TIME FOR CHANGE?: THE PRESENT STATE OF VETERINARY SERVICES IN NORTH-WESTERN NIGERIA AND OPTIQNS FOR THE FUTURE

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Abstract
This study evaluated the present state of veterinary services in North-western Nigeria comprising Sokoto, Kebbi and Zamfara States. A survey conducted in the area between 1996 and 1997 revealed that veterinary services were dominated by the state governments working through their ministries of agriculture. Donor-assisted projects such as the Zamfara Environmental Protection Agency and the Second Pilot Livestock Development Project also provided veterinary services in the area. Other veterinary services providers included the Federal Department of Livestock and Pest Control Services, the National Veterinary Research Institute, the Faculty of Veterinary Medicine' of Usmanu Danfodiyo University, the local governments, the weekly market drug sellers and drug stores. Results show that veterinary services provided by most of these agencies, particularly those funded by governments, have become skeletal or in some cases non-existent. This sorry state of veterinary services was attributed to poor funding. To improve funding and the effectiveness of veterinary services, it was suggested that governments should consider introducing full cost-recovery in their services and should ultimately aim at privatizing some of the veterinary functions. To mitigate the current shortage of veterinary personnel in the area, it was also suggested that governments should encourage the training of more veterinary personnel.

Key Words: Veterinary services, Agencies, Poor funding, Privatization, Cost-recovery

Introduction

The provision of veterinary care is a crucial aspect of livestock production. This is because the health of an animal is a major determinant of its productivity either in the form of food conversion to put on flesh or in the production of milk or in the production of young ones (Sansi, 1975). Without) an effective veterinary service, the health of the animal cannot be preserved which implies that productivity will be low.

Veterinary services include curative and preventive measures, as well as the provision of veterinary drugs and supplies. Curative services include clinical intervention to provide veterinary care to sick animals, while preventive services consist of vaccination, vector control and eradication, live-stock health care research and extension, and other disease control measures such as quarantines, the slaughter of diseased animals, disease surveillance, and movement restrictions. Livestock diseases are prevented from being transmitted to humans through veterinary inspection and quality control (Umali *et al.*,

1992).

It is evident from the veterinary functions listed above, that effective veterinary services are essential not only for the realization of the full potentials of livestock, but also for preserving the health of humans. Therefore, Uzoukwu (1974) is correct when he noted that veterinary services are crucial in keeping animals healthy in order to ensure the health and happiness of man.

It appears, however, that veterinary services in Nigeria have not performed these functions effectively in recent times, a problem which has been blamed on poor funding (Suleiman, 1990; Kela, 1991).

Consequently, suggestions have been made for a change in the institutional arrangements governing the provision of veterinary services to make the services more effective.

Specifically, the introduction of cost-recovery in the provision of services and outright privatizafion has been suggested (Suleiman, 1990; Kela, 1991; FDLPCS, 1994).

Most of these suggestions, however, are not based on empirical evaluation of the existing state of veterinary services. But such evaluations are necessary in order to ascertain where the problems are, before determining the solutions or reforms that will be required to revitalize the veterinary services. The problems of veterinary services and the severity of such problems will likely vary from one part of the country to 'another. This suggests the need to generate empirical data on the existing state of veterinary services in different parts of the country before attempting reform.

This study, therefore, describes the present state of veterinary services in northwestern Nigeria, comprising Sokoto, Kebbi and Zamfara States. The paper describes the activities of the various agencies concerned with veterinary services provision, the linkages among them, their present level of performance, as well as the problems they face. Suggestions are also made on how to revitalize the veterinary services in the area.

Methodology

Northwestern Nigeria as used in this study refers to the erstwhile Sokoto State consisting of the present Sokoto, Kebbi and Zamfara States. The area is located between latitudes 10° and 14° N, and longitudes 3° and 7°E (Abdullahi, 1985). It covers a total land area of 102,535 km^2 (FOS, 1989). The area shares international boundaries with the Republic of Niger in the north and Benin Republic in the West. It is bounded by the Nigerian states of Niger in the south and Katsina in the east. The boundary between Northern Guinea Savanna and Sudan Savanna cuts across the center of the area.

The area is an important livestock-producing zone in Nigeria, being second only to the old Borno State (Abdullahi, 1985). Livestock production is undertaken by both settled and semi-settled farmers, and by pastoralists, but the pastoralists predominate. The pastoral peoples include the Fulani and the Tuareg and they control more than 80% of the total cattle population in the area (DLPCS, 1992).

The results presented here were obtained as

part of a larger survey of veterinary services in northwestern Nigeria between 1996 and 1997. The respondents studied included 300 Fulani pastoral cattle herders, as well as 15 veterinary professionals and paraprofessionals. Data collected from these respondents were augmented by information obtained from the official records of the ministries of agriculture of the three states, the Zamfara Environmental Protection Agency, the National Veterinary Research Institute Laboratory in Sokoto, the Second State Pilot Livestock Development Project in Sokoto, the Field Office of the Federal Department of Livestock and Pest Control Services in Sokoto, six local governments in each state, and the Faculty of Veterinary Medicine of Usmanu Danfodiyo University, Sokoto. It is the information obtained from these organizations that is reported here. Information obtained include organizational structure of the agencies, veterinary functions performed, staff strength, state of facilities, linkage with other agencies, problems encountered and so on. The information collected was analyzed by description.

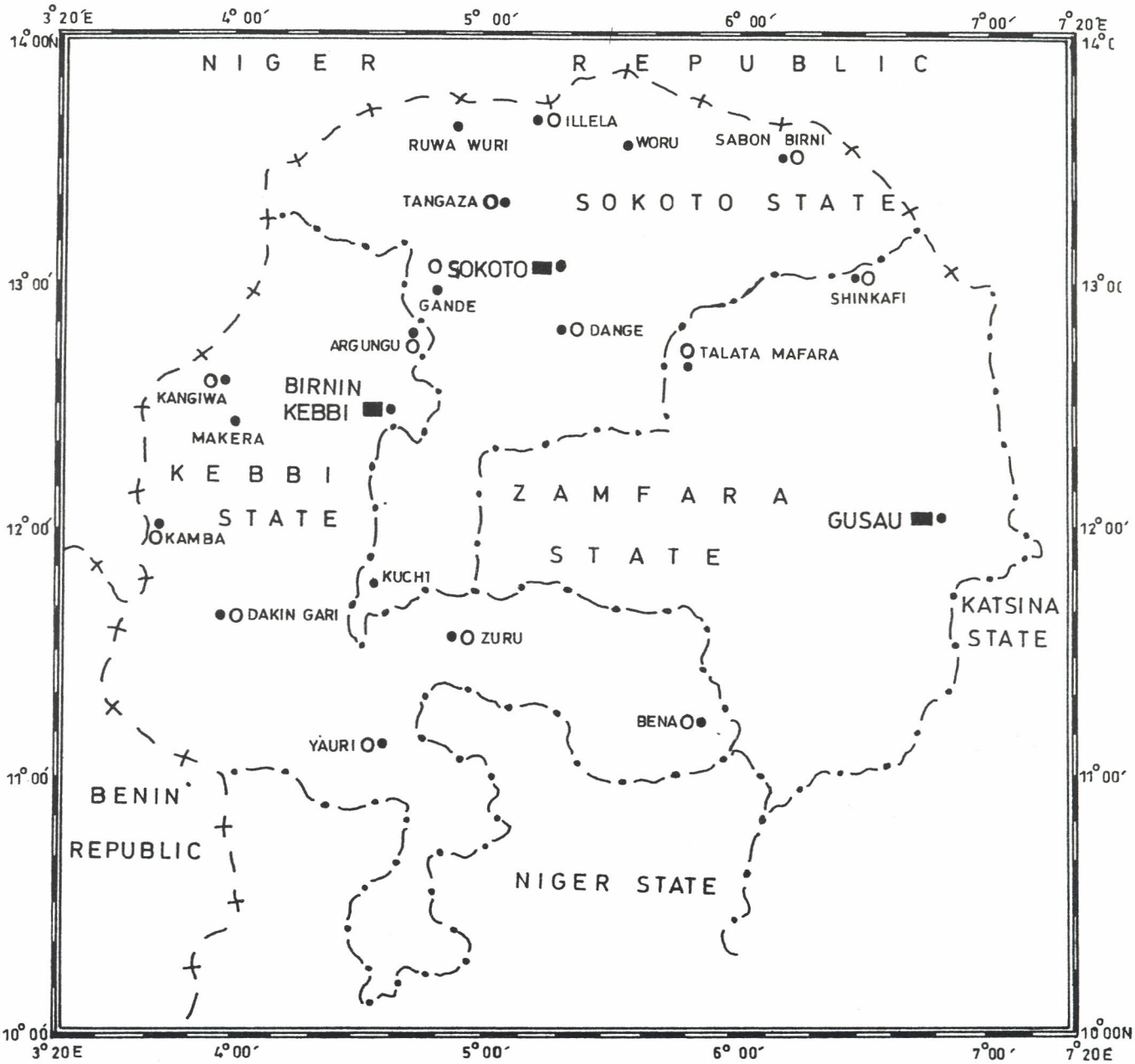
Results and Discussion

Agencies Providing Veterinary Services

Veterinary services in Northwestern Nigeria are dominated by the public sector, particularly the states and local governments. Other agencies connected with veterinary services in the area include the Zamfara Environmental Protection Agency (ZEPA), the Second Pilot Livestock Development Project (SPLDP); the Faculty of Veterinary Medicine of Usmanu Danfodiyo University Sokoto (UDUS), the Federal Department of Livestock and Pest Control Services (FDLPCS), the National Veterinary Research Institute (NVRI), drug importers and manufacturers, veterinary pharmacies (both urban and rural), human medicine stores, and weekly market retailers. These agencies provide one form of veterinary service or another directly or indirectly to herders and constitute what might be called the *veterinary matrix* of the area. Information on the relationships and linkages among the various agencies are presented in Figure 1. These relationships and linkages are these relationships and linkages are further highlighted as the activities of the agencies are discussed in the following sub-sections.

State Governments

The three state governments in the area are perhaps the most prominent providers of veterinary services. The Livestock Services Division of the Ministry of Agriculture in each state performs the veterinary functions of the states. Such functions include vaccinations, curative treatment, movement control, quarantine, and to some extent, meat inspection. The organizational structure of Veterinary Services Division is quite similar in the 'three states with the exception of slight modifications from one state to another. The structure for Sokoto State is presented in Figure 2. As can be seen from the Figure, the Livestock Services Division of the State Ministry of Agriculture and Natural Resources is headed by the Director of Livestock Services under whom are three Deputy Directors, one each for the Veterinary Services, Range Management, and Livestock Development Units. While the Animal Health Unit is charged with the role of ensuring disease prevention, control and eradication,



LOCATION OF LIVESTOCK CONTROL POSTS & INSPECTION STATIONS IN FORMER SOKOTO STATE (NORTH WESTERN NIGERIA)

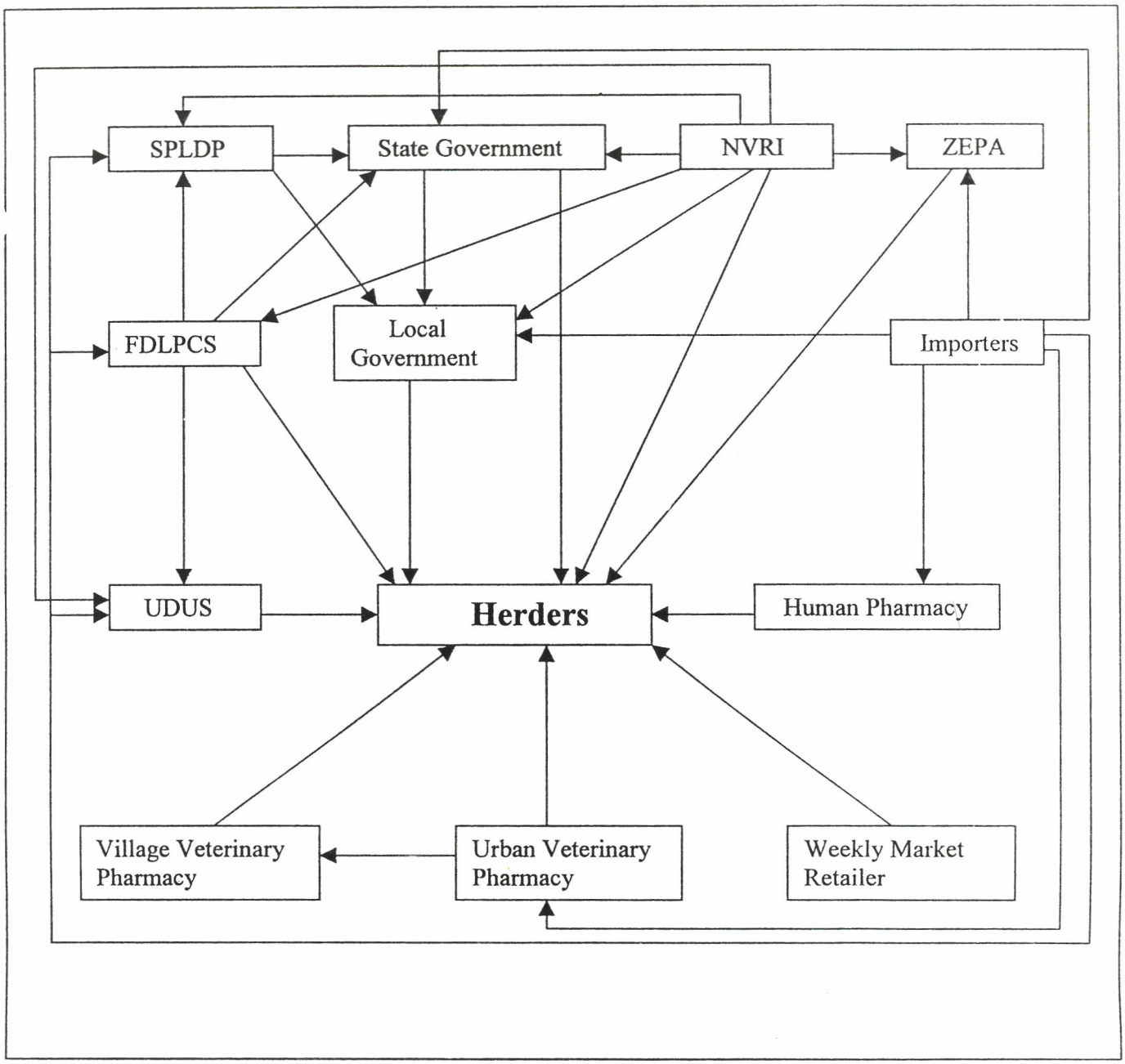


Figure 1: Linkages and relationships among agencies concerned with veterinary services in north-western Nigeria

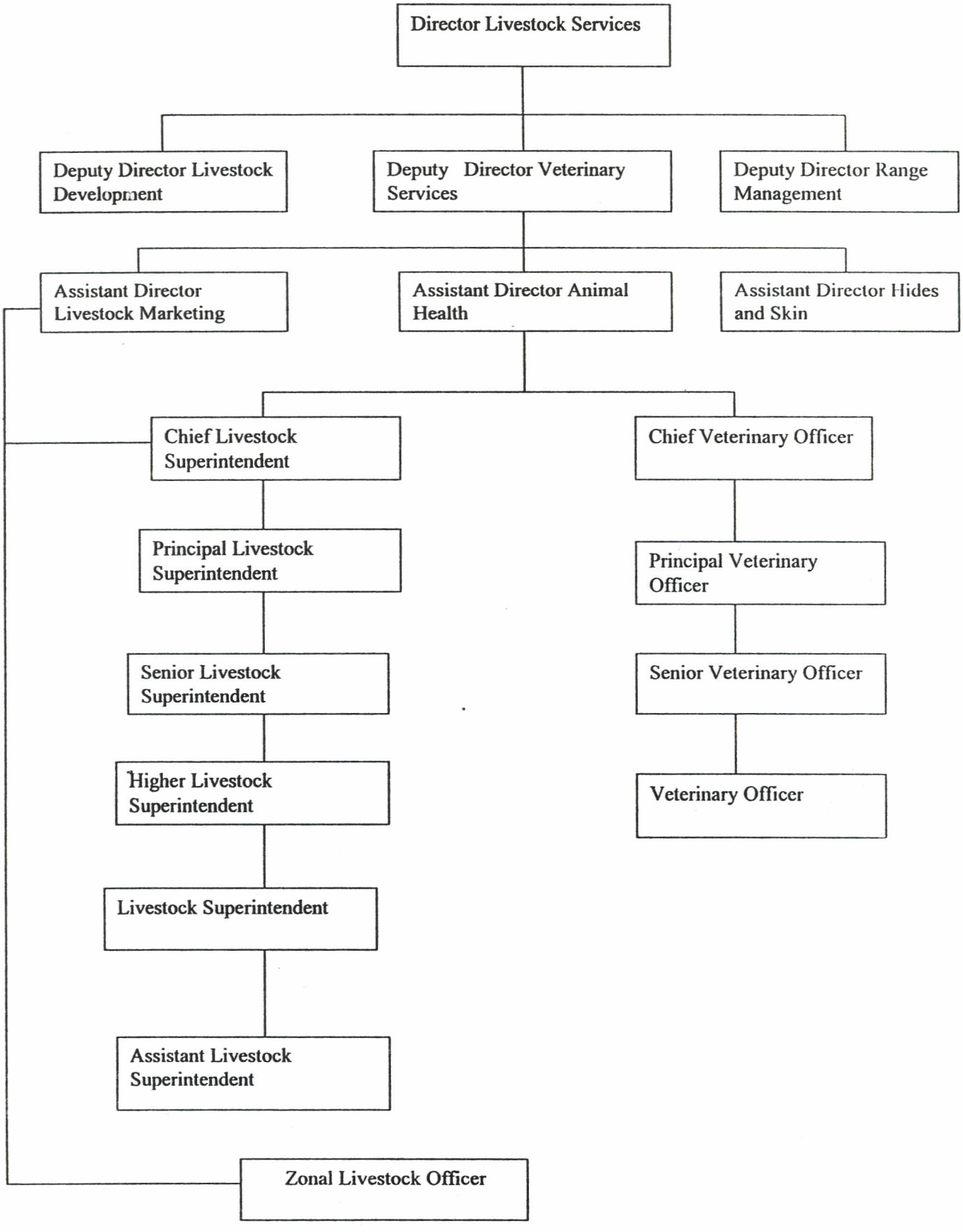


Figure 2: The Organizational Structure of the Sokoto State Veterinary Services Division

the Range Management Unit is concerned with the management of the grazing reserves in the State. The Livestock Development Unit executes livestock projects planned by the state government.

Under the Deputy Director in charge of veterinary services, are three Assistant Directors in charge of animal health, livestock marketing, and hides and skin. Below the Assistant Director there are two career lines, namely the officer line and the superintendent line. The former for is for those entering the state service with university degrees while the later is for those with diplomas (O.N.D. or H.N.D.). The superintendent cadre ranges from Chief Livestock Superintendent to Assistant Livestock Superintendent, while the officer cadre has Chief Veterinary Officer at the head and Veterinary Officer at the bottom.

The above stated structure is similar for the other units and for all the states except that in Kebbi State, the Fisheries unit is also attached to the Livestock services division, which is, therefore, called Livestock, and Fisheries Services Division. The Fisheries Unit is headed by the Assistant Director of Fisheries under who are ranges of fisheries officers and superintendents organized in a similar manner as the animal health unit.

Each zone is headed by the Zonal Officer under which is a different category of staff with expertise in the various disciplines of livestock services (i.e. animal health, range management, livestock development, as well as hides and skin). The ranks of zonal staff range from Chief Livestock Superintendent to Assistant Livestock Superintendent, although some ranks of officers cadre were found in some zones in Kebbi State. The zonal staffs are responsible to the Assistant Director or the Chief Livestock Superintendent, depending on the Zonal Officer's rank, at the Headquarters.

Table 1: Veterinary services zones according to Local Government areas covered.

State	Local Government areas covered
Sokoto State	**23**
Sokoto	Sokoto North, Sokoto South, Kware, Wamakko, Dange/Shuni, Wurno, Tureta, Silame, Rabah.
Gwadabawa	Gwadabawa, Tangaza, Gudu, Gada, Illela, Binji.
Isa	Isa, Goronya, Sabon Birni.
Tambuwal	Tambuwal, Bodinga, Shagari, Kebbe, Yabo.
Zamfara State	**14**
Gusau	Gusau, Bungudu, Maru, Chafe
Talata Mafara	Talata Mafara, Bakura, Maradun
Kaura Namoda	Kaura, Namoda, Zurmi, Shinkafi, Birnin Magaji, Gummi, Bukuyyum, Anka
Kebbi State	**21**
Birnin Kebbi	Birnin Kebbi, Aliero, Bunza, Kalgo, Dandi, Jega, Maiyama, Suru.
Argungu	Argungu, Arewa, Augie, Gwandu
Ya'uri	Ya'uri, Shanga, Ngaski, Koko Besse, Bagudo
Zuru	Zuru, Fakai, Danko/Wasagu,Sakaba

Since the zonal officers are close to the livestock farmers, they are responsible for implementing veterinary strategies of the state governments. Although the clinics in the states are under the control of local governments, following the 1976 local government reforms, each zonal office has a building structure that serves the purpose of a clinic. Thus, the zonal offices could be viewed as veterinary posts through which the state governments discharge their veterinary responsibilities, particularly preventive and curative care.

Disease prevention by the states comes in the form of annual vaccination campaigns with emphasis on rinderpest and contagious bovine pleuropneumonia (CBPP). The vaccines used in such campaigns are normally purchased from the NVRI, although the federal government through the FLDPCS occasionally provides some, especially in emergency situations. The Federal government sometimes also provides transport during such campaigns. The vaccinations are undertaken in collaboration with local governments.

Although the state governments have kept up the annual vaccination campaign against rinderpest and CBPP over the years, the coverage appears to have been on the decline. The vaccination figures for Sokoto are shown in Table 2. It can be seen that the vaccination coverage for both diseases has maintained a general decreasing trend between 1980 and 1994. For instance, the number of cattle vaccinated against rinderpest has declined from more than 1, 770, 837 in 1980 to a mere 164, 187 in 1994. This exceedingly sharp decline cannot be attributed solely to the fact that there was an outbreak in 1980, since the decline has continued even stock Services Division which is, therefore, called from one non-outbreak year to another. Neither could the decline be attributed to the reduction in overall livestock population in the state, following the carving out of Kebbi State.

In fact, the coverage has declined steadily from 290,605 immediately after the carving out of Kebbi state in 1991, to 164,187 in 1994. These are indications of absolute reduction in the effectiveness of a crucial aspect of animal health care, namely disease prevention through vaccination.

Curative services, when available, are provided either through the zonal offices or through local government-controlled veterinary clinics which are though some jointly run by the state and local governments. This arrangement was, however, seen to be working only in the state capitals (Sokoto, Gusau and Birnin-Kebbi). Other veterinary clinics in the area were generally non-functional. In addition, the states formerly operated ambulatory services in an attempt to bring curative and other services closer to the herders. Presently; however, these services are rare and only take place if the livestock owner agrees to pay the transportation cost of the veterinary personnel whose services are needed. This situation has been attributed to scarcity of functional vehicles and requisite veterinary equipment.

Table 2: Cattle vaccination figures for Sokoto State (1980-1994)

Year	T.C.R.V.	C.B.P.P.V
1980*	1,770,837	1, 770,837
1981*	1, 048,627	1, 048,627
1982*	1,389, 202	844, 413
1983	1, 548, 204	1, 032, 156
1984	673, 704	607, 801
1985	856, 485	836, 414
1986	758, 901	758, 901
1987	663, 670	664, 478
1988	467, 466	467, 959
1989	228, 472	272, 368
1990	443, 473	367, 139
1991**	290, 605	289, 997
1992**	255, 507	255, 507
1993**	136, 964	136, 964
1994**	164, 187	164, 187

*Year of major rinderpest outbreak;
** After creation of Kebbi State
Source: Field data, 1996/97

The movement restriction role of the state governments is supposed to be achieved through a number of control posts and inspection stations in each state. In Sokoto State, there are control posts and inspection stations at Illela, Sabon Birni, Dange, Sokoto, Tangaza, Kuchi, Ruwa Wuri, Gande and Woru, while Kebbi State has its control posts at Argungu, Kangiwa, Makera, Kamba, Birnin Kebbi, Dakin Gari, Ya'uri, Zuru and Bena. The Livestock control posts in Zamfara State are located at Gusau, Shinkafi, and Talata Mafara. The main objective of control posts or inspection stations is to protect the livestock in each state from infection from outside, with particular emphasis on animals coming in from other countries. Some of the control posts also have quarantine stations although facilities needed for effective quarantine work are generally lacking. In addition, the control posts are also used to determine the volume of trade in livestock and livestock products between Nigeria and the neighboring countries.

Meat inspection is conducted to prevent the spread of zoonotic diseases of livestock to human beings. In the study area, it is generally a function of the local governments. However, the livestock services divisions of the states also have personnel at the abattoirs in the state capitals along with the local government staff.

Most of the drugs and supplies used by the state governments' services are normally purchased from local manufacturers or importers, out of the annual budgetary allocations to the livestock services divisions by the state governments. These are then used to treat animals free-of-charge or at subsidized rates.

Taking an overview of the situation, it appears that veterinary services provided by the state governments have become very skeletal.

This near collapse state of the veterinary services could probably be attributed the decreasing budgetary allocation to the Veterinary Divisions of the States. For instance, approved budgetary estimates of the erstwhile Sokoto State, after deflation; decreased from N423,772 in 1987 to N162,226 in 1990 (or by nearly 62%).

Following the state creation of 1991, the funding increased momentarily toN547, 658 in 1992 for just what is now Sokoto and Zamfara States, before plummeting again to N330,312 in 1994 (MANR, 1996). Discussion with personnel of the Division suggests that funds that were actually released over this period had witnessed an even more drastic decline.

Second Pilot Livestock Development Project (SPLDP)

The SPLDP is a World Bank-assisted project of the federal government in six states of the federation, including Sokoto and Zamfara States. In each state, the Project uses the existing state and local government infrastructures and personnel to execute its plans. As far as the animal health aspect of the project is concerned, herders pay the original purchase cost of the drug administered to their animals together with the handling costs, but do not pay service charges. The Project purchases its drugs from manufacturers and importers, but some are also provided by the FDLPCS. Vaccines are obtained from the NVRI. As far as vaccination is concerned, emphasis of the Project is on small ruminants, which have been neglected by other providers. The SPLDP was to be foll6wed by the Third Pilot Livestock Development Project that was to operate a credit scheme in collaboration with the Nigerian Agricultural and Cooperative Bank for veterinarian wishing to establish private practices in the states. However, for some reasons, the Third State Pilot Livestock Development Project was not implemented.

Zamfara Environmental Protection Agency (ZEPA)

The Zamfara Environmental protection Agency (ZEPA) is an offshoot of the Sokoto Environmental Protection Project, a European Economic Community -assisted Project established in 1990. The donors withdrew in 1995 after the expiration of the project agreement, but the Sokoto State Government continued to operate it under the name Sokoto Environmental Protection Agency. Following the creation of Zamfara State, the Zamfara State Government took over the projects of the Agency located within its territory under the name Zamfara Environmental Protection Agency.

The ZEPA is concerned with protecting the environment of Zamfara State. One of the specific objectives of the Agency is to resuscitate the Zamfara Grazing Reserve. The activities of the Agency in the Grazing Reserve include, among others, provision of veterinary services to livestock farmers. Veterinary services provided include both preventive and curative care. While vaccines are sold at the cost price to herders, drugs are sold with some mark-up. The vaccines are obtained from the NVRI while drugs are purchased from manufacturers and importers. To enhance coverage; the Agency operates three veterinary service posts in the reserve. These are located at. Gidan Jaja, Gusami and Sabon Birni Dan Ali, and serve the three local government areas covered by the Project in the Reserve. The veterinary posts at Gusami and Sabon birni Dan Ali are equipped with motorcycles while the post at Gidan Jaja, which is the headquarters, has both motor-cycles and a four wheel drive vehicle. There is

a veterinarian at the headquarters and paravetetinarians at the three posts.

Veterinary services provided by ZEPA have been sustained even after donor withdrawal. This is probably attributable to the self-financing nature of the services which has been made possible by the introduction of cost-recovery.

Local Governments

Sokoto, Kebbi and Zamfara States consist of 23, 21 and 14 local government areas, respectively. With the exception of a few newly created ones, each local government across the states has a veterinary section under the Department of Agriculture, which discharge certain veterinary responsibilities. The veterinary functions performed by the local governments are supposed to include preventive' and curative care as well as meat inspection.

The preventive care is provided in collaboration with state veterinary services during the annual vaccination campaigns. During such campaigns, each local government constitutes a vaccination team consisting of local government and state zonal veterinary personnel, as well as the relevant district head. The team then draws out its itinerary covering the entire local government area. Vaccines for the annual campaigns are obtained mainly from the state governments although the local governments may also procure some directly from the NVRI.

Curative services, when available, are provided by the local governments through their clinics. The number of clinics under the control of a local government in the study area varies from one to five, depending on the number of districts in the local government area. However, most of the clinics are empty halls with no activity taking place in them and the local government veterinary staffs are busy only during the vaccination campaigns. Further-more, transportation and other requisite veterinary facilities are generally lacking at this level of government.

Meat inspection is mainly the responsibility of the local governments. Hence, local government veterinary staff could be seen at many abattoirs across the area. In some cases, particularly in the urban areas, meat inspection function is shared with state and federal government veterinary personnel.

Usmanu Danfodiyo University Sokoto (UDUS)

The Veterinary Faculty of UDUS, in addition to its primary role of teaching and research, also provides veterinary services to livestock owners. It has a veterinary teaching hospital at the Temporary Site of the university where sick animals are taken for treatment. It also operates an ambulatory service particularly to nearby local government areas.

The veterinary services provided by the Faculty include preventive and curative care, as well as offering of professional advice on livestock production and health. These services are provided on a partial cost-recovery basis. I other words, herders are charged only a certain proportion of the original cost of drugs and supplies. Herders do not pay consulting fees.

Veterinary services reduced by the veterinary

the Ilella border to monitor livestock, livestock products, as well as veterinary drugs and supplies coming into the country.

The Data and Marketing Information Unit surveys and documents the prices of livestock and livestock products, as well as the quantities of these commodities traded. Such data are normally sent to the head office to be used in policy formulation.
The Livestock Projects Unit is responsible for executing direct livestock projects planned by the Department. In North-western Nigeria, there is only one such project. This is the Zugu Goat Project located at Zugu in Zamfara State. The objective of the Project is to aid the formulation of policies aimed at improving breeding methods in goat production. Staff of the Sokoto Field Office runs the project.

The Pasture and Range Management Unit is concerned primarily with development and management of grazing reserves. The Unit works in collaboration with the Range Management Units of the states ministries of agriculture. The Pest Control Unit monitors and controls animal and crop pests and report regularly to the state ministries.

Pharmacies (drug stores)
Three types of pharmacies can be distinguished in the area. These are human pharmacies, urban-based veterinary pharmacies and village pharmacies. The primary function of human pharmacies is to dispense human medicines, but some also stock veterinary drugs as well. The urban and village veterinary pharmacies specialize in veterinary drugs, supplies and equipment.

The source of drugs for the veterinary pharmacies could be the manufacturers, importers or other pharmacies, while vaccines are obtained mostly from NVRI. All veterinary pharmacies in the area operate on small-scale, stocking a wide range of veterinary products.

Weekly Market Retailers
The weekly market retailers (sometimes referred to as *charlatans* or *quacks)* are itinerant drug hawkers who move from one rural market to another where they come into contact with herders. They dispense a wide range of veterinary drugs whose sources are not easy to determine. With the collapse of most government veterinary services, this category of providers is quite popular with the herders. They are popular also because they take their merchandise to the 'doorstep" of the herders and also because they often know the identity of the herders and are able to exercise flexibility in fee collection. However, most of them are without any form of veterinary training and could not possibly accompany drugs dispensing with expert advice on their utilization. Furthermore, the quality of the drugs traded is uncertain as no evidence of special storage facilities was seen with them. But their businesses flourish because they occupy a vacuum left by the collapsing government services. There is also no regulation of the activities of the weekly market retailers.

Staff Profile of Veterinary Services Providers
The personnel who shape the delivery of veterinary services include professional veterinarians and paraprofessional animal

Teaching Hospital at UDUS are funded partly by the University and supplemented partly by the FDLPCS. The university pays the overhead cost, including staff salaries, while the FDLPCS pays for drugs and vaccines. Vaccines are normally purchased from manufacturers and importers. The budget for drugs and vaccines was limited to the study. The rather small budget and the fact that full cost-recovery is not allowed are said to be the factors limiting the veterinary activities of the faculty.

National Veterinary Research Institute (NVRI)

The NVRI is by far the most important source of vaccines to all providers in the area. With headquarters in Vom (near Jos), Plateau State. The institute has a laboratory in Sokoto, which serves as vaccine depot for the three states. In addition, the laboratory provides diagnostic support and epidemiological services to the states. Records show rather low demand for vaccines from the laboratory. This has been attributed to the fact that some of the states by-pass the laboratory and buy vaccines directly from Vom.

Federal Department of Livestock and Pest Control Services (FDLPCS)

The FDLPCS is one of the nine departments of the Federal Ministry of Agriculture. With the headquarters in Abuja, the main objectives of the department are to monitor and undertake surveillance of livestock diseases, and to formulate policies on prevention, control and eradication of livestock diseases throughout the country. To achieve these objectives, the department is divided into a number of units including the Animal Health, Public Health, Veterinary Quarantine, Livestock Projects, Pasture Management, Data and Marketing Information, as well as Pest Control Units.

The department has field offices across the country. In northwestern Nigeria, there is a field office in Sokoto, which serves the three states. Each of the units mentioned above are represented in the field office. The Animal Health Unit collaborates with the three states in disease prevention and eradication programmes. The Unit, in collaboration with the states, undertakes vaccination and sero-monitoring, as well as distribution of drugs and vaccines to the states. Since 1994, however, it has not performed any 6f these three functions. Even the distribution of drugs and vaccines to the states and veterinary faculties of universities is handled directly by the head office, while the role of the field office is reduced to monitoring their use. Vaccines distributed by the Department are mostly obtained from the NVRI while drugs are obtained from importers and manufacturers.

The Veterinary Public Health Unit conducts ante mortem and post mortem meat inspection to prevent the spread of livestock diseases to humans, The Unit has staff at the abattoir in Sokoto who perform this function alongside staff of the state and local governments.

The veterinary quarantine unit controls the movement of livestock especially across international borders to protect Nigerian livestock population. Accordingly, the unit has staff at many lands, water and airports. In Northwestern Nigeria, staff of the unit are at

health workers. The distribution of the professionals and paraprofessional veterinarians according to the various agencies responsible for veterinary services in the area is presented in Table 3.

There were 34 veterinarians in Sokoto State, while Kebbi and Zamfara had six each, bringing the total to 46 for the entire study area. The relatively high number of veterinarians in Sokoto State is attributable to the location of Usmanu Danfodiyo University there where there were up to 29 veterinarians at the Veterinary Faculty. Two veterinarians each were at State Ministry of Agriculture and the FDLPCS while the remaining one was at the NVRI laboratory.

The situation is quite similar in Zamfara and Kebbi States with six veterinarians each. All the professionals in Zamfara were with the State Government but with one on secondment to ZEPA. Two of the remaining is at the Zonal Veterinary Clinic in Gusau while the rest were at the Ministry head-, quarters also in Gusau. In Kebbi State, all the six veterinarians were also with the State Government with two at the Zonal Clinic in Birnin Kebbi, one at a zonal office outside Birnin Kebbi and the remaining three at the Ministry headquarters.

Sokoto State had a total of 44 paraveterinarians as against 45 and 71 for Zamfara and Kebbi States, respectively. Of the paraveterinarians in Sokoto, 23 were with the State Government, 14 were with the local governments and the remaining seven were with the FDLPCS.

Thirty of the estimated 45 paraveterinarians in Zamfara state were with the local governments while ten were with the State. The remaining five were with ZEPA. With the exception of the zonal clinic in Gusau where there were veterinarians, all the other zonal offices were operated by paraveterinarians. At ZEPA, a veterinarian was present only at the headquarters in Gidan Jaja. The remaining veterinary posts at Gusami and Sabon Birnin Dan Ali were run by paraprofessionals.

Table 3: Number of veterinarians and para-professionals with various providers

State/Organization	No. of veterinarians	No. of paravets
Sokoto State	**34**	**44**
State Government	2	23
UDUS	29	0
Local Governments	0	14
NVRI	1	0
FDLPCS	2	7
Zamfara State	**6**	**45**
State Government	5	10
ZEPA	1	5
Local Governments	0	30
Kebbi State	**6**	**71**
State Government	6	31
Local Governments	0	40
North-West total	**46**	**160**

* Paraveterinarian figures were estimated from a sample of six Local Governments in each state. Source: Field data, 1996/97

In Kebbi State, 40 of the 71 paraveterinarians were with the local governments while the remaining 31 were with the State Government. Nearly all the paraveterinarians with the State Government were at the zonal offices or clinics.

It is striking that all veterinary staff of the local governments in the three states were paraveterinarians. The foregoing results also show that the zonal offices or clinics where the actual delivery of services takes place were run by paraveterinarians. This suggests that the paraprofessionals play a crucial role in the delivery of veterinary services in the study area.

The number of veterinarians and paraprofessionals available in an area could be used as a rough estimate of the availability of veterinary services in the area. To make such an estimate, Umali *et al.* (1992) has suggested the use of veterinary livestock units (VLUs) per veterinarian and per veterinary auxiliary. A veterinary livestock unit (VLU) means one cow or one camel or two horses or two pigs or two donkeys or ten small ruminants or 100 fowls (de Haan and Bekure, 1991).

It is estimated that the study area has 1.7 million cattle, 2.6 million sheep, 2.5 million goats, 6.5 million poultry, 250,000 donkeys, 40,000 camels, and 25,000 horses (FDLPCS, 1992). These figures

give a total of 2,452,500 VLUs for the area using these figures and the number of veterinarians and paraprofessionals presented in Table 3; it is evident that there were 53,315 VLUs per veterinarian and 15,328 VLUs per paraveterinarian in the area.

Sandford (1983), as cited in Urnali *et,al* (1992), suggested 20,000 VLUs per veterinarian as the appropriate ratio for curative and preventive work in extensive production system found in Africa and the Middle East. The ratio of 53,3 15 VLUs per vet-stock determined in this study excee4ed the recommended ratio by more than 167%, suggesting an inadequate supply of veterinarians in the area. For effective service delivery, Sandford (1983) also suggested a ratio of 1,000-3,000 VLUs per auxiliary (paraprofessional). The ratio of 15,328 VLUs per paraprofessional for the study area exceeded even the upper limit recommended, by more than 400% implying that the paraprofessionals were also in short supply.

Given these results, it seems that the supply of veterinary services in the area has not been generous due to inadequate supply of veterinary personnel. But the current under funding of the services, since even the few personnel available are not effectively utilized critically worsens the situation.

Conclusion and Recommendation

The results of the study suggest that inadequate funding and inadequate number of veterinary personnel in the area have resulted in the ineffectiveness of veterinary services provided by governments in the area. Confronted with this near collapse state of veterinary services, it can be concluded that a change in the approach to veterinary services provision is necessary in the area. Presently, the governments at various levels in the area maintain that veterinary services are provided free-of-charge, but with the possible exception of annual vaccination campaigns and curative services at the zonal veterinary clinics located in the state capitals, the services are virtually non-existent. Therefore, governments appear to be saddled with paying salaries of veterinary personnel whose skills they cannot effectively employ because of non-availability of funds for purchasing drugs, veterinary equipment, transport facilities and other materials required for meaningful veterinary services delivery.

On the other hand, veterinary services seem to be more available in areas covered by donor-assisted projects, such as the Zamfara Environmental Protection Agency, where cost- recovery has been introduced. Such services have been sustained largely by funds recovered from livestock owners for services rendered. Furthermore, a recent study in the entire north-western Nigeria (Baba, 1999) has shown that livestock owners are willing to pay for veterinary services provided such services are perceived to be effective. Given this situation, there appears to be some sense in making those who use veterinary services to pay for them, in order to ensure proper funding and to improve the effectiveness of service delivery. In other words, if governments in the area are unable or unwilling to fund

veterinary services, they may need to introduce full cost-recovery in their services. To do this effectively, it will be necessary for each state government to set up an efficient organization for revenue collection and a monitoring mechanism to ensure that those who handle the collected revenue make correct returns to government treasury and that such funds are reinvested in veterinary services provision.

However, given the corruption and *red-tape* that characterize most public hierarchies in Nigeria, generally, it may not be easy putting up such an organization covering the entire state. Therefore the ultimate aim of governments should be to privatize some of the veterinary services.

Regardless of the option chosen, adequate supply of veterinary personnel is essential to effective veterinary service delivery.

The results of the study show that veterinary personnel are in short supply in the area. State governments should, therefore, encourage the training of veterinary personnel at diploma and degree levels through special scholarship incentives.

References

Abdullahi, A.K. (1985). An economic analysis of a settlement model for Fulani pastoralists in Sokoto State of Nigeria. Unpublished Ph.D Thesis, University of Nottingham, School of Agriculture, Leicestershire, U.K.

Baba, K.M. (1999). Structural reform of veterinary services in north-western Nigeria: Herders' response to service cost and feasibility of private delivery. Unpublished PhD Thesis, Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria, Nigeria.

de Haan, C. and S. Bekure (1991). Animal Health Services in Sub-Saharan Africa: Initial Experiences with Alternative Approaches. *World Bank Technical Paper No. 134,* Washington, D.C.

FDLPCS (1992). *Nigeria Livestock Resources Survey. Vol. III State Reports,* Resource Inventory and Management Ltd, Federal Department of Livestock and Pest Control Services, Lagos.

FDLPCS (1994). *Staff Appraisal Report.* Sokoto Pilot

Sansi, K A 0. (1975). Improvement in animal pro- State Livestock Development Programme, Federal Department of Livestock and Pest Control Services, Federal Ministry of Agriculture and Natural Resources, Abuja.

FOS (1989). *Digest of Statistics.* Federal Office of Statistics, Federal Republic of Nigeria, Lagos.

Kela Consults (Nig.) Ltd (1991). Animal health services in Nigeria: Evaluation and proposal for

improvement. Paper prepared for Federal Department of Livestock and Pest Control Services, Federal Ministry of Agriculture and Rural Development, Lagos, Nigeria.

MANR (1996). Official files, Sokoto State Ministry of Agriculture and Natural Resources. Sokoto.

Sandford, S. (1983). Management of Pastoral Development in the Third World. New York, John Wiley and Sons.

Sansi, K.A.O. (1975). Improvement in animal production: Animal health. *Nig. J. Anim. Prod.* 2(1): 45-49

Suleirnan, H. (1990). Policy issues in pastoral development in Nigeria In Gefa, J.O., 1.F. Adu, E.A. Lufadeju, M.S. Kallah and M.O. Awogdade (eds), *Pastoralism in Nigeria: Past, Present and Future..* Proceedings of the National Conference on Pastoral-ism in Nigeria, NAPRI, Shika-Zaria, 26-29 June.

Urnali, D.L., G. Feder and C. de Haan (1992). The Balance Between Public and Private Sector Activities in the Delivery of Livestock Services, *World Bank Discussion Paper No. 163,* Washington D.C., The World Bank.

Uzoukwu, M; (1974). The veterinary profession in Nigeria: New trends and aspirations. *Nigerian J Veterinary Medical Association.* 3(20): 39-42