

The veterinary input sector and animal health management in traditional livestock systems of north Cameroon

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Summary

Lack of good organisation of the veterinary profession and the services it offers is one of the important factors contributing to failures in animal disease control in the central African region. A study aimed at assessing the field situation was conducted through a cross-sectional survey involving 328 stake holders (241 livestock owners and the rest being service providers including government and private veterinary services) in the Adamawa, North and Far North Regions of Cameroon. Three categories of farmers were identified based on their husbandry practices, perception of livestock diseases of importance and the availability and quality of veterinary services rendered. Similarly, vendors considered in the study as major service providers were classified into 2 categories based on the extent of their interventions and the economic importance of the activity. Interventions of state veterinary services were found to be largely limited to annual vaccination campaigns of cattle while clinical services were expected to be delivered by private veterinary clinics. The latter however were poorly established and functioned sub-optimally due to lack of investment capital and invasion of the sector by illicit vendors. The predominance of the type of drugs in high demand depended on the livestock system, with greater demand of antibiotics by agro-livestock owners as opposed to trypanocides by pastoralists. This was seen to be justified by the fact that most pastoralists stay permanently at the fringes of tse-tse infested zones or spend sometimes in such zones during transhumance and so animals are more exposed to the risk of trypanosomiasis, while agro-livestock owners stay on the same spot with their animals and this favours accumulation and easy transmission of infectious agents. More than 80 % of farmers did not make use of traditional pharmacopoeia. The few cases recorded involved mostly the use of plant materials but also unusual substances like animal milk and urine. There was evidence of inadequate animal health coverage by professional service providers, thus giving room for invasion by drug vendors. In conclusion, order needs to be put in the sector by regulating the activities of vendors as well as empowering private veterinary practice through proper legislation and institutional support.

Key words: Animal health; veterinary inputs, Livestock systems; North Cameroon

Introduction

Disease consistently features as a major constraint of livestock production in sub-Saharan Africa (Awa et al., 2004; De Leeuw et al., 1995; Thys et al. 2005). In most countries of the region, measures taken to reduce disease prevalence have often not been effective because of several factors among which are difficulties in the control of animal movements, but probably more importantly due to the lack of good organisation of the veterinary profession and the services it offers. In Cameroon, the Ministry of Livestock for a long time enjoyed an exclusive mandate of administering veterinary services to farmers. In recent years, the veterinary profession was liberalised and those in private practice were thus permitted to share this responsibility with state services. Most of them have however not been able to stand on their feet because of several reasons including the lack of initial investment capital and the intrusion of charlatans into the profession as drug sellers. Livestock farmers are thus caught up in the chaos and are the ones to pay the price as their animal health problems are not well taken care of. It has been a controversy on whether farmers should be encouraged to treat animals themselves or not (Ahuya et al., 2005), but the prevailing situation has compelled many farmers to treat sick animals by themselves but often incorrectly because they have not had the necessary training. This study was aimed at assessing the situation on the field among stake holders - service providers (government and private veterinary personnel, drug vendors) and consumers (livestock farmers), identify shortcomings and propose improvements.

Materials and methods

The study was conducted through a cross-sectional survey using a semi-structured questionnaire. It involved different categories of stake holders that included government veterinary staff, veterinarians in private practice, farmer organisations and common initiative groups operating veterinary pharmacies and drug vendors as service providers, as well as farmers as the consumers. The selection of respondents was not randomised but rather purposive in order to obtain maximum information. Thus, livestock farmers chosen were either traditional pastoralists with large herds or primary crop farmers who possessed a few heads of animals, especially small ruminants.

A total of 328 respondents were interviewed in 8 divisions of the Adamawa, North and Far North Regions of Cameroon (Table 1). The largest category were farmers followed by drug vendors. Information solicited from service providers included their level of training, the types of services they provide and drugs sold, the sources of their drugs and their appreciation of disease diagnosis and therapy. Information was also sought on some economic aspect of the profession especially profitability. From farmers, information requested included their appreciation of the disease situation of their animals, local remedies for animal health management, their level of dependence on and evaluation of the efficiency of modern veterinary services as well as suggestions for improvement. Constraints were also identified for each category of stake holders.

Statistical analysis of data was done principally by multivariate analytical modules of the XLSTAT software. Preliminary relationships between qualitative variables were determined by multiple correspondence analyses and further investigated with logistic regressions and simple correspondence analysis, in which significant relationships were indicated by the Chi square test. Linear relationships between quantitative variables were investigated through ordinary least square regressions. The typology of stake holders where necessary was done by the hierarchical cluster analysis.

Table 1. Stake holders involved in the study in different localities

Category of stake holder	Vina	Mbere	Faro et Deo	Benoué	Mayo Louti	Diamaré	Logone et Chari	Mayo Kani	Total
Veterinary clinics	0	0	0	2	0	0	0	0	2
Livestock Ministry technicians	9	5	7	2	2	3	3	1	32
Drug vendors	11	16	5	4	9	5	0	0	50
CIGs	0	0	0	2	0	1	0	0	3
Livestock farmers	49	126	44	3	8	3	6	2	241
Total	69	147	56	13	19	12	9	3	328

Results and discussion

A typology of two categories of stakeholders was done owing to the substantial variability of their characteristics and their relatively larger numbers. These were livestock farmers and drug vendors. All the others were described as homogenous groups.

Typology of livestock farmers

Grouping was based on 19 variables, the main discriminating ones of which are presented in table 2. Three types of respondents corresponding to different livestock systems were identified (Figure 1) and described (Table 2). Types 1 and 2 represent traditional pastoralists who possess large herds of cattle. While type 2 is still predominantly transhumant, Type 1 farmers are becoming more settled and integrating livestock with crop production, as they farm more than just maize compared to Type 2 farmers. The disease situation is more critical in Type 1 herds considering that trypanosomiasis and FMD featured as important diseases compared to only trypanosomiasis in Type 2 herds. Type 3 farmers comprised of those whose primary activity is crop farming. They possessed mostly small ruminants especially goats with flock size often less than 10. Although disease prevalence is high in this group, sick animals are hardly treated. Instead, they are salvaged for family consumption.

The relationship between primary occupation of the farmer and animal species ownership as brought out by correspondence analysis is illustrated in figure 3. There was a significant relationship between farmers' principal activity and the primary choice of animal species ($p < 0.0001$). Farmers whose primary activity was livestock rearing kept mainly cattle. Those who were engaged in crop production or commerce as primary activity, showed no preference of ownership for cattle or small ruminants. Those involved in other activities were more likely to keep

cattle than small ruminants. Hierarchical cluster analysis brought out three categories of farmers (Figure 1) corresponding to the 3 systems earlier described.

Figure 1. Different classes of livestock owners with respect to animal health management

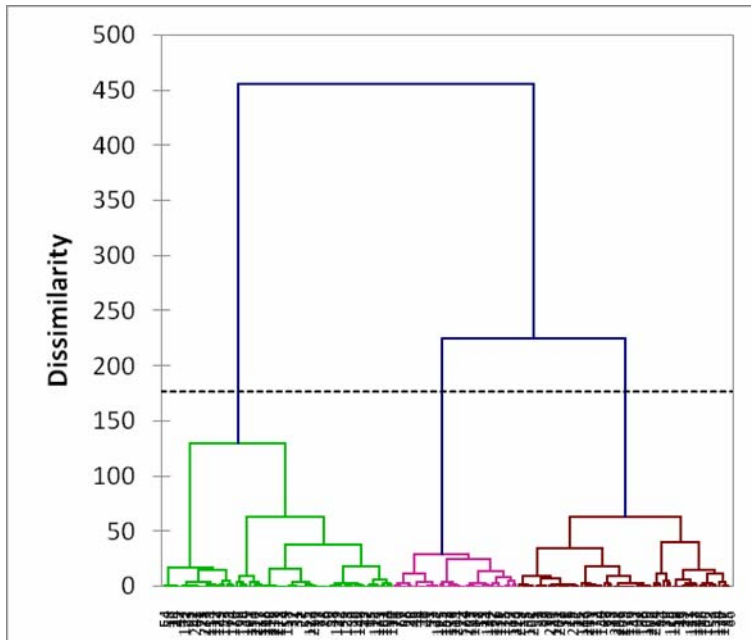


Table 2. Description of types of livestock systems identified in figure 1

Attribute	Type1	Type2	Type3
<i>Main crop farmed</i>	Maize +	Maize	Multiple
<i>Main animals spp kept</i>	cattle	cattle	goats
<i>Herd size</i>	> 10	> 10	< 10
<i>Herding</i>	Mostly herded	Herding & free roaming	Free roaming
<i>Main feed source</i>	Natural pastures	Natural pastures	Harvest residues
<i>Transhumance</i>	Less intense	Intense	None
<i>Main cattle disease</i>	Trypanosomosis and FMD	Trypanosomosis	Others
<i>Animal treatment</i>	Mostly self and sometimes vet	Vet and self	often no treatment
<i>Drug source</i>	Vendors mostly & vet	Vet	
<i>Use of local remedy</i>	Few	Generally not	Few
<i>Cattle mortality</i>	Low	High	
<i>Mortality cause</i>	FMD mainly	Trypanosomosis +	
<i>Poultry mortality</i>	High	Low	High

Farmers' appreciation of the quality of drugs and services rendered by vendors was positive but they also recognized the superiority of veterinary clinics as illustrated in Table 3, where only 3% of respondents had a negative impression for the latter as opposed to about 39% of the former. Many farmers had no opinion on this variable (drug and service quality), especially for veterinary clinics (42%). This was explained by their unavailability to most farmers who had greater access to drug vendors.

Farmers' indigenous solutions to animal health problems

Foot-and-mouth disease (37%), and Trypanosomosis (35%) were generally identified as diseases of primary importance. Farmers' indigenous knowledge on disease management was very limited as more than 80 % of respondents indicated that they had no endogenous solutions to the important livestock diseases. The few cases of local solutions involved mostly the use of plant materials including leaves, roots, fruits and barks.

Farmers' appreciation of the quality of services provided by professional veterinary staff and drug vendors

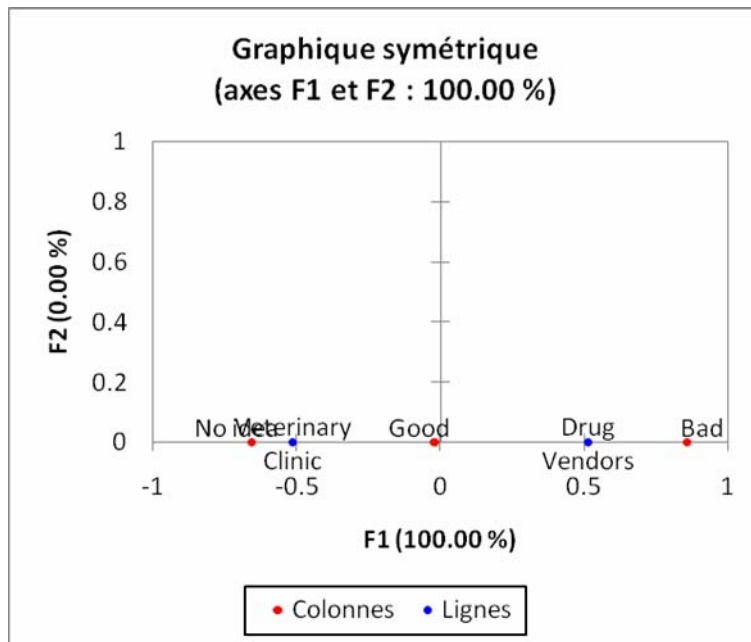
Although similar proportions of farmers positively appreciated the quality of drugs and services provided by both veterinary clinics and drug vendors, a much greater proportion had a negative impression of vendors (Table 3). This was possible because of a third category of respondents who

had no opinion of appreciation, especially for veterinary clinics because they had no access to them. The output from correspondence analysis presented in Figure 2 indicates that this association was highly significant ($p < 0.001$)

Table 3. Farmers' appreciation of the quality of services rendered by veterinary clinics and drug vendors

Service provider	Service appreciation by farmers - frequency (%)		
	Good	Bad	No idea
Veterinary Clinic	75 (55)	4 (3)	58 (42)
Drug Vendors	72 (53)	53 (39)	12 (9)

Figure 2. Correspondence analysis output of farmers' appreciation of the quality of services rendered by veterinary clinics and drug vendors



Drug vendors

Based principally on five variables (*primary occupation of the vendors, their main customers, the most sold drugs, their knowledge on the dose of drugs, and their gross monthly profits*), 2 types were identified.

Type 1

This class had pastoralists as well as agro-livestock farmers as their main customers. The most sold drugs were trypanocides, followed by antibiotics. The members of this class declared monthly gross margins that varied between 21000 and 50000 FCFA.

Type 2

The main customers here were agro-livestock farmers only and their most sold drugs were antibiotics, followed by trypanocides. Their monthly gross profit was lower than for class 1 and ranged from 10000 to 20000 FCFA.

Most respondents were primarily involved in drug sales as their main occupation and so this variable did not contribute in the differentiation of classes. Similarly more than 80% of them had a good notion of drug dosage and so this variable did not also contribute in the classification. Other variables that did not show much variability included the *source of drugs* that was generally veterinary clinics/pharmacies, with very few from Nigeria and *duration in the profession*, the majority of whom had practised it for less than 2 year. The level and type of professional training varied considerably but did not seem to have a significant effect on the classification of the vendors. 43% of them were trained as veterinary nurses, 30% educated in unrelated disciplines and 26% without formal education.

Pharmacies of Common Initiative Groups (CIGs)

Only 3 CIGs were identified, 2 of which were above 5 years in existence and one less than 1 year old. Membership of all the CIGs was composed of both men and women. Financing of CIG activities was solely through personal contributions of members. They obtained their products principally from whole sellers and veterinary clinics/pharmacies. As livestock health service providers, they had the largest range of customers including pastoralists, agro livestock farmers and drug vendors. In addition to selling drugs, CIG activities extended to treatments and sometimes vaccination of small ruminants and chickens. Like veterinary pharmacies, their impressions on the quality of drugs sold by vendors were generally negative. As their main constraint, CIGs expressed the difficulties in convincing their customers that their drugs were of better quality; the reason why they sold more expensive than those of doubtful origin presented by other stakeholders on the market.

Veterinary Clinics

Only two clinics out of about 8 in the study region were involved in the study, one 4 years and the other 14 years old. Both started with modest capitals of less than 1 million francs each. They had pastoralists, agro livestock farmers and a few CIGs as clients, and rendered services that included treatment of animals, counseling of farmers, sales of products, and vaccination. Vaccination was limited to pet animals, small ruminants and poultry, not covered by government vaccination campaigns. Cattle vaccination was still considered an exclusive responsibility of the ministry of livestock.

None of the clinics owned a field vehicle and so all outings to markets and field interventions were done by public transport. Another major constraint expressed was the difficulties faced with the marketing of products and services because of the following reasons:

- CIGs whom they expected to depend on veterinary pharmacies for their supplies instead bought directly from whole sellers.
- Whole sellers on their part extended their activities to retailing, thus creating unfair competition with veterinary clinics.
- Drug vendors and charlatans of the profession sold drugs of poor quality at cheaper prices that were more attractive to uninformed farmers.
- Private veterinary clinics lacked the legal mandate to carry out large scales vaccination campaigns and the laws governing veterinary practice were not respected.
- There were difficulties in recovering debt for services that were often rendered on credit.
- Investment capital for proper functioning of veterinary clinics was lacking.

Ministry of livestock animal health staff

In the past, regional delegations of the ministry of livestock operated well equipped clinics and veterinary pharmacies which ensured gross purchases and distribution of drugs and vaccines to veterinary centres in the province. Since the liberalization of the veterinary profession in the early 1990s, this practice was stopped and animal health activities at the level of the delegation were limited to the operation of clinics that provided minimal services, the organization of cattle vaccination campaigns and disease monitoring. Only a few basic drugs like antibiotics and vitamins were kept at the regional clinics and prescriptions were made to customers who bought them from private veterinary clinics.

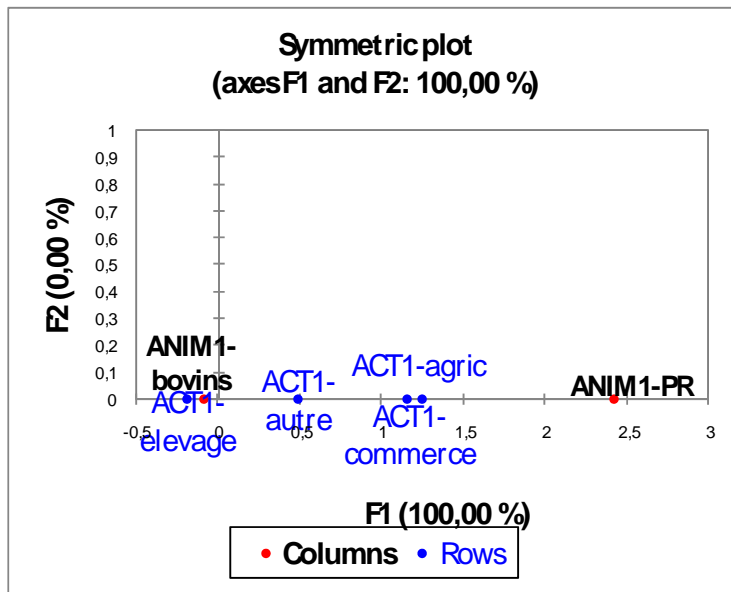
The bulk of information for this category of service providers (state veterinary staff) was obtained from regional peripheral staff composed of mainly chiefs of zootechnical and veterinary centres. This was a homogenous group of trained veterinary nurses and livestock technicians. According to them, the drugs in high demand in the order of importance were trypanocides, antibiotics, anthelmintics and vitamins. Unlike drug vendors who had pastoralists as their main customers, livestock ministry staff treated more with agro-livestock owner (51%). Other customers were pastoralists and CIGs. They identified vendors as their most important competitors and had a very negative impression of the quality of drugs they sold and services provided to farmers.

Associations and relationships among variables

Associations and relationships between key variables were studied in view of identifying areas of intervention in the sector.

Correspondence analysis of the main occupation of the farmer (*principal activity*) and the main *animal species reared* showed that cattle were generally kept by traditional pastoralists while agro-livestock farmers and those who had trade as their primary occupation had no particular affiliation to cattle or small ruminants (Figure 3).

Figure 3. Relationship between primary occupation of the farmer and animal species ownership



A similar analysis of livestock system (*type of client*) and type of drug in high demand (*type of product*) revealed a greater demand of antibiotics by agro-livestock owners as opposed to trypanocides by pastoralists (Figure 4). A logical explanation to this was that animals of most pastoralists stay permanently at the fringes of tse-tse infested zones or spend sometimes in such zones during transhumance and so are more exposed to the risk of trypanosomosis. On the other hand, agro-livestock owners stay on the same spot with their animals and this practice favours the accumulation and easy transmission of infectious agents.

A principal component analysis on *duration in the profession* of vendors, their *monthly gross margin* and the *taxes* paid (all classes combined) showed a weak association between duration and monthly profit (bigger margin for those who have been in the profession for long) (Table 3 and Figure 5). Neither of the two had any relationship with the amount of taxes paid, leaving us to ask on what basis taxation is made.

Figure 4. Association between livestock system and drug type demand

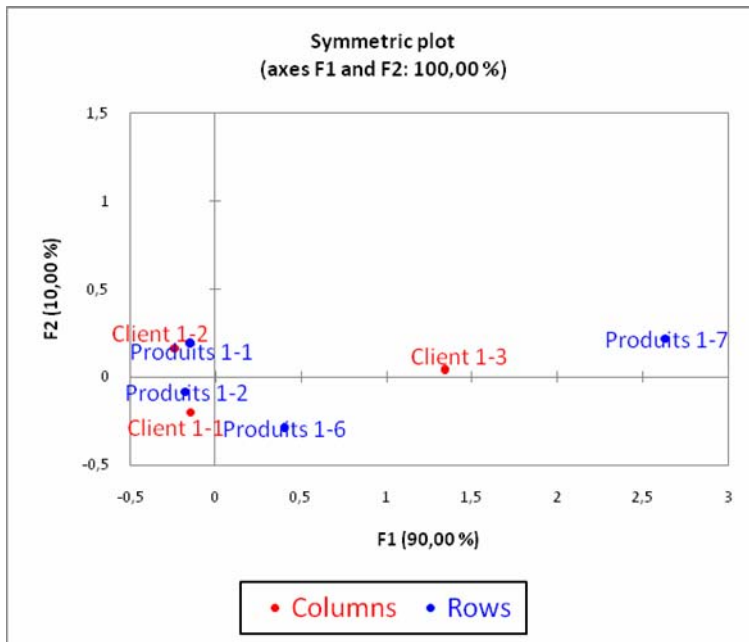
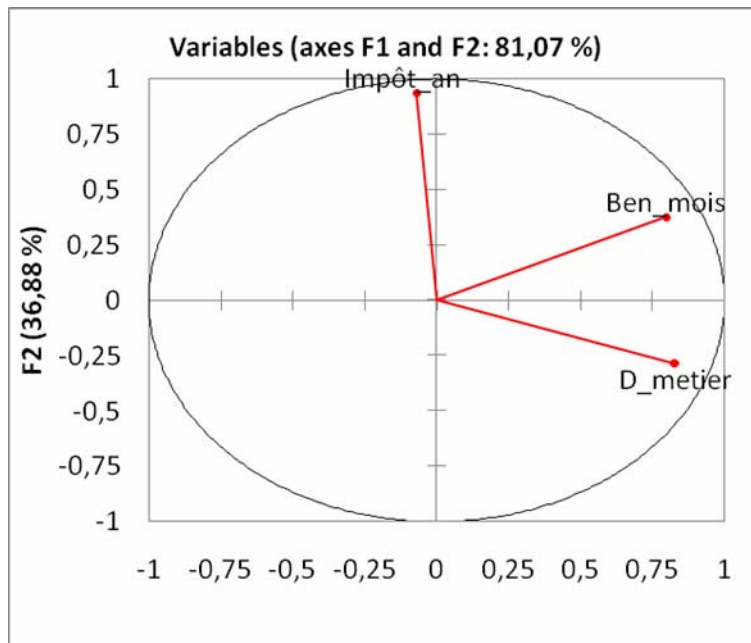


Table 3. Pearson's correlation matrix showing the relationship between duration in the occupation, monthly gross margin and annual taxes paid by drug vendors

Variables	Duration in profession	Monthly benefit	Annual tax paid
Duration in profession	1	0,325	-0,163
Monthly benefit	0,325	1	0,141
Annual tax paid	-0,163	0,141	1

Figure 5. Relationship between duration in the occupation, monthly gross margin and annual taxes paid by drug vendors.



B_mois = monthly benefit, D_metier = duration in activity, Impôt_an = annual tax

The typology of farmers in this study brought out systems that were similar to those obtained in previous studies (Awa et al., 2004, 2006; Njoya et al., 1997; Ziebe et al., 2005) using different classification variables. This was an indication of strong associations among factors governing livestock activities. Typology is important in bringing out classes of stake holders with similar attributes thus, making it easy to target interventions. Results in this study for example indicate that large pastoral herds should be targeted in the fight against trypanosomosis while smaller sedentary herds integrated in cropping systems need improved measures in combating microbial infections.

Animal health service delivery in the region without formal active participation of the primary stake holders, the stock owners, has shown its limits characterised by deficiencies in temporal and spatial coverage by state and private veterinary services, interventions by non-professionals in the supply of pharmaceutical products and treatments and failure to effectively keep disease under control. A formal participatory approach that will ensure the empowerment and capacity building of the farmers in basic animal health problems may be necessary. A step in this direction was taken in RCA since 1992 (Hamat Mal Mal et al, 2009) where the Fédération Nationale des Eleveurs Centrafricains (national federation of livestock owners) operates a central pharmacy as well as train personnel who are referred to as auxiliary veterinary staff, to deliver animal health services to members of the federation. Greater advances have been made in eastern and southern Africa through the introduction of community based animal health services (Huttner et al, 2001; Mugunieri et al, 2004, Ahuya et al, 2005). In this approach, use is made of the farmers' indigenous knowledge on disease epidemiology and traditional pharmacopoeia in the design and delivery of animal health care services.

Conclusion

There is inadequate animal health coverage by professional veterinary services, thus giving room to charlatans to invade the profession. To ensure better efficacy, a functional institutional framework governing veterinary practice needs to be put in place. This should include the empowerment of farmers in the management of animal health under the close supervision of the veterinarian. The veterinarians in private practice in turn should be provided with an enabling environment to assume a greater role in herd (population) health rather than limit them to clinical operations and drug sales.

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