

IMPACT OF COMMUNITY-BASED ANIMAL HEALTH WORKERS ON ANIMAL HEALTH AND EXTENSION SERVICES: A CASE STUDY OF SMALLHOLDER DAIRY FARMING AREAS OF EAST AND WEST USAMBARA, TANZANIA

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SUMMARY

A study was conducted in the East and West Usambara smallholder dairy farming areas to assess delivery of animal health and extension services. The study adopted participatory approach whereby information was collected by interviewing smallholder dairy farmers, leaders of farmers' networks and animal health service providers including community-based animal health workers (CAHWs), extension officers and veterinarians. Major production constraints reported by farmers were animal diseases and feeding problems. It was found that most of animal health delivery and extension services were offered by CAHWs mainly the farmer motivators and artificial inseminators thereby making extension officers almost redundant. The CAHWs had limited knowledge on diagnosis and management of disease conditions prevalent in the area. It is recommended that training and practising of CAHWs need to be improved including consideration of legal aspects so that they could offer better animal health and extension service and disease surveillance in the country.

INTRODUCTION

Smallholder dairy production is now a widespread practice in different regions of Tanzania including Tanga. In this region, smallholder dairy farming was introduced in mid 1980s through Tanga Dairy Development Programme (TDDP) with assistance from Tanzanian and Dutch governments (Zylstra et

al., 1995; Kurwijila, 2002). The main objectives of smallholder dairying were to alleviate poverty and improve human health through availability of milk for human consumption and sale.

Following phasing out of the TDDP in early 2000, a solution on the delivery of animal health services, an activity that was previously carried out by extension officers, had to be sought.

The Tanga Dairy Trust (TADAT) which was TDDP successor and the Dutch government through Smallholder Dairy Support Programme (SDSP) supported training of farmer motivators

A community-based animal health worker (CAHW) is defined as 'an individual from the community who is elected by the community to provide animal health services in the community' (Catley *et al.*, 2002). Services that are expected to be offered by the CAHW include treatment of sick animals, extension services on disease control and prevention and distribution of veterinary inputs.

The concept of CAHW has been promoted following the withdrawal of government from provision of animal health services and also new policy of the government, which encourages privatization of animal health services in the country (Presidential Circular No. 1 of 2002-URT, 2002). Following privatization of such services, a private animal health service provider has freedom to decide where to establish and run his/her business. Consequently some areas are 'marginalised' from animal health service provision, as most of the private service providers are reluctant to establish business there. Like in other countries, features such as low potential, remote, dry arid and semi-arid areas, which are predominantly inhabited by pastoral communities, identify 'marginalised' areas.

(FMs) to assist in offering animal health services based on the concept of Community Animal Health Service provision.

This study was aimed at assessing situation of animal health delivery services in high potential rural-based smallholder dairy farming areas of East and West Usambara mountains so that appropriate recommendations can be made on how to improve delivery of such services in these areas.

MATERIALS AND METHODS

Study area

The survey was conducted in rural-based smallholder dairy farming areas in the East Usambara (Upland zone of Muheza district) and West Usambara (Lushoto district) of Tanga region. The study area is mountainous with high rainfall (generally with an average annual rainfall of more than 1,500 mm). The study area is located at an altitude ranging between 400 and 1,500 m above sea level and has high relative humidity ranging between 65 and 90%. The area is covered mostly with tropical evergreen rain forest with the soils of the type generally found under the rain forests areas i.e. deeply weathered red loam soils derived from gneiss, grannulite or pegmatite which is acidic in nature (pH of 4.6 to 5.2). The topography of the area is of typical mountainous terrain posing challenge with regard to delivery of animal health services.

Data collection and analysis

The study was carried out between June and November 2005 using participatory qualitative approach. Different tools such as conducting in-depth interview of key informants who included animal health service providers in the area (CAHWs, extension officers and veterinarians) were used to collect data. Presence of farmers' organisations such as farmers' groups and networks in the study areas was exploited when leaders of these organisations called meetings thereby having forums for researchers and farmers to meet and exchange ideas. In addition, a formal meeting with extension officers was organised by the Muheza district council and researchers were given opportunity to conduct focus group discussion.

During interviews and discussions, respondents were asked to identify and rank common production constraints on their smallholder dairy farms in addition to providing information on how animal health delivery services were provided.

RESULTS

Major production constraints

Smallholder dairy production constraints identified in the study area are summarised in Table 1. Farmers considered animal diseases and dry season feeding to be the most important constraints they face.

Delivery of animal health services

It was observed that between early 1980 and 2000, the extension officers who were supported by TDDP and were also government employees mainly carried out delivery of animal health services in East and West Usambara areas. The extension officers were facilitated by TDDP through provision of motorcycles and fuel so that they could reach farmers in remote mountainous areas. The dairy development programme also supported regular training of the extension officers as part of the continuing education programme. Through this programme, animal health services were provided smoothly and timely due to commitment and mobility of service providers.

When TDDP phased out in 2000, TADAT took over as part of transition period to facilitate full-fledged handing over of dairy farming activities to farmers. The TADAT encouraged formation of farmers associations, which included farmers' groups and networks so that farmers could manage the heifer-in-trust (HIT) scheme including provision of animal health services. As extension officers were no longer supported by TDDP during this period, TADAT through SDSP facilitated training of FMs who would serve as CAHWs in the smallholder dairy farming communities.

The CAHWs interviewed reported to have had undergone an average of two-week training at the Livestock Training Institute (LITI) Tengeru in Arusha after which they started offering animal health services in their respective villages. The informants reported that during training, a participatory methodology was mainly used and that they were trained on a number of issues including:

- Introduction to animal health and how to diagnose a sick animal.
- Some specific disease conditions including tick-borne diseases such as the East Coast

fever, babesiosis, anaplasmosis and heartwater and; other diseases prevalent in Tanzania such as trypanosomosis, Food and Mouth Disease, Contagious Bovine Pleuropneumonia, Rinderpest, Pneumonia, Calf Scour, etc.

- Routine farm activities such as castration (closed method), disbudding, dehorning and hoof trimming.
- Record keeping and simplified case report writing.
- Financial and marketing issues related to veterinary input selling.

Table 1. Production constraints as identified and ranked by the smallholder dairy farmers in East and West Usambara areas, Tanga

Farmers' network	Location	Constraints	Priority
MVIAMA (network in Amani division, Muheza district)	East Usambara	1. Feeding	2
		2. Animal diseases	1
		3. Poor growth of calves	3
		4. Lack of good quality bulls	4
		4. Limited knowledge of Farmer motivators	5
MUVIWAMBUSO (network in Mgwashi, Bumbuli and Soni divisions, Lushoto district)	West Usambara	1. Poor conception rates	3
		2. Feeding (dry season)	2
		3. Animal diseases	1
		4. Limited knowledge of Farmer motivators	4
UVIWATALU (network in Lushoto division, Lushoto district)	West Usambara	1. Poverty	4
		2. Feeding (dry season)	1
		3. Animal diseases	2
		4. Lack of good quality bulls	3

It was also observed that in addition to TADAT/SDSP facilitation, training of CAHWs was supported by other non-governmental organisations such as the Land O'Lakes, which facilitated training of artificial inseminators. The inseminators were trained at the National Artificial Insemination Centre (NAIC) in Arusha for a period of two weeks after which they came back to serve their communities. This cadre was specifically trained on reproductive system and how to offer artificial insemination services to farmers in their communities. A total number of 23 and 45 CAHWs had been trained in Amani and Lushoto, respectively and were practising when we carried out this investigation.

Delivery of animal health services by CAHWs

Two scenarios were encountered with respect to delivery of animal health services by CAHWs in the smallholder dairy farming communities in the East and West Usambara areas:

Scenario I

This was the type of scenario described in many areas of the study site. Because CAHWs were chosen and expected to serve their communities after completing their training, it was reported that the CAHWs were mainly responsible to the farmers' groups or networks. In most cases, this led to conflict between the government-employed extension officers and the CAHWs.

By the time of conducting this investigation, the new cadre of FMs and artificial inseminators was the one mainly involved in disease diagnosis, treatment and offering extension services in the study area. It was also found that the extension officers in the study areas were almost redundant due to lack of logistical support including availability of means of transport and fuel and consequently, they could not reach remote areas. The situation was also complicated by the fact that most of the East and West Usambara has mountainous terrain and hence difficult to reach distant farms by the extension officers. This situation was aggravated by low number of extension staff, with a ratio of extension officers to farmers found to be 1: 277 during the study.

A number of problems were either observed by researchers or reported by the CAHWs to be associated with delivery of animal health services under this scenario, which included:

- Safety issues: It was observed that some CAHWs had limited knowledge on proper animal restraint.
- Improper taking of cardinal health parameters especially temperature: It was noted that some CAHWs mentioned to be using the 'under arm pit' areas as a site of taking body temperature in cattle.
- Estimation of body weight and proper dosage for different drugs:

It was found that most of the CAHWs had serious problem in this aspect. The most commonly used drug was long acting oxytetracycline (OTC® 20%) and respondents interviewed reported to have two categories to use while administering this drug. They reported to inject 10 ml of OTC 20% for an animal estimated to have up to 100 kg body weight and 20 ml of the same drug when the animal is above 100 kg.

- Under-reporting of diseases in the study area: It was observed that only a small proportion of cases attended by CAHWs was reported to extension officers.
- Scenario II
- This was a scenario reported to operate in Maramba areas of Muheza upland zone and was characterised by good working relations between CAHWs and extension officers where a hierarchy of roles and responsibilities was well defined. Under this situation, CAHWs were carrying out the following activities:
 - Primary identification of sick animals by using signs of ill health such as dullness, loss of appetite, dry muzzle and fever.
 - Reporting of sick animals to the local extension officers in the area.
 - Teaming up with the extension officer during initial treatment of sick animals and completing follow-up treatments.

On the other hand, extension officers were responsible for:

- Response to call made by CAHWs so that they could visit and attend sick animals reported to them.
- Making proper diagnosis of cases through detailed examination of sick animals, an activity that was carried out jointly between the extension officer and a CAHW.
- Initiating treatment of sick animals, which would be completed by a CAHW.
- Keeping correct records of all cases of sick animals for the purpose of completing monthly passive disease surveillance report forms submitted to the Ministry of Livestock Development.

DISCUSSION

Findings of this study show that the main production constraints as perceived by the smallholder dairy farmers in the East and West Usambara areas were animal diseases and feeding especially during the dry season. This observation tallies with previous studies carried out in Tanga (Urassa *et al.*, 1999; Swai *et al.*, 2005). Therefore, in order to have significant improvement of smallholder dairy production in East and West Usambara areas, efforts should be made to address these issues.

With respect to control and prevention of animal diseases, it is important to have a proper animal health delivery system that should respond to conditions prevailing in the area. Findings from this study showed that the CAHWs mainly the FMs and artificial inseminators mainly carried out management of animal diseases. The current study also identified some problems associated with delivery of animal health services by the CAHWs. Some of the problems encountered are so critical that unless they are addressed, there is a danger of losing even more animals than it would be expected. Most of the animal health problems perceived by veterinarians and extension officers to be prevalent in the study area were infectious mainly tick-borne diseases and mastitis whose management needs proper diagnosis and treatment using chemotherapeutic agents (Dolan, 1986; Coetzer *et al.*, 1994). From field experience, authors realised that it was most likely that a number of conditions in the East and West Usambara areas went undiagnosed or completely misdiagnosed and consequently mismanaged especially in areas where CAHWs did not cooperate with extension officers and veterinarians as it was reported under scenario I in the current study. This is supported by the observation that some of the CAHWs were not competent in taking cardinal health parameters such as temperature, implying that most of the infectious conditions characterised by fever would not be diagnosed.

Misdiagnosis and mismanagement of infectious conditions by CAHWs is likely to be associated with significant economic losses. This is due to the fact that most of the cattle reared by smallholder dairy farmers in Tanga region are crosses of *Bos taurus* (Friesian, Ayrshire or Jersey) and *Bos indicus* (Tanzania Shorthorn Zebu or Boran) with levels of *Bos taurus* genes varying between 50 and 85% (Swai *et al.*, 2005) whose susceptibility to disease conditions is higher than that of pure indigenous animals such as the Tanzania Shorthorn Zebu kept by traditional cattle keepers in the country.

This implies that mismanagement of infectious conditions is likely to result into serious losses in terms of productivity and even deaths of sick animals. The economic losses suffered by a smallholder dairy farmer through animal deaths is likely to be greater than what would be experienced by a traditional cattle keeper as the smallholder farmer keeps few animals whose value is relatively 4-5 times more than the Tanzania Shorthorn Zebu cattle owned by traditional cattle keepers.

Another possibility which may be associated with mismanagement of disease conditions is presence of excessive levels of drug residues particularly antibiotics that were reported to be used most in the study area. High levels of antibiotic residues in animal products such as milk may lead to allergic reactions in humans and

development of antimicrobial resistant strains of bacteria which may pose public health risks to consumers (Jones, 1999; Shitandi and Sternesjo, 2004).

Another condition that was common in the area was bovine enzootic haematuria caused by chronic ingestion of bracken fern (*Pteridium aquilinum*) and it is important that people involved in animal health delivery should be acquainted with it from its diagnosis to management of affected animals. Therefore, in order for CAHWs to be of much use, their training should take into account local conditions likely to be encountered when they start to practice as recommended by others (Catley *et al.*, 2002).

In addition, it would be more advantageous to the CAHWs to be attached or work under close supervision of the veterinarians or extension officers at least for the initial period after they have completed their training so that they can get used to proper diagnosis and management of different cases prevailing in their areas of practice.

The current study suggests also that for areas where CAHWs were not cooperating with extension officers (scenario I), the problem of either under- or over-dosing of animals with antibiotics was serious as exemplified by administration of oxytetracycline. On the other hand, experience reported in 'scenario II' of CAHWs' practice in this study supports the

concept of encouraging close collaboration between veterinarians or extension workers and CAHWs. Generally, this was considered as a cost-effective and suitable approach for disease management and surveillance in the smallholder dairy farming areas of East and West Usambara.

The legal issues related to CAHWs' practice need further attention. Currently, by requirement of the Veterinary Act 2003 (URT, 2004a), only veterinarian, veterinary specialist, paraprofessional or paraprofessional assistants are legally allowed to offer animal health services after having been registered, enrolled or enlisted with the Veterinary Council of Tanzania (VCT). Under this act, a veterinarian is considered as the person who has been awarded a veterinary degree recognised by the VCT while a paraprofessional and paraprofessional assistant is a person who has been awarded a diploma in animal health an animal health certificate recognised by the VCT, respectively. Under the current study, an extension officer is equivalent to a paraprofessional or paraprofessional assistant. Therefore, since CAHWs lack qualifications for veterinarians, paraprofessionals or paraprofessional assistants, they are not recognised by the VCT and consequently they are considered as unauthorised persons to practice and hence there is a need to look into this legal aspect in order to make smooth offering of animal health services by the

CAHWs in the country. Given examples of problems that have been identified by this investigation and also that the smallholder dairy animals are highly valuable, one can easily anticipate problems in case of professional malpractice by CAHWs that may lead to death or even permanent loss of function of some organs in treated animals which might need legal considerations.

The situation under 'scenario II' of offering animal health services was important in disease surveillance and monitoring especially in areas such as the East and West Usambara whose terrain is mountainous. Over and above what has been discussed earlier, collaboration between the CAHWs and veterinarians/extension officers will assure prompt detection of new cases of diseases and also improve passive and active surveillance of animal diseases as required by the Animal Diseases Act 2003 (URT, 2004b). Currently, the Animal Diseases Act 2003 demands that owner of animal reports diseased animals or animal deaths to the nearest veterinarian or paraprofessional, however given situation in the East and West Usambara areas, this is very difficult especially when incidence occurs in area remote from where a paraprofessional or veterinarian is based. Therefore if properly utilised, CAHWs may play an important role in primary identification and reporting of sick animals which can improve disease monitoring and surveillance in the country.

Major lessons learnt from this study suggest a need to review curriculum used to train CAHWs particularly with respect to duration of training, importance of encouraging 'hands on' practice and emphasis on local conditions in communities where CAHWs come from in addition to close collaboration or possibly supervision of a CAHW by a veterinarian or extension officer. For those who have undergone a two-week training, there is a need to undergo refresher training so that they can improve their knowledge related to offering animal health services in their areas of jurisdiction. Review of legal aspects related to delivery of animal health services in Tanzania is another important area that should be considered. This will ensure improved animal health in the country and consequently contribution to the national economy by the livestock sub-sector.

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