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INTEGRATING COMMUNITY-BASED ANIMAL HEALTH WORKERS INTO THE FORMAL VETERINARY SERVICE DELIVERY SYSTEM IN KENYA

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Abstract

The community-based animal health workers (CBAHWs) model has been one of the ways utilised in delivery of animal health services following the veterinary service reforms. Government statutory bodies have opposed the establishment of these programs arguing that their approach to animal health delivery does not fit within the existing technical, legal and policy framework. This study gives an account of the nature, characteristics, and activities of CBAHWs and provides information that would guide policy debate regarding their integration into formal health service delivery. It indicates that these programs provide mainly curative health services but the issue of sustainability has continued to dodge most of them. It establishes that, for trainees to continue actively providing services, continued professional development obtained through regular refresher training and entrepreneurship exemplified by proper record keeping are important. It therefore recommends that policy review is needed to address the role of CBAHWs and appropriately integrate their activities within the formal animal health delivery system.

1. INTRODUCTION

1.1 Background information

The delivery of livestock health services in many developing countries is undergoing restructuring. One publicised initiative to refocus service delivery has been the introduction of community-based animal health workers (CBAHWs). This involves training community-selected representatives in basic animal health care and livestock production techniques. The objective is to supplement and support the existing professional system for delivering such services to communities in marginal areas. In implementing these programs, different approaches have been adopted in different countries, presumably to tailor them to the specific needs of livestock farmers in varied

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environments. Although numerous terms have been used to describe them, Hüttner *et al*, (2001) and Oakeley (2001) have emphasised that most of them share similar features and goals such as:

- selection of individuals for training by communities within which they work;
- technical training in animal health takes a short period, usually less than a month;
- low-cost strategies concentrating mainly on important livestock health and management issues of the farming community; and
- payment for services provided comes directly from clients.

Experiences from these programs indicate that, by incorporating existing traditional knowledge, CBAHW programs encourage the participation of the local communities in the design and delivery of animal health care services (Catley & Leyland, 2001).

1.1.1 The changing structure of animal health service delivery in Sub-Saharan Africa

Until the 1990s, many governments in Sub-Saharan Africa had been the main providers of veterinary services, either free of charge or at highly subsidised level (Leonard, 2000). Substantial success had been achieved in the control of epizootic and trans-boundary animal diseases. However, with the growth of their livestock sectors, the range and volume of veterinary services to be provided increased tremendously limiting the governments' capacity in service delivery. In response, these states sought to find new models for animal health service delivery that would be adapted to the prevailing financial reality. These approaches principally entailed privatisation and were undertaken after considerable prodding from donors, mainly the World Bank and European Union (de Haan & Bekure, 1991). It was argued that the private sector would out-perform the public sector even under imperfect market conditions (Bos, 1991), and besides efficiency considerations, input delivery through the private sector was expected to be more sustainable (Umali *et al*, 1994; Leonard, 1993). Against this background, the privatisation of activities hitherto regarded as the domain of the public sector gained credibility.

In Kenya, the veterinary service privatisation program has had varied impact depending on a range of circumstances. In the high and medium potential areas where crossbred and purebred dairy and beef animals are kept, herd health has increasingly been handled by private veterinary practitioners. Even in cases where government services are available, they are provided at a fee.

In these areas, the concept of privatised animal health has been well understood by both beneficiaries and service providers (Otieno-Oruko *et al*, 2000). In the arid and semi-arid lands (ASALs) which make up to 71% of Kenya's total land mass with about 70% of Kenya's livestock (Mbogo & Mukhebi, 1997), herd health management had been in the hands of livestock owners and the public sector (Leonard, 1987). Farmers in these areas keep predominantly indigenous breeds of animals under either pastoral or agro-pastoral production systems, which are characterised by poor infrastructure, harsh climate, low household incomes and low literacy levels. It has been observed that the setting up of private practice by qualified veterinary personnel has not been achieved, given the cost of establishment and the low demand for these services (Umali *et al*, 1994).

In order to meet the needs of livestock owners in the ASALs, various groups, particularly non-governmental organisations (NGOs) and farmer associations, initiated community-based animal health delivery systems to fill in the gap left by the state. More than 40 such programs have been initiated (ITDG, 2000a; ITDG, 2000b; ITDG, 2000c). These CBAHWs are informally trained but work to complement official professional services.

1.1.2 Constraints to the development of CBAHW model

One of the constraining factors to the development of CBAHWs as a model of animal health service delivery is that their policies and approaches to service delivery does not fit within the existing animal health legal and policy framework. The law prohibits CBAHWs to administer veterinary drugs or keep these drugs for purposes of trade. If CBAHWs are to provide livestock health services efficiently, they need to be an integral part of recognised government service providers.

While literature discusses how to engender community participation in animal health service delivery, it offers few insights into facilitating their institutional participation (Oakeley, 2001). This study attempted to address this. Available literature reveals that key stakeholders such as field veterinary staff are not adequately involved in the planning and operation of some CBAHW projects (Sikana *et al*, 1992). Many projects are set up by NGOs that fund and support the early stages of implementation. Consequently, government services are not involved and thus feel no control or ownership when attempts are made to institutionalise the CBAHW model. The dependence of these programs on external support leads to serious questioning of their sustainability. This paper avails information that would facilitate the formulation of policies that would lead to the integration, strengthening and promotion of CBAHW programs for more effective

delivery of animal health services in marginal areas of Kenya, and perhaps in similar areas in other developing countries.

2. METHODOLOGY

2.1 Study area

This study was conducted in Mtito Andei division of Makueni district in Kenya. It covers an area of 7,440 km². It is semi-arid with an average annual rainfall of 550 mm with vegetation dominated by *Acacia* species. Farmers practice small-scale mixed livestock-crop farming in an agro-pastoral production system. Apart from crop and livestock farming, honey harvesting and marketing is also an important economic activity. The area borders Tsavo National Park and suffers from high level of tick-borne diseases and trypanosomosis transmitted from the park by ticks and tsetse fly respectively.

Several NGOs initiated CBAHWs programs in this division in the early 1990s. Experience has shown that CBAHWs operating in agro-pastoral areas, like Makueni have similar modes of operation. They attend to their neighbours' animal health problems in addition to their own. However, those found among pastoralist concentrate more on treating their own animals and only sell drugs to other pastoralists (ITDG, 2000a). It is assumed that the findings of this study could be applicable to other CBAHWs working within agro-pastoral communities.

2.1.1 Data collection methods

Data were collected through reconnaissance and formal surveys. The formal survey targeted all the CBAHWs resident in the study area. Information was collected using a questionnaire that had major sections on: (i) personal characteristics of CBAHWs, (ii) their training, activities and constraints encountered, and (iii) their relations with livestock keepers, para-veterinarians and veterinarians. The questionnaire was pre-tested and amended before it was applied in this study. Interviews lasted for about 45 minutes. Primary data was complemented with a review of existing literature and a search of the Internet.

2.1.2 Data analysis

Data collected were coded and stored using Microsoft Access 97 (Microsoft Corporation, Redmond, VA, USA). Statistical analysis was performed using SPSS for Windows version 9 (SPSS Inc., Chicago, IL, USA). Descriptive statistics was used to describe the characteristics and activities of CBAHW.

Relationship between the characteristics of the CBAHWs and their level of success was established using correlation and regression analyses.

In assessing the level of success of the CBAHWs, their performance was tracked through activity analysis. This was done using a quadratic model, selected because of its ease of computation and interpretation. The estimated model was of the form:

$$X = [\beta][Z] \quad (1)$$

Where X is the level of activity of CBAHWs estimated as number of cases handled in one-year period preceding the survey; β is a vector of estimated coefficients and Z is a vector of independent variables describing the characteristics of CBAHWs.

Factors that are likely to keep CBAHWs in active practice were identified using logistic regression. Logistic regression estimation was used as it was envisaged to capture the distribution of the data better. The estimated model was of the form:

$$I = \beta Z \quad (2)$$

Where $I = 1$ if CBAHW is active, otherwise zero; Z is the vector of exogenous variables describing the characteristics of CBAHW and β is vector of estimated coefficients.

The backward-stepwise variable selection approach was used to identify determinants of the likelihood of a CBAHW remaining active.

3. RESULTS

3.1 Personal characteristics and activities of CBAHWs

Table 1 shows the description and statistics of the personal characteristics and activities of the CBAHWs. All the workers could read and write, having attained a maximum of primary school level education.

The CBAHWs were on average 50 years of age and provided localised clinical services. About 57% of these workers kept practice records, taken in this study as a proxy for entrepreneurship. These records showed disease cases handled, drugs used and fees charged. They handled diseases and ailments in cattle, sheep, goats and poultry. Most of them sold drugs in single doses. This was attained by treating livestock belonging to several farmers within a short

period of time. This practice was most prevalent for antihelmintics (for gastrointestinal tract parasites), antibiotics (mainly for tick-borne diseases) and trypanocides (for trypanosomiasis).

Table 1: Description of variables

Variable	Type	Description	Mean	Standard deviation
TOTCASE	Continuous	Total cases handled for the year preceding the survey	92.59	123.80
DISVET	Continuous	Distance from worker to trained veterinarian in km	33.46	22.29
DISAGVET	Continuous	Distance from worker to veterinary drug shop in km	13.49	10.73
TOTINCOM	Continuous	Income of worker in Kshs. For year preceding survey	38500.00	27961.28
AGE	Continuous	Age of worker in years	50.49	10.49
FRMYRS	Continuous	Years of farming experience of worker	18.17	10.14
REFRESH	Continuous	Number of refresher training undertaken by worker since initial training	2.60	2.16
ENTREP	Binary	Keeping of records as a proxy for entrepreneurship; 1 if worker keeps practice records, 0 otherwise	0.568	0.504
GENDER	Binary	1 if worker is male, 0 otherwise	0.813	0.397

The most common ailments and diseases handled by CBAHWs were GIT parasites in all stock types and trypanosomiasis and tick borne diseases in cattle. CARD (1989) showed that improved animal health management including regular de-worming and disease prevention significantly increased productivity of both cattle and goats. Furthermore, Osaer *et al* (2000), while working with traditionally managed goats and sheep in the Gambia concluded that correct management of GIT parasites increased lambing and kidding rates, increased birth weights and reduced mortality in kids and lambs aged less than three months. These CBAHWs had handled about 2,963 cases during the one-year period prior to the survey. The number of cases handled by each worker varied widely. The reason for this could lie within individual-level attributes. Factors that were common to all CBAHWs such as cultural attitudes, the prevailing demand for animal health services, and regulations among others, could not be speculated as causes since they affected all CBAHWs across the board.

The level of exchange between CBAHWs and veterinarians is important for the success of these programs. The level of contact made between CBAHWs and veterinarians could be dictated by several factors, some of which include the working rapport, distance between them and the professional challenges encountered by the less qualified group (CBAHWs). If the CBAHWs handle

less challenging tasks, then there is bound to be less contact. Seventy-one percent of these workers indicated that they had made one or more referrals to professionally trained animal health workers, for the period they had been practising. A total of 83 referrals had been made since the inception of the program, giving an average of 7.5 cases per year. However, it would be difficult to judge the effectiveness of the program on the basis of the amount of referrals, unless the nature of cases handled is also evaluated. Nonetheless, this study established that there was some level of professional exchange between the two channels of animal health delivery.

3.2 Building personal characteristics into performance analysis

Factors influencing the level of activity of CBAHWs are given in Table 2. The Table shows progressive model development from 1 to 3. Based on model 3, the number of refresher courses attended and the entrepreneurial skills of CBAHWs significantly influenced the number of cases handled in the period under study. The workers who kept records handled 98 cases per year more than those who did not, *ceteris paribus*. In addition, an extra refresher course undertaken could increase the level of activity by 25 more cases per year. These findings indicate that continual professional development through refresher courses and channels that would enhance entrepreneurial skills are important factors in determining the success of the community-based animal health workers model.

Table 2: Factors influencing the level of activity - OLS estimation

Variable	Model 1		Model 2		Model 3	
	β	SE β	β	SE β	β	SE β
Constant	-35.4640	76.9665	-48.3666	44.4537	-28.4151	26.6491
FRMYRS	2.1995	2.2668	0.8773	1.7149	-	-
DISAGVET	0.8248	2.2824	-	-	-	-
ENTREP	95.5141*	55.3631	97.0706***	37.5977	97.8637***	34.7738
REFRESH	20.2964**	10.4363	24.3706***	8.2004	25.1278***	7.7756
GENDER	-18.5412	57.0640	-	-	-	-
TOTINCOM	-0.00051	0.00096	-	-	-	-
R2	0.5563		0.5272		0.5207	
Adj.R2	0.3950		0.4572		0.4876	
F- value	3.4483		7.5277		15.7541	
D.W. test	1.8866		1.8742		1.8863	

Level of significance (***=0.01; ** =0.05; * = 0.10).

Female gender, more farming years experience and longer distance from veterinary drug shops all had positive effect on level of activity without reaching level of significance. As far as gender is concerned, it would be important to mention that the proportion of female CBAHWs was about 18%

of the sample. Higher income on the other hand negatively influenced level of activity without reaching significance. Literacy level could not be captured in this model, as there was no variability in data. All the workers had attained similar level of education and could read and write. The age variable highly correlated to years of farming experience and was not used in the estimation.

3.3 Factors determining sustainability of activities of CBAHWs

The number of refresher training and possession of entrepreneurial skills by CBAHWs significantly influenced the likelihood of one remaining in active practice (Table 3). From computed odds ratios, attending refresher training three times, a CBAHW was 17.2 times more likely to remain in active practice over one that had attended only once. Furthermore, a CBAHW keeping records was 110 times more likely to remain in active practice than one without. Age of the CBAHWs and distance to a veterinarian were not included in the model due to their high correlation with years of farming experience and distance to veterinary drug shop respectively.

Table 3: Factors determining the likelihood of a CBAHW remaining in active practice - Logistic regression

Variable	Model 1		Model 2		Model 3	
	β	SE β	β	SE β	β	SE β
Constant	-12.9467	7.9998	-10.0410	5.9311	-3.8016	1.6892
BUSKILL	2.1471	2.2494	1.6951	1.9645	-	
FRMYRS	0.2048	0.1590	0.1766	0.1410	-	
DISVET	0.0638	0.0935	-	-	-	
ENTREP	6.6088**	3.0838	6.6141**	2.8875	0.9480***	0.5762
REFRESH	2.4166*	1.4686	1.9216*	1.1122	4.7015**	1.5388
TOTINCOM	0.000017	0.000022	-	-	-	
-2Log likelihood/ Goodness of fit	12.395/ 20.454		12.752/ 25.592		15.018/ 25.988	
Chi-Squared	30.84 (p=000)		30.48 (p=000)		28.21 (p=000)	

Level of significance (***=0.01; ** =0.05; * = 0.10).

4. CONCLUSIONS AND POLICY IMPLICATIONS

4.1 Issues on sustainability of the CBAHW model

This article argues that CBAHWs are providing animal health services in marginal areas and that the government may consider strengthening their activities. Possession of entrepreneurial skills and professional development through refresher courses were the main attributes that determined the level of activity of CBAHWs. It seems that CBAHWs who did not keep practice

records had difficulty in pricing drugs for subsequent sale. Those who kept records made reasonable business from their activities, whereas those who did not could have been spending more on drugs than they could recoup from sales. They were therefore unable to restock their drugs in time to continue offering services. CBAHWs who regularly enhanced their level of animal health knowledge were more active than those who did not. It appears logical to argue that if CBAHWs have to sustain their practice, they need to remain more knowledgeable than ordinary livestock keepers on livestock health matters. Those who do not enhance their level of knowledge may find demand for their services diminishing as livestock keepers in their environs could be acquiring equivalent level of knowledge.

Enhancing the two qualities: entrepreneurial skills and refresher training; CBAHWs are likely to strengthen their capacity in service delivery. Livestock keepers would then be able to purchase the exact quantity of drugs required and minimise the cost of treatment. They may therefore be more inclined to treat or protect their animals with veterinary inputs. At the same time, more knowledgeable CBAHWs may be able to effectively advise livestock keepers on correct drug dosage rates, especially in areas where they are illiterate and unable to follow instructions on drug packets. In the absence of CBAHWs, livestock keepers would have to rely on their own knowledge, or on the advice provided by drug stores, some of which have been shown to be manned by persons without any training in animal health (Bett, 2001). Under such circumstances, the risks of drug misuse are likely to be greater than when livestock keepers are acting under the advice of CBAHWs.

4.2 Issues on regulation and enhancement of service delivery

The current licensing policy for private veterinary practice in Kenya excludes important segments of animal health service providers. These include diploma and certificate holders and CBAHWs. The role of CBAHWs is crucial in provision of animal health services in marginal areas, given the state of events in these areas. Therefore CBAHWs wishing to offer services to their communities in these areas could be encouraged to do so and be recognised and registered.

A clear regulatory framework that encourages professional fair play could be enacted. The existing government animal health services structure has a clear and definitive role for veterinarians and para-professionals. Borrowing from this, a new framework to regulate the activities of CBAHWs could be designed. Under the current review of veterinary service delivery, the government may consider not only legitimising CBAHWs but also

encouraging them to form associations that could enhance training standards, and encourage establishment of strong links with veterinarians and para-veterinarians. Such associations would also act as a link between CBAHWs and the Kenya Veterinary Board (KVB). However, the KVB's mandate as a regulatory body could also be widened to include a wide range of activities, such as those related to CBAHWs.

4.3 Issues on training and support of CBAHWs

The training structure and content are vital factors for successful performance of CBAHWs programs. The technical content and scheduling of training courses could be planned in the context of the local livestock production system. Training could be expanded to not only include the identification, diagnosis and treatment of common diseases, but also the handling and use of veterinary drugs and the expected role of CBAHWs in relation to veterinary authorities. In addition, the training could be expanded to include basic principles of animal husbandry and production and extension skills. These training and supervision activities should offer opportunities for active and interactive involvement of local private and government veterinarians and para-veterinarians. The training package could be developed in close consultation with livestock keepers, through their participation using participatory techniques. Emphasis should not be given only to animal species and health problems present in the area, but also on likely epizootic diseases that could afflict the area. All programs may consider emphasising on the importance of refresher training and field visits. The activities of CBAHWs should remain community driven whereas the role of government could be supervisory.

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REFERENCES

BETT B (2001). *The role of veterinary drug outlets in the provision of primary animal health care in Busia district, Kenya*. MSc Thesis, Department of Public Health, Pharmacology and Toxicology, University of Nairobi.

BOS D (1991). *Privatisation: A theoretical treatment*. Oxford, Clarendon Press.

CATLEY A & LEYLAND T (2001). Community participation and the delivery of veterinary services in Africa. *Preventive Veterinary Medicine* 1572:1-19.

COORDINATED AGRICULTURAL AND RURAL DEVELOPMENT (CARD) (1989). *Small ruminants in Zimbabwe: A review of functions, research and proposals for communal lands*. Discussion Paper, Masvingo, Zimbabwe: Belmont Press.

DE HAAN C & BEKURE S (1991). *Animal health services in Sub-Saharan Africa: Initial experience with alternative approaches*. World Bank Paper No 134, The World Bank, Washington DC.

HÜTTNER K, LEIDL K, PFEIFFER DU, JERE FBD & KASAMBARA D (2001). Farm and personal characteristics of the clientele of a community-based animal health service program in northern Malawi. *Tropical Animal Health and Production* 33:201-218.

ITDG (2000a). *Community-based animal health care in East Africa: Experiences and case studies with particular reference to Kenya*. ITDG Group, Nairobi Kenya, ISBN 9966-931-04-X.

ITDG (2000b). *Proceedings of the Eighth Decentralised Animal Health Workshop*, Meru, Kenya, May 17-21, 1999. ITDG Group Nairobi, Kenya.

ITDG (2000c). *Proceedings of the Ninth Decentralised Animal Health Workshop*, Kichwa Tembo, Kenya, June 12 -16, 2000. ITDG Group Nairobi, Kenya.

LEONARD DK (1987). The supply of veterinary services: Kenyan lessons. *Journal of Agricultural Administration and Extension* 26:219-36.

LEONARD DK (1993). Structural reforms of the veterinary profession in Africa and the new institutional economics. *Development and Change* 24:227-67.

LEONARD DK (2000). *The new institutional economic and restructuring of animal health services*. In: Leonard DK, Africa's changing markets for health and

veterinary services: The new institutional issues. Macmillan Press Ltd, London, pp 1-39.

MBOGO SG & MUKHEBI AW (1997). *Evaluation of the role, program and resource requirements of the socio-economics unit of KETRI*. KETRI, Kikuyu.

OAKELEY R (2001). *Community livestock workers: A review of experiences with community-based animal health care delivery*.
(<http://www.fao.org/docrep/x3770t/x3770t06.htm>)

OSAER S, GOOSSENS B, EYSKER M & GEERTS S (2000). The effect of prophylactic anthelmintic treatment on the productivity of traditionally managed Djallonke sheep and West African dwarf goats kept under high trypanosomosis risk. *Acta Tropica* 5:74(1):13-24.

OTIENO-ORUKO LO, UPTON M & MCLEOD A (2000). Restructuring of animal health services in Kenya: Constraints, prospects and options. *Development Policy Review* 18:123- 138.

SIKANA P, BAZELEY P, KARIUKI D & FRE Z (1992). *The Kenya livestock and pastoral program: Some observations and recommendations*. ITDG, Nairobi.

UMALI DL, FEDER G & DE HAAN C (1994). Animal health services: Finding a balance between public and private delivery. *The World Bank Research Observer* 9:72-96.