Republic of NAMIBIA
Ministry of Agriculture
Water and Rural Development
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Directorate of Veterinary Services
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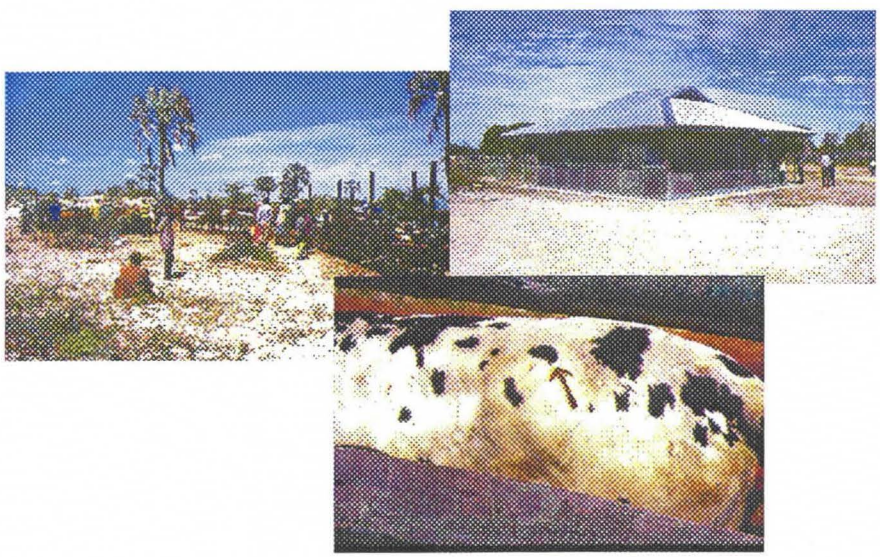
NOREESP-ONDANGWA

Ambassade de France en
NAMIBIE
WINDHOEK
Service de Coopération et
d'Action Culturelle

SUPPORT MISSION ON EPIDEMIOLOGICAL SURVEILLANCE OF PRIORITY ANIMAL DISEASES

North Central Region – NAMIBIA

Mission report
April 4 to 13, 2000



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RESUME :

Cette première mission d'appui du Cirad-emvt au projet NOREESP avait pour objectif de faire l'état des lieux de la surveillance épidémiologique dans la région du Nord-Central namibien afin de proposer des axes d'amélioration.

Le système national de surveillance épidémiologique fonctionne de manière satisfaisante depuis plusieurs années. Dans le Nord Central la surveillance épidémiologique est caractérisée par un manque d'exhaustivité et de représentativité des données collectées en raison du manque de vétérinaires et du manque d'efficacité des assistants d'élevage sur le terrain.

Nous avons proposé de recentrer la surveillance épidémiologique sur une liste de maladies prioritaires pour lesquelles les activités de surveillance seront renforcées par la formalisation, la formation et la communication.

La définition de maladies prioritaires permettra de formaliser des protocoles de surveillance spécifiques sur lesquels s'appuieront les formations des intervenants de terrain. D'autres intervenants dans les élevages (vulgarisateurs, auxiliaires d'élevage) seront également impliqués dans la surveillance épidémiologique.
L'exploitation de certaines données épidémiologiques au niveau local permettra d'efefctuer un retour d'information mieux ciblé pour les intervenants de terrain et les éleveurs.

Une fois achevée la formalisation des protocoles de surveillance et la formation des intervenants, la prochaine mission d'appui pourrait se consacrer principalement à la mise en place des indicateurs de performance de l'épidémiosurveillance.

SYNTHESE

Cette mission réalisée du 4 au 13 avril 2000 en Namibie est la première des trois missions d'appuis prévues dans le cadre de la convention d'appui signée avec le projet NOREESP.

L'objectif de la mission était de faire le point sur la situation de la surveillance épidémiologique des maladies animales dans la région du Nord Central. Pour cela, l'ensemble des acteurs impliqués dans la surveillance ont été rencontrés, que ce soit au niveau central avec l'unité d'épidémiologie de la Direction des Services Vétérinaires à Windhoek ou au niveau du terrain (Services vétérinaires, services de vulgarisation, éleveurs).

Le système national d'information épidémiologique apparaît déjà très performant et est basé dans la région du Nord-Central sur trois axes de surveillance : passive (déclaration des éleveurs), active (Enquêtes aux couloirs de vaccination) et orientée (abattoirs).

Le facteur limitant principal de la surveillance passive tient au manque de couverture du terrain par les services vétérinaire en raison du faible nombre des vétérinaires et Inspecteurs en santé animales présents sur le terrain et en raison de la faible activité des Inspecteurs Assistants d'élevage. Ceci se traduit par une faible représentativité des données collectées sur le terrain également réparties entre maladies prioritaires et non prioritaires.

Nous avons proposé que la surveillance épidémiologique soit recentrée sur un certain nombre de maladies prioritaires qui doivent être déterminées par les services vétérinaires et que leur surveillance soit renforcée afin de la rendre plus représentative, voire exhaustive.

La détermination des maladies animales prioritaires devrait conduire à la rédaction de protocoles de surveillance spécifiques qui détaillent l'ensemble des procédures de surveillance qui seront suivies par les intervenants de terrain.

Le renforcement de l'exhaustivité passe par :
- le recentrage des agents des services vétérinaires (et notamment les vétérinaires) sur des activités de surveillance des maladies prioritaires ;
- le renforcement de la relation entre les services vétérinaires et les éleveurs (notamment par l'organisation de réunions de sensibilisation des éleveurs à la surveillance) ;
- ainsi qu'une participation active des autres acteurs de l'élevage à la surveillance (tels que les vulgarisateurs).

Ces évolutions doivent être scellées par l'organisation d'une formation regroupant l'ensemble des acteurs de terrain afin qu'ils acquièrent les connaissances et savoir-faire leur permettant d'intervenir efficacement dans la surveillance épidémiologique.

La surveillance orientée de la péripneumonie contagieuse bovine au niveau des abattoirs pourrait être rendue plus efficace par le renforcement des relations entre les services d'inspections et les services vétérinaires.

En matière de gestion des données, la centralisation de la gestion à Windhoek doit être conservée tout en favorisant un niveau d'exploitation dans le Nord-Central qui devrait notamment permettre d'effectuer un retour d'information mieux ciblé vers les acteurs de terrain de cette zone ainsi que les éleveurs.

La mise en place du logiciel TAD*info* au niveau central à Windhoek pourrait motiver une intervention du Cirad-emvt au cas où les services vétérinaires souhaiteraient le développement de modules complémentaires adaptés aux besoins nationaux.

Abstract

This mission carried out from April 4 to 13, 2000 in Namibia is the first of the three supports missions envisaged within the framework of the convention signed between CIRAD and the NOREESP project.

The objective of the mission was to give a progress report on the situation of the epidemiological surveillance system of animal diseases in the North Central Division.

For that, we have met all the actors involved in the surveillance, at the central level (epidemiology unit of the Directorate of the Veterinary Services in Windhoek) and the field level (Veterinary Services, extension services, farmers).

The national Epidemiological information system appears to be already very efficient and is based in the North Central Division on three axes of surveillance : passive (declaration of the farmers), active (Crushpen visit forms) and targeted (abattoirs).

The principal limiting factor of passive surveillance is the lack of ground coverage by the veterinary services because of the low number of the state veterinarians and animal health Inspectors present in the field and because of the weak activity of the Stock Inspector assistants (SIA). This results in a low representativity of the data collected on the field evenly distributed between priority and non priority diseases.

We proposed to focus epidemiological surveillance on a certain number of priority diseases (to be determined by the veterinary services) in order to reinforce their surveillance to make it more representative, even exhaustive.

The determination of the priority animal diseases should lead to the drafting of specific surveillance protocols which detail surveillance procedures to be followed by the field workers.

Some of the key issues for the reinforcement of exhaustiveness are :
- centring of some of the veterinary services agents (and in particular state veterinarians) on surveillance activities of the priority diseases;
- reinforcement of the relation between the veterinary services and the farmers (in particular by the organisation of farmers sensitisation meetings);
- as well as an active participation of other actors to the surveillance (such as the extension services).

These evolutions must be sealed by the organisation of a training session gathering all the field actors so that they acquire knowledge and know-how enabling them to operate efficiently in epidemiological surveillance.

The directed surveillance of the contagious bovine pleuropneumonia at the abattoirs could be made more efficient by the reinforcement of the relations between the inspection services and the veterinary services.

Regarding data management, centralisation in Windhoek must be preserved while supporting a level of processing in the North-Central Division which should make it possible to carry out a better targeted information feedback towards the field workers and the farmers.

If the Directorate of Veterinary Services wishes the development of complementary modules to TADinfo after its implementation in Windhoek, Cirad-emvt is ready to participate to the adaptation of the software to the national needs.

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People met

Dr. John SHAW, Director of Veterinary Services, Ministry of Agriculture, Water and Rural development

Dr. Archie NORVAL, Deputy Director of Veterinary Services, Ministry of Agriculture, Water and Rural development

Dr. Otto HÜBSCHLE, Director of the Central Veterinary Laboratory in Windhoek

Dr. Felix METTLER, Head of the Diagnostic department, Central Veterinary Laboratory, Windhoek

Dr. Alex Verlinden, Ecologist/GIS specialist, Northern Namibia Environmental Project, Oshakati

Dr. Tina Musilika, State Veterinarian, Head of the DVS Ondangwa

Mr Thierry Dauplais, Extension Advisor, Co-ordinator for the French supported in rural development.

M. Peter, Laboratory technician, Ondangwa Laboratory

M. Arnie Larsen, technical adviser to extension services

Dr. Cleopass Bamhare, Veterinary epidemiologist, Epidemiology Unit, DVS, Windhoek

Mrs. Kohrs, Veterinarian, Epidemiology Unit, DVS, Windhoek

M. Franqueville, Advisor at the Cooperation and Cultural Action Service of the French Embassy

Dr. Bula, Veterinary Inspector at the Meatco Abattoir in Oshakati

Mr. Vaïno Ekandjo Majority, Meat Inspector at the Meatco Abattoir in Oshakati

Dr. Amuthenu Natangwe, State veterinarian in Ondangwa

Dr. Edmore Masaïre, State veterinarian in Uutapi

Mr. Ben Namwandi, Chief Animal Health Inspector in Ondangwa

Mr. Salatiel Eita, CAHA in Omhakoya

Mrs. Mateus Lumpy, SIA in Onesi

Mr. VENDELINUS, Responsible of the Oshakati municipality abattoir

Abreviations

AET : Agricultural extension technician

AHI : Animal health inspector

ARDC : Agricultural Rural Development center

CAET : Chief agricultural extension technician

CAHA : Community animal healthcare agent

CAHI : Chief animal health inspector

CBPP : Contagious bovine pleuropneumonia

DEES : Directorate of extension and engineering services

DVS : Directorate of veterinary services

DRF : Disease report form

EIS : Epidemiological Information System

FMD : Foot an mouth disease

FVF : Farm visit form

LSD : Lumpy skin disease

NOLIDEP : Northern livestock development project

NOREESP : Northern Research Extension and Epidemiology Support Project

REMP : Research management extension project

SIA : Stock inspector assistant

VREC : Veterinary rural extension centre

Mission description

Monday 3 April	7h30 Departure from Montpellier 19h00 Travel Paris – Frankfurt – Windhoek
Tuesday 4th April	8h00 Arrival in Windhoek 10h00 Meeting at French Embassy with M. Franqueville 11h00 Meeting at DVS with the Epidemiology Unit 13h00 Meeting and lunch with M. Thierry Dauplais 15h00 Departure to Oshakati
Wednesday 5th April	8h00 Meeting with Dr. Tina Musilika, head of DVS, Ondangwa 11h00 Visit of the Laboratory of Ondangwa 14h30 Meeting with M. Arnie Larsen, TA at extension services 16h30 Meeting with Dr. Alex Verlinden, Northern Namibia Environmental Project 18h30 Work at the DVS
Thursday 6th April	8h00 visit of the Meatco abattoir in Oshakati. Discussion with the veterinary inspector of the abattoir, the meat inspector and the trainee responsible for the open market butchers study. 14h30 meeting with Dr. Edmore Masaïre, state vet in Uutapi at the ARDC. 17h00 consultation on the field with Dr. Masaïre
Friday 7th April	7h30 departure to Uutapi 9h00 Meeting with the CAHA of Omhakoya 11h00 Field clinical visit in Euni with Dr. Edmore Masaïre 12h00 Meeting of the SIA of Onesi 14h30 Departure to Ruacana 15h30 visit of the Ruacana border post 16h00 Appointment with the CAHA of Elafi 18h30 Arrival in Oshakati
Saturday 8th April	7h30 departure to Uutapi 8h30 meeting with Dr. Masaïre, visit of the Ombalantu Cattle market 13h00 Visit to Elafi and Ruacana border post
Sunday 9th April	Document consultation, report writing, meeting with the AT team of Noreesp for the preparation of the technical committee
Monday 10th April	8h00 – 15h00 Follow-up of the vaccination teams at Omanbomo Crushpen Oniiwe Crushpen 16h00 Debriefing meeting with Oshakati DVS Staff
Tuesday 11th April	8h00 Visit of the Oshakati municipality abattoir Travel to Windhoek
Wednesday 12th April	Meeting with the DVS epidemiology unit Visit to the Central Veterinary Laboratory in Windhoek
Thursday 13th April	Meeting with Dr. J. Shaw, Director of veterinary services Meeting with Dr. A. Norval, Deputy Director of veterinary services First technical meeting on the EIS in NCD Debriefing at the French Embassy in Windhoek Travel Windhoek – Frankfurt – Paris - Montpellier
Friday 14th April	12h00 Arrival in Montpellier

Introduction

The veterinary component of the NOREESP Project supports the Directorate of Veterinary Services in North Central District (NCD) in order to improve the animal healthcare delivery service and the epidemiological information system (EIS).

An agreement was signed between NOREESP and Cirad-emvt for the support of the project in the field of epidemiosurveillance. One mission of 12 days is planned to be held annually during the three years of the project (see appendix 1). This mission is the first of the three and was mainly focused on the global understanding of the current operation of the existing EIS in the NCD in order to propose improvements in the different parts of the surveillance system and identify specific topics for the coming support missions (see appendix 2).

Therefore, this mission focused on meeting the different actors of the EIS from the field (farmers, Community animal health workers [CAHA]) to central level in Windhoek (Epidemiology unit of the Directorate of Veterinary Services [DVS]).

During the stay in Namibia, 7 days were spent in the NCD with several field visits (vaccination campaign, VREC, CAHA, abattoirs, markets) and 3 days were spent in Windhoek. Restitution of the mission was performed during the first technical meeting of the network held the last day of the mission in Windhoek and chaired by Dr. A. Norval, Deputy Director for the Northern communal areas.

This report follows the logical frame of the structure of an epidemiosurveillance network.

1. CONTEXT

1.1. NOREESP Project

The NOREESP project has three components :

- Extension component supporting the Farming System Research and Extension unit (FSRE) in north central. This component began in March 1999 ;
- Veterinary component supporting the veterinary services in north central in order to improve the epidemiological information system. This component began in November 1999 ;
- Institutional component supporting the Ministry of Agriculture, Water and Rural Development and coordinating the project.

The veterinary component is based in Ondangwa in the DVS office and is supported by a French technical assistant and a French volunteer.

The main objectives of this component is :

1. to improve the epidemiological information system in the NCD (data collection and processing, training, institutional organisation).
2. to improve the animal healthcare services provided by the veterinary services in the NCD (vaccinations, diagnostic, care and drug supply) ;

1.2. Cirad input to NOREESP

The input of Cirad in the project is :

2. providing the volunteer trained in the field of epidemiosurveillance ;
3. supporting the improvement of the epidemiological information system through annual support missions (12 days per year) and a regular contact with the epidemiology group of Cirad-emvt, EPITROP.

(See appendix 1)

1.3. Animal production in Namibia and North Central Division

Animal production in Namibia is characterised by the division between the Northern and Southern parts of the country.

Commercial farms (5000) are mainly located in the southern part of the country and are agreed to export meat mainly to European Union and Southern Africa. This means that the southern part of the country is free from the main epizootic diseases and has thus access to the international market.

Therefore, a cordon fence has been implemented between the north and the south to avoid the reintroduction of the diseases threatening the possibility to access to the international market.
Primarily the cordon fence was set up for Foot and Mouth Disease (FMD) and it is now mainly maintained to prevent the spread of Bovine contagious pleuropneumonia (CBPP) still present in the northern communal areas.

Animal production in Namibia

Agriculture = 10 % of Gross domesti product
Animal production = 70 % of agricultura GDP
40 % of Namibian population lives on animal production

2 280 000 Cattle
2 160 000 Sheep
1 690 000 Goats
450 000 Poultry
64 000 Donkeys
150 000 Pigs
33 000 Ostriches

Meat export : 40 % to European Union
60 % to South Africa
Living animals : 95 % to South Africa

Living animals are not allowed to cross the cordon fence but following the arrival of the Meat Company ("Meatco") in the north, quarantined, slaughtered and deboned meat is allowed to cross the cordon fence for export to South Africa or consumption in the commercial area.

There are around 100 000 households in all the North Central area with around 6,1 people per household. North central is then the most populated place in Namibia.

As the breeding system is mainly commercial in the south of the country it is mainly traditional in the Northern communal areas. The production system is agro-pastoral with seasonal transhumance during the dry season. Cattle breeding is oriented to self consumption (60 % of the offtake) or to local traditional butchers (30%).

Animal production in North Central Division

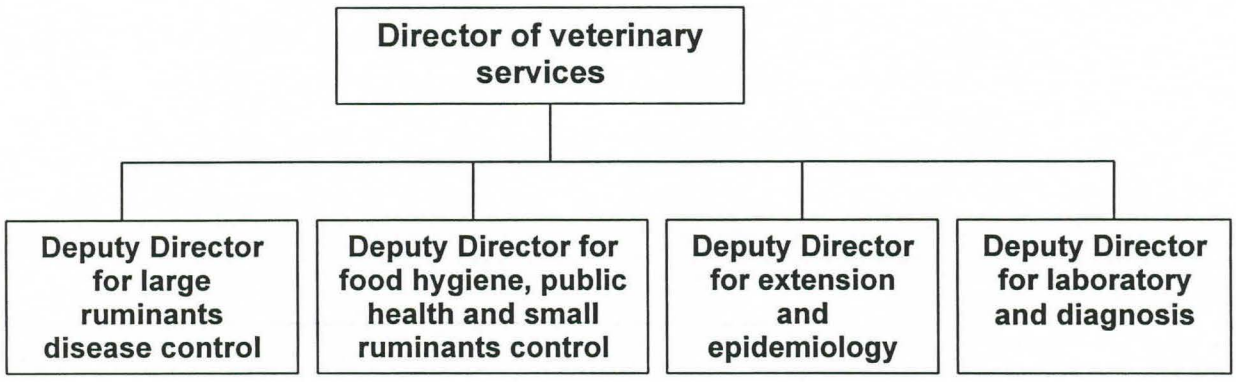
180 000 cattle owners

600 000 Cattle
19 000 Sheep
230 000 Goats
10 000 Poultry
120 000 Donkeys
2 000 Pigs

1.4. Veterinary services in Namibia and North central division

The Directorate of Veterinary services is one of the three technical directorates in the department of Agriculture and Rural Development at the Ministry of Agriculture, Water and Rural development.
The director of veterinary services is assisted by four deputy directors (see figure 1).

Figure 1 : DVS organisation



The DVS in the North Central Division is constituted of more than 90 agents as follow :

2. 2 state veterinarians ;
3. 2 chief animal health inspectors (CAHI) ;
4. 4 animal health inspectors ;
5. 65 stock inspector assistants.

An evolution of the veterinary staff in the North Central Division is planned for the near future. The number of Chief animal health inspectors and animal health inspectors will be increased and the number of stock inspector assistants will be brought zero (some of them will retire and some would be promoted as animal health inspectors.

Table 1 : Evolution of the veterinary services in the NCD area :

	Presently	Forecasted
Veterinarians	3	4
Chief AHI	2	4
AHI	4 (+3)	18
SIA	65	0
CAHA	40	> 40

The duties of the veterinary services in the North central is concentrated on :

6. implementing the vaccination campaign against CBPP, FMD and other diseases depending on the area and the demand ;

7. animal healthcare : veterinarians, animal health inspectors, stock inspector assistants cure animals on the farmers demand and sell drugs. For each consultation veterinarians fill a disease report form (DRF) feeding the national epidemiological information system ;

The private veterinary sector is not well developed. One private veterinarian is based in Oshakati and sells drug through a small network of private pharmacies.

Laboratory activities of the DVS in Ondangwa were supported through the NOLIDEP project which equipped the laboratory.
A few number of analysis can be undertaken in Ondangwa (mainly coprology, external parasites identification, serum agglutination and samples conditioning).
In fact, the lack of training and qualified personnel on the field induces a dramatic under use of the laboratory capacities.

2. National animal health information system in North Central

2.1. Objectives

The objective of the national animal health information system is to centralise all the data collected by the staff of the veterinary services on the field, to process them in order to have a description of all the diseases occurring in the country and to feed-back this information to veterinarians working in the field. Surveillance of the priority diseases take place inside the information system. The surveillance objectives are depending on the disease tackled and on the area considered.

For example :

- CBPP surveillance : the objectives in the commercial area are early warning to enable early reaction in case of reintroduction of the disease. In communal areas the objective is to detect all the remaining foci in order to reinforce the control of the disease.
- FMD surveillance : Early warning for early reaction all over the country
- Rabies : in the whole country early warning and diagnostic confirmation for public health protection.

2.2. Surveillance methodology

Disease surveillance at the herd level in the North Central is implemented through two different methods :

- passive surveillance based on the state vets activities with the disease report forms they fill and send to the epidemiology unit ;

- active surveillance collecting retrospective data through crushpen visit forms which will be replaced by farm visit forms such as in the commercial area.

- Targeted surveillance is also implemented at the abattoir level only for the Meatco export abattoir in Ondangwa. No surveillance is done at the traditional butchers level.

2.3. Coverage

The information system is ought to cover all the farmers of the North Central Region. In fact, the coverage might not be 100 % of the farmers because :

- Not all the diseases observed are reported with disease report forms because some of the data transmitted by the SIA to the state vets are not precise enough to fill a DRF correctly or some of the data are not transmitted at all because of a lack of communication.

- Not all the diseases occurring are observed because of :

  - Lack of activity of some SIA (less contact with farmers) ;
  - Lack of AHI on the field ;
  - Too wide area to be covered by a state vet.

It is nevertheless difficult to assess the real coverage for disease declaration but it appears to be a point to improve.

2.4. Data standardisation

Data standardisation is very good at the state veterinarians level through the DRF they fill for most of their activities.

At the SIA and AHI level the collection of data regarding occurring diseases is not standardised and these information are usually lost for the EIS. These data are usually simply reported on a simple sheet by the SIA. Afterwards, these informations are seldom reported to the AHI or the state veterinarians.

Implementation of the farm visit form by the AHI in the North Central will standardise the collection of retrospective data in the farms.

2.5. Data flow

All data collected throughout the country are centralised at the epidemiology unit in Windhoek.

Data transmission (forms and samples) appears to be very efficient from the state veterinarian to the central level in Windhoek. Data losses at this stage appear to occur seldom.

Data transmission appears to be difficult from the field (SIA, AHI) to the state veterinarians what causes losses of information.

2.6. Feed-back

Feed-back of information is done on a very regular basis. The epidemiology unit at the central level is responsible for this feed-back.

Three kinds of high quality reports are reaching state veterinarians, CAHI and some partners or collaborators of the EIS in Namibia:

- Epidemiology updates, on a monthly basis (Appendix 6);
- National summary reports, on a monthly basis;

- Annual report.

These informations summarise shortly and clearly all the health data collected by the EIS in the country and help the field workers to compare their situation with the one of their colleagues.

This feed-back is one of the very strong points of the information system.

The return of information usually stops at the CAHI level while no specific feed-back is given to the SIA.
Limiting factor for the feed-back to some of the SIA would be their level of literacy and their possibility to understand the scientific formulation of the information.

2.7. Institutional organisation

The EIS is co-ordinated on the central level by the DVS in Windhoek. For the North Central, no specific co-ordination is operating at the time. This level of co-ordination would help the DVS headquarters for the supervision of the system and the improvement of data collection and quality.

A technical committee has been constituted to deal with all technical aspects of disease surveillance in North-Central.

Composition of the technical committee is as follows (could be changed in the future):

- Deputy Director of veterinary services (Chairman)
- Epidemiology unit of the DVS;
- Head of the DVS in Ondangwa;
- Central Veterinary Laboratory;
- Noreesp project;
- French Cooperation.

The first meeting of this committee has been held at the occasion of our mission restitution.

Constitution of a steering committee dealing with all the general orientation of the EIS at the national level would probably be helpful.

2.8. Material means

State veterinarians and AHI benefit from good material means (means of transport, office etc.) except for drug supply.

At the opposite, SIA suffer from a lack of means of transport, communication means (such as telephone) and they sometimes even don't have a real office.

3. Needs for epidemiological surveillance

The Directorate of veterinary services has three main objectives regarding animal health :

- Animal healthcare extension
- Disease control and prevention
- Disease surveillance

Disease control and animal healthcare extension needs exhaustive coverage of the farmers (veterinary services should be given to all the farmers, vaccination campaigns should cover all the cattle).

Disease surveillance can be implemented through three different ways corresponding to different objectives :

- Exhaustive surveillance for important diseases needing early detection in order to implement early reaction (CBPP, Rabies, FMD...) ;

- Surveillance on a representative sample of herds for prevalence surveys (rabies survey, serological surveys...) ;

- Surveillance on a purposive sample in order to assess prevalence and incidence of most occurring diseases (information given through the "professional subsystem" of the national EIS)

The low coverage of farmers in the North Central division by the DVS staff has a consequence on two important objectives of the DVS requiring exhaustive coverage :

- Difficulties to implement an exhaustive surveillance for priority diseases ;

- Low animal healthcare extension.

Regarding epidemiosurveillance, we consider that the priority is to improve the exhaustive surveillance of major diseases by :

- involving more field staff of the DVS in passive surveillance, particularly the AHI ;

- strengthening the link between the farmers and the field staff of the DVS for better disease reporting ;

- involving the partners of animal health to develop awareness of the farmers for priority diseases, particularly the AET and CAHA.

Training, communication and formalisation of the procedures will play a major role for meeting these objectives.

We propose therefore to improve the information system through the following ways :

- Definition of the priority diseases requiring an exhaustive surveillance ;

- Improving and widening the data collection on these priority diseases ;

- Follow-up the surveillance system by implementing performance indicators according to specific surveillance protocols.

4. Priorities and surveillance objectives

The criteria to use for the definition of the priority diseases needing an exhaustive surveillance are the following :

- Contagious character of the disease (collective importance) ;

- Economical importance ;

- Zoonotic importance ;

- Possibility to implement control actions.

These priorities must be chosen together by the local and national DVS staff through a qualitative risk analysis procedure to assess if the country or a zone of the country is at risk. It would be then possible to formalise precise objectives for each priority disease and to specify surveillance procedures to be implemented.

An important step in improving a specific disease surveillance is to develop a complete and specific surveillance protocol. This protocol ensures that nothing is forgotten in establishing the network and that everything implemented actually meets the original objectives.

The surveillance protocol must be designed as a detailed instruction regarding all of the procedures to be used to monitor the targeted disease. A protocol is not an academic monograph of the disease (clinical medicine, epidemiology, etc.), but the formalisation of everything that must be done for its surveillance.

At the very least, the following core items must be included in any such protocol:

- Surveillance objectives ;

- Definition of the case ;

- Surveillance procedures (active approach in a minimum number of villages, setting up sentinel cattle farms, investigation of rumours in the markets, retrospective studies [foot and mouth disease (FMD)], surveillance in the abattoir [Contagious Bovine Pleuropneumonia (CBPP), tuberculosis], etc.).

- Practical intervention procedures at cattle farms:

  - Clinical examination procedure in the event of an active search.
  - Survey procedures (forms to be completed).
  - Sampling procedure (nature, number, processing, preservation).

- Methods and means of data transmission (reports, forms, samples, intermediaries, etc.).

- Place of reception, registration and analysis of data (messages, forms and samples).

- Deadline for processing the data and returning the results to the field.

- Method for returning the results to the field.

- Time span of the protocol (permanent [continuous surveillance] or limited [retrospective or cross-sectional survey]).

This procedure makes it possible to ensure that the surveillance objectives are really being met and that all aspects of surveillance of the disease are taken fully into account.

For the North Central the following diseases can be potentially considered as priorities and motivate a specific surveillance protocol : CBPP, FMD, Anthrax, rabies, botulism, Blackquarter...

5. Improving data collection on the field

5.1. Actors of the surveillance

5.1.1. DVS Staff

Animal health inspectors and some SIA could be more involved in the surveillance of the priority diseases. Therefore, a specific training on epidemiosurveillance procedures and their role in it should be implemented. They would then be responsible to train their team (SIA) to help them in this work. All the data they collect would have to be validated and controlled by the state veterinarian and CAHI they are depending on.

By increasing the coverage of the surveillance, the number of priority disease suspicions might increase. It would be therefore necessary for the state veterinarians to be downloaded from a part of their work (on non priority diseases like primary healthcare) to let them concentrate on the management of major diseases surveillance. Therefore, training of the people identified to take over these primary healthcare services should be intensified (AHI, CAHA, farmers).

5.1.2. Extension services

Widening the means of information could be done by the involvement of the Agriculture Extension Technicians in the priority diseases awareness and reporting by providing them specific training on this topic.

5.1.2.1. Actual situation of extension services

The extension area is divided into 4 regions :

- Omusati : 18 extension technicians
- Oshana : 11 extension technicians
- Ohangwena : 13 extension technicians
- Oshikoto : 13 extension technicians

Around 50 Agriculture Extension Technicians (AET) are in North Central, they all have a three years diploma in agriculture.

- 8 of them are working in pilot communities with research activities (trials and tests)
- 42 are working with 300 Farm Extension Development groups (FED Groups) [5 to 6 FED groups for each AET] where demonstrations are performed (coming from the results of the research activities or other validated techniques).

All the AET have means of transport and have a regular follow-up of the communities during the year. They can therefore play an important role in awareness-raising activities towards farmers.

5.1.2.2. Activities

Each AET had to form 3 to 5 FED groups with specific activities :
- Diagnostic surveys (baseline study)
- Set up committee
- Design of the demonstration programs
- Leadership training

- Feedback
- Annual planning

The final objective is to have independent groups having their own activities following their specific interests regarding the community (animal health, education ...)

The demonstration programs are very much oriented towards agriculture and crop problems and mainly :
- Mahangu varieties
- Use of fertiliser and manure
- Animal traction (very useful and successful topic because of the good support given to the farmers and a good way to solve the problem of lack of labour in rural areas) ;
- Plant pests (armoured bush crickets)
- Animal feeding and urea treatment

The research activities are today focused on :
- on-station research in two sites
- on-farm trial tests on 8 FRSE Communities on a participatory basis

5.1.2.3. Perspectives

The relations between the extensions services and the DVS were very poor in the past. There seemed to be a very clear demarcation between livestock and health activities devoted exclusively to the DVS and the extension services interested mainly in crop and agricultural problems.
Little by little the situation is improving and the implementation of a training session on epidemiological surveillance in October for DVS and Extension Services technicians is a good example of the coming collaboration.

Three different ways could be followed in order to improve the disease declaration system by involving the extension services :

- Extension services could take "Epidemiosurveillance of the priority diseases" (scheduled and high prevalence diseases) as a topic for the FED groups by providing to the 300 groups the message about how priority diseases are monitored (knowledge of the disease, definition of the case), how and whom to report a disease suspicion, the consequences of the disease report (actions taken by the DVS to confirm the case, actions to be taken in case of confirmation) ;

- Extension services could facilitate the work of the DVS agents (AHIs and SIAs) by making it possible for them to participate to the meetings with the FED groups and providing themselves the message about the farmers role inside the surveillance network ;

- AET could be trained to be familiar to the recognition of the priority diseases for the surveillance network in order to transmit to the DVS agents some health information about the disease situation in the groups they are working with.

This collaboration would be to the benefit of the three counterparts :

- DVS would benefit from the relationship established between the AET and the FED groups sometimes located in remote areas where they usually have difficulties to access. This would strengthen the relationship between the AHIs or SIAs and the farmers ;

- Extension Services would benefit by providing to the farmers important messages about animal health which are of main interest to the livestock owners of the FED groups ;

- Farmers would benefit by being informed and involved in the national surveillance system (to make them play an important role in the early warning system in order to benefit from the DVS early reaction) and by having a closer contact with DVS agents in order to tackle diseases of economical importance (such as parasitic diseases).

In order to formalise this collaboration with the extension services it would be appropriate to follow these different stages :

- formalise the surveillance procedures for the priority diseases ;

- Establish an early collaboration with the head of the extension services in order to work together for the terms of reference of this collaboration.

5.2. Standardisation

The data collected by the AHI and some of the SIA should be standardised in order to help the validation and reporting through a DRF by the state veterinarians.
Therefore, a specific form (called for example "Suspicion form") could be implemented.

AHI and some SIA could also be responsible to do samples to confirm the suspicion of certain major diseases, it would then improve the use of the laboratory for the confirmation of certain clinical suspicions.

5.3. Activation of passive surveillance

As part of continuous surveillance (so-called "passive" surveillance), it may be useful to introduce an active system of searching for suspected cases of the diseases under surveillance.

A passive network is based on livestock farmers reporting cases. For effective reporting, livestock farmers have to be fully informed of the key surveillance aims and they must play a genuinely active part in the network. Without the involvement of livestock farmers, the data collected by the network can never be complete.

To ensure this, it is important to organise a system for field workers (mainly AHI and some of the SIA, with the assistance of some AET) to organise meetings/training courses for the benefit of livestock farmers in order to maintain a close relationship and to reach out to a large number of animal owners.

Such meetings/training courses can be rounded off by herd inspections in order to ensure the absence of suspicions of the diseases under surveillance and to reinforce the message amongst livestock farmers by practical means.

Organising awareness-raising meetings is a job that must be clearly formalised and for which those responsible must be meticulously prepared. For this purpose, the network training of field workers must include training in communicating with livestock farmers to enable them to correctly convey the desired message.

When training field workers, the content of meetings with livestock farmers must be prepared in advance, along with the communication aids to be used in the field.

The objectives of such meetings are for livestock farmers to :

- Learn about the network and the way it operates ;
- Learn about the diseases under surveillance ;
- Learn about their role in the network and what they must do ;
- Learn what will happen once the report has been made ;
- Learn about the results already achieved by the network.

And for the network worker to:

- Establish a relationship of trust with the livestock farmers.
- Collect information about rumours of the diseases under surveillance in his area.
- Collect information about other diseases on farms.

As a guide, below we suggest the core content of such training meetings, which may include the following stages:

- Why an epidemiological surveillance network has been set up in North Central and Namibia ;

- Presentation of the structure and organisation of the network (DVS in Windhoek, in Oshakati, field workers) ;

- Presentation of the diseases under surveillance and of the case definition of the suspicions ;

- How to declare a suspected case ;

- What happens once the report has been made.

For each point, a presentation, together with communication aids (maps, 'flip charts', photos of diseases), is prepared in advance to dispel any reservations about reporting the diseases under surveillance.

Each field worker should organise a minimum number of meetings every month and make a monthly report on these activities to the network.

5.4. Improving targeted surveillance

Some fields of targeted surveillance could be improved, especially for CBPP surveillance at the abattoir and butchers level.

5.4.1. Surveillance at the abattoir level

Since CBPP is one of the priority diseases, abattoirs are one of the main surveillance points for the success of the surveillance.

The meatco abattoir in Oshakati is an old abattoir constructed in the 70's and totally renewed two years ago.

The animals processed in this abattoir come only from Northern Namibia and are spending 21 days in quarantine to avoid the slaughtering of animals having a contagious disease.

This quarantine is supported by the farmers or traders themselves (they have to pay for the station in quarantine) or by Meatco when they are purchasing themselves the animals in auction pens.
It is more worthy for the farmers to sell the animals to Meatco just after the quarantine instead of selling them at the auction pen where the price given for an animal is much lower. Usually, farmers try first to sell the animals on other markets or on open markets and if they don't succeed they sell them to the auction pen.
Auction pens can be held only once a month while markets can take place every two or three days and are thus more attracting.

After slaughtering the meat is carved and sold exclusively for exportation to Southern Africa or to the commercial area.

Animals coming from Angola or from Northern Namibia without a quarantine can only go through the abattoirs managed by the municipalities (Oshakati municipality for example) but can never be sold to the commercial area.

Meat inspection is performed at the Oshakati abattoir. CBPP lesions are regularly found and samples are sent to Windhoek for confirmation. But the number of cases has significantly reduced these last years.

Information for epidemiosurveillance :

Regarding epidemiological surveillance, it is interesting to assess the possibilities to trace back an animal suspected of CBPP at the abattoir.

Two situations occur :

- Animal purchased by Meatco : possible to find the auction pen where the animal has been bought, the village where the animal comes from and the name of the farmer who sold the animal ;

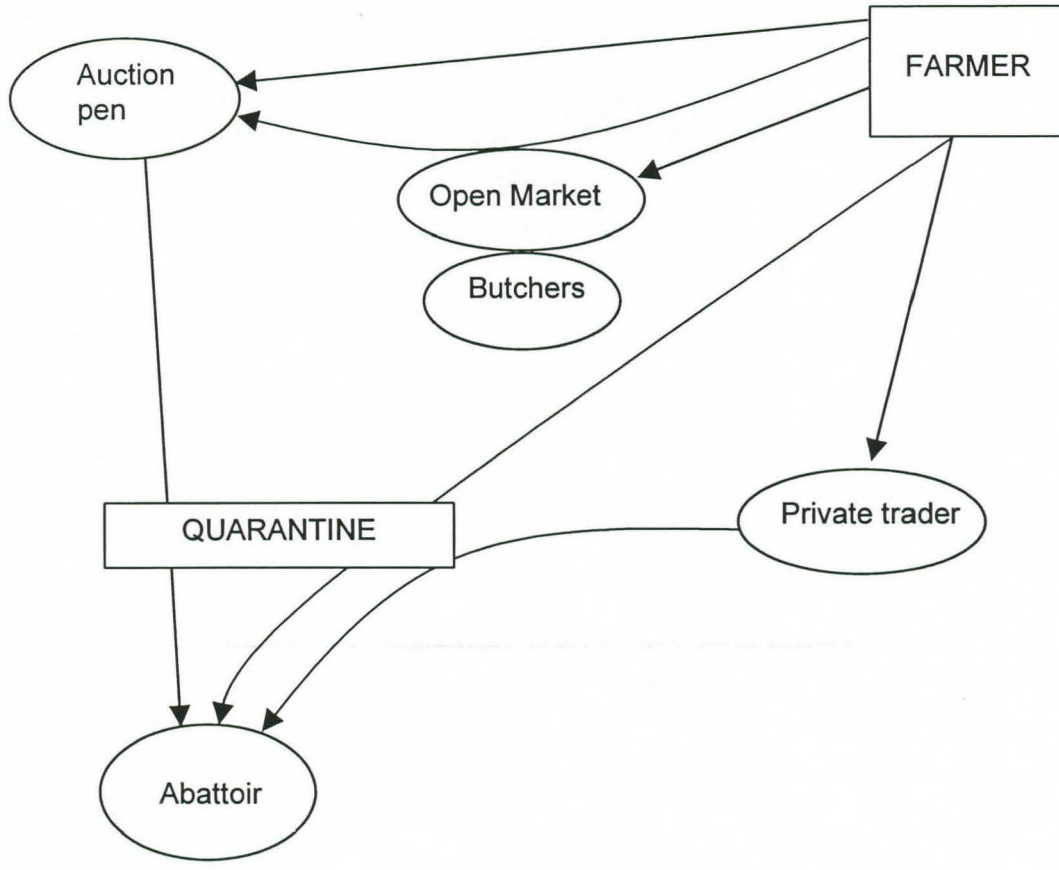
- Animal brought by a trader : it is then very difficult to find the exact origin of the animal because the trader has no list and doesn't ear-tag the animals.

Moreover, just 5% of the animals slaughtered at the Meatco abattoir in Oshakati are coming from the North Central because stockholders of this area don't like to sell their animals.
If an animal is sold by a farmer, it is even difficult to know if this animal comes from his herd because in many cases the animals are bought from another place (market, auction pen, other farm, Angola) for a specific purpose (marriage, ceremony ...).

The other abattoirs working in Northern Namibia are :
- Oshakati local abattoir (run by Meatco), where the animals are coming mainly from North Central ;
- Katima (run by Meatco)
- Rundu (run by a private company).

All the town should have a municipality abattoir but because of lack of money they usually don't have one.

Figure 2 : Cattle commercial routes to the abattoir



CBPP surveillance activities at the Meatco abattoir in Oshakati

A lot of CBPP suspicions are made at the abattoir but the laboratory results are seldom positive. For example, on 53 histopathology samples sent to the laboratory in September 1999, results received January the 19th, all showing interstitial pneumonia but not officially positive for CBPP.

This shows a problem with the type of samples sent (bacteriological analyses should complete histopathology) and with the delay for sending the samples to the laboratory in Windhoek (grouping of samples for several weeks or months). Adding the delay of the laboratory result it is usually impossible to trace back the origin of a suspicious animal.

Especially through the decrease of CBPP cases in North Central, it would be useful to improve these surveillance procedures at the abattoir by improving communication between the North Central DVS office and the Meat hygiene inspection officers at the abattoir.

Table 3 : CBPP suspicions at Meatco abattoir in Oshakati

Month	Nb of suspicions	Lab results
01/1999	0	
02/1999	?	
03/1999	66	
04/1999	18	
05/1999	3	
06/1999	0	
07/1999		
08/1999	2	
09/1999	3	Neg
10/1999	1	
11/1999	0	

5.4.2. Surveillance at the butcher level

The majority of the North Central Region Cattle slaughtered are processed through the "open markets butchers". These butchers could therefore be excellent provider of information for the CBPP surveillance network.

A forthcoming study on these butchers will provide the network with information on their traditional organisation and on the ways to motivate them to take an active role in epidemiological surveillance. Their involvement in the network appears to be a difficult issue as long one haven't found the proper incentive to motivate their collaboration.

6. Training issues

6.1. Co-ordination of the network

Once a person will be identified for the co-ordination of the network in the North Central Division, one should ensure that it has a basic training in epidemiology and epidemiological surveillance.

Such knowledge of epidemiology is important to coordinate the different functions involved in the network and maintaining the necessary descriptive objective of surveillance.

Several international training courses in epidemiology are available such as in the Onderstepoort Faculty of Veterinary Science in South Africa.
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6.2 Field workers

A specific training of the AHI and some SIA on epidemiosurveillance should be done on all aspects of their involvement in the EIS : priority diseases reporting and retrospective data collection through farm visit forms.

The following principles must be applied when preparing and implementing this training course :

- Training for field workers must be both theoretical and practical:
  - Theoretical training in:
    - ✓ Clinical medicine, epidemiology and diagnosis of the diseases under surveillance.
    - ✓ The key aims of a national network as opposed to a regional network.
    - ✓ The operation of the network and in particular the role of the various people involved;
  - Practical training, to develop proficiency in:
    - ✓ Taking, processing and dispatching the samples that must accompany any suspected cases.
    - ✓ The "Suspicion forms" that must be completed during surveys in suspected cases and during routine inspections.
    - ✓ Organising awareness-raising meetings for livestock farmers (communication techniques).
- Every action, reaction and conduct expected of the network officers must have been completed successfully at least once during the training and only the equipment that will be available to the officers in the field must be used during the training.
- Instructors must provide training using all of the equipment that will be required by the network officers when carrying out the actions expected of them, as well as the documents summarising their interventions in the field.
- The trainees' knowledge must be assessed upon completion of the training (anonymously) in order to verify that the key messages have actually been absorbed.
- Recognised training techniques must be used (if possible with the participation of training specialists when organising the training course)
  - Use of recapitulative questions at the start of each work session (questions asked by one half of the trainees and answered by the other half, summary by the instructor responsible for the subject).
  - Use of participatory methods for the theoretical training, rather than lectures.
  - Use of role-play during exercises for completing survey forms and organising meetings with livestock farmers.

Such training courses must therefore be organised over a period of several days (the number of days depends on the number of subjects to be covered) for twenty or so people.

A number of pitfalls have to be avoided:

- drift of practical activities towards demonstrating the actions to be carried out (it must be the trainee who carries out the practical actions);

- drift of epidemiological surveillance training towards general training in the diagnosis of all types of animal disease, involving topics that will not specifically be needed for the purposes of the network.

Finally, such training must be followed up by regular refresher courses, preferably on an annual basis.

Experience has shown that training is the first critical point in motivating a network's officers and it is at this time that the team, which will later be working towards a common objective, becomes a cohesive unit.

The organisation of such a training would be the right occasion to involve the AET in the surveillance.

7. Data management

7.1. Centralisation

The problem of the place for data processing has been put forward during the mission.

Centralisation of data processing should be maintained as it is because of its actual efficiency.

This does not mean that it is impossible or undesirable to carry out a certain amount of data processing at the regional level of North Central. Indeed, the possibility of processing data at the regional level could boosts the motivation of the people responsible for this level and could speed up some of the feedback to the field. However, such pre-processing should not slow down or reduce the flow of data to central level.

Maintaining the centralisation of data has the following advantages

- It becomes possible to check that the data collected is standardised. Based on certain indicators, it is possible to check that all of the data has been collected in a similar way, allowing one region's results to be compared with another;

- It becomes possible to compile information at a higher level and so highlight significant elements that would not have emerged at local level (an increase in abortion rates among small ruminants may not be significant on the scale of a small region but may emerge as a general trend in all areas of the country at risk of Rift Valley fever for example and hence prompt an alert);

- Working on raw epidemiological data at central level makes it possible to adjust the analysis during the course of data processing and to use indicators with a national value, something that would not be possible if the data had been pre-processed (if only the average number of infected animals in a herd is provided, it is difficult to carry out a statistical calculation at national level).

7.2. Use of Geographical Information system (GIS)

There are different interests in using GIS for the surveillance network :

- general mapping of the results of the information system (cf. The general use of Tad-Info for disease mapping) ;

- mapping of the surveillance activities implemented by the field technicians : repartition of the places where meetings, farms visits, disease reports have been implemented in order to assess the land cover of the field technicians (for example it is then easy to identify the areas with lack of surveillance) ;

- mapping of the data needed and resources available which could be mobilised for an emergency intervention in case of an outbreak of a major contagious disease (number of cattle to be vaccinated inside a buffer zone around the outbreak, material means available near the outbreak [freezers, cars, phones, etc.] human resources available [police, army etc.] social, economical and physical constraints around the outbreak [roads to close, rivers, cattle markets, cattle posts etc.]).

At the North Central level the use of a GIS will enable to link the data processed by the epidemiology unit with geographical data. Many information layers already exist (part of the crushpens, homesteads ...) some have to be created or updated.

The British government founded the Northern Namibia Environmental Project in order to gather all spatial information regarding all aspects of development in Northern Namibia which could be eventually related to environmental component. These information are dedicated to be used by all the potential users of Northern Namibia (The nine Ministries working there and the different projects).

During three years, all kind of spatial information have been gathered through the different projects and Ministries working in the area.
Therefore, the project is able to provide all kinds of maps, free of charge, to the different users (agriculture, environment, forestry, education, police ...). The demands are very high (around 340 demands per year) and all ministries and project are more and more interest by the service provided.

The project is also providing training in
- GPS use ;
- Map reading ;
- Database management ;

For the veterinary side, some information layers are already available such as :

- location of the 400 existing crushpens with the number of vaccinations in each crushpen for the past three years ;

- all the household of the North central (done with aerial photographs) and number of animals owned for around 10 % of these households ;

- location of the 2000 villages of Northern Namibia ;

- location of the 300 FED groups and extension technicians (in progress [half of the work done])

For the use of the DVS it would be interesting to :

- Identify all the already existing information layers interesting animal health ;

- Identify the interesting layers to create for the management and result representation of the information system (like location of all the State Vets, CAHIs, AHIs, SIAs for example) ;

- Identify the person to be trained for

  - Updating the existing layers (new crushpens, new bore-holes etc.)
  - Managing the spatial representation of the surveillance network data at the DVS

All data processing at North Central level should be done in close collaboration and understanding with the epidemiology unit in Windhoek.

7.3. Performance indicators

Performance indicators should be designed in order to assess the operation of priority disease surveillance on a regular basis.

Performance indicators provide the means for managing and evaluating epidemiological surveillance networks. They are needed by national authorities wishing to evaluate their own progress in setting up an effective surveillance programme, as well as by international authorities, which have to evaluate objectively and reliably the programme. Performance indicators must also provide neighbouring or importing countries with reliable methods of evaluating the quality of information provided by the country making the declaration, so it is an important element of commercial risk analysis, as defined by the World Trade Organisation and the OIE.

Such performance indicators can be classified into three levels:

- General indicators that make it possible to verify the smooth operation of the network as a whole. They constitute a trend chart of ten or so indicators of the network's major functions. If the value of these indicators is in line with the established minimum value, the network is considered to be functioning satisfactorily.

- If any indicators fail to achieve a satisfactory level, a list of diagnostic indicators makes it possible to examine part of the surveillance network in more depth to find out why a particular general indicator is not satisfactory.

- Finally, a third level is comprised of checklists, which make up the inventory, for each point of the network, of all the means required for the epidemiological surveillance system to run smoothly. In the event of a failing in a diagnostic indicator, such checklists make it possible to calculate what resources are needed for the network to run smoothly.

These indicators have to be designed at the central level with the involvement of all the players of the network. This work can be done specifically for the North Central Region and afterwards eventually extended to the national surveillance system.

7.4. Database

At the central level, the use of the TAD*info* software (FAO) is planed.

Tad-Info, developed by the FAO, provides the entire basic structure for registering health data nation-wide. It also has the advantage of providing a structure common to all countries in a region, making it easy to synthesise data at regional level.

TAD*info* is based on the relational database software ACCESS® related to the GIS software ARCVIEW®. It provides therefore an easy to use system for spatial representation of health data.

An official request should be made to the FAO for the implementation of TAD*info* in Namibia. After assessment by the epidemiological unit, some additional modules might be requested by the DVS in order to use data already collected on the field, and adapt the software to the specific needs of the country animal health management.

The epidemiology group of CIRAD-EMVT, EPITROP, has already an experience in developing these kind of adaptation. The main issue is to add specific modules to the software without disturbing the possibility to aggregate the data on a regional level in the "Regional TAD*info*". This has been done successfully for Senegal (after the translation of the software in French) and is planed for several other West African countries.

If needed, CIRAD could possibly give a support to the DVS for this adaptation in Namibia.

7.5. Feed-back

Redistribution of the information generated by the surveillance network is a very important phase of data management. It must be considered extremely seriously because it is time-consuming and influences the motivation of many network players and partners.

Information feedback is targeted at:

- livestock producers: in the form of information meetings, written leaflets or by radio;
- network officers: in the form of the analysis results of samples sent and a summary of all of the information collected, in the form of an epidemiological bulletin for example;
- national and international partners: in the form of interim reports or summary information that is easy and pleasant to read (bulletin).

The national EIS provides already high quality feed-back means but the motivation of some of the field staff in the North Central for disease reporting (such as SIA, AET ...) could be reinforced by providing them a specific and adapted feed-back about disease surveillance in the North Central.
This reinforcement of feed-back would meet the following objectives :

- To show the field worker that his work has been useful by demonstrating what results it has been possible to achieve;
- To provide the field worker with information about the work achieved by his colleagues, in order to reinforce the sense of involvement in a collective effort that started with the initial training course;

- To provide the field worker with information in local language, more accessible to farmers

- To serve as an active link between those involved in the network, by allowing them to express their views (either directly, through articles in a bulletin, or indirectly, through radio interviews);

For this activity, some specific outputs could be processed by the epidemiology unit in Windhoek in order to enable the DVS in Ondangwa to design a specific feed-back like a quarterly newsletter.

Conclusion

Epidemiological surveillance in the North Central Division in Namibia benefits from the structure of the national Epidemiological Information System.
Some specific constraints have to be considered in order to improve the surveillance operation in the North Central.

Definition of priority diseases, formalisation of disease specific surveillance protocols, training of the field actors are the key issues for the improvement of the EIS in the North Central Region.

These general orientations have been proposed during this first mission. After completion of the priority diseases surveillance protocols and training of the field actors of the network, the next support mission could be focused on the development and validation of performance indicators for the EIS in the North Central Division.

Acknowledgement

I would like to thank the Director of Veterinary Service for having made this mission possible and the DVS staff in Windhoek and in the North Central Region for their welcome and the quality of the discussion we have had during these 10 days.
I would like to thank also the NOREESP project and particularly the two technical assistants of the project for the perfect organisation of this mission.

Appendix list

Appendix 1 : Terms of reference of the support from CIRAD

Appendix 2 : Terms of reference of the mission

Appendix 3 : Aide-Mémoire of the mission

Appendix 4 : Slides presented at the mission restitution

Appendix 5 : Minutes of the technical meeting

Appendix 6 : Epidemiology update

APPENDIX 1

TERMS OF REFERENCE
SUPPORT FROM CIRAD-EMVT

The Cirad-emvt groups together through its three programmes (animal health, animal production, Rangeland and Wildlife management) the competencies needed to bring a support to national epidemiological surveillance networks implementation.
This support can be focused on the different methodological aspects of networks implementation and on the control of the major tools needed to guaranty the efficiency of the national surveillance systems.
These competencies are distributed in the four major domains of epidemiological surveillance:

- Networks organisation (veterinary services organisation, networks general methodology, communication, health economy) ;
- Surveillance protocols development (epidemiology of priority diseases, sampling, risk analysis) ;
- Diagnostic (viral, bacterial and parasitic diseases, laboratory organisation);
- Data management (databases, sampling, Geographic Information Systems, modelisation).

Cirad-emvt is moreover the FAO World Reference Centre for CBPP, which is considered as the priority disease to tackle in the NOREESP Project.
Therefore Cirad-emvt will assist the NOREESP during the three years of the project trough :

- Annual field missions ;
- Constant communication with the Cirad-emvt epidemiology group.

Field missions:

Twelve days annually (during the first quarter of each year) an expert of the Cirad-emvt will assess the situation of the project regarding the implementation of the epidemiological surveillance network and will make recommendations in order to improve the efficiency of the surveillance system. These recommendations will be based on the knowledge of the existing epidemiological surveillance networks in other African countries and on the need to meet the requirements of international organisations for epidemiological surveillance (OIE, FAO).
Before each of these missions, specific terms of reference would be designed. They will focus on the assessment of the different parts of an epidemiological surveillance network:

General organisation :

- Assessment of the institutional organisation : role and composition of the steering committee, the technical committees or working groups, the co-ordination unit of the network and the field actors
- Study the role and position of the actors and partners of the network : farmers, public and private sectors, laboratories, projects, NGOs etc. to make sure that all the essential partners of the network are involved in the activities ;
- Analysis of the specific regulation for epidemiological surveillance in order to secure the existence of the network

Surveillance protocols

Assessment of the surveillance protocols of the priority diseases especially focused on :

- The sampling procedures for continuous, active and oriented surveillance ;
- The procedures followed by the actors from the field to the laboratory side (epidemiological investigation, samples, laboratory procedures) ;
- The specific procedures implemented for active surveillance (sampling, communication and specific training activities) ;
- Implementation of the performance indicators specific for each surveillance protocol on the priority diseases ;

Data management and communication

Data management will be assessed through the following points :

- Data collection and standardisation (training procedures in order to standardise the collection, type of data collected [samples and investigation questionnaires]) ;
- Database structure and use (organisation of the database, updating, controls) ;
- Data analysis related with the use of GIS (type of analysis, frequency) ;
- Information feed back : return of the analysis results to the field actors, use of a newsletter to publish the results, organisation of meetings on the basis of the results, training ;
- Management of the results : use of the results by the veterinary services, complementary field investigations, emergency preparedness ;
- Delays of data processing.

Main tools

- Diagnostic capabilities of the laboratory and general organisation of the laboratory regarding epidemiological surveillance ;
- Training capabilities : organisation of the workshops for the field actors and farmers (workshop programmes, training methods and results), training of the other staff involved in the network ;
- Means of material (means of transport of the field actors, cold chain, sampling material etc.).

To perform these field missions, the expert will both have to visit the field (especially the field actors of the network and farmers of the area of the project) and work with the central co-ordination unit of the surveillance network.
An aide-memoire will be presented at the end of each mission containing the main recommendation.
Following, assessment and recommendations of each mission will be recorded in a detailed final mission report presented to the Namibian authorities.

Communication with the epidemiology group:

The epidemiology group is based on the Cirad-emvt epidemiologists working in France and in different African countries and the collaborating institutions (FAO, OIE, AFSSA [French Association for Sanitary and Food Security]).

A close contact will be maintained with the team of the NOREESP project and the epidemiology group in order to:

- Update any needed information regarding epidemiological surveillance and epidemiology;
- Provide a quick reply to any question related to the field of competence of the epidemiology group.

APPENDIX 2

Terms of reference
CIRAD-EMVT mission N° 1

Project : NOREESP – Convention N°

Title: **Support to the CBPP epidemiosurveillance network in the North-Central region - Namibia**
Duty Station: **North Central, Namibia**
Duration: **12 days**

CONTEXT

NOREESP signed an agreement with CIRAD-EMVT for the support of the project in the field of epidemiosurveillance. One mission of 12 days is planed to be held annually during the three years of the project.
These terms of reference are completing the general terms of reference for the field missions attached to the agreement.

METHODOLOGY

A correct support can be given only with a good knowledge and understanding of the existing situation. Therefore the mission will have to meet all the actors involved in the existing national epidemiosurveillance network, starting with the central unit of the network at the Directorate of Veterinary Services in Windhoek.

The mission will focus on the general structure of the network in the North Central Region and its integration at the national level.
Therefore, the main field of interests of the mission will be :
- Institutional organisation : committees (local and national), terms of reference of the networks actors ;
- Surveillance protocols : conception, objectives, surveillance methodology and implementation on the field ;
- Data flow : standardisation, centralisation, feed-back, tools ;
- Performance indicators ;
- Training activities in the surveillance network.

Considering training as the major activity to implement in order to improve the surveillance performance, one goal of the mission will be to contribute to the conception of the training sessions to be organised in the short term of the project.

Finally, the mission will have to assess the needs of the project for the next support missions (for example identify the need of more specific support in one field of activity of the network).

MISSION DESCRIPTION

- Meeting in Windhoek with the Directorate of veterinary services
- Meeting with the group of epidemiologists responsible of the management of epidemiosurveillance at the national level, detailed presentation of the existing data flow organisation at the national level, database used, Tad-Info perspectives ;

- Directorate of the veterinary services in the North-Central region. Detailed description of the organisation of the veterinary services regarding epidemiosurveillance and evaluation of priority diseases in the region ;
- Meeting with the professionals susceptible to be, or already involved in the epidemiosurveillance network (private veterinarians, stockholders representatives, butchers, slaughterhouses, cattle traders, etc.) ;
- Field exploration in order to better understand veterinary services current work regarding disease surveillance.
- Restitution meeting at the end of the mission with an "aide-mémoire" organised with the North-Central veterinary services and mission debriefing at the Central Veterinary Services in Windhoek before departure.

Assessment and recommendations of this mission will be recorded in a detailed final mission report presented afterwards to the Namibian authorities.

APPENDIX 3

Aide–Mémoire

CIRAD-EMVT mission for NOREESP Project

4th to 13th April 2000

Pascal Hendrikx – Cirad-emvt

The first CIRAD-EMVT support mission to the NOREESP project has been performed from the 4th to the 13th April in Namibia.
The mission visited the North Central from the 4 to the 11th April and more specifically :

- DVS and Laboratory in Ondangwa ;
- DEES and Northern Namibia Environmental Project in Oshakati ;
- Meatco Abattoir in Oshakati ;
- State veterinarian based in Uutapi and field visits with him ;
- The VREC and SIA in Onesi ;
- The CAHA of Omhakoya (Omusati region) ;
- The cattle market of Ombalantu ;
- The border post in Ruacana ;
- Vaccination campaign at Omanbemo and Onsiwe crushpens ;

The 4, 12 and 13th April the mission had the following contacts in Windhoek :

- Directorate of Veterinary Services and the epidemiology Unit of the DVS ;
- Central Veterinary Laboratory ;
- Cooperation and Cultural Action Service of the French Embassy ;

This Aide–Mémoire has been presented on the 13th April during the first technical committee of epidemiosurveillance in the North Central held at the DVS in Windhoek.

1. Objectives of the mission

The objective of the present mission was to assess the animal diseases epidemiosurveillance network in the North Central division of Namibia in order to support the DVS in Ondangwa, through the Noreesp project, for the improvement of this network.

2. Understanding of the national animal health information system working in North Central

1. The objective of the national animal health information system is to centralise all the data collected by the staff of the veterinary services on the field, to process them in order to have a description of all the diseases occurring in the country and to feed-back this information to veterinarians working on the field. Epidemiosurveillance of the priority diseases take place inside the information system. The surveillance objectives are depending on the disease tackled and on the area considered. For example :
   - CBPP surveillance : the objectives in the commercial area are early warning to enable early reaction in case of reintroduction of the disease. In communal areas the objective is to detect all the remaining foci in order to reinforce the control of the disease.
   - FMD surveillance : Early warning for early reaction all over the country
   - Rabies : in the whole country early warning and diagnostic confirmation for public health protection.

2. Disease surveillance at the herd level in the North Central is implemented through two different methodologies :
   - passive surveillance based on the state vets activities with the disease report forms they fill and send to the epidemiology unit ;
   - active surveillance collecting retrospective data through crushpen visit forms which will be replaced by farm visit forms such as in the commercial area.

   Disease surveillance is also implemented at the abattoir level only for the Meatco export abattoir in Ondangwa. No surveillance is done at the traditional butchers level.

3. The information system is ought to cover all the farmers of the North Central Region. In fact, the coverage might not be 100 % of the farmers because :
   - Not all the diseases observed are reported with disease report forms because some of the data transmitted by the SIA to the state vets are not precise enough to fill a DRF correctly ;
   - Not all the diseases occurring are observed because of :
     - Lack of activity of some SIA (less contact with farmers) ;
     - Lack of AHI on the field ;
     - Too wide area to be covered by a state vet

   It is nevertheless difficult to assess the real coverage for disease declaration but it appears to be a point to improve.

4. Data standardisation is very good at the state veterinarians level. At the SIA and AHI level the collection of data regarding occurring diseases is not standardised and these information are usually lost for the EIS. Implementation of the farm visit form by the AHI in the North Central will standardise the collection of retrospective data in the farms.

5. All data are centralised at the epidemiology unit in Windhoek. Data transmission (forms and samples) appears to be very efficient from the state veterinarian to the central level in Windhoek. Data transmission appears to be difficult from the field (SIA, AHI) to the state veterinarians what causes losses of information.

6. Feed-back of information is done on a very regular basis. Three kinds of high quality reports are reaching state veterinarians, AHI and some partners or collaborators of the EIS in Namibia. This feed-back is one of the very strong points of the information system. No specific feed-back is given to the SIA

7. The EIS is co-ordinated on the central level by the DVS in Windhoek. For the North Central, no specific co-ordination is operating at the time. This level of co-ordination would help the DVS headquarters for the supervision of the system and the improvement of data collection and quality.

8. We strongly support the constitution of the technical committee to deal with all technical aspects of disease surveillance in North-Central. Once a year, a steering committee would be helpful to validate and propose the general orientations of this programme.

9. Availability of material means (transport, office etc.) is good (except drug supply) for the state vets and the AHI. Material means are very poor for the SIA (no means of transport, sometimes no real office, no communication means).

3. Needs for epidemiological surveillance

The Directorate of veterinary services has three main objectives regarding animal health :
- Disease control and prevention
- Disease surveillance
- Animal healthcare extension

Disease control and animal healthcare extension need exhaustive coverage of the farmers (veterinary services must be given to all the farmers, vaccination campaigns must cover all the cattle).

Disease surveillance can be implemented through three different ways corresponding to different objectives :
- Exhaustive surveillance for important diseases needing early detection in order to implement early reaction (CBPP, Rabies, FMD...)
- Surveillance on a representative sample of herds for prevalence surveys (rabies survey, serological surveys...)
- Surveillance on a purposive sample in order to assess prevalence and incidence of most occurring diseases (information given through the "professional subsystem" of the national EIS)

The low coverage of farmers in the North Central division by the DVS staff has a consequence on two important objectives of the DVS requiring exhaustive coverage :
- Difficulties to implement an exhaustive surveillance for priority diseases.
- Low animal healthcare extension

Regarding epidemiosurveillance, we consider that the priority is to improve the exhaustive surveillance of priority diseases by :
- involving more field staff of the DVS in passive surveillance, particularly the AHI ;
- strengthening the link between the farmers and the field staff of the DVS for better disease reporting ;
- involving the partners of animal health to develop awareness of the farmers for priority diseases, particularly the AET and CAHA.

Training, communication and formalisation of the procedures will play a major role for meeting these objectives.

The mission proposes therefore to improve the information system through the following ways :
- Definition of the priority diseases requiring an exhaustive surveillance ;
- Improving and widening the data collection on these priority diseases ;
- Follow-up the surveillance system by implementing performance indicators according to specific surveillance protocols.

4. Priorities and surveillance objectives

The criteria to use for the definition of the priority diseases needing an exhaustive surveillance are the following :
- Contagious character of the disease (collective importance) ;
- Economical importance ;
- Zoonotic importance ;
- Possibility to implement control action.

These priorities must be chosen together by the local and national DVS staff through a qualitative risk analysis procedure to assess if the country or a zone of the country is at risk. It would be then possible to formalise precise objectives for each priority disease and to specify surveillance procedures to be implemented.

These points can be gathered in a specific disease surveillance protocol :
- surveillance objectives
- definition of the suspicion case
- laboratory tests for confirmation
- complementary epidemiological survey to implement
- performance indicators of the protocol

For the North Central the following diseases can be potentially considered as priorities : CBPP, FMD, Anthrax, rabies, botulism, Blackquarter...

5. Improving data collection on the field

1. Animal health inspectors could be more involved in the surveillance of the priority diseases. Therefore, a specific training on epidemiosurveillance procedures and their role in it should be implemented. They would then be responsible to train their team (SIA) to help them in this work. All the data they collect would have to be validated and controlled by the state veterinarian they are depending on.

2. The data collected by the AHI should be standardised in order to help the validation and reporting through a DRF by the state veterinarians. Therefore, a specific form (Suspicion form) could be implemented. The AHI could also be responsible to do samples to confirm the suspicion of certain diseases, it would then improve the use of the laboratory for the confirmation of certain clinical suspicions.

3. Communication with the farmers should be improved and targeted on the surveillance of the priority diseases :
   - meetings with the farmers organised by the AHI, implementation of the Farm visit form in North central will play a major role by strengthening the link between the farmer and the field staff.
   - Farmers training (epidemiosurveillance included in the training programme)
   - Broadcasting

   Training on communication techniques towards the farmers should be therefore included in the training programmes of the AHI.

4. Widening the means of information could be done by the involvement of the Agriculture Extension Technicians and the CAHAs in the priority diseases awareness and reporting by providing them specific training on this topic.

5. The motivation of the field staff for disease reporting could be reinforced by providing them a specific and adapted feed-back about disease surveillance in the North Central. Therefore, some specific outputs could be processed by the epidemiology unit in Windhoek in order to enable the DVS in Ondangwa to design a specific feed-back like a quarterly newsletter.

6. By increasing the coverage of the surveillance, the number of priority disease suspicions might increase. It would be therefore necessary for the state veterinarians to be downloaded from a part of their work (on non priority diseases like primary healthcare) to let them concentrate on the management of major diseases surveillance. Therefore,

training of the people identified to take over these primary healthcare services should be intensified (AHI, CAHA, farmers).

6. Training issues

The training of the AHI on epidemiosurveillance should be done on all aspects of their involvement in the EIS : priority diseases reporting and retrospective data collection through farm visit forms.

General programme will include the following topics :
- Good knowledge of the priority diseases and their surveillance protocol (clinic, differential diagnosis, cure and prevention) ;
- Questionnaire filling (farm visit form, suspicion form)
- Sampling techniques
- Communication techniques towards the farmers (how to organise a meeting, how to do advertisement, the tools to be used)
- Partnership with the other field people involved in the system (AET, CAHA)
- Operation of the EIS at the regional and the national level

Training of trainers on animal health and animal husbandry meant to gather AHI and AET will be also the right occasion to involve the AET in the surveillance system.

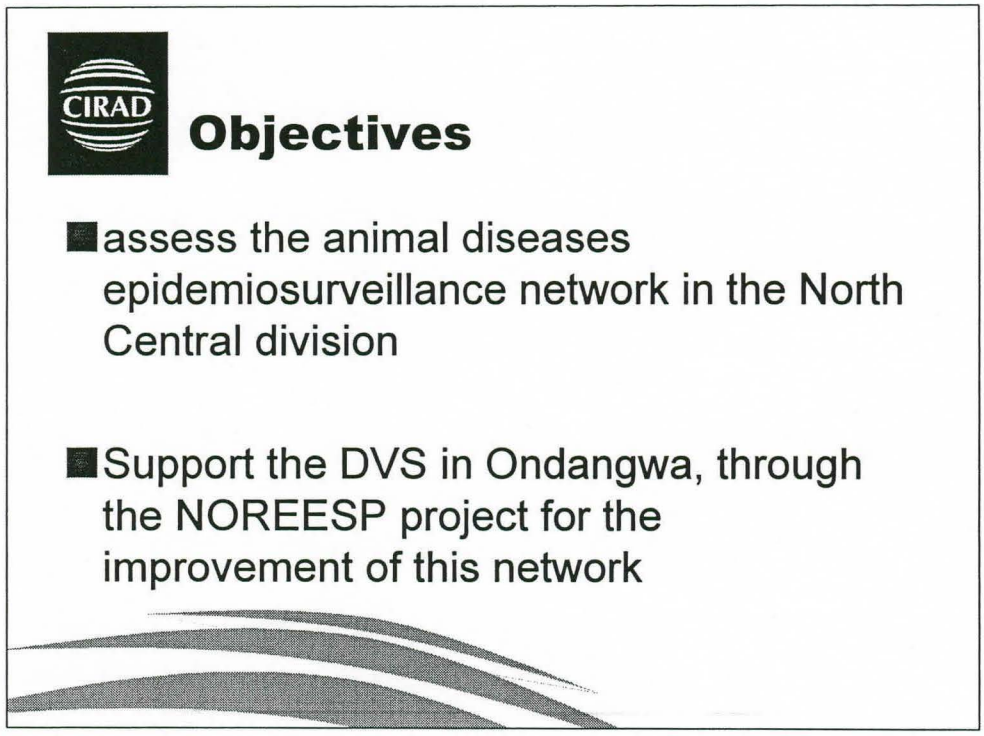
7. Data management

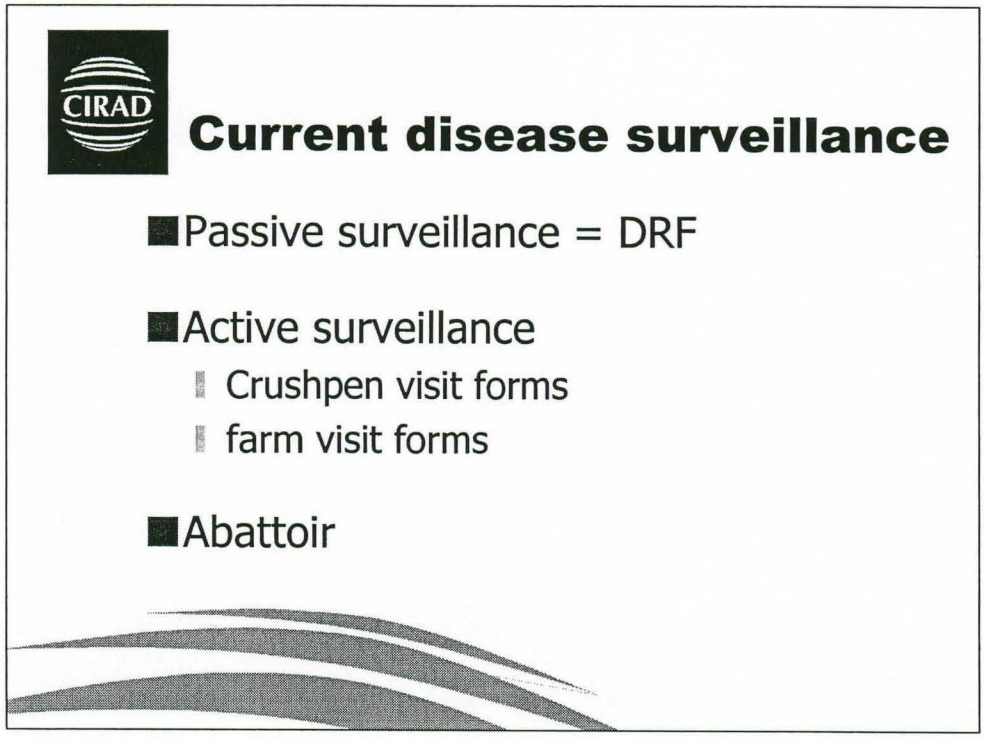
1. At the North Central level the use of a GIS will enable to link the data processed by the epidemiology unit with geographical data. Many information layers already exist (part of the crushpens, homesteads ...) some have to be created or updated.
   For the use of the DVS it would be interesting to :
   - Identify all the already existing information layers interesting animal ;
   - Identify the interesting layers to create for the management and result representation of the information system (like location of all the State Vets, CAHIs, AHIs, SIAs for example) ;
   - Identify the person to be trained for
     - Updating the existing layers (new crushpens, new bore-holes etc.)
     - Managing the spatial representation of the surveillance network data at the DVS

   All data processing at North Central level should be done in close collaboration and understanding with the epidemiology unit in Windhoek.

2. Performance indicators should be designed in order to assess the operation of priority disease surveillance on a regular basis (number of disease suspicions, delay for the different steps of the surveillance protocol)

3. At the central level, the use of the Tad-Info software (FAO) is planed. Therefore, an official request should be made to the FAO for the implementation of this database for the country. After assessment by the epidemiological unit, if some additional modules are requested by the DVS in order to use data already collected on the field, CIRAD-EMVT could possibly give a support for this adaptation.


CIRAD
Objectives
assess the animal diseases epidemiosurveillance network in the North Central division
Support the DVS in Ondangwa, through the NOREESP project for the improvement of this network


CIRAD
Current disease surveillance
Passive surveillance = DRF
Active surveillance
Crushpen visit forms
farm visit forms
Abattoir

Coverage

- 1 state vet / 200 000 cattle / 20 000 farmers
- 1 AHI / 75 000 cattle / 7500 farmers
- 1 SIA / 10 000 cattle / 1000 farmers
- Lack of state vets and AHI
- No real disease reporting by the AHI
  - Communication problems
  - Standardisation problems

Data

- Standardisation
  - Good at state vet level, not at AHI or SIA level
- Transmission
  - Good from state vet to Windhoek, difficult from field to state vets
- Processing and Feed-back
  - Very efficient point
  - Specific feed-back for North-central

Organisation

- No specific operational co-ordination identified in North-Central
- Importance of technical and steering committee
- Material means
  - Good for state vets and AHI
  - Poor for SIA
  - Problem of drug supply

DVS OBJECTIVES

1. **Disease control and prevention** → **Exhaustive** = vaccination against priority diseases
2. **Epidemiological surveillance**
   - **Exhaustive** surveillance = priority diseases (CBPP, FMD, Anthrax, Rabies ...)
   - **Sample**
     - Representative = specific prevalence surveys (Serosurveillance survey, rabies survey ...)
     - Purposive = DVS staff activities information system [DRF] (evaluation of disease prevalence and incidence) [Anaplasmosis, Mange, worms ...]
3. **Service to the farmer (animal healthcare extension)** → **Exhaustive** coverage needed (State veterinarians, AHI, CAHA)

Improving priority diseases surveillance

- Involving AHI in passive surveillance
- Strengthening the link farmers / DVS field staff
- Involving partners of animal health to improve farmers awareness (AET, CAHA)

→ **Training**
Communication
Formalisation of the procedures

Priority diseases

- Criteria
  - Contagious character
  - Economical impact
  - Zoonotic importance
  - Possibility to implement control actions
- Specific disease surveillance protocol
  - Objectives, definition of the case, laboratory tests, epidemiological surveys, performance indicators

Improving data collection

- Training of AHI in epidemiosurveillance
- Standardisation : suspicion form
- Communication towards the farmers
  - meetings, training, broadcasting
- AET and CAHA
- Motivation with specific feed-back

Data management

- Data processing and GIS
- Performance indicators
- Tad-Info

Appendix 5

MINUTES OF THE TECHNICAL MEETING
Thursday 13th of April 2000

Present:	Veterinary Services:	Dr. A. NORVAL (Chairman)
		Dr. C. BAMHARE
		Dr. T. MUSILIKA
		Mrs. KOHRS
	CIRAD:	Dr. P. HENDRIKX
	NOREESP:	Dr. F. GOUTARD
		Dr. L. LARBODIERE
	French Cooperation:	Mr. T. DAUPLAIS

The first technical meeting for the improvement of the Epidemiological Information System (EIS) in North-Central was held on the 13th of April at the Directorate of Veterinary Services at Windhoek.
Dr. P. HENDRIKX, expert from CIRAD, was on mission between the 2nd and the 13thof April to make an assessment of the EIS. He made a presentation about the mission and his main observations and recommendations. The proposals were discussed widely and the meeting concluded the following:

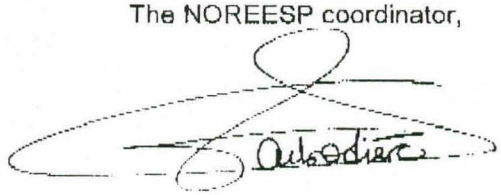
1. Identify priority diseases and formalize specific surveillance protocols.
2. Widen the early warning system by involving AHI in priority-diseases suspicion. A specific "suspicion form" will be designed in order to collect the necessary information to be transmitted to the State Veterinarian.
3. Train DVS staff on priority diseases surveillance procedures. Involve CAHAs and AETs.
4. Improve communication with farmers (Farm Visit Forms, farmer's training, broadcasting).
5. Design a quarterly epidemiological newsletter for the field staff and the farmers, completed if needed by emergency reports.
6. Appoint, as a part time activity, a State Veterinarian to be in charge of the co-ordination of the network in North-Central.
7. Implement performance indicators to follow the surveillance system.

Actions:

1. Appointment between NOREESP and the epidemiology unit to formalize the feedback of data/outputs to Ondangwa (newsletter and performance indicators).
2. Organize training on the EIS for field staff in October (involvement of CIRAD).
3. Proceed with quarterly technical meetings at Ondangwa (next one in August) and with an annual steering committee at Windhoek.
4. Make an official request to FAO for the installation of TAD-INFO.

DVS Ondangwa, the 18th of May,

The NOREESP coordinator,



Dr LARBODIERE

Appendix 6 *Directorate of Veterinary Services*

Epidemiology/Extension Division - Promoting Holism in Veterinary Medicine

Private Bag 12022 Ausspannplatz. Namibia Tel. 061-2022048

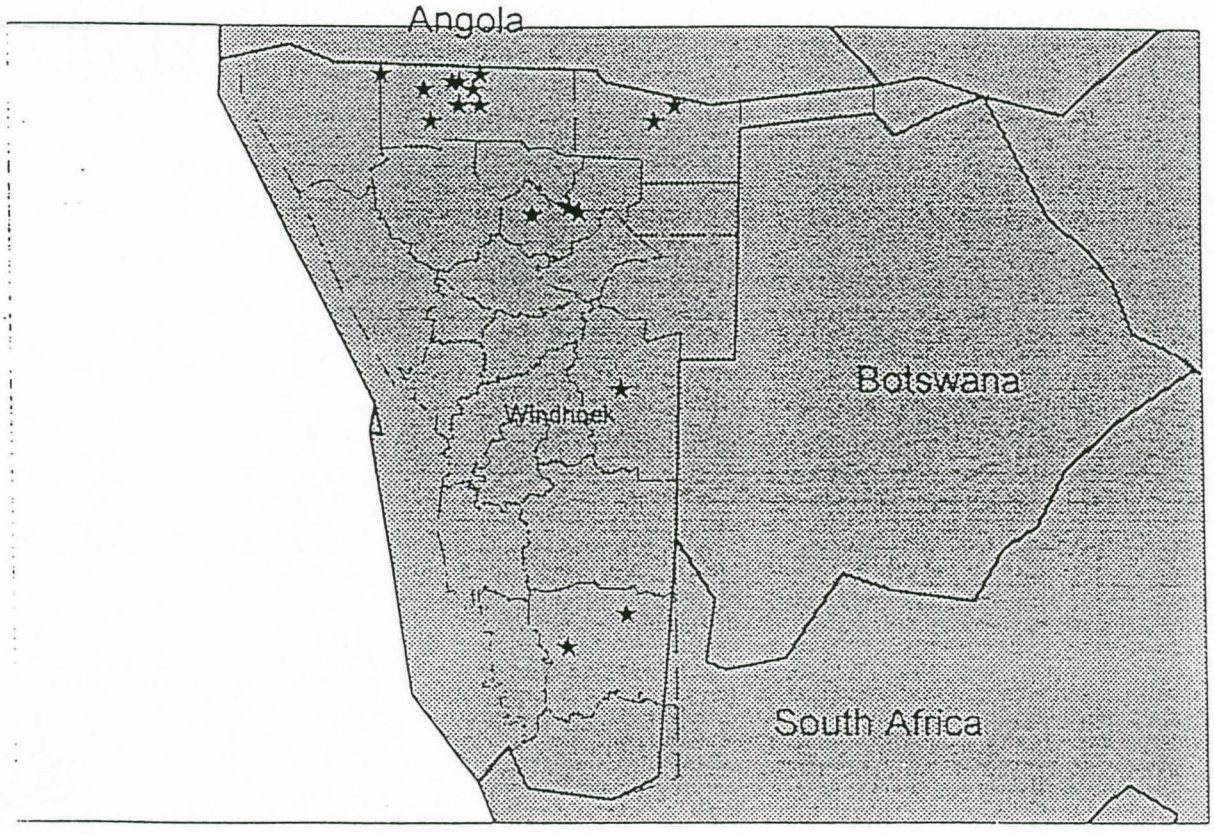
EPIDEMIOLOGY UPDATE

November, 1998

Newcastle Disease

The following map and table illustrates the 1998 Newcastle Disease (NCD) situation in Namibia.

Because wild birds can serve as carriers, outbreaks of this disease show up regularly across the world. Unvaccinated poultry are, generally, very susceptible and rural flocks are exposed to wild birds – hence these outbreaks. Because positive antibody titres were found in ostriches the question about the influence of NCD on ostriches and what role they could play as carriers must still be answered.



Newcastle Disease distribution in 1998

Number of foci/cases reported per month (total = 19 foci, 699 cases)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2/ 60	0/ 0	1/ 40	2/ 10	0/ 0	3/ 26	4/ 123	1/ 25	3/ 392	3/ 23	0/ 0	still open

Newcastle Disease occurred in chickens and poultry only, ostriches were not involved.

We need to take note of the new '**definition of Newcastle Disease**' as proposed by the OIE in its *Manual Of Standards For Diagnostic Tests And Vaccines (chapter 2.1.15):*

Newcastle disease is defined as an infection of birds caused by a virus of avian paramyxovirus serotype 1 (APMV-1) that meets one of the following criteria for virulence:

a) The virus has an intracerebral pathogenicity index (ICPI) in day old chicks (*Gallus gallus*) of 1.2 or greater.

b) The virus has both an ICPI of 0.7 or greater and multiple basic amino acids at the cleavage site of the F protein as defined in c) below.

c) Multiple basic amino acids have been demonstrated in the virus (either directly or by deduction) at he C-terminus of the F2 protein and phenylalanine at residue 117, which is the N-terminus of the F1 protein. The term 'multiple basic amino acids' refers to at least three arginine or lysine residues 113 and 116. Failure to demonstrate the characteristic pattern of amino acid residues as described above would require characterisation of the isolated virus by an ICPI test.
In this definition, amino acid residues are numbered from the N-terminus of the amino acid sequence deduced from the nucleotide sequence of the F0 gene, 113-116 corresponds to residues –4 to –1 from the cleavage site.

Report compiled by Dr. Stan Miller & Ms. Bertchen Kohrs
Epidemiology & Extension Unit
Windhoek
For the Director of Veterinary Services, Windhoek, Namibia