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SPECIAL ISSUE

Linking research and community-based animal healthcare in East Africa

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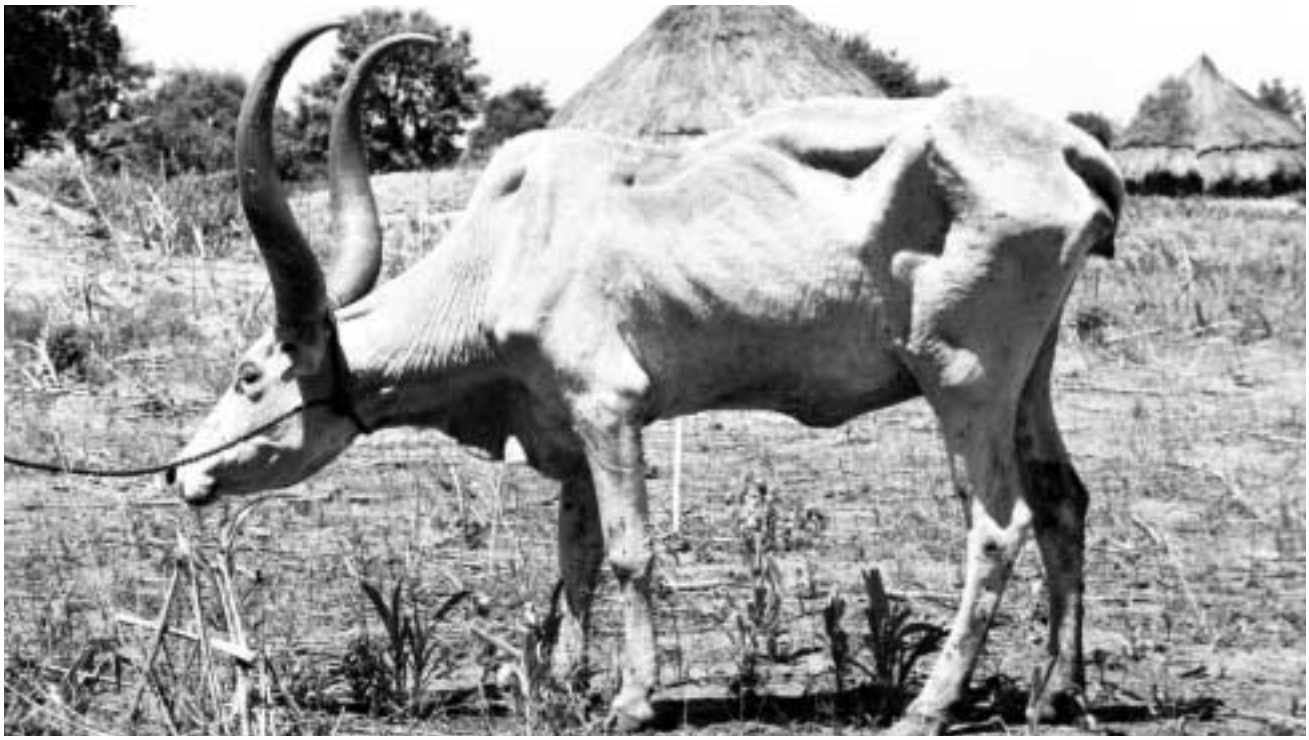
Introduction

Almost by definition, community-based animal health programmes operate in more remote and marginalised areas. Difficult access to these areas often means that limited disease investigation or research has been conducted and therefore, basic technical information on livestock diseases is lacking. During participatory assessment, livestock keepers usually identify a limited number of important diseases that can be prevented or treated by community-based animal health workers (CAHWs). Typically, the selection of medicines to reduce problems such as worms, ticks, trypanosomiasis or other diseases is decided by a veterinarian or animal health assistant. Professional judgements are made concerning the most appropriate types of medicines to use, and how to use them. This approach enables CAHW programmes to become functional relatively quickly and people soon see the benefits of improved animal health. However, there are important limitations:

- Some important diseases 'look the same'. They show similar clinical signs and can only be distinguished using laboratory tests or other diagnostic procedures. To complicate matters, an animal can also be suffering from two or more diseases at the same time. In remote areas, the nearest laboratory can be many kilometres away and blood or tissue samples are easily spoiled in transit to the laboratory. Even when diagnostic tests are available for field use, veterinarians can lack the specialist skills required to use and interpret the tests correctly. If identification of a disease problem is incorrect, CAHWs will be trained to prevent or treat the wrong disease.
- Even when diseases are correctly identified and successfully controlled in the short-term, long-term control strategies require an understanding of the epidemiology and economics of disease. The epidemiology of livestock diseases is often complex and sub-optimal use of medicines can lead to drug resistance. Medicines used in CAHW programmes include drugs to control worms (anthelmintics), bacterial infections (antibiotics), blood parasites (e.g. trypanocides), and ticks (acaricides). Resistance to all these drug types is common, even in relatively developed areas where veterinarians control drug distribution and use. As CAHW programmes develop, veterinary professionals need to provide advise on the use of medicines based on technical information.

Both these issues indicate that CAHW programmes can be strengthened through linkages with veterinary investigation specialists and researchers. This paper describes how such linkages were developed in southern Sudan, Kenya, and Tanzania. It discusses how both CAHW programmes and researchers benefit from working together using participatory research approaches.

What's your diagnosis? A thin cow in southern Sudan could be suffering from various diseases



Linking community-based projects to veterinary researchers

The Participatory Approaches to Veterinary Epidemiology (PAVE) project at IIED ran from 1998 to 2000 and aimed to assess the roles of participatory appraisal in veterinary investigation and epidemiology. The first stage of the project was a survey of veterinarians working in Africa to find out if and how they were using participatory approaches and methods. An important finding of the survey was that although many vets considered participatory approaches to be good for building better relationships with communities, they also felt that participatory methods were not reliable and therefore, not acceptable to senior decision makers (Catley, 2000). For veterinary researchers, there was a strong feeling that 'we can't publish papers if we use these methods, and we must publish.'

Therefore, PAVE focused on assessing the validity and reliability of methods. The research methodology was based on a series of disease studies and comparison of results derived from participatory and conventional veterinary methods. PAVE hoped to work with field-level animal health workers to design and implement studies on disease problems. The criteria for selecting research partners and topics for research included:

- evidence that livestock keepers had requested assistance to solve a particular disease problem;
- presence of a well-established and functional animal health service at field level, with good links to communities; and
- capacity for sharing of research costs with PAVE.

PAVE was not restricted to specific disease problems. With these criteria in mind, PAVE approached government veterinary services, research institutes, and non governmental organisations to identify research topics and partners. Two PAVE studies involved work with CAHW programmes in southern Sudan and Kenya, as summarised in Table 1.

The Ormilo Research Project is based at the Veterinary Investigation Centre, Arusha, Tanzania and is ongoing. Ormilo emerged as a problem in northern Tanzania around 1980 and was diagnosed by veterinarians as bovine cerebral theileriosis[1] (using molecular diagnostics tools). The outputs of the project were to confirm the incidence of the disease, to assess its true social and economic impact, to record the presence of blood parasites and other possible disease agents and risk factors, and to make a start in understanding the epidemiology of this disease. One interesting feature of the disease was that the causal parasite was previously thought to be harmless to cattle. The project also aimed to evaluate possible treatment regimes and to develop appropriate control methods.

1 This disease is caused by a parasite called *Theileria taurotragi* that is transmitted by ticks. Affected cattle show signs of nervous system disease.

Table 1: Research activities involving community-based animal health programmes

Description	Community-based animal health programmes	Technical partners
Southern Sudan PAVE Project: Diagnosis of liei, a chronic wasting disease in cattle Western Upper Nile, Upper Nile, and Bahr el Ghazal, with Nuer and Dinka communities. Local characterisation of diseases and comparison with veterinary opinion, pathological examination, and laboratory investigation.	• Operation Lifeline Sudan (Southern Sector) Livestock Programme • VSF Switzerland • Save the Children UK	• Kenya Trypanosomiasis Research Institute (KETRI)
Kenya PAVE Project: Studies on bovine trypanosomiasis or gandi with Orma communities in Tana River District. Local characterisation of disease, incidence estimates, and analysis of preferences for disease control methods.	• Catholic Relief Services • Diocese of Malindi	• Kenya Trypanosomiasis Research Institute (KETRI)
Tanzania Ormilo Research Project: Studies on bovine cerebral theileriosis or ormilo with Maasai communities in Arusha region. Sampling of clinical cases, estimates of disease incidence, drug trials on clinical cases	• VETAID-Tanzania • Ilaramatak (a local pastoralist NGO)	• Veterinary Investigation Centre, Arusha (Ministry of Water and Livestock Development) • Sokoine University of Agriculture, Tanzania • University of Pretoria, South Africa

Who was saying that the research was needed?

In the three studies outlined in Table 1, there was strong evidence that the research topic was a priority for livestock keepers. In southern Sudan, the disease called liei was mentioned with increasing frequency by herders to NGO vets on the ground. The exact diagnosis of this chronic wasting disease, and therefore the most appropriate treatment, was the subject of debate among vets and herders. In Kenya, trypanosomiasis in cattle was considered a priority by cattle herders in Tana River and there was regular purchase of drugs to prevent and treat the disease. However, the Kenya Trypanosomiasis Research Institute was keen to test alternative methods of disease control, and was also concerned that sub-optimal use of drugs might lead to drug resistance. Therefore, the Tana River study included participatory analysis of control methods for trypanosomiasis and identification of best-bet solutions. In both studies, research objectives and study locations were defined with partner organisations centrally. However, the detailed design of the research was conducted at field level with the assistance of various local players, including CAHWs.

In the Ormilo Research Project, the need to investigate the disease was articulated by livestock keepers during participatory ranking of priority diseases in 2000 and 2001 carried out by another project, the Tick and Tick-borne Disease Control Project. Ormilo was ranked as the highest disease priority by pastoralist communities and up to 80% of affected animals died. Conventional and ethnoveterinary control methods had proved to be unsuccessful.

Roles of community-based workers

Research design

In more effective community-based animal health programmes, communities select workers who are respected, active, good communicators, and who possess know-how of livestock management and diseases. Therefore, when designing research activities it is useful to form a team comprising the 'outsider' researchers and field-level workers. CAHWs and other workers can provide information on issues such as:

- history of the communities;
- community leadership and organisation, and local politics;
- location of livestock and communities, and seasonal movements;
- appropriate ways to approach communities and convenient times for meetings and other activities;
- logistics – condition of paths, roads, and rivers; areas of insecurity; and,
- possible expectations of communities.

Although CAHWs may be illiterate, methods such as participatory mapping by groups of CAHWs can be very useful for visualising the research area and identifying specific communities or livestock herds for research activities. This applies to either purposive or random sampling approaches. In all three studies described here, CAHWs were involved in identifying research sites.

Research implementation

In addition to helping with planning the research activities on

Well established community-based programmes in southern Sudan use participatory methods to analyse livestock disease problems

the ground, community-based workers can also greatly assist with research implementation. For example, in the PAVE study in southern Sudan, local workers were trained as translators and facilitators for participatory methods.

Another important task can be sampling animals and with some additional training, CAHWs soon become skilled at taking blood or other samples. Commonly, livestock are less disturbed by CAHWs than by visitors, and the sampling is actually easier with CAHWs than people with more formal training. Also, livestock keepers may prefer to have local CAHWs rather than outsiders handling their animals. In the PAVE Project in southern Sudan, CAHWs had been previously trained by UNICEF, Save the Children UK, and Vétérinaires san frontières-Switzerland depending on location. For the research, further hands-on training was provided in collection of blood samples from the jugular vein into blood tubes (vacutainers). A vet supervised the CAHWs when they were sampling. Here, it was clear that pastoralist CAHWs were used to bleeding cattle and easily located a jugular vein, even in fractious animals.

In the Ormilo project a different approach was used because the project involved regular monitoring of sentinel[2] herds in locations where no vets were present. The CAHWs had already undergone a two-week training course in 2000 at the Simanjiro Animal Health Training Centre, implemented by an NGO called Ilaramatak in collaboration with VetAid Tanzania. They had also received an additional two weeks of follow-up (refresher) training in 2001. At the start of the project, further training was given to CAHWs on sample collection, filling in of clinical cards, and clinical examination of animals as well as post mortem examinations.

Drug treatments were discussed as well as dosage and weighing of animals. Equipment such as microscope slides, slide storage boxes, alcohol preservatives, drugs, and needles were handed over to the CAHWs. A researcher or field officer visited the CAHWs every two weeks and all samples collected were handed over. This project also used CAHWs to administer on-the-spot treatments to cases of ormilo and in some cases, administer daily injections for up to four days.

2 The sentinel herds comprised livestock managed under normal field conditions by their keepers, and which were used to detect new cases of Ormilo and test different treatments.

Box 1: CAHWs and research implementation

■ **Identifying informants and organising groups**
As CAHWs can have very good relationships with communities and know who is who, they can assist with identifying informants and organising groups for discussions and sessions using participatory methods. CAHWs can be key informants for identifying other informants of various categories e.g. men and women, rich and poor.

■ **Translation**
CAHWs can be good translators if they speak the languages of the researchers and the community, but the usual rules apply. They can be biased and careful practice of interviews is required to ensure that questions and answers are properly translated. Translation is a skill – despite practise, not all CAHWs will make good translators.

■ **Sampling**
Routine training of CAHWs does not usually include sample collection. However, with additional training they often become skilled at taking blood or other samples. Teams of CAHWs, supervised by researchers, can be very efficient at this task.

■ **Administering trial treatments**
After sampling, a research project may require administration of trial medicines. As CAHWs are always with the animals, they can provide these treatments and record their activities. As with sampling, additional training is usually needed.

■ **Disseminating findings**
An existing network of CAHWs is a ready-made system for disseminating research findings to livestock keepers. Dissemination can be via community meetings or individual contact with people. Methods include simple oral transfer of news about a project to dissemination of leaflets or other materials.

■ **Applying new disease control strategies, better use of medicines**
When research leads to recommendations about improved ways to control disease, researchers can work with trainers of CAHWs to incorporate new information into CAHW refresher training courses. Again, CAHW systems are ready made networks for actually applying new methods of disease control.

Again, the close proximity of the CAHWs to the livestock and the understanding between CAHWs and herders made possible this aspect of the research.

Sharing the findings

As findings start to emerge from research, the presence of a CAHW system means that a mechanism for disseminating and discussing results is already in place. For example, in southern Sudan research findings were used to revise CAHW training courses and materials, and so better equip them to handle cases of liei. In Tanzania, results were discussed during the regular field visits by researchers or field officers to the study sites and CAHWs disseminated messages to communities during village meetings.

Should CAHWs be paid for their work?

Whatever the role of CAHWs, it is important at the beginning to discuss and agree incentives. When CAHWs work in the private sector, they cannot be expected to work for nothing and payments need to be defined. Also, many researchers use free treatment of animals as an incentive for livestock keepers to 'participate' in research. We prefer not to do this, but use CAHWs to provide treatments using their usual charging system. If the problem being investigated is a local priority, people are usually willing to take time to discuss the problem.

In the Ormilo project, CAHWs were paid a monthly allowance of Tanzania Shillings 20,000 (USD 20) after they had been appraised on their performance during that month. If irregularities occurred, such as poor compliance in filling in clinical cards, identification and fixation of samples, poor documentation of treatments and follow-up, and misuse of the drugs, the allowance was not paid. In southern Sudan, the research was more short-term and CAHWs were recruited on a daily basis and payments in cash, food or soap agreed beforehand.

Outcomes of the research

PAVE Southern Sudan

As described above, information about the diagnosis of liei was used to revise some training courses for CAHWs and other veterinary workers in southern Sudan. The research also led to a proposal to work with communities to test different treatments for liei, including assessment of clinical responses to treatment by both livestock keepers and vets. An important lesson however was that this proposal did not attract donor support, apparently because it lacked a quantitative description of liei in southern Sudan and evidence that communities perceived the disease as a major problem. At this time, two papers about the research had been published in a leading veterinary journal, including an account of how communities expressed a need for the research. This indicated that while an independent peer-reviewed assessment of the research was positive, donor assessment was driven by other values.

PAVE Tana River

The study in Tana River enabled KETRI, the main research partner, to revise their project. Initially, the project focused on the control of tsetse flies that transmit the disease trypanosomiasis. However, community assessment revealed that people were already accustomed to using drugs to prevent or control the disease, and they preferred information on how to use the drugs properly rather than control tsetse flies. They also assessed various control options in terms of the likely sustainability of each option and again, opted for

Community-based animal health workers are experienced handlers of livestock and with some additional training, soon become adept at sample collection.

the improved use of drugs. Although this was a good example of how community-based analysis can help researchers to refine their work, the actual implementation of the revised project was stopped by conflict between Orma pastoral communities and neighbouring Pokomo farmers. This experience indicated that in common with conventional research approaches, more community-based research is also affected by factors outside the control of the researchers.

Ormilo Research Project

The close monitoring of the sentinel herds by CAHWs as well as treatment of Ormilo cases has provided a better understanding of the age groups of cattle affected by the disease. It has also allowed an interim evaluation of different treatment options and confirmed the presence of the disease and causal parasite in the areas in the study. The work is ongoing and so far, disease confirmation could only be done (using molecular tools) on post-mortem samples. Therefore, care has to be taken on the treatment messages disseminated back to communities via the CAHWs about which drugs work best. However, the communities involved are happy with progress because the research has confirmed their opinion at the start of the project that Ormilo was different from classical East Coast Fever (ECF). This is an important scientific finding as the limited literature available restricts the condition of cerebral theileriosis in East Africa to ECF.

Lessons learnt

Strengths of using CAHWs for research

- Researchers addressing local problems with local people, rather than working in isolation of realities on the ground.
- CAHWs are key informants with good understanding of disease; they can be trained in research tasks (e.g. sample collection, translation) and because they are trusted locally, can assist with communicating with and organising community involvement.
- CAHWs are willing to work in remote areas under difficult conditions i.e. their normal working conditions, and will walk long distances to follow up reports of sick animals.
- CAHWs are close to the animals so that sample collection and treatments happen soon after animals become sick.
- Solutions to problems are tailored to local needs and capacity.
- A delivery system for research findings, via CAHWs, is already in place.
- A monitoring system for measuring both uptake and the impact of uptake of research findings is already in place.
- Although CAHWs need financial incentives, they are still relatively inexpensive.
- Improves technical credibility of CAHW programmes and helps to establish acceptance among policy makers.

Limitations of using CAHWs for research

- Needs more time to arrange the research, e.g. written

These CAHWs in Tanzania prepare and store blood smears in the Ormilo Research Project

agreements need to be made with more agencies than is the case with conventional approaches.
- Researchers need to be adaptive to constraints in more inaccessible areas and willing to adopt more participatory research approaches: this can require training of researchers, and lengthens the research process and increases costs.
- CAHWs make useful informants, translators, interviewers, and sample collectors, but bias needs to be considered – good supervision is important.
- CAHWs can be influenced by powerful elders or village leaders to use project medicines to treat animals affected by diseases other than those under investigation. Again, good supervision and monitoring is needed.
- Researchers need to work with good translators during CAHW training and when disseminating research findings. Poor translation can lead to confused messages being passed back to the community.
- A strong, well-established CAHW programme is needed to work with, as misunderstandings regarding financial remuneration between an implementing agency such as an NGO and the CAHWs can arise. This can interfere with the research process.
- Research using CAHWs is subject to some of the constraints facing more conventional approaches, such as insecurity and donor support.

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