

Working Papers

10. Keeping Up With Technology:
The use of mobile telephony
in delivering community-based
decentralised animal health services
in Mwingi and Kitui Districts, Kenya

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& Ali Hassan Mohamed

FARM-AFRICA WORKING PAPER



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Keeping Up With Technology: The use of mobile telephony in delivering community-based decentralised animal health services in Mwingi and Kitui Districts, Kenya

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Abbreviations

AHA	Animal Health Assistant
BAT	British American Tobacco
CAHW	Community Animal Health Worker
CBD AH	Community-Based Decentralised Animal Health
DVO	District Veterinary Officer
FARM-Africa	Food and Agriculture Research Management Ltd
GDP	Gross Domestic Product
GoK	Government of Kenya
ICT	Information Communication Technology
KDGCBP	Kenya Dairy Goat and Capacity Building Project
MWIKI	Mwingi Kitui Animal Health Workers Group
PSV	Public Service Vehicle
SAP	Structural Adjustment Programmes
SF	Safaricom Foundation
SMS	Short Messages Service

I. Introduction

Following the decline in the Gross Domestic Product of African countries in the late 1980s, the World Bank and International Monetary Fund recommended an implementation of Structural Adjustment Programmes (SAPs). One of the effects of the SAP in Kenya was a freeze on the employment of veterinary graduates of different cadres by the Government of Kenya (GoK). Due to retirement and natural attrition, the number of veterinary personnel has continued to decline over the past 20 years. The Arid and Semi-Arid Lands (ASALs), already disadvantaged by their poor infrastructure, have been the most affected by the GoK policy change.

To improve farmer livelihoods in the ASAL region, FARM-Africa implemented the Kenya Dairy Goat and Capacity Building Project (KDGCBP) in Mwingi and Kitui Districts. An animal health delivery service component was included to ensure the success of the project. From FARM-Africa and other service providers' experience, and lessons learnt in the delivery of animal health services over the years, conventional models of private animal health services would not be suited to the marginalised and resource-poor area of Mwingi and Kitui Districts. Poor awareness of animal health and the subsistence-oriented production system, combined with a poor communication and transport infrastructure, required that an alternative animal health delivery service system be implemented. A system incorporating a network of Community Animal Health Workers (CAHWs), Animal Health Assistants (AHAs) and Veterinary Surgeons was introduced. To enable effective communication at all levels within the network, FARM-Africa approached the Safaricom Foundation (SF) to provide a telecommunications infrastructure which included the use of mobile phones and community pay phones.

2. Project background

FARM-Africa has been implementing dairy goat improvement projects in rural African communities for more than 10 years. The Kenya Dairy Goat and Capacity Building Project (KDGCBP) started in August 2004 with funding from the European Union (EU), Safaricom Foundation and FARM-Africa among others. The KDGCBP is operating in semi-arid Mwingi and Kitui Districts of Kenya (see Appendix I for additional information about the implementation of the project) and has two major components: a community-based goat improvement programme and a Community-Based Decentralised Animal Health (CBDAH) service delivery system (see Figure 1 on page 4).

Goat improvement involves cross-breeding of local goat breeds (see Photo 1) with high milk yielding Toggenburg goats imported from the UK (see Photo 2). The cross-bred goats (see Photo 3) (75 per cent Toggenburg and 25 per cent local variety) are a very effective way of increasing livelihood assets of poor households as the cross-bred goats produce more milk and grow much faster and larger than the local goats. The Breeding Plan ensures that the stabilised cross-bred goat continues to produce more milk (due to its predominantly Toggenburg genetic make-up) but with minimal veterinary care.



Photo 1. Local Galla female goat



Photo 2. UK Toggenburg goat



Photo 3. Offspring from cross-breeding - 75% Toggenburg, 25% Galla

Previous Non-Governmental Organisations' (NGOs) goat projects in Kitui and Mwingi relied on distributing improved stock, but without the corresponding support to animal health and sustainable breeding systems. As a result, the output of goat's milk and meat declined as the genetic improvements dissipated and animals were managed on a free-range basis, leaving

them more susceptible to the spread of disease and high rates of mortality. Existing animal health services available to farmers have also been in decline whilst they remained a public sector monopoly. The GoK has failed to deliver clinical and extension services to the rural poor in Mwingi and Kitui districts due to:

- Strained government budget to meet the operational costs;
- High costs of veterinary drugs and equipment;
- Unreliable transport facilities from the government offices;
- Poor infrastructure especially road network, communications;
- Inadequate veterinary personnel on the ground to meet the demand for the service;
- Sparsely placed or non-existent GoK personnel; and,
- High cost of veterinary surgeons attending cases.

A baseline survey conducted by FARM-Africa in March 2005 at the start of the project found that:

- Farmers spend a lot of time and money looking for veterinary services;
- There are very unreliable veterinary services and inputs in both districts;
- There were no veterinary personnel in the area where the survey took place; and,
- Very serious disease outbreaks were common which frequently led to the death of many animals because they were not noticed early enough.

With the implementation of the Kenya Veterinary Privatisation Scheme, the possibility of a sustainable community-based private sector approach became legally possible.

In response, one of the major elements of FARM-Africa's strategy is the promotion of a cost-effective CBDAH system to ensure that animal diseases, which threaten the goats and other livestock, are carefully monitored and treated. The CBDAH system serves as the lifeblood of the project, creating animal health services for the project beneficiaries and the wider community, as well as offering new livelihoods for CAHWs.

Figure 1. KDGCBP Community-Based Decentralised Animal Health Delivery System

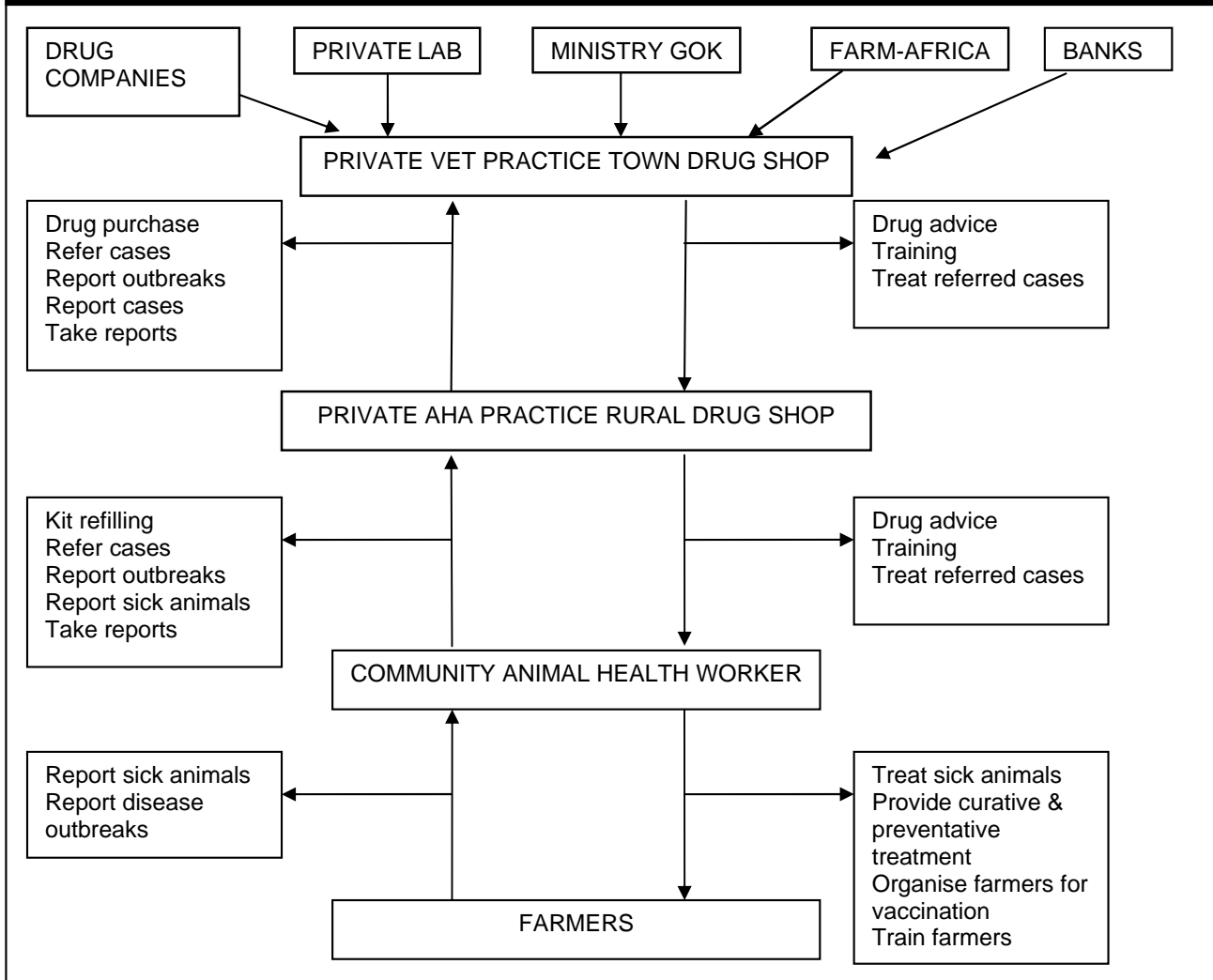
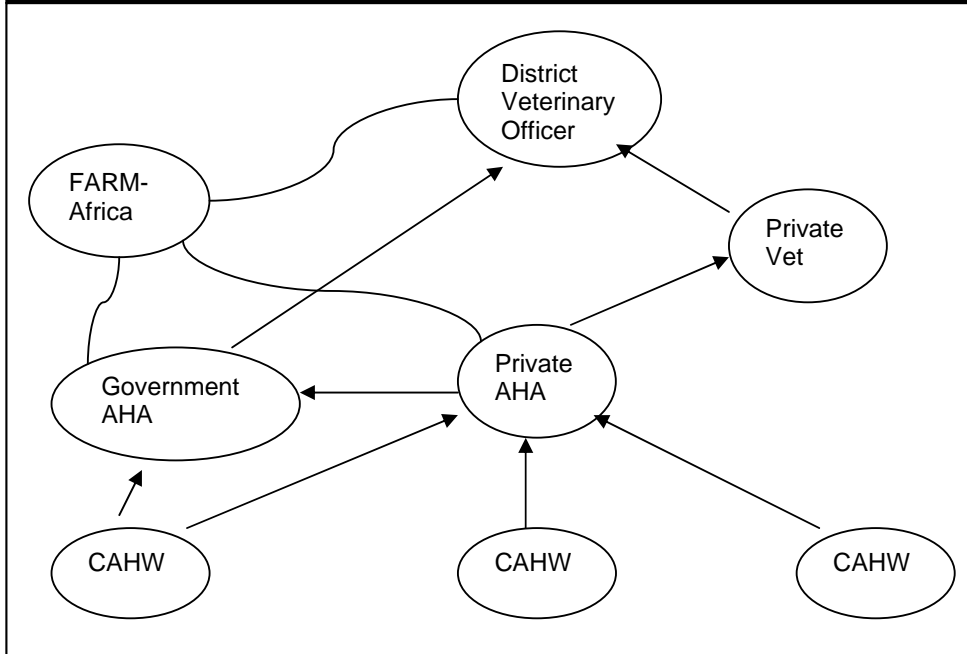


Figure 2. The CBDAH reporting system



Groups of resource-poor community members (see Photo 4) are first established to manage a goat improvement breeding programme. This method is more cost-effective, reaches more people and utilises resources more effectively. Each group then selects one member to be trained as a CAHW to take care of their livestock health. They receive basic veterinary and livestock healthcare training from FARM-Africa to allow them to diagnose common diseases, castrate livestock, apply preventative treatment and practice basic animal health care. CAHWs also receive a drug kit to help them deliver the animal health service.



Photo 4. Community meeting

To improve the farmers and CAHWs' access to animal health services in their areas of operation, a CBDAH system was established (see Figures 1 and 2 above). The CBDAH system involves linking farmers to trained CAHWs, who deliver basic animal health care services at the village level, and they in turn, are linked to FARM-Africa-supported private Animal Health Assistants (AHAs). The AHAs undergo a one-year professional training course and are provided with loans by FARM-Africa to set up small rural drug shops. Each

rural drug shop serves four to five CAHWs. The AHAs are, in turn, linked to fully qualified private Veterinary Surgeons for supervision and referrals. The vets are also provided with a FARM-Africa loan to establish a veterinary drug store which is usually located in the larger towns.

Challenges faced by the CBDAH system

As the CAHWs were drawn from the most resource poor of the community, they did not have the resources to regularly communicate with the AHAs in the CBDAH system to seek advice and report any incidences. The distances they had to travel, coupled with their limited funds to hire alternative transport, restricted their ability to meet with AHAs and other CAHWs. The lack of a telecommunications infrastructure (there was no mobile phone network in the project area) further prevented the members of the CBDAH system to communicate with each other. Consequently, reporting of diseases was haphazard, vaccination campaigns stalled and CAHWs were unable to seek assistance in treating more complex cases. It was also difficult to arrange meetings of all the CAHWs due to the high cost involved in contacting each one. The CBDAH system, which should have acted as an informal communications network providing the spread of agricultural information and encouraging CAHW, AHA, vet and farmer contact, was therefore undermined. Failing to provide a comprehensive and effective animal health service delivery would affect the health of livestock and the livelihoods of the farmers.

3. Using telecommunications to improve communications within the Community-Based Decentralised Animal Health (CBDAH) system

In order to develop an effective CBDAH system, it was decided to link key participants with a telecommunications infrastructure. This would enable CAHWs to communicate with each other and AHAs, enabling them to get assistance with disease diagnosis and more effectively target interventions and resources. They would also be able to communicate directly with the vets and AHAs on the disease situation and obtain assistance if needed. More widely, a telecommunications infrastructure would allow for more effective access to and sharing of local and global knowledge on dairy goats, crops, pest management and other aspects of small-scale agriculture relevant to the needs of the poorest. Vaccination campaigns could also be organised and conducted more effectively.

In addition local government officials would receive better information about the needs of the poor, communicate these needs more effectively to other levels of government, and be held more accountable by the local people they serve.

The telecommunications infrastructure would also help local businesses (veterinary practices, micro enterprise projects) be more productive and responsive to their clients/customers. Market information could be obtained more readily and relayed to the rural communities and feedback obtained. The technology would help community groups to mobilise more effectively, articulate the interests of the poor at the local level and share information and strategies with similar groups elsewhere.

The KDGCBP project was an exiting and innovative test of telecommunications technology within agricultural development, particularly with it being used for the benefit of the poorest.

Implementation of the telecommunications infrastructure

FARM-Africa approached the Safaricom Foundation (SF), the Corporate Social Responsibility arm of a Kenyan mobile phone service provider, to support and strengthen the KDGCBP CBDAH system through provision of funds for training CAHWs and purchasing CAHW veterinary drug kits, mobile phones, bicycles and community pay phones. SF participated in

the KDGCBP project as part of their Social Reasonability Programme. The project also gave them an added benefit of expanding their services into a new area, increasing client numbers and improving their public corporate social image.

At the official project launch on 21st September 2005, SF Chairman Mr. Les Baillie presented mobile phones to 30 CAHWs, six AHAs and two vets, (see Photos 5 and 6) who subsequently received training in the proper use of the equipment from Safaricom employees (see Photo 7).



Photo 5. SF Chairman presenting the phones



Photo 6. CAHWs, AHAs and vets with their drug kits and mobile phones

All the CAHWs had undergone basic formal education so it took a relatively short time for them to understand how to operate the mobile phones. The CAHWs pay 50 per cent of the total drug kit and mobile cost over a period of 24 months with the money going towards the CAHW group's revolving fund. The CAHWs' mobile phones are a basic type (able to make and receive calls and with Short Message Service (SMS), but they are not able to access the internet). All mobile phones were provided with an initial credit of one thousand Kenya shillings. This money did not need to be repaid into the revolving kitty.

In addition, eight community pay phone units were given to the AHAs and vets to be placed in the drug shops (see Table 1 overleaf) for use by the local community at a small fee (see Photos 7 and 8). The owner of the community pay phone would remain responsible for maintenance and repairs, and would keep all the money it generates. The community pay phones are powered using battery and solar panels, since electricity supply is a problem in the project area.



Photo 7. A CAHW receiving training on how to use the mobile phone

Table 1. Distribution of drug shops in KDGCBP

Location	Owner	Sex	Qualification	District	Supervision
Mwingi Town	Dr. Martha Kata	Female	Veterinary Surgeon	Mwingi	3 AHAs
Nzeluni	Savali Mbui	Male	AHA	Mwingi	6 CAHWs
Ngomeni	Ruth Katunge	Female	AHA	Mwingi	6 CAHWs
Nuu	Safari Muthuka	Male	AHA	Mwingi	6 CAHWs
Kitui Town	Dr. Bernard Muindi	Male	Veterinary Surgeon	Kitui	3 AHAs
Nzangathi	Charles Mutunga	Male	AHA	Kitui	4 CAHWs
Kitui	Magdalene Mueni	Female	AHA	Kitui	4 CAHWs
Chuluni	Peter Mwau	Male	AHA	Kitui	4 CAHWs



Photo 7. The community pay phone kit



Photo 8. A vet in his shop with his community pay phone

4. Benefits of the telecommunications infrastructure

The telecommunications system has enabled the animal health care service providers to keep one another updated on animal health issues (see Photo 9), share information on availability of essential veterinary drugs and perfect the referral system. Referrals are now more cost-effective and take the shortest time possible. It has also contributed to a reduction in transaction costs (the cost of farmer and vet transport, cost of time spent travelling and other miscellaneous costs involved in animal treatment), leading to increased access to and efficiency of animal health service delivery (see Tables 2 and 3 overleaf). Transport costs have reduced for the CAHWs as they are able to make case referrals and diagnosis over the phone. Farmers' lives have been made easier as they can now use SMS (using their own or the CAHWs' mobile phones) or the community phones to contact a CAHW, AHA or vet instead of having to walk very long distances to look for them. Supervision, reporting and monitoring of CAHW/AHAs' performance has also been made easier. Beneficiaries (farmers and livestock traders) are also more informed on what is happening around them particularly on disease occurrences and developments in the livestock market.



Photo 9. An AHA receiving a call from a CAHW on his mobile

The mobile phones have also increased the social capital of the CAHWs, AHAs and vets which have resulted in a greater use of the CAHW service. The mobile phones, together with the bicycles, have helped the CAHWs to cover a greater area and each CAHW is currently serving an average of 300 households. Drug sales and the number of services rendered have also increased thereby increasing the incomes of the CAHWs, AHAs and vets. In the first year (September 2005 to August 2006) a total of 12,707 cases have been attended to (treated) generating an income of 571,201 Kenya Shillings for the CAHWs.

The community pay phones have helped the AHAs and private vets to diversify their income. Mr. Savali Mbui, a private AHA, reported in 2006 that the community mobile phone services helped him increase his profit margin by 28 percentage points (from 17 per cent to 45 per cent).

Table 2. Actual cost of KDGCBP organising a meeting for 30 CAHWs

Description	Without mobile	With mobile	
		SMS	Calling
Travel (700 km)	35,000	0	0
Driver salary (2 days)	2,000	0	0
Officer salary (2 days)	4,000	0	0
Subsistence (2 days)	8,000	0	0
SMS cost	0	75	0
Calling cost	0	0	600
Miscellaneous	5,000	50	100
Total	54,000	125	700

* Note: all costs are in Kenya Shillings (KES) where £1 = KES 136.

Table 3. Average cost of a CAHW or AHA referring a case to the supervisor (this can also be applied to the cost of a farmer seeking veterinary service)

Description	Without mobile	With mobile	
		SMS	Calling
Transport	400	0	0
SMS cost	0	2.50	0
Calling cost	0	0	20
Time spent (10 hrs)**	500	0	0
Total	900	2.50	20

Note:

* All costs are in Kenya Shillings (KES) where £1 = KES 136.

** The distance to reach a veterinary advisor was very long and time consuming

The local government's veterinary department is also benefiting from the new CBDAH system as disease surveillance has improved. The CAHWs in the rural areas are keeping them regularly informed about incidences of notifiable diseases such as rift valley fever, avian

flu, foot and mouth disease and caprine pleuro-pneumonia. For example, rift valley fever was detected by CAHWs in the two districts and they passed this information immediately to the District Veterinary Officer (DVO). Samples were taken and the disease confirmed. The DVO then called the CAHWs to mobilise the community for vaccination of their livestock.

For the entire community, the support from Safaricom Foundation has brought hope to areas where accessing a mobile phone network was previously only a dream. Richer members of the community have bought their own mobile phones having seen their importance and this has also increased the CAHWs' client base. In addition, the mobile phones and, more particularly the community phones, are not just limited to animal health related issues – they have helped a community maintain and expand their social networks.

Case Study – Mr. Savali Mbui, an Animal Health Assistant



Mr Savali Mbui, 40 years old from Mwingi District, is a trained Animal Health Assistant. Although he is a qualified AHA, he could not secure a job with the GoK veterinary services as they had stopped taking on new staff in its effort to implement the structural adjustment programmes.

He returned home and started offering animal health clinical services. Savali used a bicycle given by his father to attend to animal cases. On average Savali could only attend to one case a day and many days went without clinical cases.

Savali struggled to cope. “I became so frustrated that I had not appetite and so I was losing my weight day by day,” Savali remembers.

“In September 2005, I was invited by FARM-Africa for CAHWs training preparation and later on for CAHWs training. It is after this training that my life witnessed a turn. On the material day in September 2005 I received a mobile phone and a Safaricom line number 0723764528 and a community pay phone, Safaricom line number 0720525524. I was extremely elated. All the other five AHAs, two vets & 30 CAHWs received mobile phones. What excited me most together with other AHAs and vets was the phone. I had never thought of owning a community pay phone in my life.

“I went home from this CAHWs training a very happy person. Upon arrival at home with all these electronics my wife was also very excited. At that day, I thought I should think outside

the box and now see how best the phones can help me. I printed business cards and distributed them to various people and neighbouring markets as I went out treating animals.

“Unfortunately the Safaricom network was so limited and scanty that I could not effectively use the phone I had just acquired. Nevertheless, I started getting an improvement in my clinical cases. Many people can now reach me through SMS instead of coming to our home. This has improved my work. On average, clinical cases increased to about five a day.

“I received the mobile and payphones in September 2005 and in January 2006, I was advanced a loan by Kenya Commercial Bank, in collaboration with FARM-Africa, and opened a drug shop at Mwanzilu market in Nzeluni location, Mwingi Central division. Immediately I opened the drug shop I placed my payphone in the shop. Despite poor Safaricom network, the Adondo payphone could receive the network well. This was not only a miracle but also an advantage to my business,” Savali noted. “It was the only payphone in the market that could receive calls and the community really made many calls. People in that market said and continue to say that my pay phone is very cheap, even cheaper than calling through their mobile phones.

“Since my drug shop is located in an area without electricity, FARM-Africa bought for us a solar panel and solar battery so that the pay phone can run for 24 hours. With an increase of pay phone profit margin from 17 per cent to 45 per cent, there has been a saving and also a boost to my drug shop business.

“Because of the Safaricom network and mobile phones, I am able to communicate with the CAHWs I supervise, whether I am in the shop or in the field, and provide advice in case of a challenging case. I also frequently call the vet for advice or even to procure drugs, this has saved me money for transport from field to vet and to the field again.”

Savali continued to say that he currently does not have to travel to town to buy drugs, he just calls the vet, orders them, they are then put in Public Service Vehicle (PSV) and he receives them at his shop. This, he noted, continues to raise his profit margin.

“This communication system has helped me get many customers because farmers may call me either through mobile or payphone. At any given time, my shop attendant (Celina Nzambi) is available to answer payphone incoming calls. Farmers can get me wherever I am.” Savali noted that particularly the rich clients prefer calling him because they say it saves them fuel to his home or drug shop.

“CAHWs also call me any time even if they are unable to make diagnosis and I advise them. They also ‘SMS’ me and in turn I give them advice. This has made my current clinical cases

to a daily average of eight, with my monthly pay phone averaging 3,000/= . I also sell mobile phone credit cards and I sell an average of 4,000/= a day.”

Savali now says that his social capital has “tremendously gone up, for he is now well recognised by both the poor and the rich”. Farmers think that the drug shop is a good idea as they used to travel 17km in search of vet drugs and services. Now they just click a button and services are available.

5. Challenges faced in the implementation of the telecommunications system

The KDGCBP faced several challenges in the implementation of the CBDAH system. Specific challenges related to the introduction of the telecommunications infrastructure in animal health service provision are outlined below – the more general challenges are described in Appendix 2.

First, the CBDAH system is being implemented in remote districts of Mwingi and Kitui, which, at the beginning of the project, did not have a mobile phone network. Safaricom gradually installed more aerials and within nine months the project area was fully covered by the mobile network and all 30 CAHWs could access it (see Table 4 overleaf). This has led to an increase in the number of cases referred to AHAs (see Table 5 on page 17).

Second, the mobile phone handsets require regular charging of their batteries, which is not easy for CAHWs since they operate in areas without electricity. They have therefore had to rely on neighbours and AHAs with solar panels for charging their handsets. A community source of electricity to the area is not foreseen in the near future so people who have solar panels and batteries now charge mobile phones for a fee. The vets and AHAs who have solar panels are also able to offer this service. Some CAHWs and AHAs also hire out their mobile phones for neighbours to use at a small fee. As the CAHWs, AHAs and vets are responsible for repairs and maintenance of their phones, they are able to keep any profits that the phone generates.

Finally, the AHAs and vets operating the community pay phones are not able to ‘top-up’ the credit on their phones locally. Instead, they have to deposit money with the National Bank of Kenya for the ‘top-up’ to be effected. There are no branches of this bank in the project area which makes it difficult to get regular ‘top-ups’ of the community phones. Some CAHWs also find it difficult to get additional credit for their phones.

Table 4. Showing increase in mobile network coverage in the project area

CAHW	Dec 05	Mar 06	Jun 06	Sep 06	Jun 07
Bernard Wambua	+	+	+	+	+
David Mutinda	-	+	+	+	+
David Mwinzi	-	-	-	-	+
Job Mwinzi	-	-	-	-	+
Joseph Nguli	-	+	+	+	+
Kilonzo Nguu	-	-	-	-	+
Kimanzi Kimotho	-	-	-	+	+
Kithuku Musya	-	-	-	-	+
Macdonald Munuve	-	+	+	+	+
Maria Kituku	-	-	-	-	+
Monica Mutia	-	-	+	+	+
Mulinge Syengo	-	-	-	-	+
Musyoki Munyoki	-	-	-	-	+
Mutheki Mutunga	-	-	-	-	+
Mutunie Kasyula	-	-	+	+	+
Mwangangi Malomb	-	-	+	+	+
Mwangangi Maithya	-	-	-	+	+
Mwangi Muthembwa	-	+	+	+	+
Mwendwa Kitheka	-	-	-	-	+
Paul Museembeie	-	+	+	+	+
Pauline Kikuu	-	-	-	-	+
Rochester Mwema	-	-	+	+	+

Rose Kivonya	-	+	+	+	+
Ruben Mbulu	+	+	+	+	+
Samweli Musyimi	-	-	-	-	+
Syengo Solomon	-	-	-	-	+
Syombua Titus	+	+	+	+	+
Veronica Nzau	-	+	+	+	+
Titus Mbuvi	+	+	+	+	+
Winfred Ndenge.	+	+	+	+	+
Without Network	25	18	14	12	0
With Network	5	12	16	18	30

Table 5. Number of referral cases made after the improvement of mobile network coverage

Month	No of referred cases by CAHWs, AHA and vests
Jan 2007	55
Feb 2007	45
March 2007	39
April 2007	55
May 2007	82
June 2007	123
July 2007	117
Total	516

6. Conclusion

The use of telecommunications has helped to improve communication within the CBDAH system as it overcomes the infrastructure challenges experienced in the arid districts.

Overall the introduction of this new technology has been a great success.

One of the principal lessons learned from the implementation of this project is that mobile phones telephony will only work well in increasing animal health service delivery if the network is available at the inception of the project. The delay in CAHWs, AHAs and vets having access to the mobile phone network had a negative impact on the project and the communities' opinion of it.

Despite this limitation, the telecommunication infrastructure has improved the CBDAH system and the following outcomes have been observed.

- Mobile phones have played a key role in fighting livestock disease outbreaks. Livestock diseases in the district are reported in a timely fashion by the CAHWs using their phone handsets and can be effectively contained by the veterinary department. The referral system is rendered more cost-effective and takes the shortest time possible, while supervision, reporting and monitoring of CAHWs, AHAs and vets' performance is much easier.
- Mobile phones have contributed to increased attendance and participation in animal health providers' meetings, which can now be convened or cancelled at short notice through use of the mobile phones.
- Use of mobile phones has reduced the transaction costs to the farmer since it is now possible to make a diagnosis over the phone without incurring transportation costs.
- Use of mobile phones has helped the AHAs and vets increase profit margins at their veterinary drug shops; they have used them to place orders for drugs, thus avoiding the time and expense of unnecessary trips for drug procurement. The community pay phones also attract more clients.
- The introduction of community pay phones has led to increased drug shop business particularly in the rural towns.

- Through the use of mobile phones the KDGCBP beneficiaries, who are mostly poor farmers, are more informed about what is happening around them particularly in relation to disease occurrences and market prices of animals.
- The use of mobile phones by the animal health service providers has greatly increased their social capital and networks. After seeing their usefulness and efficiency, other beneficiaries have bought mobile phones. One such case is a buck keeper who sold water from his shallow well, constructed through the project, and used it to buy a mobile phone handset.

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Appendix I. The KDGCBP Project

The KDGCBP project establishes sustainable community-based dairy goat production and animal healthcare systems which are strengthened and supported by community-based organisations and local extension services. The project team works closely with farmers and government staff to develop appropriate systems in the dry Mwingi and Kitui Districts of Eastern Kenya. FARM-Africa's approach here is to build on its experiences in Meru and in Ethiopia, Tanzania and Uganda and to share our successes with farmers in a range of environments in sub-Saharan Africa.

FARM-Africa implemented the KDGCBP project in response to the following challenges which Kitui and Mwingi districts faced:

- High livestock morbidity and mortality due to diseases;
- Frequent prolonged drought leading to inadequate fodder and water;
- Poor performing locally-adapted animal breeds;
- Poor infrastructure (e.g. roads, communication systems, markets);
- Inefficient and/or inaccessible agricultural and livestock extension services to farmers;
- High poverty levels (75 per cent of the population in the project area live on less than \$1 per day);
- Inappropriate development interventions, which have led to dependency syndrome in the population;
- Lack of community-based mechanisms or institutions to handle livestock-based community development processes;
- Lack of institutional linkages between local, divisional, district and national levels;
- Grossly inadequate veterinary personnel and poor linkages between service providers; and,
- No appropriate interventions to address animal health service delivery at the community level.

The project aims to increase the productivity of local dairy goats through breeding them with Toggenburg goats. Cross-bred goats (50 per cent Toggenburg, 50 per cent local) fetch more money in the local market than the local goats because they reach market weight at a younger age and consumers prefer tender meat. The second generation female offspring (75 per cent Toggenburg, 25 per cent local) produce about six times more milk than the local

doe. The stabilisation of the breeding is done at this second generation (75 per cent: 25 per cent) genotype because the local goats are more resistant to the local diseases and pests and more adapted to the local harsh environmental conditions. This ensures that the stabilised cross-bred goat continues to produce more milk (due to its predominantly Toggenburg genetic make-up) but with minimal veterinary care.

The groups themselves undergo a series of trainings to make them more cohesive, to increase their social networks and to better utilise their available resources.

Appendix 2. Challenges to the Community-Based Decentralised Animal Health system

There have been additional challenges to the CBDAH system which are not related to the implementation of the telecommunications infrastructure. These are:

- Government personnel resistance - some personnel were viewing the CBDAH system as unnecessary competition to veterinarians in the wake of dwindling clinical cases.
- Government Policy – the Veterinary Surgeons Act has no provision for CAHWs or even AHAs, thus they are not legally recognised.
- Low cash economy - it is not viable for vets to set up business inside the project area.
- Dependency syndrome - the community believed that FARM-Africa would give handouts and thus that the services from the vets, AHAs and CAHWs would be subsidised or free. This misconception was cleared up as early as possible.
- Lack of entrepreneurship skills – the vets' and AHAs' college training curriculum lacks a component on entrepreneurship. The project thus had to introduce special short courses in business skills.
- Lack of loan securities - many of the young vets and AHAs, though enthusiastic to take up loans, didn't have the conventional collateral. FARM-Africa had to assist through a fixed deposit at Kenya Commercial Bank and also negotiate with the bank to accept non-conventional securities from the borrowers.
- Interest rates and bank charges - the interest rates offered by banks are very high hence FARM-Africa had to negotiate with the bank to lower the interest rates, using the interest from the fixed deposits to cushion the young entrepreneurs.
- Adverse weather conditions – businesses are severely affected by the frequent droughts, leading to some vets and AHAs experiencing problems in repaying their monthly loan premiums.
- Lack of funds for diversification - the farmers expect a one-stop shop where they can get clinical services, artificial insemination, veterinary drugs and extension services. The loans offered to the AHAs and vets are inadequate to enable them to diversify.
- Training of CAHWs – although they are all literate, the CAHWs are virtually all only trainable in the vernacular. This was a challenge as the trainers were not necessarily conversant with the language and it was thus important that they adopt very practical training methods.



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