuno	27/09/2004

**Annex 2: Matrix Scoring Analysis (Ongino and Malera together).**

	Private vet.	Government vet.	Traditional healer	CAHW	Quack
'Which of these services is nearest from you?' (W= 0.296***)	●● (1 – 4)	● (0 – 4)	●●●● (3– 7)	●●●●● (3– 14)	●●●●● (3– 9)
'Which of these services has always drugs available?' (W= 0.043)	●●● (1 – 8)	●● (0 – 7)	●●● (3 – 5)	●●●●● (2 – 10)	●●●● (1– 7)
'Are there differences in the quality of the drugs in these service providers?' (W= 0.081*)	●●● (1 – 13)	●●●● (0 – 12)	●● (1 – 4)	●●●●● (3 – 10)	●●● (1 – 4)
'How does your animal reach the recovery after used these different services?' (W= 0.082*)	●●●● (1 – 11)	●●●●● (0 – 9)	●● (1 – 3)	●●●●● (3 – 12)	●● (1 – 6)
'Do you get any advice from these service providers?' (W= 0.127**)	●●●●● (1 – 10)	●●● (0 – 10)	●● (1 – 3)	●●●●● (3 – 12)	●● (1 – 5)
'Which service can treat all your animal healthy problems?' (W= 0.222***)	●●●●● (1 – 13)	●●●●● (3 – 13)	● (0 – 2)	●●●●● (1 – 10)	●● (0 – 4)
'Which of these services is affordable for you?' (W= 0.153**)	●● (0 – 8)	● (0 – 4)	●●●● (2 – 7)	●●●●● (2 – 13)	●●● (1 – 8)
'Which service do you trust more?' (W= 0.126**)	●●● (1 – 6)	●● (0 – 6)	●● (1 – 3)	●●●●● (3 – 16)	●●● (1 – 7)
'What is the support of these services from the community?' (W= 0.117**)	●● (1 – 7)	● (0 – 8)	●● (1 – 3)	●●●●● (2 – 14)	●●● (1 – 8)

The total number of participating groups is 27; W is the Kendall Coefficient of concordance (\* p<0.1; \*\* p<0.01; \*\*\* p<0.001) with values ranging from 0 to 1 (the higher the value, the closer the opinions are between the groups). The number of spots represents the median (the bigger the number of spots, the stronger the relationship between the item and the specific service provider; therefore a low number of spots represents a weak relationship

**Annex 3: List of diseases names in Ateso.**

<b>ENGLISH</b>	<b>ATESO</b>
Anaplasmosis	Opiu
Trypanosomiasis	Eseny
CBPP	Oukoi
Rinderpest	Esotoka
Worms	Ikur
Foot & mouth disease	Eciga/Omulat
Blackquarter	Okuwat
Anthrax	Ekurara
Rabies	Ikerep
ECF	Angaruei
Heartwater	Eiriaria
Ringworm	Elowa
LSD	Adeka na emukule
Brucellosis/Abortion	Aijech
Mastitis	Adeka na ikisin
Babesiosis	Ookot
Bloat	Aitebiukin
Orf	Engurububu
Mange	Emugege
Tetanus	Eteregege

**Annex 4: Mapping Questionnaire:**

Reporting format for Mapping	
Location:	Date:
Group no:	Number of people in the group:
Make an A4-size copy of the map here: (be sure to add a North-South orientation and a scale to the map)	

1. Distance (km) between community/village and:

Quack .....  
 CAHW .....  
 Traditional healer .....  
 Government vet. ....  
 Private vet. ....

2. Time required (hours) and cost (Ushs) for livestock keeper to reach:

	<i>Time</i>	<i>Cost</i>	<i>Mode of transport</i>
Quack	.....	.....	.....
CAHW	.....	.....	.....
Traditional healer.....	.....	.....	.....
Government vet.....	.....	.....	.....
Private vet. ....	.....	.....	.....

3. Time required (hours) and cost (Ushs) for animal health service provider to reach livestock keeper

	<i>Time</i>	<i>Cost</i>	<i>Mode of transport</i>
Quack	.....	.....	.....
CAHW	.....	.....	.....
Traditional healer.....	.....	.....	.....
Government vet. ....	.....	.....	.....
Private vet. ....	.....	.....	.....

4. Comments (where are they living,...)

Quack:  
 CAHW:  
 Traditional healer:  
 Government vet.:  
 Private vet.:

**Annex 5: Cattle Before – After Proportional Pilling questionnaire:**

<b>Reporting format for Livelihood Impact of Diseases - CATTLE</b>								
Date:		Location:						
Name of head of household:		Male/female:		Household no:				
		<b>Cattle diseases</b>						
		<b>WORMS</b>	<b>ECF</b>	<b>CBPP</b>	<b>HEARTWATER</b>	<b>TRYPANOS.</b>	<b>MASTITIS</b>	<b>RINGWORM</b>
<b>Impact on livelihood before the project</b> (divide 100 stones)								
<b>Attribution</b> (divide 10 stones)	Water							
	Pasture							
	Other vet care							
	CAHWs							
	Instability							
<b>Impact on livelihood now</b> (divide new pile of around stones)								
<b>Difference</b> (Before - Now)								
Write additional notes here and overleaf:								

**Annex 6: Goat Before – After Proportional Pilling questionnaire:**

Reporting format for Livelihood Impact of Diseases - GOATS							
Date:		Location:					
Name of head of household:		Male/female:		Household no:			
		Goat diseases					
		WORMS	BLOAT	ANAPLAS.	ORF	ABORTION	MENGE
<b>Impact on livelihood before the project</b> (divide 100 stones)							
<b>Attribution</b> (divide 10 stones)	Water						
	Pasture						
	Other vet care						
	CAHWs						
	Instability						
<b>Impact on livelihood now</b> (divide new pile of around stones)							
<b>Difference</b> (Before - Now)							

Write additional notes here and overleaf:

**Annex 7: Matrix scoring questionnaire:**

**Reporting format used for matrix scoring of animal health service providers**

Date:

Location:

Informant group number:

Number of people in group:

Ranking of indicator (1 to 9)	Indicator (use 25 stones per indicator)	Type of animal health service provider				
		Private vet.	Government vet.	Traditional healer	CAHW	Quack
	'Which of these services is nearest from you?'					
	'Which of these services has always drugs available?'					
	'Are there differences in the quality of the drugs in these service providers?'					
	'How does your animal reach the recovery after used these different services?'					
	'Do you get any advice from these service providers?'					
	'Which service can treat all your animal healthy problems?'					
	'Which of these services is affordable for you?'					
	'Which service do you trust more?'					
	'What is the support of these services from the community?'					
	Total					

Additional notes (continue overleaf):

## Annex 8: Paravets Training Plan

1 <sup>st</sup> MODULE FOR PARAVET TRAINING				
TRAINING OF PARAVETS – MALERA SUBCOUNTY TUES 24 <sup>TH</sup> TO SAT 28 <sup>TH</sup> SEPT 2002				
DATE	MORNING	LUNCH	AFTERNOON	RESOURCES
Tuesday	Introductions /Registration <b>Betty</b> Overview of Paravet component <b>Paulo</b> Animal handling/ restraint <ul style="list-style-type: none"> <li>• Knot making</li> <li>• Crushes</li> </ul> <b>Cochas</b>	<b>Richard</b>	Practical: Animal Restraint <b>Paulo</b>	10 ropes      10000
Wednesday	Giving an injection <ul style="list-style-type: none"> <li>• Handling of syringes/ needles</li> <li>• Sterilization</li> <li>• Routes of drug administration</li> <li>• Injection sites</li> <li>• Disposal of used materials</li> </ul> <b>Cochas</b>	<b>Betty</b>	Practical: Giving injections, Drenching <b>Paulo</b>	5 Syringes      5000 1 box of needles      20000 Soda bottles Tape for weight estimation

Thursday	Animal health <ul style="list-style-type: none"> <li>• Signs of a sick and healthy animal</li> <li>• Examination of a sick animal</li> </ul> <b>Paulo</b> Helminthiasis <ul style="list-style-type: none"> <li>• Types</li> <li>• Signs</li> <li>• Control</li> </ul> <b>Cochas</b>	<b>Richard</b>	Practical: Field visit examination of a sick animal, various Dewormers <b>Paulo, Cochas</b>	Assorted dewormers 50000
Friday	Introduction to tick born diseases <ul style="list-style-type: none"> <li>• Importance of ticks</li> <li>• Identification of ticks</li> <li>• Tick predilection sites</li> <li>• Tick control</li> </ul> <b>Cochas</b>	<b>Betty</b>	Practical: hand picking of ticks for identification  Predilection sites on an animal <b>Paulo, Cochas</b>	Kaveras (Transparent) Assorted acaricides 70000
Saturday	Tick born diseases ECF Anaplasmosis Babesiosis Heart Water <b>Paulo</b>	<b>Richard</b>	Various acaricides, drugs used for treatment  Field visit	

SECOND MODULE OF PARAVETS TRAINING IN MALERA SUB-COUNTY,  
FROM MONDAY 3-6/FEB/2003.

DATE	MORNING	LUNCH	AFTERNOON	RESOURCES
Monday 3/2/2003	Review of previous module Cochas.	Richard	Field visit	
TUESDAY 4/2/2003	Castration -open castration -close castration FMD Paulo.	Betty	Practicals Paulo Cochas	Pen-strep Razor blades Aburdizzor Ropes
WENSDAY 5/2/2003	Reproduction -Heat detection  Cochas	Richard	BQ Poultry diseases Paulo	
THURSDAY 6/2/2003	Milk/Mastitis Trypanosomiasis  Paulo	Betty	CBPP Cochas	Multimast tubes Trypanocides.

**PARAVET TRAINING  
THIRD MODULE**

MORNING	LUNCH	AFTERNOON
CCPP, ORF/Ecthyma, Heart Water,  <i>Paulo</i>		ASF, and Mange  <i>Paulo</i>
Overview of poultry production systems  <i>Paulo</i>		Field visits  <i>Cochas</i>
Poultry diseases  <i>Cochas</i>		Sharing of field experiences  Field visits  <i>Cochas</i>
Poultry health management  <i>Paulo</i>		Sharing of field experiences  Field visit  <i>Cochas</i>