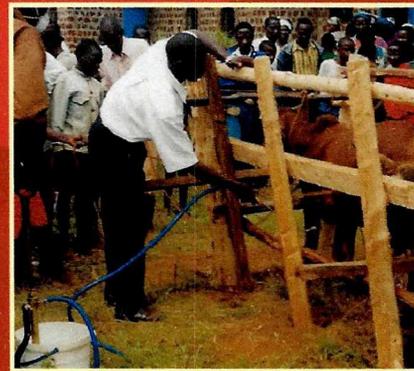


FARMING IN TSETSE CONTROLLED AREAS

## FITCA Regional Co-ordination Unit



### 3<sup>rd</sup> WORKSHOP ON HARMONISATION OF NATIONAL STRATEGIES FOR TSETSE CONTROL/ERADICATION

26<sup>th</sup>/27<sup>th</sup> September 2003  
Pretoria, South Africa



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# **A message from the Director of AU/IBAR, Dr. J. T.Musiime**

In sub-Saharan Africa population pressure continues to increase and more fertile land must be liberated from occupation by tsetse flies in order to be able to increase crop and livestock production. As part of the African Union's long-term mission to contribute positively towards self-sustainability in food production the African Heads of States have recognised the constraint of trypanosomiasis on land-use, poverty-alleviation and human and animal health and declared a long-term war against the disease.

The FITCA Programme has been implemented in four eastern African countries and has demonstrated its relevance by addressing the crucial poverty alleviation issues through suppressing the tsetse fly population, building capacity in the human infrastructure and supporting rural development.

FITCA is a role model for other rural development programmes by demonstrating the importance of combining the resources of the community, the private sector and government and has made significant improvements to the livelihoods of communities within the participating countries. FITCA is addressing several sectors including capacity building and livestock and crop production. These areas of development require a long time to bring about improvements in the quality of life of the rural community and for this reason the lifespan of FITCA should be extended in order to maintain and sustain its achievements.

I would like to take this opportunity to thank our major donor, the European Union, for supporting the FITCA Programme through a grant of 20 Million Euro over a four-year period. I would also like to thank the four AU member countries for closely co-operating and providing much-needed support to AU/IBAR as co-ordinator of FITCA.

Finally I would like to assure the beneficiary countries, the donor community, regional and international organisations and all other partners and stakeholders that AU/IBAR is committed to provide all the necessary support for the continued success of FITCA.

# **Inter-African Bureau for Animal Resources (IBAR)**

## **INTRODUCTION**

Animal resources are important in the economic development of African countries. Africa has a wide variety of animal resources with an estimated livestock population of 224 million cattle, 447 million sheep and goats and about 34 million equines and camels. With an annual output value of US\$13.3 billion of meat and US\$5.3 billion of milk, livestock contribute about 36% of Africa's agricultural gross domestic product.

Of all the sub-regions of the world, Africa is the continent where production of livestock products has the greatest potential to improve. It is also the continent where consumption is growing at a faster rate than any other, spurred-on by a rapidly rising human population, rising income levels and falling market prices of livestock products. In recent years domestic production of livestock products has increased slowly, allowing the deficit between supply and demand to increase. It is estimated that in Sahelian Africa where production of red meat currently satisfies 56% of the total consumption, this will just cover 36% of the needs in 2020. The deficit will be imported, leading to an annual loss of US\$1.5 billion in foreign exchange on imports of meat and milk alone. It is estimated that the human population in sub-Saharan Africa will be 1.3 billion by the year 2025 and that an estimated 19 million tons of meat and 43 million tons of milk will be required annually to feed Africa's population.

Through the New Partnership for Africa's Development (NEPAD) initiative, African leaders have recognized the importance of animal resources to the economic development of African countries, and have committed themselves to the highest levels, to achieve sustainable development in this sector. In support of the NEPAD initiative, African heads of state and Government, meeting in Durban South Africa in July 2002, inscribed in the African Union (AU) Constitutive Act among others, the objective to promote sustainable development at the economic, social and cultural levels....and to establish the necessary conditions which enable the continent to play its rightful role in the global economy and international negotiations. Over the past 50 years, the Inter African Bureau for Animal Resources (IBAR) has been working to develop the animal resources of Africa and stands at the forefront for the implementation of the AU and NEPAD Initiatives.

## **THE MISSION OF IBAR**

The mission of IBAR is to become "a center of excellence that enables AU member states to sustainability improve their animal resources so as to enhance the nutrition and the incomes of their people, especially the rural poor"

## **THE OBJECTIVE OF IBAR**

In order to achieve its mission, IBAR will work towards the following objectives:

- Improve animal health, through the control and eradication of trans-boundary animal diseases in Africa.
- Improve animal productivity to enhance food security taking into account environmental sustainability and social issues.
- Improve public health, through control of zoonoses and quality assurance of food and animal products.
- Improve marketing and trade of animals and animal products.
- Harmonize policies appropriate for livestock resource development in Africa.
- Collate and Disseminate information relevant to improved use of African animal resources.

## **CHALLENGES**

In the rapidly changing world, IBAR faces the challenge of working in increasingly complex environments. At the beginning of the 21st Century, change has been accelerated by three major forces:

### **1. Globalization of trade and setting of international standards**

Globalization of trade and the formation of international standard setting bodies of the WTO have made the understanding of comparative advantages, equivalence and access a complex issue, particularly for developing countries.

### **2. Technological advances**

Technology has transformed the way products and services are created and delivered- in particular, information technological advances

### **3. Stakeholder behaviour**

The power base of stakeholders is rising. A wide range of stakeholder groups has become more vocal and influential. They now demand to be involved in governance, priority setting, financing and evaluation of development interventions. Consequently all players in the global community have to act in ways that fit with the emerging international paradigm.

IBAR believes that by remaining a flexible and learning organization within African Union it can cope with the challenges mentioned and all the technical and scientific issues that it has been dealing with for over 50 years.

# **International Scientific Committee for Trypanosomiasis Research and Control (ISCTRC)**

The ISCTRC is one of the longest-standing projects managed by the Inter-African Bureau for Animal Resources. Its primary purpose is to organise a conference on a biennial basis during which experts in all aspects of controlling both the livestock as well as the human forms of trypanosomiasis are invited to contribute scientific papers for discussion. The ISCTRC celebrated its 50<sup>th</sup> anniversary in 1999 at its conference in Mombasa, Kenya. Subsequent conferences have been held in Ougadougou, Burkina Faso (2001) and Pretoria, South Africa (2003).

The reports of the conference are published in both English and French\* and contain all the papers presented to the conference as well as reports from international organisations involved in the field and country reports from throughout Africa. These reports enable everyone to keep track of the progress that is being made in the battle against trypanosomiasis throughout the continent and upcoming developments and problems.

The gathering together of so many people from throughout Africa and well beyond enables a wide range of peripheral meetings to be held both before and after the main conference proceedings. Indeed, the workshop on which this report is based was held prior to the 2003 ISCTRC Conference in Pretoria, South Africa. Meetings of the Programme Against African Trypanosomiasis (PAAT) are regularly scheduled to coincide with the conference as are workshops for national Directors of Livestock, Animal Health and Veterinary Services from throughout Africa.

Other notable occasions often occur in juxtaposition to the conference. In 2001 the Pan-African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC) was launched by the President of Burkina Faso. Also at this conference WHO representatives announced a co-operation with a series of pharmaceutical companies which enabled the drugs against sleeping sickness, including a completely new one, to be made available without cost to the medical community.

The Committee itself comprises experts in various aspects of tsetse control and trypanosomiasis drawn from throughout the continent and international organisations. The chairman serves for two years and is usually appointed at the conference, being appointed from the host team that has organised that particular conference.

\*Proceedings of the 2001 and 2003 conferences can be obtained from The Librarian, AU/IBAR, P.O. Box 30786, Nairobi, Kenya.

# **The Farming in Tsetse Controlled Areas (FITCA) Programme.**

Originally the concept of developing a new approach for the control of Tsetse Flies emerged as a result of a regular consultative meetings made between the Governments of Kenya and Uganda along their borders under the auspices of AU-IBAR in the early nineties. The Ministers and their experts met at least 8 times between 1990-1997 to appraise the FITCA project. As a result of this meticulous dialogue and consultation the FITCA project was born. The European Union committed 20 million Euros and a Financial Agreement (FA) was signed in 1997 covering Kenya, Ethiopia, Uganda, Tanzania, Rwanda and Burundi. By the end of 2003 four countries had fully implemented the FITCA project; Rwanda will start to implement the project at the beginning of 2004. Burundi was not able to implement the FITCA project since the political situation was not suitable. The FITCA project will come officially to an end by December 2004.

Although the FITCA project took time to be implemented at the same time in the various counties, the project achievements by the end of 2003 in the 4 implementing countries was very encouraging. Among the various achievements the following could be mentioned in brief:

- Baseline Socio-economic studies were made in all the participating Countries.
- Training was given throughout the project life to High, Middle and Junior level Technicians and Farmers.
- Infrastructures including laboratories, stores, office facilities, etc. were built in project areas.
- Transport facilities including Four-Wheel Drive Vehicles, Motor Bicycles, Bicycles , Laboratory Equipments were facilitated in the various project areas.
- Tsetse Flies are controlled in highly infested areas by involving the community
- Mass treatment was given to affected human and livestock population in the project areas.
- A Longitudinal Disease survey was made and a planned treatment against Tsetse Flies, Ticks and Tick Borne Diseases , Worms etc. was introduced by the private sector.
- FITCA assisted the introduction of a private Animal health delivery system by providing initial inputs and mobility to private Veterinarians and Technicians.
- Over 500 village crush were built to provide regular spraying against tsetse flies, ticks and other prevailing ectoparasites. The village crushes are generating funds from the community for sustainability of these schemes.

--A new technology to protect Zero-Grazing dairy farms from tsetse flies using the impregnated netting technology was introduced and became very popular in some project areas.

--Environmental management and monitoring activities were also introduced in cooperation with the International Livestock Research Institute (ILRI)

--Collaborative research activities were implemented involving several national and international Institutes.

--FITCA organized more than 10 Ministerial coordination meetings in the region to secure political support from decision-makers.

--FITCA assisted Eastern African countries in developing national strategies for tsetse and trypanosomosis interventions.

--FITCA has launched a website to disseminate information's and results.

On several occasions the FITCA project was evaluated and the opinion of the Consultant Evaluators was that although FITCA has taken time to become fully operational in the participating countries the project has introduced a unique approach by using tsetse control as an entry point to rural development and encouraged farmers with their activities.

In future some of the achievements of the FITCA project can be replicated in non-FITCA countries. The Evaluation Mission also recommended a No-Cost Extension for the FITCA project to the end of 2004 and a possible second phase. The AU-IBAR is on the process of discussion to establish the various possibilities for a second phase FITCA project and so far discussions has been made with partner countries, IGAD and the EAC, all of whom have expressed interest in the continuation of the FITCA Project for a second phase.

# 1.1 INTRODUCTION TO THE WORKSHOP

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**Mr. H. Rojahn**

**Regional Technical Assistant, FITCA**

The most important outcome of this 2-day meeting will be the exchange and sharing of experiences in the different countries on issues related to tsetse and trypanosomosis control. Although there are different opinions on the different ways to combat tsetse and trypanosomosis, this is not the forum for re-opening that debate. Neither is this the opportunity for opponents and protagonists of FITCA and PATTEC concepts to hit at each other.

The responsibility for formulating tsetse and trypanosomosis control strategies lays with the Directors of Animal Resources, and this is therefore an opportunity for them to exchange ideas, but more importantly for them to develop viable strategy documents. Several participants have also been invited from West Africa, primarily to share their experiences from their own region but also to enable them to develop models for similar projects in their own region.

The agenda for the meeting is as follows. The first day will be devoted to looking at national tsetse and trypanosomosis control strategies while the second will be devoted to harmonising, coordinating and integrating the common elements and approaches. In conclusion it is not the intention to produce recommendations. Instead guidelines for developing national tsetse and trypanosomosis control strategy documents will be developed which could be used not only by the participants at the workshop but also by other countries.

## **1.2 STATEMENTS FROM REPRESENTATIVES OF ORGANISATIONS ATTENDING THE WORKSHOP**

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### **Director, AU – IBAR (Dr. J Musiime)**

He thanked all participants for responding positively to the invitation to attend the meeting. He provided a short narrative of tsetse and trypanosomosis control from the 1960's to the present time and noted that control efforts are now more environmentally friendly compared with the past measures. He appealed to all participants to participate positively in this meeting although the FITCA Project is only found in eastern Africa

### **Regional Technical Assistant, FITCA (Mr. H. Rojahn)**

He thanked all respondents for responding to the invitations. He observed that FAO had been working in similar areas so there was therefore a need to learn from their experiences. He reported that the FITCA project was coming to the end of its first phase and there was therefore a need to harmonise activities before a possible second phase. Lastly, he noted that stakeholders needed to be clear about the problem at hand, and this was an opportunity to demonstrate that the FITCA concept was viable.

### **AU-PATTEC (Dr. J. Kabayo)**

Dr Kabayo started by describing the evolution of PATTEC since 1999 when the ISCTRC meeting in Mombasa agreed to raise its profile. It was resolved that countries would identify pockets of infestation and depending on their resources and equipment would start the process of eradication using an area-wide approach. He noted that whether it was FITCA or PATTEC, the idea was to remove the constraint posed by tsetse flies, but how could this be done on a sustainable basis? Reorganisation of resources and thinking was required.

### **FAO (Dr. R. Mattioli)**

Dr. Mattioli noted that the problem of T&T exists in 36 or 37 African countries, which were basically poor countries depending primarily on agriculture i.e. no access to credit, reliance on simple methods of production etc. He therefore noted that to get these countries out of poverty was a more complex issue than just the removal of trypanosomosis. Instead the strategy requires a broader focus, which required assessment of the root causes of poverty.

### **WHO (Dr. J. Jannin)**

Dr Jannin reported that sleeping sickness drugs are now free and all affected countries should make use of this facility. He requested FITCA Coordinators to create linkages with FAO and also to provide information on their activities to WHO. He noted that in most countries the SS programmes are often weak and information is sought. He confirmed that WHO is willing to develop linkages with other projects.

### **IAEA (Dr. U Feldmann)**

Dr Feldmann observed that IAEA and PATTEC had developed criteria for identification of priority areas for intervention for nagana, and these were areas where most benefits could be realised. He reported that UNDP had offered to contribute US\$ 300,000 to support an initiative to help raise funds.

He noted that there were several projects on tsetse and trypanosomosis control in some countries but they were not collaborating with each other. He noted that this was not the responsibility of donors but rather of national governments to coordinate them. He noted that the regional economic communities (RECs) and AU-IBAR would have to take the lead at continental level.

### **PAAT (Prof A. Ilemobade)**

Prof. Ilemobade thanked the organisers for the two-day meeting that would focus on harmonisation of issues between countries. He noted that FITCA was providing a very useful link in coordinating these issues, and that there was a possibility of sustainability of opportunities.

He reported that PAAT had recommended and FAO had accepted a TCP with PATTEC to assist member states develop national capacity. He confirmed that PAAT was working together harmoniously with AU-IBAR.

### **ICIPE (Dr. R. Saini)**

Dr. R. Saini reported that ICIPE was willing and able to provide technical backstopping to research projects. He observed that an integrated approach was needed for tsetse and trypanosomosis control in order to achieve poverty alleviation, and to spur rural development and improvements in animal health. He noted that there was a need for adoption of new technologies with community participation for successful tsetse and trypanosomosis control.

### **CIRDES (Dr. I. Sidibe)**

Dr Sidibe commented that the harmonisation meeting was a good precursor to the ISCTRC conference. He reported that in West Africa the experience was slightly different. CIRDES was implementing a project in several West African countries (including Mali, Côte D' Ivoire, Benin, Togo and Burkina Faso) and the objectives were to develop capacity of the NARS to focus on goals and control strategies required. He also reported that the region would be drafting a concept note for a control project following the PATTEC initiative.

### **EANETT (Dr. J. Ndungu)**

Dr Ndungu explained that EANETT originally started in 4 countries and was funded by the Swiss Government and that the focus of the programme is on the human disease (sleeping sickness surveillance). The programme has been supporting training at Master's and PhD level and has annual workshops where information and findings are exchanged disseminated. It is hoped that the network would expand to other countries and invitations to that effect had already been sent out.

## 2. MODERATOR'S REPORT

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### 2.1. INTRODUCTION

This workshop was initiated as one of several FITCA initiatives. FITCA recognised that most countries in Africa did not have up-to-date written strategies for combating tsetse flies, trypanosomosis and sleeping sickness and this workshop was set up in order to help both member countries and those outside the FITCA programme to develop such strategies.

Without a written strategy it is difficult for governments, and particularly the Ministries of Finance, to properly allocate funds for any particular purpose. Doors are reassured when they see evidence of nations spending their own money on a particular issue as they infer that this confers a level of priority on it.

There was initially some misunderstanding that the purpose of the workshop was to ensure that the national strategies adhered to the particular FITCA philosophy of using community participatory methods of tsetse control as an entry point for general rural development in areas affected by trypanosomosis. It was made clear at an early stage in the workshop that this was not so and that nations were free to deploy any technique for tsetse control that they considered would be effective. However, there was general recognition that, in order to secure the most benefits for the farming community, tsetse control would need to be harmonised with other initiatives in order to develop the rural areas.

### 2.2. NOMENCLATURE

The terms used for official documentation and their hierarchy can easily lead to confusion and so it is appropriate to first examine the terms used in this workshop in relation to Tsetse and Trypanosomosis Control. The *Oxford English Dictionary* will be used to provide definitive dictionary definitions of words.

#### Policy

<p><b>Policy</b> A course of action adopted and pursued by a government, party, ruler, statesman, etc.; any course of action adopted as advantageous or expedient. <i>Oxford English Dictionary</i></p>
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Policy-making on a wide range of issues is one of the major tasks of governments and is usually carried out by politicians, closely supported by senior civil servants. In the case of tsetse and trypanosomosis control the Heads of States agreed on a continent-wide policy at the AU Heads of State meeting in Lomé in 2000 which was endorsed in their subsequent meetings in 2001 and 2002. As part of their joint declaration the Heads of State;

**RECOGNIZE the seriousness of the problem as one of Africa's greatest constraints to socio-economic development severely affecting human and livestock health, limiting land use, causing poverty and perpetuating underdevelopment on the continent;**

**URGES Member States to act collectively to rise to the challenge of eliminating the problem through concerted efforts in mobilizing the necessary human, financial and material resources required to render Africa tsetse-free within the shortest time possible.**

As part of this declaration the Heads of State established a body to co-ordinate and oversee this process, namely the Pan-African Tsetse Eradication Campaign. The declaration and this name suggested that eradication of tsetse flies was the main objective. Recognising that the primary objective is to eradicate trypanosomosis, and that eradicating the vector is merely a means of achieving this, the name was subsequently changed by the Scientific Advisory Committee to the Pan-African Tsetse and Trypanosomosis Eradication Campaign (PATTEC).

Therefore in the absence of any other national policy this is the policy to which each country should address its own strategy. The emphasis by the Heads of State on 'Eradication' of tsetse flies has caused some controversy particular amongst those who advocate that either controlling the tsetse fly populations or controlling the disease through drugs and, in West Africa, trypanotolerant cattle, is more appropriate than all-out eradication of the vector. These viewpoints are reconciled by recognising that 'control' is merely the short-term objective for any particular area but that eradication is the long-term objective. The ultimate objective is for trypanosomosis to be eradicated from Africa but it is widely accepted that this will take many decades to be achieved.

## Strategy

**Strategy** In (theoretical) circumstances of competition or conflict, as in the theory of games, decision theory, business administration, etc., a plan for successful action based on the rationality and interdependence of the moves of the opposing participants.

*Oxford English Dictionary*

Even though the above definition from the Oxford English Dictionary implies a battle against an intelligent and reactive 'enemy' the term can still be applied in the battle against passive enemies such as tsetse flies and trypanosomes. A strategy document in this case describes the principles upon which the battle will be fought. It describes the enemy, options for attacking the enemy based on its weaknesses and outlines preferred methods of attack. The resources that will be needed are outlined, as are the partners who will form the attacking forces as well as how they will be commanded and co-ordinated. An outline budget will be presented and this might be supported with a prediction of the potential gains from the battle so that a basic cost : benefit comparison may be made.

A strategy document does not go into any great detail about operational details but merely describes the overall concept. The operational details are left to an 'implementation' or 'action' plan - these two terms are synonymous. Such a document will also contain an outline of how the operation will be monitored and evaluated.

## Implementation Plan

**Implementation** To complete, perform, carry into effect (a contract, agreement, etc.); to fulfil (an engagement or promise).

*Oxford English Dictionary*

An Implementation or Action Plan describes in detail how the strategy will be put into effect on the ground. If the plan will take several years to implement then it might be divided into several phases with the probability of a review between each phase. Such a plan will not explain the justification or rationale of the programme but merely how the objective of the strategy will be achieved. The resources to be deployed will be described in detail supported by definitive budgets. A schedule of operations will be provided along with contingency plans.

As such the implementation plan will provide the basis on which operations will be managed in the field. A good plan will include a methodology for reviewing operations at certain stages and, if necessary, modifying the plan accordingly. Such reviews may even lead to modifications to the overall strategy.

### **2.3. CO-ORDINATING BODIES**

All of the countries considered that there should be some form of overall co-ordinating body to bring together at least all of the ministries involved, and possibly all of the stakeholders as well. This body should be responsible for executing its government's policy on tsetse and trypanosomosis control and, as such, should take the initiative for developing the strategy. It would also be the body that would oversee its implementation.

However, apart from Uganda which already has the Co-ordination Office for Control of Trypanosomosis in Uganda (COCTU), no such body exists in the other East Africa countries and consequently the initiative to develop a strategy in this field has been taken by the Livestock and/or Veterinary Departments encouraged by FITCA. Because this initiative has not had the full weight of the government it has not always been possible for these departments to secure the co-operation of all the appropriate ministries, let alone all the stakeholders.

It is therefore suggested that such a co-ordinating body be established at as high a level within the government as possible, preferably with its secretariat operating within the Cabinet/Prime Minister's Office. This will enable it to have the authority to bring together all the 'technical' Ministries (Agriculture, Livestock, Natural Resources, Health, Wildlife, etc.) as well as the Ministries of Finance and Planning and other stakeholders as appropriate. In this position the secretariat will be funded properly and without the need to 'topslice' funds from projects.

It is inevitable that in such a position within government the secretariat of the co-ordinating body will be run by experienced civil servants and that the current initiators of the strategy may, to a greater or lesser extent, be sidelined. However, their technical expertise and deep knowledge of the trypanosomosis problem and rural societies would be vital to the professional operation of its technical sub-committee which would be established in order to provide technical guidance.

### **2.4. WORKING GROUPS**

In addition to the plenary sessions the meeting broke twice into small groups for detailed discussion on a range of strategic and harmonisation issues. The full reports of these groups comprise Chapter 3.

#### **1. Strategy document - chapter headings.**

This workshop group devised model chapter headings for a national tsetse and trypanosomosis control strategy. They cover all the appropriate issues and the chapters are organised in a logical progression. This provides a good framework for countries that still have to embark on the strategy development process. For those countries that have already developed draft documents it may be used as a checklist to ensure that all the topics noted here have been included. It may also be used to ensure that factors which relate primarily to implementation are only mentioned in outline in the strategy document.

## 2. Prioritisation

This workshop group built on the work of the PAAT-PATTEC joint workshop held in Rome in May 2002 (see Appendix 1) and expanded it to form a useful rationale and methodology for prioritising areas within a country.

As suggested in the text, prioritisation need not necessarily coincide with phasing. For instance, if the centre of a fly belt is identified as the highest priority because of, for instance, high prevalence of sleeping sickness, it may be most efficient to first address the fly problem on the outside of the fly belt and then systematically work inwards towards the centre. In this way there will be less risk of re-invasion (a major problem) as the exposed areas will be smaller and thus easier to manage. Meanwhile the priority issue of sleeping sickness could be addressed by establishing a sleeping sickness surveillance and treatment programme in that area.

## 3. Funding

Securing adequate funding for tsetse and trypanosomosis control has traditionally proved to be a very difficult issue. Donors seem to be more and more reluctant to provide an level of support that is proportionate to the size of the problem. This workshop group pointed out that until governments of affected countries move this issue up their agenda by not only allocating their own funds but also recognising it as a significant cause of poverty and therefore including it in their Poverty Reduction Strategy Papers then donors are unlikely to respond. The development of national strategies provides a firm foundation on which governments can build support amongst the donor community.

The group also pointed out that livestock and livestock products contribute between 20% and 25% of east African countries' GDP and that at several points this sector was taxed. This argument could be deployed to justify increased government spending on the livestock sector. This group also considered alternative methods of funding projects, e.g. by modifying the toll system used for building roads, bridges, etc. As there are few precedents of this type of private/public funding partnerships in Africa a special study on the viability of such a funding methodology would be worthwhile.

## 4. Stakeholders

### Stake

- a. *n.* That which is placed at hazard; esp. a sum of money or other valuable commodity deposited or guaranteed, to be taken by the winner of a game, race, contest, etc.
- b. *fig.* to have a stake in (an event, a concern, etc.): to have something to gain or lose by the turn of events, to have an interest in. Hence spec., a shareholding (in a company).

*Oxford English Dictionary*

NB The Oxford English Dictionary does not contain a modern definition of *stakeholder*.

The original definition of a 'stakeholder' was an independent person who held the stakes (bets) of people betting on the outcome of a game, race or contest. Those betting on the winners took the stakes of all, those betting on the losers lost their stakes. Definition *b* indicates that a stakeholder could also be a person with an interest in a business, specifically as a shareholder. These dictionary definitions clearly indicate that there is an element of risk; although a gain is hoped for, there is a distinct possibility that a loss could be incurred.

In the last two decades the term 'stakeholder' has been expanded by liberal thinkers to include any person or organisation that has any interest in an activity; usually a business or, in the sphere of development, a project, and encompasses people and organisations, whether or not they bear any risk or will directly benefit from the project.

Thus whereas the original definition stakeholders would solely have referred to shareholder the new definition includes employees, customers, suppliers and the local community within which it operates. To a greater or lesser extent all these stakeholders are affected by the success or failure of 'their' business or activity. This concept has now been accepted as mainstream policy by social democrats.

The working group who tackled this issue identified a comprehensive range of stakeholders in the national tsetse and trypanosomosis control strategy and listed them according to category (public sector, private sector, farmers etc.) and denoted the role, which they would play in the implementation of the strategy. They also noted the importance of those roles by awarding them one, two or three '+s'.

From this analysis it is evident that not all stakeholders are equal. For instance, a research organisation providing technical support will barely be affected, one way or the other, whether the project it supports succeeds or fails. However, livestock owners and farmers could have their whole livelihoods significantly improved by the removal of the trypanosomosis constraint. If the control programme is based on the principle of community participation and livestock owners are required to provide inputs of cash and/or time then they stand to forfeit their stake in the project if it fails or proves to be unsustainable.

It is therefore suggested that stakeholders could, alternatively, be categorised on the basis of the level of stake they have in the programme. Such a method of categorisation would enable the identification of those with the biggest stakes in the programme so that they could play a greater role in developing the national strategy than stakeholders whose role is predominantly supportive. Thus the farming community in tsetse-infested areas would be offered the opportunity to play a major role in strategy formulation. However, the working group on integrating the private sector points out that to be able to play a full role in developing a national tsetse and trypanosomosis control strategy there will be a need to train the selected representatives of groups who are not otherwise organised for this purpose.

## **5. Harmonisation with other policies**

The working group on policy harmonisation has identified a comprehensive list of existing national policies with which the tsetse and trypanosomosis control strategy would need to be harmonised. Whilst the tsetse and trypanosomosis control strategy needs to be harmonised with most of these policies the Poverty Reduction Strategy needs to reflect it, particularly in relation to the role that removal of the trypanosomosis constraint can play in alleviating poverty of not only livestock-owners but also the wider rural community and beyond. Many donors do take notice of these documents and some are unwilling to provide aid outside the factors outlined in these documents.

The group also identified where it was appropriate to harmonise the national policy with that of neighbouring countries. This is particularly important in relation to prioritisation and project phasing where cross-border fly belts occur. Common strategies will facilitate mutual cross-border support. Where such situations occur then a common control project is ideal; failing that, cross-border issues should be addressed by a common project management body.

## **6. Harmonisation of Legislation**

The legislation harmonisation working group identified a number of regulations with which the tsetse and trypanosomosis control strategy would need to consider, harmonise with, or, if appropriate, propose changes to that legislation. Probably the most important of these is regulations on the movement of cattle as there have been instances where imported cattle have carried trypanosomosis with them which caused outbreaks in their new home areas. Unfortunately, current privatisation policies have reduced the capacity of the government veterinary services to regulate such movements and so the primary problem is the enforcement of existing regulations rather than the need for new ones.

This working group also identified a range of international legislations with which the national tsetse and trypanosomosis control strategy needs to harmonise. Possibly the most important of these in relation to tsetse and trypanosomosis control is the registration and certification of veterinary drugs and pesticides. It makes more logic and will be more cost-effective for this to be carried out on a regional rather than country by country basis.

## **7. The Private Sector**

This working group identifies the various elements that comprise the private sector in relation to tsetse and trypanosomosis control. For a variety of reason different countries adopt different policies with regard to the private sector. However, whether the control programme is implemented as a government scheme or handed over to a commercial agency the private sector will have a role to play, even if it is only as a supplier of inputs. The group recommends that the private sector is involved as early as the design stage of the tsetse and trypanosomosis control strategy. They point out that there might be a need to provide representatives of groups of small-scale entrepreneurs, e.g. animal health assistants, with training in the skills necessary to properly represent the views of their peers, e.g. meeting procedures, preparation of submissions, note taking, public speaking etc.

## **8. Rural Development Priorities**

This working group took the view that the tsetse and trypanosomosis issue was not regarded with the importance it was due because the damage that the disease causes to livestock was not fully either by poorly-informed livestock-keepers or governments. Their main conclusion was that there was a need for better education of decision-makers on the subject and that this could only be achieved by adopting a professional approach to advocacy in order that it may be incorporated into the overall rural development agenda.

## **9 Conservation Issues**

This group recognised that there were valid concerns by those people and organisations who supported the conservation viewpoint especially in relation to the likelihood of overgrazing and consequent environmental degradation as a result of higher livestock populations arising from the removal of the trypanosomosis constraint. They suggested that national tsetse and trypanosomosis strategies should build in safeguards to prevent this happening. With regard to pesticide use then every effort must be made to demonstrate that the proposed use of these chemicals would not damage the environment by citing previous experiences and the results of environmental monitoring in other regions, e.g. Zimbabwe.

### **3. REPORTS OF STRATEGY DEVELOPMENT WORKING GROUPS**

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#### **3.1 THE CORE ELEMENTS (i.e. CHAPTER HEADINGS) OF A MODEL NATIONAL STRATEGY FOR TSETSE AND TRYPANOSOMOSIS CONTROL.**

##### **1. Background**

This section refers to policies within which the strategy will operate i.e. the continental policy for eradication in the long-term as stated by the Heads of State in 2000 (PATTEC), national livestock policies, national agricultural and rural development policies, poverty-reduction policies and relevant regional policies.

Where there have been previous tsetse and trypanosomosis control programmes in the country a brief history should be provided including an assessment of their effectiveness. Where these have not been completely successful it should be shown that lessons have been learned and that these have been borne in mind in developing this current strategy.

##### **2. Current situation**

This chapter describes the current situation with regard to human and livestock populations, tsetse distributions, severity of trypanosomosis infections in livestock (including prevalence and PCV data) and where sleeping sickness is a problem. This chapter should be backed up with the most up-to-date maps and GIS data available as well as a preliminary economic analysis to quantify the magnitude of the problem in financial terms.

##### **3. General Objective**

The Vision/Mission statements form the basis of this chapter. The link between the national policy and the strategy will be explained. The timescale during which the strategy will be implemented and how the national strategy will be harmonised with neighbouring countries will be introduced.

##### **4. Rationale and Justification**

The focus of this chapter is a discussion of all the factors influencing the need for a tsetse and trypanosomosis control programme. As such, the discussion should consider the role of tsetse and trypanosomosis control in alleviating poverty and enhancing rural development as well as economic, socio-cultural and environmental factors. In some countries its role in peacemaking could be important. The discussion should honestly discuss factors that would mitigate against having a tsetse and trypanosomosis control programme, e.g. conservation issues.

This chapter also outlines the parameters on which phasing/prioritisation will be based and how cross-border issues will be handled.

## **5. Analysis of Stakeholders**

This chapter identifies all stakeholders and categorises them as initiators, managers, primary and secondary partners and primary and secondary beneficiaries and describes each one's role.

## **6. Institutional Framework**

Building on the previous chapter this describes the role of the institutions and how they will relate to each other. Particular emphasis should be placed on the need for an overall co-ordinating body which will operate at the highest levels of government such that it is fully mandated to secure the co-operation of all ministries and institutions.

This chapter should include a summary of each institution's terms of reference and how it will relate to all other stakeholders. However, detailed terms of reference should be included in the strategy document as appendices. An organogram could also be included provided that it is clear.

The role of and policy towards the private (commercial) sector should be clearly stated in this chapter. If this sector is to play a significant or management role within the programme, e.g. as a project manager or major contractor then it should be regarded as an institution.

## **7. Intervention Methodologies**

Nowadays there are many techniques for combating tsetse flies and trypanosomosis. This chapter evaluates them and assesses whether they are appropriate for deployment within the national implementation programme. Due regard should be paid to harmonisation with neighbouring countries policies. (Some countries may disapprove of certain insecticides as they may influence control of other diseases; others might be reluctant to embrace the Sterile Insect Technique because of its nuclear associations.)

Assessments of the merits of tsetse control or eradication and the role of the community could be included in this chapter.

## **8. Funding**

For anything apart from local projects national funding will need to be topped up by donor funding. This chapter describes the strategy for attracting outside funding and considers to what extent conditions placed by donors that would influence the implementation plans could be accommodated, e.g. environmental issues, unacceptability of particular tsetse control techniques.

An outline of the internal scrutiny procedures laid down by the Ministries of Planning and Finance that would have to be satisfied before the implementation programme could be funded by a loan rather than grant aid should be described in this chapter (if lengthy, these should be included in an appendix with an outline in this chapter).

## **9. Monitoring & Evaluation**

Using a logframe approach this chapter will describe how the strategy for tsetse and trypanosomosis control will be monitored and evaluated. In addition it will describe how any modifications to the strategy that are deemed appropriate are implemented.

## Appendices

1. Table showing short, medium and long-term objectives
2. Organogram of institutions and their relationships (optional)
3. Terms of reference for each institution
4. Outline of Ministry of Finance/Planning scrutiny procedures before loan application.

### **3.2. THE REASONS FOR ESTABLISHING PRIORITIES AND HOW THEY SHOULD BE INCORPORATED INTO A NATIONAL TSETSE AND TRYPANOSOMOSIS CONTROL STRATEGY.**

#### ● **Reasons**

- The areas affected by trypanosomosis are very large and the available resources limited; this means that any intervention will have to be phased over a period of years.
- The severity of the problem varies from area to area and consequently the level of benefits arising from interventions will also vary.
- Spreading the intervention over time allows for the efficient utilisation of limited resources through avoiding duplication and competition for scarce resources.
- It could be appropriate to commence an intervention programme in areas that have the most severe problem.
- It could be appropriate to commence an intervention programme where it is technically easiest in order to refine the techniques being used. Once the techniques have been refined then technically more difficult areas can be tackled with more confidence.
- There is a need to harmonise with neighbouring countries with regard to interventions where there is a common fly belt or significant cross-border movement of livestock.
- There is a need to establish the basis and effectiveness of techniques in local situations before concrete action can take place.
- There is a need to harmonise with priorities of potential financial supporters of the strategy, e.g. in relation to poverty-alleviation, environmental issues, etc.
- The opportunity for interventions against trypanosomosis to support parallel programmes relating to poverty reduction, increasing food security and maximising socio economic returns through enhanced SARD\*. As such, interventions against trypanosomosis should consider;
  - Expansion and intensification of mixed farming
  - Improved subsistence farming and / or production of cash crops
  - Land use and tenure as components of sustainability
  - Sustainable and environmentally appropriate utilization of natural resources

\* Sustainable Agricultural and Rural Development

- **Method**

- Need for thorough understanding of the current situation through collection of **baseline data**:
  - Tsetse distribution, Trypanosomosis epidemiology
  - Assessment of severity of trypanosomosis problem in livestock
  - Physical and geographical features influencing tsetse distribution.
  - Current practices for combating trypanosomosis, e.g. drugs, pour-ons.
  - Human and livestock populations and distributions.
  - Economic analysis of predicted costs and benefits.
  - Presence and level of Sleeping Sickness.
  - Identification of areas where increasing livestock and/or crop farming would have serious negative environmental consequences.

In addition to the quantitative assessment of factual data there is also a need to assess the political priorities of national and local government. Assessment of trypanosomosis as a priority is more difficult because many communities are not sufficiently aware of the details of trypanosomosis and therefore do not consider it to be a problem.

- Need to identify and incorporate **factors that will contribute to implementation** and early success of programme activities, i.e. objectives achievable within medium-term;
  - Minimising the risk of re-invasion of flies from cleared areas through the incorporation of natural barriers, e.g. mountains, lakes, arid areas, into project planning.
  - The strategic use of artificial barriers during phases against re-invasion.
  - Autonomous removal of natural tsetse fly habitat for farming due to population pressure and consequent settlement.
  - Existence of local technical and logistical support
- Need to identify and consider **factors that will influence sustainability** of programme activities and objectives;
  - Ongoing agricultural development projects that can assist farmers take advantage of removal of trypanosomosis risk, e.g. opportunity to upgrade livestock breeds, introduction of draught animals, greater benefits from improved veterinary care, etc.
  - Expanding marketing opportunities to harness the benefits from improved livestock and crop productivity.
  - Ability to identify and control residual fly populations.
  - Areas at risk of environmental degradation through increasing livestock populations, e.g. through overgrazing.

### 3.3. HOW TO INCORPORATE THE FUNDING ISSUE INTO A NATIONAL STRATEGY

#### OBJECTIVE

The overall objective of the National Tsetse and Trypanosomosis Control Strategy should be to enable the issue to be included as a priority within national budgets. Once a government has shown it is serious about addressing this problem through allocating its own limited financial resources for this purpose then potential donors are more likely to seriously consider approaches for assistance. A preliminary step will often be to include the tsetse and trypanosomosis issue within Poverty Reduction Strategy Papers.

#### HOW?

1. The tsetse and trypanosomosis control strategy will stand a much better chance of being adopted if it is part of an effective and viable Livestock Development Plan. Livestock and livestock products comprise up to one-quarter of GDP in East African countries and create employment beyond the farming community, e.g. processing, distribution, etc.
2. Support individuals and groups who are able to lobby at Parliamentary level on behalf of the livestock sector. These efforts can be supported by diligent cooperation with journalists and the press in general.
3. An awareness of the political priorities for national governments, particularly in relation to the aspirations of donors in relation to poverty-alleviation, environmental, gender and livelihood issues.
4. Demonstration within the tsetse and trypanosomosis control strategy that systems will be put in place to ensure transparency and probity in handling funds and that where the private sector is incorporated contracts will be awarded on the basis of a fair and clearly-stated set of conditions.
5. The incorporation of a clear policy for terms and conditions upon which grant aid and/or loans are to be accepted from international donors.
6. The strategy should include the need for an economic justification as an integral part of early project development, whatever the source of funds. This also includes projects that are being funded by farmers themselves.

#### SOURCES OF FUNDS

Local	Local Government Authorities Primary Beneficiaries, i.e. Farmers Communities – Cost Sharing (In HAT areas?) Private Contributions/Donations from secondary beneficiaries e.g. veterinary products suppliers.	Livestock Marketing Fees (Export) NGOs
National	Ministry of Finance Rebate levies on livestock and livestock products	Micro-finance Institutions
International	NEPAD Initiatives PATTEC Initiatives Bilateral and Multilateral Donors Debt Relief (HIPIC) through the Poverty-Reduction Strategies	Development Banks Regional Economic Communities Foundations – Welfare funds

### 3.4. IDENTIFICATION OF STAKEHOLDERS AND EVALUATION OF THEIR ROLES AND IMPORTANCE.

STAKEHOLDER	ROLE	IMPORTANCE + to +++
<b>A. <u>PUBLIC SECTOR</u></b>		
Government Ministries e.g. Mins. of Agric., Health, Finance, Planning	- Policy formulation	+++
	- Regulation	+++
	- Co-ordination	+++
	- Capacity building	++
	- Funding	+++
	- Technology dissemination	+
Policy-makers/Parliament	- Political support	+++
	- Sensitisation?	+
Regional government	- Implementation	+++
	- Sensitisation	
Research Institutions and Universities	- Technology generation	+++
	- Adaptation	+
	- Training	++
	-	
Media	- Promotion	++
	- Advocacy	+
<b>B. <u>REGIONAL</u></b>		
AU/IBAR, AU/PATTEC RECs	- Technical Assistant	+++
	- Financial Assistant	+
	- Capacity building	++
	-	
<b>C. <u>DONORS / DEVELOPMENT BANKS</u></b>		
EU, WB, USAID	- Funding	+++
<b>D. <u>PRIVATE ORGANISATIONS</u></b>		
- NGO's	- Funding	++
- Private Companies	- Implementation	+++
- Business communities	- Technology Adoption	++
- Private Vets	- Dissemination	++
- Farmers Groups		
- CBO's		
<b>E. <u>INTERNATIONAL</u></b>		
ILRI, IAEA, FAO, WHO IFAD, etc.	- Technical Assistant	+++
	- Capacity building	+++
	- Financial Support	++
<b>F. <u>FARMERS</u></b>		

### 3.5. THE ELEMENTS OF A STRATEGY THAT NEED TO BE HARMONISED A) AT NATIONAL LEVEL AND B) AT REGIONAL LEVEL

**Harmonisation:** Institutions or persons who consider themselves equal, coming together to get common understanding for common action

#### **National**

Elements of a national tsetse and trypanosomosis control strategy need to be harmonised with the following existing national policies and strategies;

- Poverty Reduction Strategy Papers (PRSPs)
- Rural Development Policy
- Livestock Development Plans
- Policy for Control of Livestock Diseases
- Policy for Control of Sleeping Sickness and Public Health
- Management of National Wildlife Parks
- Management of National Forest and Conservation Areas
- De-centralisation Policy
- National policies/traditions regarding community participation
- Normal procedures for community sensitisation
- Government attitude towards capacity building
- Agricultural marketing and infrastructural development policies
- Land Tenure Legislation/Systems
- Land Settlement Policies
- Natural Resource Utilisation Policies (pastoral, water).
- Privatisation policies
- Decentralisation policies
- Policy for Sourcing Donor Funds/Loans
- National Review, evaluation and reporting authorities

#### **Regional**

A national strategy for tsetse trypanosomosis strategy will need to harmonise with relevant policies that have been developed by organisations that operate on a regional or continental basis;

- PATTEC Plan of Action
- Regional Economic Community policies
- Livestock trade and marketing policies
- Livestock sector policies e.g. regarding trans-boundary diseases
- Sourcing of external support
- Agreed mechanisms (meetings etc) to solve “conflicts”
- Review, evaluation and reporting

It is noted that the actual selection of priority areas and the timing and methodology of tsetse and trypanosomosis interventions will need to be harmonized across borders within the implementation programme.

### **3.6. THE ELEMENTS OF LIVESTOCK-ORIENTATED LEGISLATION WITH WHICH A NATIONAL TSETSE AND TRYPANOSOMOSIS CONTROL STRATEGY NEED TO BE HARMONIZED AT:**

#### **A) NATIONAL LEVEL AND B) REGIONAL LEVEL (RECS)**

##### **Why Harmonise**

To create synergy and increase the level of impact of different interventions and thereby alleviate poverty.

##### **National Level**

Elements of a national tsetse and trypanosomosis control strategy need to be harmonised with the following existing national legislation;

- Disease Control – Animal & Human
- Movement – Livestock & Human
- Keeping of cattle and other livestock in urban areas
- Land use plans
- Biosafety
- Weeds/Plant/Pests Control
- Drugs Control
- Livestock Markets (Traders)
- Environment (Wildlife/Forests)
- Operations of NGOs
- Research/Technology Transfer
- Malaria /Tick Control

##### **Regional level**

A national strategy for tsetse trypanosomosis strategy will need to harmonise with relevant legislation that applies within the immediate region or on a global basis in order to avoid contradicting regulations that could create bottlenecks and thereby create problems for the farming and wider community.

- Movement (human and livestock)
- Disease (animal and human)
- Research/Technology
- Licensing of veterinary drugs and pesticides
- Biosafety including handling of bulk insecticides (for Aerial Spraying)
- Protection of irradiation sources for SIT
- Health and welfare of livestock exports

- Environment (Wildlife & Forests)
- Price control mechanisms

### **Actions**

- Awareness creation on Policies & Legislation
- Training – field staff
- Form legal advisory body
- Review existing legislation and provide consolidated guidelines
- Involve professional bodies, e.g. Medical & Veterinary Councils
- Form Inter-ministerial Committees

### **Advisory authorities**

- OIE (Rules & Regulations)
- WTO (Rules & Regulations)
- WHO
- IAEA
- FAO

## **3.7. INTEGRATING THE PRIVATE SECTOR WITHIN A NATIONAL TSETSE AND TRYPANOSOMOSIS CONTROL STRATEGY**

### **Who comprise the 'Private Sector'**

- Private Vets. Animal Health Assistants and their respective Professional Associations
- Commercial companies and their Sector Associations (National and International)
- Community-based Organisations (which represent beneficiaries)
- Non-Government Organisations (National and International)

### **Strategy Elements**

- The private sector should be incorporated into the process of formulating the tsetse and trypanosomosis strategy at as early a stage as is feasible.
- Where appropriate train and encourage delegates in the skills of representing their members.
- The private sector should be represented on all co-ordinating and executive bodies by the appropriate level of representative.

- Build the representational capacity of the private sector through
  - Provision of information
  - Training in knowledge management.
  - Provision of expenses where appropriate
- Continuously review relevant policies, legislation and operations of the strategy to ensure an enabling environment for the private sector.
- Ensure proper definition of the roles for the different sectors of the private sector within the tsetse and trypanosomosis control strategy.

### **3.8. HARMONISING THE TSETSE AND TRYPANOSOMOSIS CONTROL STRATEGY WITH OTHER PRIORITIES FOR RURAL DEVELOPMENT.**

- Identify the roles and contributions of tsetse and trypanosomosis control to Rural Development, e.g. increased production of livestock and livestock products, increased crop production resulting from the use of draught animals, more efficient exploitation of tsetse-infested areas for farming, greater opportunities for employment in downstream activities, etc.
- Ensure the tsetse and trypanosomosis control strategy is integrated into a large voice involving other players and partners, e.g. a livestock development plan.
- Lobby influential groups at all levels and involve appropriate professional expertise in order to achieve this.
- Develop arguments, materials and publications to support advocacy and develop in-house expertise.
- Emphasize regional context of tsetse and trypanosomosis control in rural development.

NB It is essential that the advocacy case put forward is both technically and economically credible.

### **3.9. ADDRESSING THE CONCERNS OF CONSERVATIONISTS WITHIN THE TSETSE AND TRYPANOSOMOSIS CONTROL STRATEGY.**

- Emphasise the safety and environmentally friendliness of the techniques that will be used, citing previous experience and post-project environmental monitoring reports.
- Emphasise that increased livestock productivity can be achieved through farmers upgrading to more efficient breeds rather than an increase in livestock populations.
- Point out that where the carrying capacity of the land is already near its maximum the implementation programme will be required to take action to avoid it being exceeded, thereby reducing the risk of environmental degradation through over-grazing.
- Support strengthening and harmonising related legislation for livestock and environment issues.

## 4. PERSONAL CONCLUSIONS FROM THE WORKSHOP

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Participants were asked to write down the most important lesson that they would take away from the workshop. Their responses were as follows:

- Need for long-lasting solutions to tsetse and trypanosomiasis problem
- Paramount importance of strategy
- Need for institutional framework
- Need for Benefit/Cost Analysis within strategy
- Importance of role of stakeholders in national strategy
- Stakeholders must be involved from the start
- Need to link tsetse and trypanosomiasis control strategy into PRSPs and NEPAD Initiatives
- Strategy documents are only FIRST STEP
- T&T control has regional aspect
- Need for regional evaluation of T & T problem for common flybelts
- Need for harmony between national strategy documents
- Ethiopia and Sudan are disadvantaged as not part of East African Community
- Role of PATTEC in formulating plans
- PATTEC approach should be harmonised with PRSPs
- Importance of role of AU/IBAR
- Need for training and/or professional help in lobbying and advocacy
- Need for early successes to provide confidence
- Good baseline information required before commencing actual control projects
- Need for training in community-based approach to tsetse control
- Disparity between commitment and funding by governments
- There is a role for T&T control in supporting peace (e.g. Sudan)
- Good to share experiences in developing national strategies for T and T Control
- Workshop provided a unique opportunity to consider strategy for T&T control
- Workshop encouraged us to take action

Need to continue the strategy development process in a follow-up workshop.

# Appendix 1 PAAT / PATTEC Report on Prioritisation



## Workshop on PAAT-PATTEC Harmonisation FAO HQs, Rome, 2 – 3 May 2002



### Criteria / guidelines for joint international action against T&T in the context of sustainable agricultural and rural development.

In the context of SARD and based on previous outcomes of PAAT meetings, the workshop developed the following criteria / guidelines for prioritising areas for joint international action against T&T in the context of rural development and identified the factors contributing to increased feasibility and early success of project activities and sustainable outcomes as outlined below (Table 1). Joint international action against Human African Trypanosomiasis will be guided by WHO.

**Table 1:** Criteria / guidelines for prioritising areas for joint international action against T&T in the context of sustainable agriculture and rural development (SARD)

1.	Severity of the impact of the T&T problem.
2.	Desire / need for intervention by local communities and national governments.
3.	Opportunity to support poverty reduction, increase food security and maximise socio-economic returns through enhanced SARD, such as
	a) Expansion and intensification of mixed farming;
	b) Improved subsistence farming and / or production of cash crops;
	c) Land use and tenure as components of sustainability;
	d) Sustainable and environmentally appropriate utilisation of natural resources.
4.	Factors contributing to increased feasibility and early success of project activities and sustainable outcomes, such as
	a) Activities phased and initial objectives achievable within 5 – 7 years of a programme / project cycle;
	b) Natural barriers;
	c) Possibility for artificial confinement;
	d) Favourable agro-ecological production trends;
	e) Favourable climatic variations and trends;
	f) Commitment and involvement of local authorities and communities;
	g) Existence of local technical and logistical support;
	h) Existence of ongoing agricultural development project that identifies T&T as major constraint.

This is also available at:

[http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGA/AGAH/PD/paat\\_I/Harws.doc](http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGA/AGAH/PD/paat_I/Harws.doc)

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# **ANNEX 3.1**

## **TSETSE AND TRYPANOSOMOSIS CONTROL AND ERADICATION STRATEGY FOR ETHIOPIA**

**MINISTRY OF AGRICULTURE**

**FINAL DRAFT**

**TSETSE AND TRYPANOSOMOSIS CONTROL  
AND ERADICATION STRATEGY FOR  
ETHIOPIA**

**Addis Ababa  
21 January 2003**

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## Executive summary

Trypanosomosis affects both human and domestic animals. With the exception of *Trypanosoma equiperdum*, which is transmitted venereally, all trypanosomes have arthropod vectors in which transmission is either cyclical by the bite of a tsetse fly or non-cyclical by biting flies other than tsetse. Apart from *T. vivax* which can be encountered out side of the distribution of tsetse flies, all tsetse-borne trypanosomosis cases follow strictly the distribution of the vector. The distribution of acyclically transmitted trypanosomosis is wider than tsetse-borne trypanosomosis.

There are three different groups of tsetse flies which exploit ecologically different habitats. These are palpalis group (riverine spp), morsitans group (savanna spp) and fusca group (forests).

Until 1976, a total of 98,000 km<sup>2</sup> area of Ethiopia was infested by five species of tsetse flies (Langridge, 1976). In more recent years, tsetse flies have progressively invaded productive agricultural areas in the west, south and southwest parts of Ethiopia. Consequently, it is estimated that a total area of 150,000 km<sup>2</sup> is currently believed to be infested with different species of tsetse flies.

Methods used to control trypanosomosis include, parasite control, vector control and the exploitation of trypanotolerant livestock. As far as tsetse flies is concerned, there are five proven and effective control and eradication methods. These include aerial spraying, ground spraying, traps and insecticide impregnated targets, insecticide treated cattle and SIT.

Tsetse and trypanosomosis is a trans-boundary problem in most of the affected countries in Africa. The control and eradication of tsetse and trypanosomosis from Africa, therefore, requires a concerted effort at national, regional, continental and global levels. Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC) is established with an aim of coordinating the efforts of African Member States to eradicate tsetse flies through the progressive creation and subsequent expansion of tsetse free zones. Moreover, PATTEC is taking an initiative to establish a Regional Center for Tsetse Control and Eradication in Addis Ababa.

In summary, there is a need for an urgent strategy which ensures a sustainable and economical use of tsetse infested areas in the country using an integration of all appropriate tsetse and trypanosomosis control and eradication methods and area development programmes.

# 1. Background and justification

The economy of Ethiopia is principally based on agricultural sector which contributes 40-50% to gross domestic product (GDP), over 90% to foreign exchange earnings and about 85-90% of employment opportunities of the country (NLDP, 1997). On the other hand, the majority of agricultural output is generated from crop and livestock integrated production systems. The livestock sub-sector alone contributes an estimated 16% the total and over 30% to the agricultural GDPs. Moreover, excluding draught power and manure values, the sub-sector contributes about 40% of the agricultural production of the country (Winrock, 1991). Therefore, livestock play a very crucial role for almost all agricultural produces as they constitute the greater part of the energy source for traction, cultivation, transport and threshing of cropping lands.

Ethiopia has the largest livestock population in Africa which includes 30 million heads of cattle, 42 million heads of sheep and goats, about 7 million equids, one million camels and over 53 million chickens (NLDP, 1997). However, the economic benefit derived from the livestock sector does not proportionate with the existing potential and the sub-sector remained enormously underutilized. This is because, the development of the sub-sector is confronted with numerous constraints and these can be generalized as inadequate feed supply and poor nutrition, high prevalence of diseases, poor animal genetic resource management and poor marketing. Nevertheless, animal diseases remain as one of the most important constraints to livestock development since they are distributed across all agro-ecological zones of the country. Although other animal diseases also cause heavy losses of domestic livestock, there is no evidence that any one disease has had the same profound influence on the distribution of livestock as has tsetse borne animal trypanosomosis (FAO, 1993). Accordingly, trypanosomosis is unique among other animal diseases because it limits the expansion of the national herds and farming practices by denying access to woodland and savannah areas with good grazing and agricultural potential. For instance, land resource studies carried out in Ethiopia have revealed that the lowland areas in the western parts of the country have the highest potential for agricultural production (FITCA, 1989). However, these areas are infested with tsetse flies. On the contrary, there is a high concentration of people and livestock in the adjacent highlands which results in intensive land use pressure and the adoption of disproportionate farming practices with consequent environmental degradation and progressive decline in average farm size.

Although the utilisation of tsetse infested areas with a high potential for agricultural production is a major priority of the government, this can only be achieved if the problem of tsetse transmitted animal trypanosomosis is controlled or eradicated from these areas.

Even though the scale of the operation is very limited, compared with the overall infested area of the country, governmental and non-governmental organizations as well as other international institutes are involved in tsetse control and eradication activities. However, the efforts are so fragmented and uncoordinated and they lack appropriate land use policies and strategies to bring about any significant impact on tsetse and trypanosomosis problems at all levels. More over, there is no much capacity in the country to design, oversee, manage and evaluate wider ranging tsetse and trypanosomosis control and eradication programmes within the context of overall rural development plans of the country.

Therefore, the strategy will help to develop national capacity on tsetse and trypanosomosis control and eradication and to effectively coordinate and harmonize the intervention efforts of the country at national, regional and global levels; and within the overall rural development plans, assist to optimally use tsetse infested areas through the strategic control and eradication of the problem using an integration of appropriate techniques and multi-disciplinary approaches.

## **2. Overview of tsetse and trypanosomosis**

Trypanosomosis is a disease caused by flagellated protozoan organisms of the genus *Trypanosoma*. Trypanosomes are elongated spindle-shaped organisms with a single nucleus ranging in size from 10-35  $\mu\text{m}$ . The disease is characterized, mainly, by intermittent fever, progressive anemia and loss of body condition of susceptible hosts, which if untreated lead to heavy mortalities. The disease affects both human and domestic animals. The disease in human is known as sleeping sickness and nagana in cattle.

With the exception of *Trypanosoma equiperdum*, which is transmitted venereally, all trypanosomes have arthropod vectors in which transmission is either cyclical by the bite of a tsetse fly or non-cyclical by biting flies other than tsetse.

In cyclical transmission, tsetse flies are intermediate hosts in which the trypanosomes undergo a series of morphological transformations before they become infective. In this mode of transmission, a tsetse fly remains infective for the rest of its life once infected with trypanosomes

and can infect any animal while it feeds. *Trypanosome* spp. which are transmitted in this fashion are *T. congolense*, *T. b. brucei* and *T. vivax*.

Non-cyclical transmission is a type of transmission in which the trypanosomes are transmitted from one mammalian host to another through the contamination of mouth parts during interrupted feeding of biting insects such as *Tabanus* spp, *Haematopota* spp, *Stomoxys* spp...etc. In this case, there is no multiplication of trypanosomes in these flies, and they just acts as a needle. *T. evansi* which is widely distributed in Africa, Asia and South America is transmitted mechanically by biting flies. There is also a suspicion that *T. vivax* can also be transmitted acyclically. Apart from *T. vivax* which can be encountered out side the distribution of tsetse flies; all tsetse-borne trypanosomes follow strictly the distribution of the vector. In general, the distribution of acyclically transmitted trypanosomosis is wider than tsetse-borne trypanosomosis.

Unlike most other insects, tsetse flies do not lay eggs but they give birth to a fully grown larva at intervals of about 9-10 days. The larva burrows into the soil and within an hour or so, it turns into a hard-shelled puparium. After about one month, an adult fly emerges from the puparium. The low reproductive nature and high survival rates of tsetse flies is more like that of a mammal than that of an insect.

Both sexes of tsetse flies derive their blood meal from many hosts which are mainly wild games, in which warthogs, bushbucks, Kudu, wild pigs are among the species. However, tsetse flies seldom feed on impala and zebra. In the absence of wild games, domestic animals serve as ideal sources of blood meal to tsetse flies.

Tsetse flies are attracted to various hosts as a result of a wide range of stimulants such as visual (colour, shape, size and movement) and olfactory (host odour) and environmental factors such as temperature and humidity.

There are three different groups of tsetse flies which exploit ecologically different habitats. They can be found associated with the riverine vegetation (palpalis group), the savanna woodland (morsitans group) or woody forests (fusca group). The risk of contracting trypanosomosis is widespread in areas where the morsitans groups of tsetse are the vectors of the disease. As far as riverine species of tsetse is concerned, transmission of trypanosomosis occurs particularly along rivers with dense vegetations. However, many of the fusca groups of tsetse are confined to dense forest and are, therefore, not normally in contact with livestock but sometimes may also occur on the forest edge and may locally play a significant role as vectors of African animal trypanosomosis.

### 3. Magnitude of tsetse and trypanosomosis

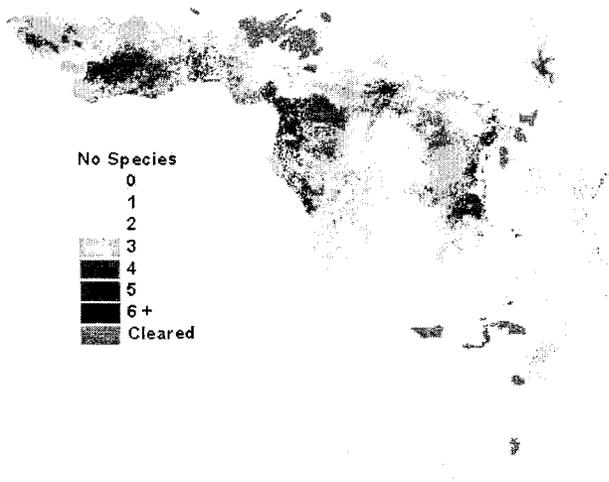
Tsetse transmitted bovine trypanosomosis is one of the most economically important diseases of domestic livestock in sub-Saharan Africa (Gu *et al.*, 1999) and is distributed in about 37 African countries (IAEA, 2000).

Currently, tsetse flies infest approximately 10 million km<sup>2</sup> of Africa, about 37% of the land area of the continent; an area larger than the USA which is 9.8 million km<sup>2</sup> (Trail *et al.*, 1985).

Economic impact assessments of African animal trypanosomosis suggest annual losses which amount to several billion of dollars; and when held against the total livestock associated GDP in sub-Saharan Africa, tsetse and trypanosomosis induced losses equate to 20-25 % of the total production value (IAEA, 2000). According to Budd (1999), African farmers spend 35 million US dollars per year on trypanocidal drugs to protect and cure their cattle. The disease in cattle has more impact on rural poverty than can be estimated in billions of dollars per annum (Hursey and Slingenbergh, 1995). The situation with regard to sheep, goats, pigs, donkeys, horses and camels is probably as serious but is less documented (Gu *et al.*, 1999).

It is estimated that 7 million km<sup>2</sup> of tsetse infested Africa would otherwise be suitable for livestock and mixed agriculture if trypanosomosis could be controlled (MacLennan, 1980).

The cost of human African trypanosomosis is extremely difficult to quantify; however, it has been estimated that at least 50 million people are at risk of contracting sleeping sickness (Kuzoe, 1991).



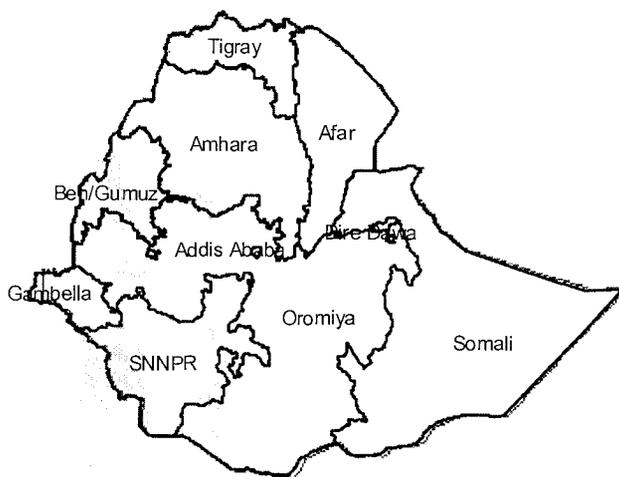
**Figure 1. Tsetse infested areas of Africa**

Ethiopian tsetse and trypanosomosis situation shares many characteristics with the rest of African countries occupied by the different species of tsetse flies.

Until 1976, a total of 98,000 km<sup>2</sup> area of the country was infested by five species of tsetse flies (Langridge, 1976). In more recent years, tsetse flies have progressively invaded productive agricultural areas in the west, south and southwest parts of Ethiopia. Consequently, it is estimated that a total area of 150,000 km<sup>2</sup> is currently believed to be infested with different species of tsetse flies in which case, livestock below 2000 m contour are exposed to various levels of trypanosomosis risk (NTTICC, 1996). As a result, a total of 14.8 million cattle, 6.12 million sheep and goats, one million camels and 1.23 million equines are at risk of contracting trypanosomosis in Ethiopia (MOA, 1995). The overall economic loss due to the disease is estimated to be between US\$ 1,408 and 1,540 million annually (NTTICC, 1996). None tsetse-borne trypanosomosis also affects a considerable number of animal populations in tsetse free zones of the country (MOA, 1995). More over, the tsetse infested lowlands of the country are highly fertile and very suitable for agriculture and considerable parts of these areas are devoid of people and livestock.

There are five economically important animal trypanosome species in Ethiopia. These are *T. congolense*, *T. vivax*, *T. brucei brucei*, *T. evansi* (Langridge, 1976) and *T. equiperdum* (Dagnachew and Shafo, 1981). However, sleeping sickness is of negligible public health importance in the country.

As far as the vector is concerned, there are as well five species of tsetse flies distributed along the lowlands of western, southern and southwestern parts of the country. *Glossina morsitans submorsitans*, *G. pallidipes*, *G. fuscipes fuscipes* and *G. tachinoides* are the most important tsetse flies whilst *G. longipennis* is of minor economic importance (Langridge, 1976).



**Figure 1. Tsetse infested areas of Ethiopia (shaded part)**

The problem of tsetse-borne animal trypanosomosis is the main cause for the decline in the number of cattle and particularly draft oxen in tsetse affected areas of Ethiopia (Abebe and Jobre, 1996; NLDP, 1997). The loss of draft oxen, generally, causes a dramatic decline in farm size and crop production. As a result, farmers always shift from cultivating higher valued teff to maize, as the latter requires less plowing (Berhanu, 1998).

Tsetse flies force human and livestock populations to excessively concentrate in the highlands of the country by limiting access to arable and grazing areas where it eventually produces detrimental environmental effects. Furthermore, tsetse flies are steadily advancing into newer areas occupying more territories. As a result, they expel resident farming populations and bring about a decline in farm size and additional pressure on these fragile areas. In general,

trypanosomosis prevents the development of mixed farming practices and has a direct and indirect effect on human health, nutrition such as milk, meat and protein and holds back social development. The control of the disease places a continuous strain on the national economy through the maintenance of tsetse and trypanosomosis center, the purchase of insecticides, spraying equipment, trypanocidal drugs.

#### **4. Methods of trypanosomosis control and eradication**

Methods used to control trypanosomosis include, parasite control, vector control and the exploitation of trypanotolerant livestock (Uilenberg, 1997).

##### **4.1. Parasite control**

While tsetse control has been successful in several African countries (Jordan, 1986) and use of trypanotolerant livestock is the basis for livestock development in many countries of West and Central Africa (d'Ieterenen *et al.*, 1998), the major strategy used to control bovine trypanosomosis in sub-Saharan Africa is based on trypanocidal drugs (Peregrine, 1994). It can also be argued that cattle only occur in many parts of Africa because of the availability of trypanocidal drugs (Jordan, 1986).

If trypanocidal drugs are properly used, they can provide a cost-effective and sustainable approach to trypanosomosis control (Trail *et al.*, 1985).

Drugs can be highly effective provided they are continuously available and treatments are given regularly and at appropriate dose rates. More over, drugs can offer the possibility of reducing the disease to a level where infested land can be exploited most economically with minimum risk of contracting trypanosomosis. However, if sufficient intensity of land use does not result following treatment of animals with trypanocidal drugs and tsetse habitats remain, then the presence of cattle can even cause an increase in the number of flies. This is because treated animals will serve as readily available sources of blood meal to tsetse flies. Therefore, the use of drugs to protect cattle owned by peasant farmers could be most efficacious in such circumstances when it increases the amount of land in effective cultivation, which in turn decreases the amount of suitable tsetse habitat.

Chemotherapy of trypanosomosis in domestic livestock is at present dependent upon the salts of a relatively small number of synthetic compounds; namely, homidium, isometamidium, diminazene and quinapyramine (Guelmbaye *et al.*, 1993). All four compounds have been on the market for the last 30 years and there are reports of drug resistance in *T. congolense* and *T. vivax* in many parts of Africa. Further more, because of the close chemical relationships between the compounds, the development of resistance to individual trypanosomes often appears to be associated with cross resistance to others (Whitelaw *et al.*, 1986).

## 4.2. Vector control

At the moment, there are five proven and effective tsetse control/eradication methods. These techniques are aerial spraying, ground spraying, traps and insecticide impregnated targets, insecticide treated cattle and SIT.

Aerial spraying using residual insecticide formulations have been applied from helicopters (Baldry *et al.*, 1981) to control/eradicate tsetse flies. Sequential aerial spraying has also been used to treat several thousand km<sup>2</sup> in Botswana, Kenya, Nigeria, Somalia, Uganda, Zambia and Zimbabwe with varying successes (Allsopp, 1991). Aerial spraying can be used to treat large areas rapidly and is particularly appropriate in epidemic situations. It is also suitable where ground access is difficult, dangerous or undesirable (Allsopp, 1991). However, aerial spraying using ultra-low volume (ULV) and non-persistent insecticide is expensive and cannot be implemented in areas with ragged topography. In other words, deep escarpments along river valleys do not allow for aerial spraying to be carried out just above the tree canopy at nighttime.

As far as ground spraying is concerned, DDT was applied by handspraying on the vegetation, in particular on the favourite resting sites on tree stems, and also under fallen logs and other potential pupae sites. Ground spraying has been used with great success in many parts of Africa (Allsopp, 1991). However, spraying using persistent and long acting insecticide is environmentally polluting and the technique has practically become abolished throughout the continent. Apart from this, the technique is too laborious and costly.

Target and trap techniques are not intended as a means to eradicate flies from an infested area. They are employed to reduce populations of tsetse to levels which reduce the challenge or risks to humans and animals. They are also deployed to prevent re-invasion of fly from a previously cleared area. The attractiveness of traps and targets for

tsetse flies depends on their shape, size, colour and colour pattern, and this differs from species to species. The catch or killing efficiency can be increased, in many cases, by certain substances which have an attractive odour for the flies, e.g. acetone, phenolic molecules, bovine or buffalo urine. The choice of the technique depends very much on the species of tsetse fly one is dealing with, and can even be seasonally different. Savanna tsetse flies are generally more attracted by the odours studied so far than riverine species.

Despite successful field trials, livestock farmers and national governments in Africa have been slow to embrace traps and targets as a means of tsetse control (Baylis and Stevenson, 1998). The reasons for this were difficulties associated with deployment and maintenance of traps and targets over large and often inaccessible areas and the cost of odour attractants and insecticides. Apart from these, the scientifically rigorous approach to the design of the control programme often requires a level of infrastructure and organization rarely available to the people whose animals are at risk of trypanosomiasis. Apart from this, community based fly suppression efforts are difficult to sustain. The motivation of the owners may diminish after the tsetse population has gone down. Traps and screens may be stolen for the cloth they contain. This is particularly serious when they are part of a barrier against (re)invasion. During the rainy season, the rapidly growing vegetation may camouflage the trap or screen, which thus loses its visual attractiveness for the flies.

Insecticide treated cattle offer numerous advantages over odour-baited traps and targets. Cattle are used as moving targets and hence no cost on odor baits, besides cattle can be moved to spray races or dips rather than staff travelling to widely dispersed traps/targets. Moreover, it can be based on existing infrastructure like dips and spray races and can bring about significant savings in operational costs. However, fly-cattle contact is necessary if tsetse flies are to be controlled. This requires alternative means of protection of cattle using prophylactic trypanocidal drugs when they are first introduced into tsetse infested areas; and consequently, accepting a low level of disease incidence. This problem may also be recurrent if cattle are moved frequently in search of better grazing. In addition to this, tsetse numbers may need to be monitored using odour baited traps to assess the effectiveness of the control programme which re-introduces many of the shortcomings of traps and targets as mentioned above. Furthermore, blood meal analysis should be undertaken to determine the percentage of flies feeding on cattle. Apart from this, the number of cattle population should be significantly high for the technique to be effective. The technique was field tested and found successful in a number of African countries such as Ethiopia (Keno and Mengistu,

1995), Zimbabwe, Tanzania, Zanzibar, Kenya and Burkina Faso (FAO, 1992).

Male tsetse flies which have been rendered sterile by gamma irradiation or by certain chemical compounds will mate with females, but these will not produce offspring, as females normally mate only once after hatching, contrary to males. With the continuous release of sterile males in large numbers, it is possible to eradicate tsetse flies from a particular area. During the recent campaign in Zanzibar, a ratio of more than 100 sterile males against one wild one was used at some stage. The method is very specific and not polluting in itself, but the effect on the population only becomes apparent after a period, as opposed to control by instantly killing insecticides. Because of this and to allow the sterile males to be competitive, a substantial fly suppression has to precede the application of SIT, which is reserved for the final "mopping up" of the remaining population. The released males will seek out the females even in places where the insecticide cannot penetrate. The males to be sterilized have to be mass reared in the laboratory. Also, the numbers of males that can be obtained are limited by the low rate of reproduction of tsetse flies and the fact that they have to be fed at least twice a week on blood. Where tsetse eradication is envisaged in places where several tsetse species occur in association, as is often the case, mass rearing has to be carried out for each individual species separately. SIT was applied in large scale tsetse eradication programs in Burkina Faso and Northern Nigeria (Jordan, 1986). Perhaps the most notable example of the success of the SIT, after tsetse population suppression with targets and pour-ons, is the case in Zanzibar where *G. austeni* has been eradicated from the island. However, the value of eradicating tsetse from the vast tsetse infested areas using the SIT lies to a large extent on the economic justification and on its sustainability. The benefits of tsetse eradication depend mainly on the rate and extent at which cleared areas are put to productive use and the sustainability of the operation which in turn is dependent on whether or not re-invasion of the cleared areas does not occur. The only sure way of maintaining eradicated area from re-invasion is to eradicate an entire fly belt. However, tsetse infested areas are, mostly, very large and eradication of the entire belt may not be economically justifiable and would take an ample amount of time. Apart from this, the SIT should succeed other tsetse suppression techniques, like traps and targets, which leads again to many of the disadvantages of trap and target techniques.

### **4.3. Use of trypanotolerant livestock**

It is well-known that genetically determined innate resistance to many diseases, including trypanosomosis, occurs in animal populations which

have been subject to natural selection by exposure to disease pressure over many generations. Taurine (humpless) breeds of cattle were the first to be introduced into Africa. They populated what is now the Sahara, but were pushed back further south when this area became a desert thousands of years ago. At present, they persist in the subhumid and humid northern parts of subSaharan Africa where they live and produce in tsetse areas (Uilenberg, 1997). Such taurine breeds are now mainly confined to West Africa, from Senegal to Nigeria, but they used to occur as far to the east as the central Sudan (Nuba Mountains) and even western Ethiopia (NLDP, 1997). N'Dama cattle, which originate from Guinea, have rather long horns while breeds with short horns comprise for example the Baoulé (Burkina Faso and northern Ivory Coast) and the Muturu (Nigeria). Although a N'Dama cow can weigh as much as 200 kg, similar to the size of many of the smaller zebu breeds, they are "dwarf" cattle.

There have been attempts to introduce West African trypanotolerant cattle to other areas but with limited success. Livestock owners who are used to larger cattle, are not readily attracted to the smaller trypanotolerant breeds. There are also limits to their trypanotolerance and when challenge is high even such animals may show clinical trypanosomiasis. Their resistance is particularly effective in the face of riverine species of tsetse, which usually occur in lesser numbers and have a lower infection rate with pathogenic trypanosomes than the savannah species. Apart from this, they are small in number, poor in productivity and highly susceptible to other diseases compared with other breeds of cattle (Jordan, 1986).

## **5. Efforts made to date**

Efforts to control tsetse in Africa date back to the early years of the 20th century. The first efforts were based on the removal of habitat and host animals, and fencing to prevent contact between cattle and wild animals. With the discovery of the synthetic organochlorine insecticides, large ground spraying operations were conducted in the 1950's and 60's. During this period, the technique was refined from blanket spraying of habitat to discriminative spraying of specific tsetse resting sites. This was followed by non-residual aerial spraying using sequential applications of non-persistent chemicals. Work in West Africa and later in Zimbabwe and Kenya on improved trapping and attractants for tsetse opened the way for the development of the "bait technologies" using traps and insecticide impregnated screens (with or without attractants) and insecticide treated cattle. Other technologies that have been investigated include repellents, chemosterilants, parasitoids and various pathogens, but none has yet been used in large scale control operations.

Tsetse and trypanosomosis is a trans-boundary problem in most of the affected countries in Africa. The control and eradication of tsetse and trypanosomosis from Africa, therefore, requires a concerted effort. There was very little effort in the continent to address the trans-boundary nature of the problem except in Southern Africa. As a result, most affected African countries were trying to manage tsetse and trypanosomosis problems independently.

Following the decisions of African Heads of State during the summit in Lome, Togo in 2000 and Lusaka, Zambia in 2001, the African Union (AU) has established a Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC) Coordination Office. PATTEC aims to coordinate the efforts of African Member States to eradicate tsetse flies through the progressive creation and subsequent expansion of tsetse free zones. Moreover, PATTEC is taking an initiative to establish a Regional Center for Tsetse Control and Eradication in Addis Ababa.

As far as Ethiopia is concerned, the increasing problems posed by trypanosomosis was becoming apparent from time to time and the government was obliged to established a mobile trypanosomosis control unit in 1971, Trypanosomosis Control Service (TCS) in 1977 and National Tsetse and Trypanosomosis Investigation and Control Centre (NTTICC) in 1985.

As far as the NTTICC is concerned, it is a national institution responsible for carrying out tsetse and trypanosomosis investigation, training and provision of technical backstopping to animal health personnel in the field. In 1986, the NTTICC started a pilot tsetse control operation using bait technology in the upper Didessa valley, western Ethiopia. The control operation has demonstrated the effectiveness of odour-baited and insecticide treated traps and targets for the control of tsetse flies under Ethiopian conditions. The tsetse fly population and trypanosomosis prevalence drastically fell down after the commencement of the control operation. As a result, the total cultivated land was increased and farmers were able to diversify their crop production. More over, the total cultivated land and cultivated land per farmer has considerably increased. The control operation is still ongoing and about 1500 Km<sup>2</sup> is estimated to be cleared off tsetse flies and around 90 peasant associations are benefited from the operation.

More over, a number of trials have been conducted by the center on improvement of tsetse control methods, ecology and dynamics of tsetse and epidemiology of trypanosomosis, study on the development of drug resistance in trypanosomes, livestock productivity studies under

different levels of tsetse challenge and improvement of trypanosomosis diagnostic methods.

Training of animal health personnel is also a mandate of the center. As a result, the center provides training to animal health professionals, development agents and farmers in the tsetse affected areas of the country. More over technical backstopping is also provided to Regional Agricultural Bureaus and non-governmental organizations. This is usually provided in the form of assistance in tsetse and trypanosomosis surveys, training of personnel and advice on control strategies.

As mentioned above, the center has long experience on tsetse and trypanosomosis related issues. However, the center could not coordinate and harmonize tsetse and trypanosomosis control and eradication efforts of the country due to problems associated with its location, shortages of trained manpower, poor communication and information networks and lack of clear policy and strategy on tsetse and trypanosomosis control and eradication.

As an extension of the previous activities of the NTTICC, an Eastern Africa Regional Programme "Farming in Tsetse Control Areas (FITCA)" project is operating over a total area of 4,500 km<sup>2</sup> of the upper Didessa valley to control tsetse flies and rehabilitate mixed farming practices (FITCA, 1998). The project is supported by the Ethiopian government and EU and is expected to make significant contributions to the national capacity building in tsetse and trypanosomosis control and related area development programmes.

Apart from this, operation is underway to eradicate tsetse flies from an area of 25,000 km<sup>2</sup> in the southern rift valley of Ethiopia using the Sterile Insect Technique (SIT). The project is a multimillion project and is technically assisted by the International Atomic Energy Agency (IAEA). Baseline data collection, population suppression, eestablishment of a mass rearing facility, sequential releases of sterile male tsetse flies, eradication programme and surveillance are the main components of the project.

Since vector control operation is very limited in scope, trypanosomosis control by the use of imported trypanocidal drugs is the most widely applied technique of trypanosomosis control in Ethiopia. Trypanocidal drugs were used in Ethiopia, for more than 40 years, to control the disease in different domestic animals (NTTICC, 1996). The use of these drugs was significantly increased over the past 20-30 years due to the

increase in the magnitude of the problem of tsetse and trypanosomosis from year to year. Although the demand is much higher than this amount, one to two million doses of the drugs are administered at the cost of some US \$ 0.5 - 1 million per annum; excluding illegal and NGO drug imports (MOA, 1995).

As far as efforts of other international institutions are concerned, ILRI, formerly ILCA is active in tsetse research, both pure and applied. The institution is based in the Ghibe valley, western Ethiopia and it is involved in livestock productivity studies and tsetse control activities using targets and pour-ons.

Since 1995, the International Center for Insect Physiology and Ecology (ICIPE) was also trying tsetse traps to control the devastating effects of the fly on livestock population of the country. The center officially began a project named Biovillage in mid-1999, and the animal health component of the project introduces tsetse control technologies like Lethal Insect Technique (LIT), pour-ons and traps.

## **6. Constraints of tsetse and trypanosomosis control in Ethiopia**

There are a number of constraints which impede the efforts of tsetse and trypanosomosis control and eradication in Ethiopia.

### **6.1 Agent, vector and host**

Trypanosomosis is a complex disease that is brought about by the interaction of biological (agent, vector and hosts) and geo-climatic factors. Trypanosomes are harbored in different vertebrate hosts of domestic and wild animals. Moreover, there are different species of trypanosome which have different strains which can produce many variants and serodemes in the face of chemotherapeutic drugs and host defense mechanisms. Therefore, it is technically difficult to devise a specific control method of controlling the disease. For this same reason, no vaccine is currently available against the disease. Furthermore, trypanosomes are developing drug resistance against the existing range of trypanocidal drugs, and for various reasons, there is no future prospect for the development of new drugs. More over, trypanosomes can be maintained in a sylvatic cycles (between wild vertebrate animals and tsetse flies) without the involvement of man and his domestic animals. Therefore, any measure directed against the parasite in domestic animals and man will not be able to guarantee an effective control or eradication mechanism.

Apart from this, there are more than 30 species and sub species of tsetse flies each of which has its own ecology and behavior (host preference...etc). Methods devised to attack one species in one area would not necessarily be effective for another in a different area. Besides, tsetse flies occupy a vast portion of land and, therefore, any single control or eradication technique employed has tremendous technical and logistic insufficiencies to effectively eliminate flies over vast area within the required time span possible.

Even the best plans for the use of land cleared from tsetse flies are not always implemented, which on the one hand may relieve pressure in the highlands, and on the other hand lead to uncontrolled settlement and land degradation in the areas cleared off tsetse flies.

In summary, there is a need for an urgent strategy which ensures a sustainable and economical use of tsetse infested areas in the country using an integration of all appropriate tsetse and trypanosomosis control and eradication methods and area development programmes.

## **6.2. Socio-economical**

The control and eradication of tsetse and trypanosomosis often involves high input in terms of finance and man power requirements. In general, the government alone is incapable of providing sustainable services without the help of the community. Apart from just participating in tsetse control activities, there is considerable scope for communities to take over the management of tsetse control operations. Whilst government may have a vital facilitating role and the donor in providing initial capital investment, sooner or later the operation should be sustained from local sources. However, communities in tsetse infested areas are too poor to afford animal health services in general and tsetse and trypanosomosis control services in particular.

Women are not competing with men in the public domain where tsetse control operations are concerned. In terms of workload, however, women can contribute more time to trap making than to trap placement and maintenance. Women can also make a significant proportion of financial contribution to tsetse control, if account is taken of the fact that they have certain control over some livestock and livestock products such as poultry and dairy products.

Therefore, there is a need to encourage women to participate in the control efforts, motivate and improve the financial capabilities of

communities in order to shoulder tsetse and trypanosomosis control efforts of the country.

### **6.3. Organizational and management**

Tsetse and trypanosomosis control requires effective organizational and management capacities. As tsetse flies and the disease they transmit are not restricted to one locality, the management of the problem requires cooperation, coordination and harmonization of activities in a concerted manner at local, regional, national and international levels in order to minimize duplication and fragmentation of efforts and ensure sustainability. The national unit responsible for dealing with tsetse and trypanosomosis control could not assume this responsibility because it is located far away from the point where it can effectively coordinate tsetse and trypanosomosis control and eradication programmes at all levels.

### **6.4. Lack of reliable and adequate information system.**

Concrete and complete information are lacking on the socio-economic impact of trypanosomosis in order to convince decision makers to allocate all the requirements for tsetse and trypanosomosis control and eradication in terms of finance, manpower, equipment and facilities. As a result, information on spatial and temporal distribution of the vector and the disease, livestock population at risk, the socio-economic aspects of the problem...etc are lacking.

Therefore, much information is required to enable professionals and decision makers to select approaches and to make choices where and how to control and eradicate tsetse transmitted trypanosomosis and where not.

### **6.5. Shortage of trained manpower**

Senior professional staffs are only exposed to a technical research background and do not have enough concept of tsetse control as one component of integrated rural development. Therefore, there is little capacity to design, oversee, manage and evaluate area wide tsetse and trypanosomosis control and eradication activities in the context of interdisciplinary development approaches.

## **7. Rural Development Policy and Strategy of Ethiopia**

In line with the rural development policy and strategy, the purpose of the tsetse and trypanosomosis control and eradication strategy is to support integrated area development and rational use of tsetse infested areas of the country.

## **8. National strategy for tsetse and trypanosomosis control and eradication**

During the implementation of the strategy, emphasis will be put on the establishment of clear and realistic goals with measurable indicators of success. Implementation of the strategy will be dynamic so it opens a room for flexibility and contingency planning. In this strategy, tsetse control and eradication will be executed through a phased, systematic and sustained programme until all areas of the country are tsetse-free. To achieve sustainable control and eradication programme, the tsetse population in a given area will be isolated through a natural or artificial barrier. Each isolated area will be tackled independently, until all tsetse flies in the area are eradicated.

Tsetse control and eradication efforts in affected regions will be coordinated through a forth coming National Tsetse and Trypanosomosis Control and Eradication Coordination body which will ensure that relevant regional offices and focal points are identified and established. The direct involvement and participation of all relevant stakeholders (Government, private, NGO, international institutions, local communities...etc) will be strengthened through consultations, meetings and creation of awareness.

By implementing a regular environmental impact assessment and an appropriate land use plans and policies, efforts will be made to avoid the negative environmental impact of tsetse control, eradication, survey and surveillance activities. Therefore, it will be ensured that all environmental agencies and other relevant stakeholders are properly consulted on these issues.

## 8.1 Overall objective

The overall objective of the strategy is to enhance mixed crop livestock production system and support the national effort to ensure food security and reduce poverty through the control and eradication of tsetse and trypanosomosis problems.

## 8.2 Specific objectives

- To remove the burden of tsetse and trypanosomosis related problems from communities that live within the tsetse and trypanosomosis infested areas of the country;
- To make tsetse and trypanosomosis infested areas accessible to communities living outside the tsetse infested areas through rational and sustainable land resource planning and utilization and thereby reducing population pressure in the highlands
- To avoid the adverse effects of recurrent drought on people and their livestock in other parts of the country by allowing a planned and voluntary settlement programmes in tsetse and trypanosomosis control and eradication areas
- To indirectly minimize the risk of mechanical transmission of trypanosomes in tsetse free areas through the control and eradication efforts in tsetse infested areas
- To support the efforts of the government to satisfy the national demand for livestock and livestock products through increased livestock production.
- To increase crop production in affected areas through the availability of draft oxen
- To promote the foreign exchange earnings of the country through increased livestock and livestock products export volume;

### **8.3. Expected output of the tsetse control and eradication strategy**

Following the implementation of the tsetse and trypanosomosis control and eradication strategy in the tsetse infested and adjacent areas, it is expected that herd health and productivity as well as human nutrition will be enhanced, there will be a rational and strategic use of tsetse infested areas and ultimately the livelihood of these rural communities will be improved.

### **8.4. National tsetse and trypanosomosis control and eradication strategy**

- Tsetse and trypanosomosis control and eradication
- Tsetse and trypanosomosis survey and surveillance
- Capacity building
- Research
- Extension
- Service delivery (Public/ Private)
- Community participation
- Institutional linkage

#### **8.4.1. Tsetse and trypanosomosis control and eradication**

The control and eradication programme will focus on tsetse infested areas that are prioritized on the basis of the existing knowledge on resource potential (arable potential), economic viability of the mixed farming system, feasibility of community-based development initiatives including interactive land management and planning, environmental impact monitoring and systems of optimal tsetse control and eradication methods that are affordable and manageable to the Federal and Regional Governments as well as communities.

Tsetse and trypanosomosis control and eradication effort will be based on area wide, interdisciplinary development and integrated approaches with appropriate combinations of available technologies that allow a sustainable and economical use of tsetse infested areas.

The distribution of mechanically transmitted animal trypanosomosis will be promptly investigated and its control intervention will, adequately, be addressed under the regular animal diseases control strategy.

The strategy will support and encourage indigenous knowledge of the community on tsetse and trypanosomosis control.

#### **8.4.2. Tsetse and trypanosomosis survey and surveillance**

The control and eradication programmes will be supported by tsetse and trypanosomosis survey and surveillance activities in order to know the areas of intervention against the disease and the vector, the effectiveness of the control and eradication programmes, temporal and spatial distribution and the magnitude of tsetse and trypanosomosis.

Tsetse and trypanosomosis survey and surveillance activities will be conducted using all appropriate methodologies that are cost effective and technically feasible and acceptable.

#### **8.4.3. Capacity building**

The organisational, management and technical capacity, at Federal and Regional levels, will be strengthened through manpower and infrastructure development and establishment of appropriate information technologies to coordinate, design, implement, monitor and evaluate tsetse and trypanosomosis control, eradication, research and extension programmes within the context of overall area development approach.

#### **8.4.4. Research**

The National Coordinating body in collaboration with national and international institutions will identify tsetse and trypanosomosis related problems, propose areas for adaptive and applied research, embark on research activities and verify the appropriateness of tsetse and trypanosomosis control, eradication, survey and surveillance methods.

#### **8.4.5. Extension**

The National Coordinating body will assure that effective extension service delivery systems are in place to strengthen the link between research outputs and the end users through the existing agricultural extension systems of the country.

## **8.4.6. Service delivery**

### **8.4.6.1. Public involvement**

National (Federal and Regional) tsetse and trypanosomosis control and eradication coordinating bodies will be established and the overall planning, guidance, coordination, monitoring and evaluation of all tsetse and trypanosomosis control and eradication programmes and other related activities will be the responsibility of the government/Federal coordinating body. Moreover, the government/Federal coordinating body will play a major role in implementing tsetse control and eradication programmes while encouraging the private sector to participate in the initiatives.

### **8.4.6.2. Private involvement**

Where government policies and plans allow, tsetse control and eradication activities will be sub-contracted to the private sector.

### **8.4.6.3. NGO and other national and international institutions involvement**

Subject to the endorsement of the programmes of NOGs and other national and international institutions by the Federal coordinating body, the afore-mentioned stakeholders will be encouraged to be involved in the delivery of appropriate services related to tsetse and trypanosomosis control eradication activities.

## **8.4.7. Community participation**

Community participation will be ensured through awareness creation, training and motivation mechanisms in order to sustain tsetse and trypanosomosis control and eradication programmes.

Women in tsetse affected areas will be communicated about their contributions and perspectives and they will be encouraged to participate in the tsetse and trypanosomosis control and eradication programmes.

#### **8.4.8. Institutional linkage**

The Federal coordinating body will identify all stakeholders (NGOs, international organizations, national institutions... etc.) and exert all efforts to integrate, harmonize and ensure their inputs, full participation and supports in tsetse and trypanosomosis control and eradication programmes.

Representatives of stakeholders (NGOs, international organizations, national institutions... etc.) will, as required, participate in a technical advisory forum to ensure that all partners share the task of planning and guidance of activities of tsetse and trypanosomosis control and eradication programmes; and hence, minimizing duplication and fragmentation of efforts.

#### **8.5. Institutional set up**

Proper organizational structure is a prerequisite for the success of the proposed control and eradication strategy. Therefore, based on current government policy, administrative and technical feasibilities, the following institutional set up is identified.

##### **8.5.1. National Tsetse and Trypanosomosis Control and Eradication Coordination Office (NTTCECO)**

A strong and autonomous National Tsetse and Trypanosomosis Control and Eradication Coordination Office (NTTCECO) should be centrally established under the Ministry of Agriculture. The existing National Tsetse and Trypanosomosis Investigation and Control Centre (NTTICC) should take the lead during the establishment of the new office. The NTTCECO will have the following duties and responsibilities.

- It will coordinate and harmonize all tsetse control and eradication initiatives at national and international levels.
- It will act as focal point for national and international institutions including the forthcoming Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC).
- At a national level, it will ensure the identification of focal points for tsetse and trypanosomosis control and eradication programmes.

- It will determine short, medium and long-term tsetse and trypanosomosis control and eradication programmes and raise funds for the implementation of activities.
- It will also launch public awareness campaigns, conduct consultation missions, identify stakeholders and coordinate existing tsetse and trypanosomosis control and eradication projects.
- In consultation with regional governments, it will set up Regional Tsetse and Trypanosomosis Control and Eradication Coordination Offices (RTCECO) within the affected regions.
- The NTTCECO will establish a Technical Advisory Forum composed of representatives of relevant national, regional and international organizations and other stakeholders. The Technical Advisory Forum will technically advise the NTTCECO through regular review of action plans, reports and project proposals.
- Perform other duties and responsibilities related to tsetse and trypanosomosis control and eradication and area developments activities at Federal level.

### **8.5.2 National Tsetse and Trypanosomosis Investigation and Training Centre**

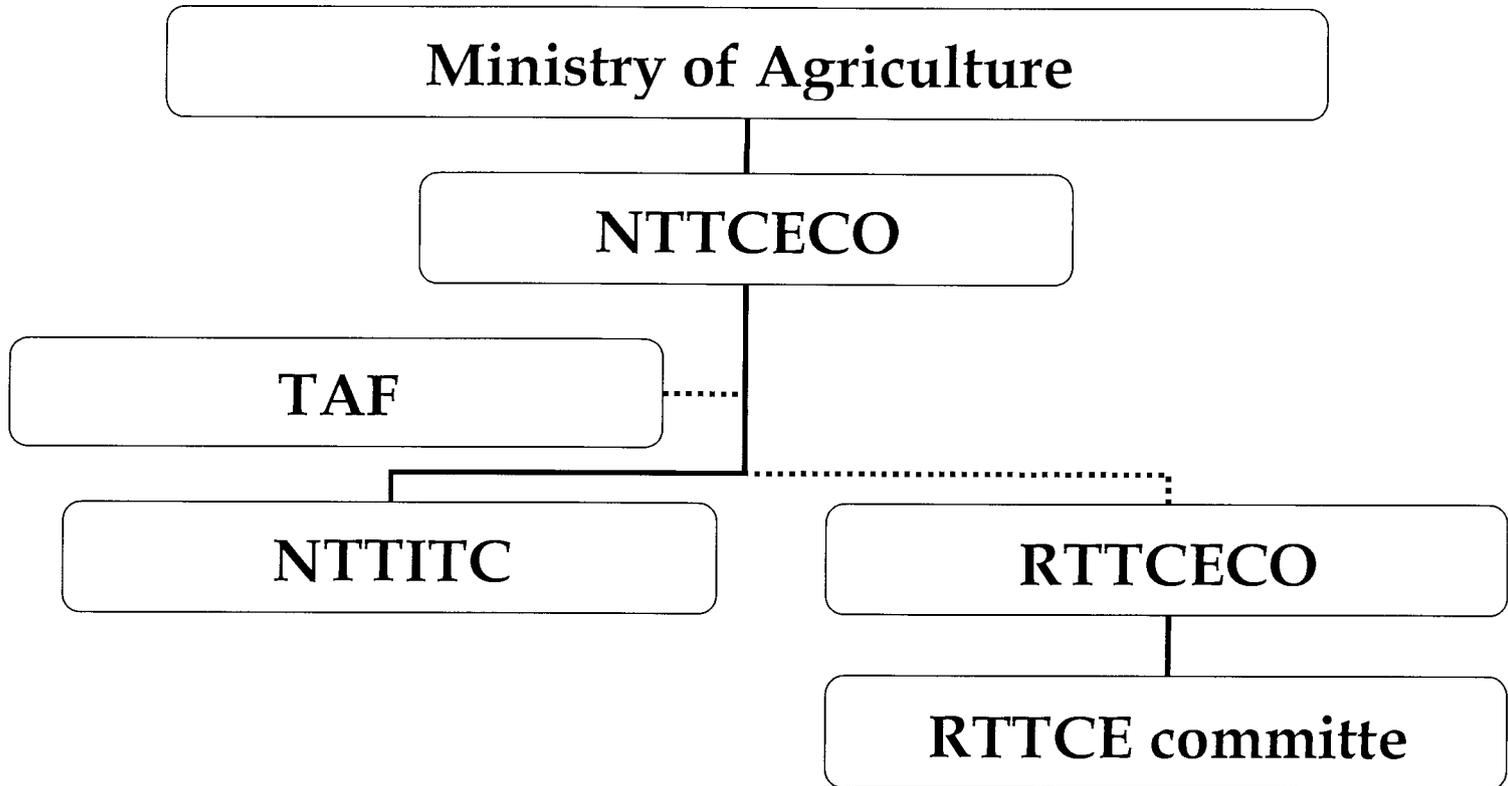
From the technical point of view and considering the existing infrastructure, it is proposed that the NTTITC, which is located at Bedelle will serve as the main field station for investigation training and technical backstopping in the country. The NTTICC will be answerable to the NTTCECO.

### **8.5.3 Regional Tsetse and Trypanosomosis Control and Eradication Coordination Office (RTCECO)**

A strong and autonomous Regional Tsetse and Trypanosomosis Control and Eradication Coordination Office (RTCECO) should be established within the affected regions. The RTCECO will be accountable administratively to the respective Regional Agricultural Bureaux and technically to the NTTCECO. The RTCECO shall have the following duties and responsibilities.

- Formulate policy issues at regional level concerning tsetse and trypanosomosis control and eradication and related area development programmes.
- Prepare action plans, budget, manpower, equipment and supplies required for tsetse and trypanosomosis control and eradication and related area development programmes.
- Coordinate, monitor and evaluate tsetse and trypanosomosis control and eradication activities in the respective regions.
- Avail tsetse and trypanosomosis technical reports to the NTTCECO. However both vertical and horizontal communication and information exchange between the NTTCECO and RTTCECO will be encouraged and promoted
- Perform other duties and responsibilities related to tsetse and trypanosomosis control and eradication and area developments activities of the respective regions.

# Proposed Organizational Structure



**TAF = Technical Advisory Forum (Gov., NGO, Inter. Institutions, private)**

**N(R)TTCECO = National (Regional) Tsetse and Trypanosomosis Control and Eradication Coordination Office**

**NTTICC = National Tsetse and Trypanosomosis Investigation and Training Center**

**RTTCE = Regional Tsetse and Trypanosomosis Control and Eradication**

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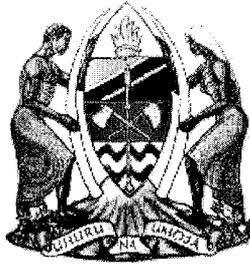
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## **ANNEX 3.2**

# **NATIONAL STRATEGY ON INTEGRATED MANAGEMENT OF TSETSE AND TRYPANOSOMOSIS IN TANZANIA**

**THE UNITED REPUBLIC OF TANZANIA**

**MINISTRY OF WATER AND LIVESTOCK DEVELOPMENT**



**NATIONAL STRATEGY ON INTEGRATED MANAGEMENT OF  
TSETSE AND TRYPANOSOMOSIS IN TANZANIA**

**DRAFT**

**LIVESTOCK SECTOR**

**September 2003**

## CONTROL AND ERADICATION IN TANZANIA

### List of abbreviations

AAT	Animal African Trypanosomosis
AU	African Unity
AU-IBAR	African Unity – Inter-African Bureau for Animal Resources
CBO	Community Based Organization
DDT	Diethyl-dichloro-trichloroethane
DRC	Democratic Republic of Congo
ELISA	Enzyme Linked Immunosorbent Assay
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
HAT	Human African Trypanosomosis
HIV/AIDS	Human Immunodeficiency Virus/Aquired Immunodeficiency Disease Syndrome
IAEA	International Atomic Energy Agency
ITC	Insecticide Treated Cattle
LGAs	Local Government Authorities
LITI	Livestock Training Institute
MAC	Ministry of Agriculture and Cooperatives
MAFS	Ministry of Agriculture and Food Security
MATI	Ministry of Agriculture Training Institute
M&E	Monitoring and Evaluation
MoH	Ministry of Health
MWLD	Ministry of Water and Livestock Development
NARCO	National Ranching Company
NBS	National Bureau of Statistics
NGO	Non Governmental Organization
NTTCC	National Tsetse and Trypanosomosis Control Committee
NTTCES	National Tsetse and Trypanosomosis Control and Eradication Strategy
PATTEC	Pan African Tsetse and Trypanosomosis Eradication Campaign
PORALG	President’s Office Regional Administration and Local Government
PRA	Participatory Rural Appraisal
SIT	Sterile Insect Technique
SS	Sleeping Sickness
TALIRO	Tanzania Livestock Research Organisation
TARO	Tanzania Agricultural Research Organisation
T & TC	Tsetse and Trypanosomosis Control
TTCP	Tsetse and Trypanosomosis Control Programme
TTCS	Tsetse and Trypasomosis Control Strategy
TTRI	Tsetse and Trypanosomosis Research Institute
URT	United Republic of Tanzania

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## 1.0 BACKGROUND

Tanzania has about 17.7 million cattle, 12.5 million goats, 3.5 million sheep and about 27 million local chickens. The largest concentrations of small stock are to be found in more or less the same areas, which have high cattle numbers. The small ruminant population (goats and sheep) consists almost entirely of local breeds and they have significant contributions to local consumption and incomes in the rural areas. There are estimated 3.5 million farming households in Tanzania, 58% of which own poultry, 19% own small stock and 17% own cattle. About 80% of the livestock keepers are also crop farmers and the rest (20%) are pastoralists. Livestock production is largely subsistence and for the local market and wealth is limited to the livestock ownership in most of the livestock keeping communities.

Tanzania has a total area of about 94,500,000 ha of which over 49,979,000 ha is suitable for grazing, but only about 26,143,000 ha is currently being used while 13,127,000 ha is infested with tsetse flies. There are seven species of *Glossina* of economic importance affecting both human and livestock, namely, *Glossina morsitans*, *G. pallidipes*, *G. longipennis*, *G. brevipalpis*, *G. austeni*, *G. swynertonni* and *G. fuscipes*. These flies have excluded cattle from a large portion of good grazing lands leading to problems of over grazing and soil degradation of tsetse free lands. Furthermore, there is forced migration of livestock keepers in search of pasture causing a great impact on social relations, environmental degradation and transmission of other diseases.

### 1.1 Contribution of the Livestock Sub-sector

Livestock sub sector contributes about 18% to the National GDP and about 30% to the agricultural GDP (of which 40% come from meat, 30% from dairy and the remaining 30% from small stock and poultry. In addition to the above, livestock also provide draught power, biogas, manure (organic farming) for crop production, and contribute to financial stability of farm income through regular cash flow and generation of employment.

### 1.2 Livestock Production Systems

Livestock production in Tanzania is characterised by a large traditional sector and a small but growing commercial sector. There are four cattle production systems commonly distinguished in Tanzania. These are Pastoral, Agro-pastoral, Commercial Ranching and Dairying (Small-scale, medium and large-scale dairy). Pastoral livestock production is mainly practised in traditional grazing areas where climatic and soil conditions do not favour crop production. This system accounts for about 20% of the national herd. The main roles of livestock in this system are subsistence, store of wealth, and source of cash incomes.

Agro pastoral livestock production system accounts for about 77percent of the national livestock population. It combines production of crops and livestock for sustenance, income and savings.

Commercial ranching accounts for about 2 percent of the total cattle herd. It is mainly practiced by National Ranching Company (NARCO) a state owned company established with the responsibility of managing all ranches in the country.

Dairy livestock production system, accounts for about 1percent and is divided into smallholder dairy farming, medium and large scale. This system is fast growing and prominent in urban and peri-urban areas.

### **1.3 Estimated losses due to Tsetse and Trypanosomosis**

It is estimated that about 4.4 million livestock and 4 million people are at risk of contracting trypanosomosis. On average, each year 150,000 cattle and about 300 people are affected by trypanosomosis. It is estimated that losses due to mortality and reduced milk yield is about US\$ 7.98 million annually. These losses do not include other production parameters and control costs.

### **1.4 Tsetse and Trypanosomosis control**

In the past, tsetse control relied on destruction of tsetse habitats through bush clearing and use of pesticides. Aerial application of insecticides was abandoned because it was expensive and non discriminative. Later, safer control techniques were developed and applied. These include insecticide treated cattle (ITC), tsetse traps and insecticide treated targets. Although, the technologies are environmentally friendly and reduce tsetse tremendously, reinfestation can occur on cessation of the operations. Due to the vastness of the tsetse infested area and limited ability to apply control measures experience has shown that protection of small areas are of limited value and economically unjustifiable. In this context, the most viable choice will be to apply the area-wide approach, targeting the entire tsetse population in the area.

The Sterile Insect Technique (SIT) involves the release of sterilised males from laboratories into the field which transfer sterile sperms when mating with fertile females. In 1977 Tanga Tsetse and Trypanosomosis Research Institute-TTRI conducted the first trial using SIT at Mkwaja ranch with satisfactory results. This was done through the collaboration of the governments of Tanzania and United States. Consequently, a wide area application of SIT with the support of IAEA was implemented in Zanzibar resulting in a successful eradication of the insect (*Glossina austeni*) in the Island in December 1997

Control of trypanosomosis date back nearly 100 years ago using trypanocidal drugs to treat or prevent the disease. The use of these drugs has been variable depending on a number of factors including availability, prices and the intensity of the disease. Under these circumstances, the use of trypanocidal drugs has not followed the recommended regime thus leading to the development of resistance.

### **1.5 Research Initiatives**

In 1970s, the government made a decision to test the application of SIT for tsetse eradication. The initial effort included establishment a Tsetse and Trypanosomosis Research Institute - TTRI at Tanga. The institute was given mandate to conduct research on tsetse and trypanosomosis. Since its inception TTRI has managed to perfect SIT use in laboratory mass rearing, radio-sterilisation, blood meal analysis genetic studies and field release of sterile males.

In 1994 the government in collaboration with the International Atomic Energy Agency (IAEA) embarked on a biological control of tsetse. The activities included production, sterilization, and packing of sterile males and field release. Initial suppression of wild tsetse population was achieved through application of residual pyrethroids, as pour-on formulations to livestock before the release of sterile male flies. In areas where cattle population was small, the pour on method was supplemented with the deployment of insecticide-impregnated blue-cotton screens.

Fly colony was increased to almost 1 million flies by late 1996. This was the largest colony ever maintained anywhere. In total over 8.9 million gamma sterised male flies were shipped to Zanzibar twice a week between 1994 and 1997.

effectively engaging the private sector and empowering the communities to become self-reliant in animal health services provision is concerned. This strategy advocates participatory tsetse and trypanosomosis control by involving all stakeholders (the government, the private sector and farmers).

## **2.0 RATIONALE AND JUSTIFICATION**

### **2.1 Economic**

The total rangelands have the capacity to carry a total of 20 million livestock units but presently only 17 million livestock units are available, thus 3 million livestock units can be accommodated. There is therefore, a potential for expansion of the livestock industry to increase the contribution of livestock to the national GDP and producers' income. In order to realise the above potential, deliberate efforts must be directed to the control of tsetse in the arable and potential grazing area covering 50 million hectares.

### **2.2 Social**

Human African Trypanosomosis (HAT) or Sleeping Sickness (S.S) is one of the major public health problems. Sleeping sickness seriously affects the workforce and cost households in terms of treatment and time spent in taking care of sick members of the family. Convalescing individuals take long before re-engaging in substantial productive work.

The disease has spread throughout mainland Tanzania with annual recorded incidences ranging from the highest record of 3,262 cases in 1929 to 232 in 2002. In the last ten years, six regions (Kigoma, Tabora, Arusha, Rukwa, Mbeya, Mara) have reported sleeping sickness cases. Kigoma region is the worst affected with 90% of all recorded sleeping sickness cases. The described situation does not reflect the true picture of disease in the country.

### **2.3 Research**

The complexity of biology, ecology and host range of the vector and parasite require continuous research in order to achieve effective control of trypanosomosis. Advanced research should also be undertaken to deal with all stage of tsetse fly.

Use of trypanocides has been the major method of control of trypanosomosis. Unfortunately, trypanocidal drug resistance has been reported in Tanzania. Furthermore, new effective trypanocidal drugs are unlikely to be available in near future due to high costs of development and production. Therefore, rational use of the available drugs is desirable for improvement of livestock production and productivity and national economy.

Research directed to develop diagnostic techniques should be addressed in order to intervene with appropriate treatment. Further research on trypanosomosis using more sensitive diagnostic kits (PCR and ELISA) is necessary in order to detect low fluctuating trypanosome parasitaemias and emerging drug resistant trypanosomes. This will help give early warning on the likelihood of appearance of drug resistant trypanosomes, hence advise accordingly.

### **2.4 Harmonisation of Tsetse & Trypanosomosis control.**

Tanzania has taken up the Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC) initiative to harmonize approaches to eradicate tsetse flies. Area-wide approaches using cost effective and sustainable integrated tsetse control methods and Sterile Insect Technique (SIT) will be utilised to ultimately eradicate tsetse and trypanosomosis. Thorough environmental impact assessment will be conducted to ensure proper preservation of environment.

In Tanzania, Tsetse fly infestation is one of the most important constraints to livestock and crop production across vast areas that hold great potential for increased agricultural production. It is estimated about 4.4 million cattle are at risk while losses due to mortality and reduced milk yield are estimated at US\$ 7.98 million annually. An average of 150,000 people contract the disease per year with 4 million at risk of contracting trypanosomosis. Therefore, trypanosomosis is considered to be one of the major factors restricting livestock development at the same time causing morbidity and mortality in human. The disease greatly reduces human capability to undertake agricultural production activities.

### 3.1 Policy Issues

For many years prior to and after independence the government was responsible for the control of tsetse and trypanosomosis through the provision of drugs as well as providing funds for control activities. The Livestock Policy of Tanzania (1983) stated that the government would continue to provide these services to the livestock keepers. Due to a number of reasons including financial as well as other structural changes this policy was revised in 1994 when it was decided that the livestock keepers were to pay for the services. Therefore in 1997 Agriculture and Livestock policy was prepared and approved by the government. The policy states that “ *The overall strategic principle is that farm level disease control is the responsibility of livestock keeper and he/she should buy services, drugs, vaccine and inputs from the private sector. The role of the government will be limited to the control of epidemic and infectious diseases, sanitary control and inspection and fighting pests and disease beyond farm level (Tsetse control)....*”. It therefore means that at farm level the livestock keepers are responsible for the control of trypanosomosis while the government through the involvement of various stakeholders is responsible for the control of tsetse flies.

### 3.2 Legislation Issues

Control of tsetse flies should be supported by effective legislation. The current law was enacted in 1943 and it is only dealing with the regulation of traffic into and from areas infested with tsetse flies. It is therefore deficient because it is not clearly regulating control measures on tsetse and trypanosomosis. To date this law has not been revised to reflect the various policy changes that have taken place. The Animal Disease Ordinance Cap.156 although dealing with the control of animal diseases in general it does not adequately deal with tsetse flies and trypanosomosis.

### 3.3 Research Issues

TTRI, Tanga in collaboration with the IAEA are conducting a project on “ Support to National Tsetse and Trypanosomosis Management”, (URT/5/019). The project objective is to integrate the SIT into the National Tsetse and Trypanosomosis Management Programme with special reference to the infestation of *G.swynnertoni* in the north Eastern Tanzania and *G. brevipalpis* in Mafia island.

The project on application of SIT to eradicate tsetse fly *G.brevipalpis* on Mafia Island started in 2000 with the following objectives: (i) to find out the most effective types of traps and odours for *G.brevipalpis* (ii) to establish the distribution and abundance of *G.brevipalpis* on the island (iii) to develop and document techniques for mass rearing of *G.brevipalpis*, necessary for future supply of sterile males to sustain the SIT during the course of its field application (v) to initiate the colonisation of *G.brevipalpis* in the laboratory.

Preliminary results indicate that Mafia is infested by only one tsetse species, *G. brevipalpis*. A colony of *G.brevipalpis* has been established at TTRI

Another on-going activity is the application of SIT to eradicate *G.swynnertoni* in north eastern Tanzania, which has high livestock population, large scale cash crop farms and high tourist attractions.

## **4.0 CONTROL APPROACHES**

The control of the disease has a long history dating back to the colonial with minimal success. Tsetse and trypanosomosis control efforts have mainly been carried out by different institutions without proper coordination and little community participation.

### **4.1 Tsetse Control**

Several measures have been applied in the control of tsetse flies, these measures included destruction of tsetse habitats through bush clearing and use of pesticides. The 1983 livestock Policy stated that bush clearing was to be used as a long term method for the control of tsetse while spraying and biological control were considered as short term measures. The present situation of open land and absence of forests in some parts of Shinyanga, Tabora and Mwanza regions is a result of discriminative bush clearing carried out to control trypanosomosis and tsetse flies in 1940s. Ground and aerial application of insecticides was used massively in Tanzania in the beginning of the 20<sup>th</sup> century. The chemicals used included residual, non residual organochlorine as well as organophosphate compounds such as DDT and Endosulfan. Environmental concerns, high costs and limited financial resources limited their use. These methods were eventually abandoned in the late 1980s to comply with international ban on their use.

The use of Sterile Insect Technique (SIT) was initiated in Tanzania after the trials conducted at Mkwaja ranch in Tanga in 1972 proved useful and was eventually applied in Zanzibar for eradication of tsetse flies. This activity was mainly carried out by the Ministry responsible for livestock. Implementation of control measures was greatly hampered by inadequate allocation of funds as well as low community participation. Application of other control measures including use of traps and targets/screens have proved to be effective because they are simple, cost-effective and environmentally friendly. The use of Insecticide Treated Cattle (ITC) as moving targets has also been effective and successful in Tanga and Kagera regions for both traditional as well as dairy cattle.

### **4.2 Trypanosomosis control**

Besides the control of tsetse flies using various methods, control of animal trypanosomosis has for quite sometime been through the application of trypanocidals. These are diminazene aceturate, homidium and isometamedium compounds. The supply and the administration of these drugs to the animals was the responsibility of the government and these services were provided free of charge. It was essentially compulsory for the control of trypanosomosis through prophylaxis and chemotherapy.

Due to various policy and structural adjustments this strategy operated up to 1994 when this function was transferred to the private sector. Although it was the government policy that diminazene compounds were to be used as reserve drugs to be used only for resistant strains, this was never observed and it failed because of poor supervision, uncontrolled use of the drugs and gradual reduction in government funding. Consequently there has been an increased trypanosomosis incidences and resistance of the trypanosomes. Since mid 1980s, the government has been rationalising its functions and this has included the privatisation of veterinary services delivery. The private sector among other functions is allowed and encouraged to import and distribute drugs. The capacity of the private sector to meet the demand of the drugs has not been satisfactory due to various reasons including lack of capital.

The Ministry of Health has a mandate to control sleeping sickness. However, it does not have a routine program in the control of the disease except by attending cases of SS when they occur.

### **4.3 Institutional Involvement**

There are many institutions in Tanzania which are potential stakeholders in the control of tsetse and trypanosomosis but collaboration has been lacking. Major stakeholders are ministries, local government authorities, various institutions, NGOs, agencies, village communities etc.

coordination. For example the control of animal trypanosomosis has mainly been the responsibility of the ministry and institutions mandated to deal with livestock while the Ministry of Health and its institutions have been dealing with sleeping sickness when cases occur. On the other hand the Ministry of Natural Resources and Tourism and its institutions has not been very active in the control of tsetse and trypanosomosis probably because the disease does not affect wildlife.

## 5.0 DISEASE STATUS

### 5.1 Animal Trypanosomosis

Tsetse transmitted animal trypanosomosis or nagana is much more widespread in Tanzania making it the second most important cattle disease after tick borne diseases. About 16.4 million cattle and 11.6 million goats are at risk of contracting the disease. Losses due to mortality and reduced milk yield are estimated at US\$ 7.98 million annually. Three trypanosomes are reported more often. These are *Trypanosoma congolense* (73%), *T. vivax* (23%) and *T. brucei* (4 %). Trypanosomosis incidences vary from one area to another due to the seasonal variation of both cattle and tsetse densities.

### 5.2 Human Trypanosomosis

In Tanzania, sleeping sickness has become a serious problem and is one of the major public health concerns. Cases are increasingly being reported from endemic as well as foci once considered to be dormant. The acute form of sleeping sickness was first reported in the Serengeti Ecosystem in 1917 and in Maswa district in 1922. Since then, the disease has spread to other parts of Tanzania. Records indicate that annual incidences of S.S have ranged from 3262 cases in 1929 to 232 cases in 2002. For the last ten years about 90% of recorded cases have been reported from Kigoma region. However, this figure does not reflect the true picture of the disease situation in the country due to under-reporting as well as failure to make proper diagnosis.

There are also possibilities of introducing the chronic form of the disease (*T. gambiense*) due to large influx of refugees into the western part of Tanzania, from neighboring countries of Rwanda, Burundi and The Democratic Republic of Congo (DRC).

## 6.0 CHALLENGES

Tanzania recognizes the problem of tsetse and trypanosomosis as it cuts across many sectors as an obstacle to rural development. The following challenges have been identified:-

- The magnitude of the problem of tsetse and trypanosomosis is not clearly known due to lack of new information and distribution maps. An average of 130,000 Animal African Trypanosomosis (AAT) and 300 Human African Trypanosomosis (HAT) new cases are reported annually in the country. Multiple trypanosomal infections are common but mostly three economically important species i.e. *T. congolense*, *T. vivax* and *T. brucei* are frequently encountered.
- The biology of reproduction and life cycle of the tsetse fly is complex. They have a very low intrinsic rate of population increase with only one life stage readily available for control i.e. adult stage. Furthermore, the feeding behaviour of adults which is characterised by host preference affects the efficacy of traps and baits. Lack of barriers and proper land use in tsetse controlled areas has resulted into re-invasion.
- Development of drug resistance as a result of chemoprophylaxis and chemotherapy. Studies on animal trypanocidal resistance done along the coast by Animal Disease Research Institute (ADRI) reveal that most areas have this problem. This may be due to antigenic variations, under dosage, low quality drugs or breakthroughs (relapses).
- The development of a viable vaccine has not been successful to date. This is largely attributed to antigenic variations of trypanosomes.

- There is limited research, development and production of new drugs for treating animals and humans. This is due to a small market targeting only Africa.
- Prophylactic treatment is not available for humans and drugs used for the treatment of sleeping sickness are toxic, expensive and of low efficacy.
- Malaria, meningitis and HIV/AIDS which have similar clinical manifestation to sleeping sickness complicate early detection of cases.
- Presence of a reservoir status in wildlife perpetuates the trypanosomes this poses a great limitation to the control of this disease in both animals and humans.
- The threat of introducing the chronic form of the disease by *T.b. gambiense* due to influx of refugees from Rwanda, Burundi and the Democratic Republic of Congo.
- Inadequate technical staff for tsetse and trypanosomosis control as a result of retrenchment, retirement, deaths and freezing of employment.
- Lack of coordination of tsetse and trypanosomosis control programmes has led to the failure sustain achievements in controlling the disease.
- Inadequate funding for tsetse and trypanosomosis activities has resulted in limited success.

## 7.0 OPPORTUNITIES

Tsetse and trypanosomosis control has high chances of being successful because of the roles which can be played by the public and private sectors. Improved control methods that are environmentally friendly, easy to adopt by the rural communities and cost effective are available. The communities are also knowledgeable of the problem and are willing to participate in the control programmes.

There is national political commitment, international collaboration and support as shown under PATTEC initiative and FITCA implementation which is fundamental in the ownership of tsetse and trypanosomosis control programmes.

To consolidate the above efforts, a multi-sectoral National Tsetse and Trypanosomosis Control Committee (NTTCC) has been formed. It will coordinate and harmonize tsetse and trypanosomosis control initiatives.

## 8.0 SPECIFIC OBJECTIVE AND INTERVENTIONS

### 8.1 Specific Objective

### 8.2 Interventions

Tsetse infestation is one among the major constraints affecting not only livestock development in Tanzania but also human health. The proposed interventions however, will require medium to long-term implementation periods.

#### 8.2.1 Strengthening Institutional framework.

The implementation of tsetse and trypanosomosis control programmes and activities involves many stakeholders but there has been no established institutional coordination mechanism. Consequently, there is undefined roles of the stakeholders. The establishment of the NTTCC will coordinate and harmonize tsetse and trypanosomosis control initiatives. The lead ministries in the implementation of the National Tsetse and Trypanosomosis Control and Eradication Strategy (NTTCES) will be the Ministry of Water and Livestock Development, the Ministry of Health and Ministry of Regional Administration and Local Government. These ministries will also be responsible for setting policies, regulatory framework and developing mechanisms to ensure their effective implementation.

The legislation governing tsetse and trypanosomosis control is the Tsetse Fly Control Ordinance (Cap. 100 of 1945), Animal Disease Ordinance (cap 156) and Cattle Grazing Ordinance (Cap. 155 of 1944). They need to be updated and harmonised.

### **8.2.3 Human Resource Development**

There are few skilled staff to effectively implement the control programmes. In order to overcome this problem, human resource development and deployment by both the public and private sector is necessary.

### **8.2.4 Develop a comprehensive National Tsetse and Trypanosomosis Research Framework.**

There is lack of coordination in the tsetse and trypanosomosis research being conducted in the country. In order to overcome the above problem research activities will be coordinated to focus on acquiring appropriate technologies for the control and eradication of tsetse and trypanosomosis.

### **8.2.5 Strengthen Extension Services**

Active involvement and effective participation of various stakeholders, including the target communities in implementing control interventions is important. Sustained participation and contribution of communities will be encouraged through training, motivation, awareness creation and advocacy of tsetse and trypanosomosis control.

## **9.0 INSTITUTIONAL AND FINANCIAL ARRANGEMENTS**

### **9.1 Institutional arrangement.**

The tsetse and trypanosomosis control programme will be implemented by the stakeholders through concerted efforts. The two lead ministries, Water and Livestock Development and Health will guide the implementation of the strategy. The strategy will be harmonised with the PATTEC initiative and other similar regional and sub regional strategies.

At international level, NTTCC will liaise with International Organizations – FAO, WHO, IAEA, AU/IBAR, AU member states and other agencies on all matters pertaining to tsetse and trypanosomosis control.

### **9.2 Financial arrangement**

The implementation of the strategy will require sufficient financial resources from a number of sources. Financial inputs will be derived from the government, the private sector and donor communities. The NTTCC will play an active role in soliciting for funds.

## **10.0 MONITORING AND EVALUATION**

The lead ministries and the NTTCC will be responsible for developing a comprehensive and suitable framework for monitoring and evaluation of T&TC programmes.

TSETSE AND TRYPANOSOMOSIS CONTROL AND ERADICATION STRATEGY (TTCES)			
SUMMARY OF PURPOSE, OBJECTIVES, OUTPUTS AND INTERVENTION	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<b>OVERALL GOAL</b> <ul style="list-style-type: none"> <li>Improvement of the well being of people and contribute to overall GDP growth while sustaining crop and livestock production.</li> </ul>			
<b>PURPOSE</b> <ul style="list-style-type: none"> <li>Increase human and animal health, production and productivity of livestock and household incomes.</li> </ul>	<ul style="list-style-type: none"> <li>Percentage increase in livestock contribution to agricultural GDP.</li> <li>Reduced incidences of AAT</li> <li>Reduced SS cases.</li> <li>Percentage increase in household incomes</li> </ul>	<ul style="list-style-type: none"> <li>Annual Economic Review Reports</li> <li>NBS reports</li> <li>Poverty Monitoring Master plan</li> <li>Survey reports</li> </ul>	<b>Political will</b> <ul style="list-style-type: none"> <li>Economic stability</li> <li>Stable macro economic policy</li> </ul>
<b>STRATEGIC OBJECTIVES</b> <ol style="list-style-type: none"> <li>To increase farm income in order to reduce rural poverty and ensure household food security To Coordinate and harmonise activities of stakeholders towards control of tsetse and trypanosomiasis</li> </ol>			
<b>OUTPUTS AND INTERVENTIONS</b> <b>STRATEGIC AREA 1.0 Strengthening the Institutional Framework for managing tsetse and trypanosomiasis control and eradication programs.</b> <b>Output 1.1 Tsetse and Trypanosomiasis Control Strategy Coordination Framework Established</b>			
<b>INTERVENTIONS</b> 1.1.1 Identify and define roles and functions of key actors 1.1.2 Establish Multi-sectoral National Tsetse and	<ul style="list-style-type: none"> <li>Institutional framework defining functional responsibilities and mandates of key actors formulated</li> </ul>	<ul style="list-style-type: none"> <li>MWLD/MoH /PORALG reports</li> <li>LGAs reports</li> <li>TTCP document</li> </ul>	<ul style="list-style-type: none"> <li>Adequate resources are allocate</li> </ul>

<p>Trypanosomosis Control Committee (NTTCC)</p> <p>1.1.3 Mainstreaming on going programs in line with TTCS</p> <p>1.1.4 Formulate TTCP for implementation of the strategy</p> <p>1.1.5 NTTCC monitor implementation of TTCS</p>	<ul style="list-style-type: none"> <li>▪ NTTCC implementation established</li> <li>▪ On going tsetse and trypanosomosis programs mainstreamed basing of TTCS</li> <li>▪ TTCP prepared and operational</li> </ul>		
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**STRATEGIC OBJECTIVES**

- Avail competent personnel to cater for public and private sectors.

**OUTPUTS AND INTERVENTIONS**

**STRATEGIC AREA 2.0 Human Resource Development**

**Output 2: Adequate competent Tsetse Control personnel**

**INTERVENTIONS**

<p>1.1 Curriculum development and introduce modules for demand driven course for farmers and other stakeholders</p> <p>1.2 Training of lead ministries staff</p> <p>1.3 Recruitment and retraining field extension cadre.</p> <p>1.4 Provide facilities and equipment</p> <p>1.5 Update the knowledge and skills of Tsetse Control and trypanosomosis trainers at training institutes</p> <p>1.6 Involve private sector participation in tsetse and trypanosomosis activities</p>	<ul style="list-style-type: none"> <li>▪ Number of curricular and modules deveoloped.</li> <li>▪ Number of staff trained</li> <li>▪ Number of staff/field staff recruited/ retrained</li> <li>▪ Type of facilities and equipment provided</li> <li>▪ Private sector involved</li> <li>▪ Activities contracted</li> </ul>	<ul style="list-style-type: none"> <li>▪ LITI reports</li> <li>▪ M&amp;E reports</li> <li>▪ MWLD &amp; MoH reports</li> </ul>	<ul style="list-style-type: none"> <li>▪ Willingness of farmers, livestock keepers and field staff to upgrade their skills</li> </ul>
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**STRATEGIC OBJECTIVE :**

- To reduce the prevalence of tsetse and trypanosomosis in Tanzania and reduce mortality of cattle and human being due to trypanosomosis.

**STRATEGIC AREA 3.0: Review and enforcement of existing laws and regulations on tsetse and trypanosomosis control**

*Output 3.1 : Tsetse and Trypanosomiasis control laws and regulations reviewed and enforced*

**INTERVENTIONS**

3.1.1 Review and harmonise laws and regulations on control of tsetse and trypanosomosis

- Tsetse Act reviewed and harmonied
- Mechanisms for enforcement of laws in place

- Bills, Acts by Parliament
- Radio programmes on legislation
- Publications on legislation issued to farmers
- LGAs reports

- Good governance in place

3.1.2 Enforce the existing laws and regulations

**STRATEGIC OBJECTIVE:**

- Develop technologies for combating T&T for sustainable livestock and crop production and improved human health

**OUTPUTS AND INTERVENTIONS**

**STRATEGIC AREA 4.0 Develop a comprehensive National Tsetse and Trypanosomosis research framework**

*Output 4.1: National Tsetse and Trypanosomosis research framework coordination established*

**INTERVENTIONS**

4.1.1 Mainstream ongoing research program in line with the National Tsetse and Trypanosomosis control strategy

- Ongoing program mainstreamed in line with the National T&T control strategies
- Inter-ministerial research coordination committee established

- M& E administrative reports from LGAs & Zonal Research Centre

- Political will to support and promote tsetse research policy reforms
- Willingness of the private sector to implement tsetse activities

4.1.2 Establish an inter-ministerial research coordination committee

- Guidelines for preparing and implementing T&T research programs in place

4.1.3 Prepare guideline for LGAs to prepare and implement T&T research programs

- Various actors / stakeholders trained on their roles
- Formulated rolling T&T research programs in

<p>4.1.4 Form district T&amp;T control committees where appropriate</p> <p>4.1.5 Train various actors / stakeholders on their roles</p> <p>4.1.6 Formulate a rolling T&amp;T research programs in conjunction with district T&amp;T programs</p> <p>4.1.7 Zonal research centre to monitor closely T&amp;T at district level</p> <p>Technical implementation committee to monitors implementation of the National T&amp;T control strategy</p>	<p>conjunction with district T&amp;T programs</p>		
<p><b>STRATEGIC OBJECTIVE :</b></p> <ul style="list-style-type: none"> <li>▪ To reduce prevalence of tsetse and trypanosomiasis in Tanzania and minimize mortality of cattle and human being due to trypanosomiasis</li> </ul>			
<p><b>STRATEGIC AREA 5: To create public awareness on problems associated with tsetse and trypanosomiasis and involve stakeholders in Tsetse and Trypanosomiasis activities</b></p> <p><i>Outputs 5.1: Well-informed public on T&amp;T control hence reduced population of tsetse and prevalence of trypanosomiasis incidences.</i></p>			
<p><b>INTERVENTION:</b></p> <p>5.1.1 Create awareness on problems associated with T &amp; T</p> <p>5.1.2 Educate actors on their roles and responsibilities on tsetse and trypanosomiasis control strategy</p> <p>5.1.3 Develop educational awareness programs</p>	<ul style="list-style-type: none"> <li>▪ Education awareness programs developed</li> <li>▪ Number of actors educated</li> <li>▪ Adoption rate of technology packages</li> <li>▪ Number of LGAs with educational programmes</li> </ul>	<ul style="list-style-type: none"> <li>▪ TTCS implementation reports</li> <li>▪ LGAs and Village Gov. reports</li> </ul>	<ul style="list-style-type: none"> <li>▪</li> </ul>

<b>STRATEGIC OBJECTIVE :</b> <ul style="list-style-type: none"> <li>To make an efficient use of resources for the control of T&amp;T</li> </ul>			
<b>STRATEGIC AREA 6: Strengthening the collaboration of stakeholders and integration of T&amp;T control methods</b> <b>Outputs 6.1: Effective application of T&amp;T control methods and utilization of resources among the stakeholders</b>			
<b>INTERVENTION:</b>			
6.1.1 Develop formal collaboration among stakeholders  6.1.2 Harmonise and adopt of appropriate T & T control methods.	<ul style="list-style-type: none"> <li>Annual increase in budgetary allocations for collaborative research</li> <li>Appropriate T&amp;T control methods harmonised</li> </ul>	<ul style="list-style-type: none"> <li>M&amp;E administrative reports from LGAs, Zonal Centres, CBOs &amp; NGOs</li> </ul>	<ul style="list-style-type: none"> <li>Political will to support and promote tsetse research policy reforms</li> <li>Willingness of the private sector to implement tsetse activities</li> </ul>
<b>STRATEGIC OBJECTIVE :</b> <ul style="list-style-type: none"> <li>To develop the capacity to manage trypanosomosis in animals and humans.</li> </ul>			
<b>STRATEGIC AREA 7: Improvement of diagnosis and management of trypanosomosis in humans and animals</b> <b>Outputs 7.1: Improved health (animals and humans) hence increased production and productivity</b>			
<b>INTERVENTIONS</b>			
7.1 Disease surveillance  7.2 Train in proper diagnosis and effective management practices.	<ul style="list-style-type: none"> <li>Work plan for surveillance developed</li> <li>Number of animals diagnosed</li> <li>Samples collected</li> <li>Number of field staff trained</li> </ul>	<ul style="list-style-type: none"> <li>MWLD &amp; MoH reports</li> <li>PRA Reports</li> <li>M &amp; E Reports</li> </ul>	<ul style="list-style-type: none"> <li>Staff are sufficiently motivated to maintain surveillance network</li> <li>Funds available</li> </ul>
<b>Outputs 7.2: Up -to -date and relevant information on tsetse and trypanosomiasis</b>			
<b>INTERVENTIONS</b>			
7.2.1 Update tsetse and trypanosomosis data 7.2.2 Strengthening tsetse and trypanosomiasis units at MWLD, MoH and POLARG to	<ul style="list-style-type: none"> <li>Access and use of available updated data / information</li> </ul>	<ul style="list-style-type: none"> <li>PRA Reports</li> <li>M &amp; E Reports</li> </ul>	<ul style="list-style-type: none"> <li>Willingness of the actors at all levels to share tsetse and</li> </ul>

<p>collect, process and disseminate tsetse and trypanosomiasis data and information</p>	<ul style="list-style-type: none"> <li>▪ Tsetse and Trypanosomiasis units strengthened</li> </ul>	<ul style="list-style-type: none"> <li>▪ LGAs and Village registers</li> </ul>	<p>trypanosomiasis information</p>
<p>7.2.3 Develop mechanism for networking ministerial databases, for collating and disseminating information to LGAs</p>	<ul style="list-style-type: none"> <li>▪ Mechanism for Networking in place</li> <li>▪ User guidelines in place</li> </ul>		
<p>7.2.4 Prepare user guidelines for data collection, processing, storage, retrieval and dissemination</p>			

## **ANNEX 3.3**

# **DRAFT KENYA NATIONAL POLICY AND STRATEGY ON TSETSE AND TRYPANOSOMOSIS CONTROL FOR SUSTANABLE RURAL DEVELOPMENT**

**DRAFT  
NATIONAL POLICY AND STRATEGY ON TSETSE AND TRYPANOSOMOSIS  
CONTROL FOR SUSTANABLE RURAL DEVELOPMENT**

**MINISTRY OF  
LIVESTOCK AND FISHERIES DEVELOPMENT,  
VETERINARY DEPARTMENT.  
KENYA**

**Veterinary Department  
Kenya Wildlife Services (KWS)  
Kenya Trypanosomosis Research Institute (KETRI)  
AU-Farming in Tsetse Controlled Areas (FITCA)  
Intermediate Technology Development Group (ITDG)  
CEVA East Africa**

## 1.1 BACKGROUND

The early workers viewed the scourge of tsetse as a problem awaiting solution. “The tsetse’s, it is true, have in the past performed an invaluable duty in saving the great areas of the country from becoming peopled, exhausted and ruined, but now that we are here to regulate settlement and prevent erosion, we wish to see a stop put to the destruction of people, the exclusion of cattle and the obstruction of development; and, if we are prepared to do our duty to the country reclaimed in the way indicated, we are justified in attacking tsetse. Otherwise we are not” (Swynnerton,1936).

By this time Medical entomologists were protecting settlements in sleeping sickness areas in Kenya through bush clearing and hand catching tsetse and Veterinary entomologists surveying for tsetse distribution countrywide. They consolidated their findings to produce tsetse distribution map depicting seven out of eight species currently known to be in the country except *Glossina morsitans*. Zoological and Tsetse Section in Department of Veterinary Services dealt chiefly with field measures against parasites and pests of domestic animals. A large part of its work was concerned with control of tsetse and animal trypanosomosis. The section had a variety of staff to address the diverse activities that included adaptation of new technology. Zoologists that were recruited were specialists in ecology, parasitology and insecticide applications. A core team in tsetse survey and reclamation was backed up with a small team of specialised investigators that tackled most of arising technical difficulties.

Tsetse control was based on establishment of settlement schemes distributed in all the affected districts both to distribute the resources evenly and prepare rural communities for land development. Most tsetse control methods make land available far more quickly than it can be effectively settled. With introduction of potent trypanocides, a critical number of cattle could be kept in tsetse infested settlements after partial bush clearing because the cost of removing the flies completely would be uneconomical. Thus management of the disease was fundamental and eradication of tsetse, where feasible considered only one of the options. Thus a policy was developed that active tsetse control was necessary in the sleeping sickness areas and partial bush clearing and strategic trypanocide use adopted for the rest of the country. The use of isomentamidium and diminazine ececurate as a sensitive pair was strictly enforced by the Department of Veterinary services, the rest of the drugs being zoned for use in specific districts according to challenge to minimise drug resistance.

Tsetse flies are the primary vectors of both Animal African Trypanosomosis (AAT) and Human African Trypanosomosis (HAT). A non-tsetse-transmitted trypanosomosis affects camels, and is a crucial constraint to the development of the rangeland where camels and donkeys are the main basis of the economy. The impact of tsetse problem is the economic loss arising from reduced livestock productivity and reduced animal draught power. It impoverishes livestock farmers and threatens food security. Tsetse flies are probably the most important agricultural pests in the world today and new strategies are called for to avert their debilitating effects.

Tsetse-Transmitted bovine trypanosomosis is one of the most economically important diseases of domestic livestock in Africa. Currently, tsetse flies (*Glossina*) infest 37 African countries, approximating 11 million km<sup>2</sup> of Africa, an area larger than the USA. The disease has a direct devastating effect in livestock due to increased mortality, reduced milk yield, low live weight gain, infertility, increased rate of abortion increased susceptibility to other infections. A similar influence of trypanosomosis has been observed in herd sizes of sheep sheep goats. The disease causes infertility can reduce lambing and kidding rates. Live weight gain and milk production in cattle in tsetse infested areas is 20% less compared to those in tsetse free similar production systems. The indirect benefits include loss of animal draught power and lack of nutrient cycling through manure.

According to Morton and Sutton (1999), a farm family with only hand tools may cope with only two hectares and produce food for subsistence whereas with draught animals they can feed six more people. Thus draught power has the potential to move the family economy from subsistence to cash economy. The neighboring families without cattle also benefit from traction. Donkeys do not survive even under minimum trypanosomosis challenge thus having negative impact on animal traction and transport.

Another important contribution of livestock is production of manure. Feeding crop residue and available pasture to livestock results in dung and urine that provide nutrient that is immediately available to crops.

The challenge of trypanosomosis faced by Kenya is typical of most countries infested by tsetse flies. About two thirds of Kenya (25%) comprising 7 out of 8 administrative provinces and 60% of productive well watered rangelands are tsetse infested, reducing food security by about 40-50% and thereby enhancing poverty. The challenge is so severe in some parts of the country that cattle cannot be kept economically even with use of trypanocides making the regions like coastal belt devoid of livestock. A herd of cattle in these areas become 100% infected within a period of 20 days. Thus the disease limits production of livestock to the rangeland which has reached a maximum carrying capacity and well settled parts of the country where there is severe competition with crops and parasitic diseases. 1989-1993 estimates show that out of 9,571,000 cattle, 23% live in tsetse infested districts. Nearly 100 years of efforts has achieved very little impact on tsetse infestation and trypanosomosis problem in Kenya.

The tsetse and disease situation is compounded by competition for land for both human settlement and wildlife conservation. Over the last two decades, have decreased by one third, livestock numbers have decreased by 10%, the steepest rates of decline which have been moderated since then were between 1970s and 1980s. One quarter of Kenyan wildlife lives within the protected areas and a further 25% are found within 20 km of these protected areas. Wildlife losses have been significantly higher outside the protected areas than inside (48% compared with 31%) and unadjudicated trust land. There is always competition for pasture and water especially during dry seasons and periodical droughts in addition to predation of livestock and humans. The prevailing conditions are symptomatic of more general competition for land resources that can only increase in the coming years where livestock keepers blame wildlife for enzootic diseases affecting them and their domestic animals. From the previous trends, tsetse will persist wherever wildlife survives and

suitable habitats exist and trypanosomosis will remain a serious constraint to livestock production in such areas in the foreseeable future.

This strategy paper is proposed to focus human and financial resources from all the affected stakeholders to manage tsetse and trypanosomosis to increase productivity in the affected areas. It is also intended to provide a legal framework in the country for intervention through which national and other development agency resources will be channeled and coordinated.

## 1.2 INTRODUCTION

The control of tsetse and trypanosomosis in Kenya is one of the core functions of the Veterinary Department under the Ministry of Agriculture and Livestock Development. The history of trypanosomosis and its control in Kenya was reviewed by Wilson (1953) and Whiteside (1958). HAT was first recorded in Kenya in 1902 (Duggan, 1970) it was restricted between Uganda border and Kisumu before 1920 and slowly spread through out the Lake Victoria basin. AAT threatens livestock production in both high and medium potential lands (HMPL) and in the arid and semi arid areas (ASAL).

The Government has been the major player in the control of Tsetse and Trypanosomosis since the 1940s and succeeded in reclaiming large tracks of lands. These achievements were not sustained due to various problems that have been addressed in this strategic plan. The long history of the tsetse control as a Government responsibility made it difficult for farmers to adjust to the policy change through Sessional paper No.1 of 1986, Economic Management for Renewed Growth, which marked the advent of cost sharing and private sector involvement in the delivery of Veterinary services. Moreover the tools available for tsetse control was either not appropriate for community participation or were of environmental concern. The dwindling resource allocation to the Ministry of Agriculture and Rural Development and consequently to the tsetse and trypanosomosis control programmes is a serious constraint.

On the other hand improved methods of controlling tsetse flies have been developed especially in the last decade. Some of the farmer based technologies like use of artificial and live baits can promote livestock wildlife coexistence. Alternative forms of private sector and non-governmental animal health care delivery are also emerging on balance with declining veterinary services. This, however, needs supportive policies and legislation and availability of accurate, reliable and up-to-date on many of the disease widely recognised.

The future of trypanocidal drugs, as an effective tool against animal trypanosomosis is not very promising due to resistance and cross-resistance.

According to the welfare monitoring survey of 1994, about 43% of the 30 million Kenyan population cannot meet the minimum daily needs for food, clothing or educate their children.

One of the Ministry's policy priorities is to improve animal health services through pest and disease control for increased incomes to livestock farmers. The economy relies heavily on agriculture with about 25% contribution of gross domestic product (GDP). A

comprehensive strategy is required to address the tsetse and trypanosomes problem to support the livestock sector which has been identified as a priority in Sessional paper No.2 of 1994 and 8<sup>th</sup> National Development plan.

The need for international support to review the strategies is being acknowledged and has culminated in the formation of the FAO/IAEA/OAU/WHO committee called Program against African Trypanosomosis (PAAT). This body is charged with promoting the development of integrated measures, which are robust and economically sustainable, that could lead to large-scale tsetse control. The urgent need to rid Africa of tsetse/trypanosomosis associated problems brought African Governments together and have issued a declaration that the year 2001 was the start of a Pan-African campaign to eradicate tsetse from the continent. Under the auspices of the OAU, the Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC) was launched. Currently, the Governments are expected to increase prioritized budgetary allocations to tsetse and trypanosomosis control in an integrated rural development strategy. This strategic plan is designed for policy makers, planners, managers, researchers and stakeholders in both public and private sectors to focus and mobilize resources toward the identified priorities. The role played by NGOs, communities, private sector and donors in animal health delivery systems has been recognized.

The National strategy paper is organized as follows:

Chapter 1. Presents the background

Chapter 2. Gives an overview of the current situation

Chapter 3. Provides the vision mission statement and strategic objectives

Chapter 4. Highlights information on programme management and coordination

Chapter 5. Outlines information on monitoring and evaluation

Chapter 6. Gives conclusion and way forward

In summary, the strategic paper sets out framework within which resources will be mobilized on a proactive and multi-sectoral approach basis to achieve the stated objectives.

## 2.1 OVERVIEW OF THE CURRENT SITUATION

The purpose of this section is to give the present situation of tsetse and trypanosomosis in Kenya and describe the background against which the National policy and strategies have been developed.

### 2.1.1 Problem

In one-third of the continent, agricultural and rural development remains seriously impeded by the animal and human forms of this debilitating and often fatal disease. The consequences for human welfare are compounded by the fact that the hardest hit is invariably the most poverty-stricken countries.

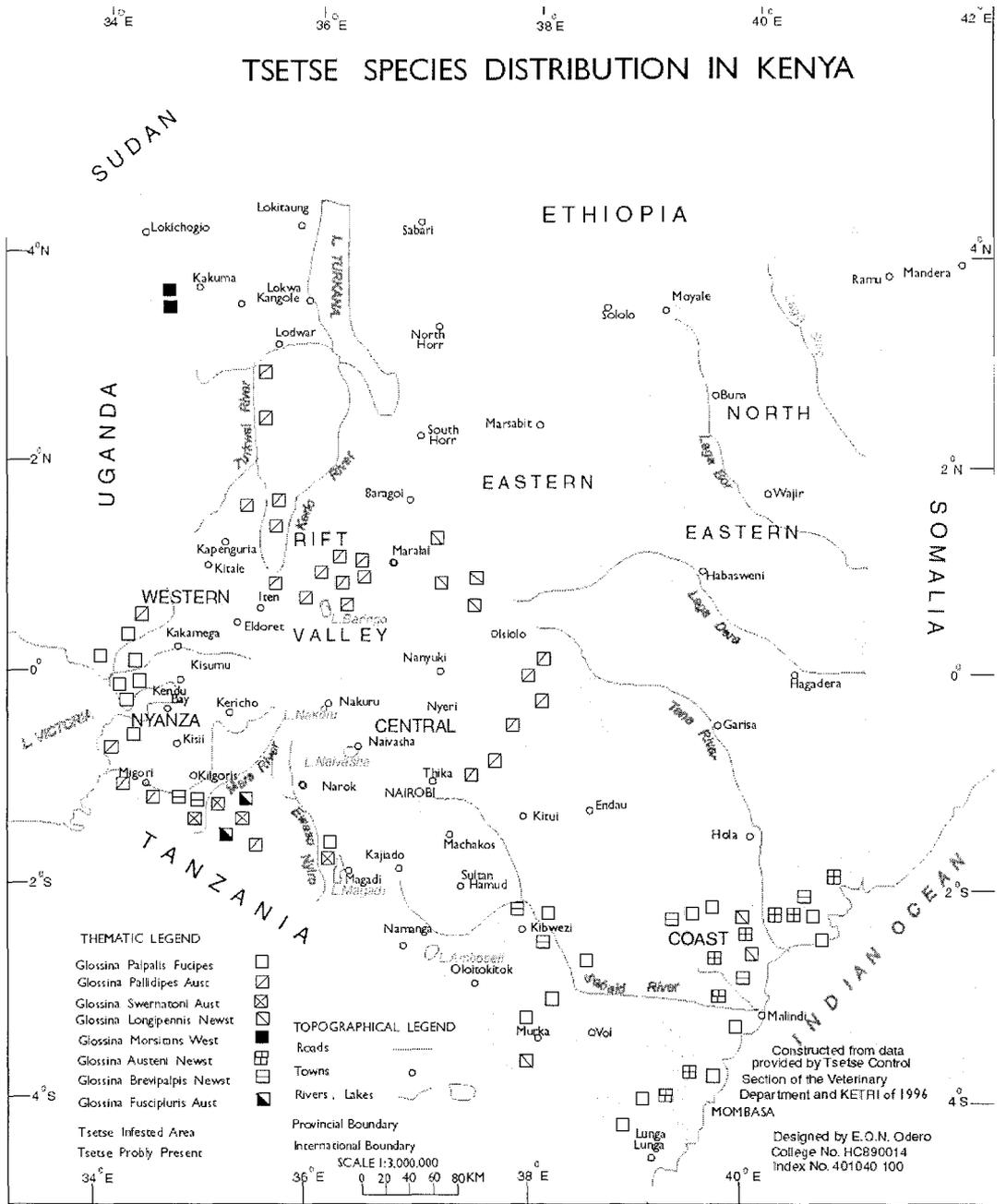
About two-thirds of Kenya comprising 7 out of 8 administrative provinces and 60% of productive, well-watered rangelands are tsetse infested. Some of the high potential areas including coast, Western and Nyanza Provinces have serious tsetse and trypanosomosis problems. Lack of draught power as a result of trypanosomosis has led to low acreage under crops. Tsetse and non-tsetse transmitted trypanosomosis has severely limited livestock productivity and the disease is therefore a threat to food security. Food production is reduced by about 40% -50% a result of animal trypanosomosis. Trypanosomosis more often than not occurs in combination with other diseases. Chronic trypanosomosis predisposes affected animals to other infections and this is responsible for huge economics losses in terms of high mortality, low body weight and high sterility. Economic loss to the country is estimated at Kshs.700 million annually from livestock deaths. The cost of importation of trypanocidal drugs and pesticides amounts to Kshs.200million and Kshs.40 million respectively. Nearly 100 years of concerted efforts have failed to curb the distribution of tsetse infestation and the resulting incidence of trypanosomosis in Kenya.

### 2.1.2 Tsetse Distribution

Trypanosomosis, a disease caused by protozoan parasites of genus *Trypanosoma* is mainly transmitted by a two winged insect which belong to genus *Glossina*. The recorded twenty two species are divided into three subgroups viz: fusca that occupy the forest, morsitans of the savanna woodlands and palpalis that occupy the water edge of rivers and lakes.

Eight species of tsetse are found in Kenya, reflecting a diversity of habitats and niches: *G.brevipalpis*, *G.fuscipleuris* and *G.longipennis* belong to the fusca subgroup. They are a problem in forest where they feed mainly on large game. *G. pallidipes*, *G.austeni*, *G. swynnertoni* and *G. morsitans submorsitans* are efficient transmitters of the livestock disease in the wooded savanna where most settlements and livestock are found. *G. fuscipes fuscipes* is the only member of the palpalis group in Kenya where it is the main transmitter of human sleeping sickness.

# TSETSE SPECIES DISTRIBUTION IN KENYA



The 8 species of tsetse occur in 6 major tsetse belts covering about 51 Districts in 7 administrative provinces as follows:

- Lake Victoria- Kyoga fly belt  
This covers South Nyanza, Kisumu, Siaya, Bondo, Busia, Teso, Bungoma and Mount Elgon districts, extending into Uganda.
- Narok- Kajiado fly belt:  
This covers Migori, Kuria, Gucha, Bomet, Kajiado, Narok and Transmara, extending into Tanzania.
- Lake Baringo- Kerio Valley- Turkwell fly belt:  
This covers Baringo, Turkana, West Pokot, Keiyo and Marakwet districts
- The coastal fly belt:  
This covers upper Tana river drainage system, Kangundo, Yatta, Masinga, Makueni, Embu, Mbeere, Meru south, Meru East, Nyambene, Lower Thika and Maragua districts.
- Isiolo- Samburu fly belt:  
This covers Isiolo and Samburu districts
- Small isolated fly belts in ASAL areas.

The Coastal Belt is the most extensive extending from Tanzania border to Somali border. It is heavily infested with *G. pallidipes*, *G. austeni* and *G. brevipalpis*. The Lake Victoria Basin tsetse belt extends from Tanzania to Uganda and *G. fuscipes fuscipes* is the major tsetse species. *G. pallidipes* has been reported recently in areas where it had been eradicated specially in the border districts of Siaya, Busia, Teso and Bungoma. The rest of the Lake Basin tsetse belt consists of isolated patches with a stretch extending into Tanzania where *G. fuscipleuris* and *G. swynnertoni* occur. Along the Northern common border with Uganda is to be found a tsetse belt which is unique in the sense that it is the only belt where *G. morsitans submorsitans* occur in the country. *G. longipennis* occur mainly in the drier parts of the rangelands.

### 2.1.3 Epidemiology

#### Animal trypanosomosis

The major pathogenic trypanosomes in Kenya are *Trypanosoma congolense*, *T. vivax*, *T. simiae* and *T. evansi*. Cattle have been found to be reservoir hosts of *T. brucei rhodensiense* in sleeping sickness endemic areas in Nyanza and Western provinces of Kenya.

Animal trypanosomosis is widespread in Kenya and occurs both within the tsetse belts, where it is transmitted by tsetse flies and outside tsetse belts where it is transmitted by biting flies. Camel trypanosomosis in Northern Kenya (*T. evansi*) is transmitted by biting flies. It has been established that some species of wildlife act as reservoirs for trypanosomes making the vector parasite cycle very difficult to break posing danger to the communities even after successful on farm eradication programmes.

#### Human Trypanosomosis

Cases of sleeping sickness in Kenya have been reported since the first case in 1902. The disease is caused by *Trypanosoma brucei rhodensiense*, which is endemic in Lake Victoria basin. Small-scale outbreaks occurred in 1950-54, 1962-67 and 1980-84 in South Nyanza

(Lambwe Valley) and in 1964-65 (Siaya) and 1989-90 in Busia district. In the year 2001, twenty eight cases were confirmed, 16 cases in Bungoma and 13 cases in Teso. Last year 5 cases have been confirmed in Teso and 3 cases in Bungoma.

There are two foci of human sleeping sickness in Kenya namely:-

- Siaya, Busia, Teso and Bungoma foci to the North of Lake Victoria Basin.
- Lambwe Valley foci to the South of Lake Victoria Basin.

#### 2.1.4 Tsetse and Trypanosomosis Control Methods

Control of tsetse and trypanosomosis is a continuous activity carried every year.

The methods that have been used in Kenya are as follows.

- Chemotherapy and Chemoprophylaxis:  
Trypanocidals are used both as curative and for prophylaxis drugs mainly by the pastoralists. Drug resistance has been reported in some parts of the country posing a great danger to future management of trypanosomosis in Kenya.
- Odour baited insecticide Impregnated Traps/Targets  
Targets/traps made from cotton material are impregnated with synthetic Pyrethroids, which are then placed in the tsetse infested habitats.
- Use of Synthetic Pyrethroids as Pour-ons, sprays or dip formulation  
Synthetic pyrethroids are used either as pour-ons, cattle sprays or dip formulation on cattle which act as mobile targets from where tsetse pick the killer insecticide.
- Ground spraying using synthetic pyrethroids.  
Synthetic pyrethroid, Cypermethrin has been used during sleeping sickness outbreaks. However due to environmental concern, ground spraying is being phased out.
- Sterile Insect Technique (SIT)  
SIT is being applied to eradicate *G. pallidipes* in Lambwe Valley. It involves mass rearing of *G. pallidipes* going on at KETRI in readiness for mass release of sterile males to stop reproduction.
- Modification of tsetse habitat  
Selective bush clearing is done in infested lake-shore, Riverine and peridomestic thickets in Western Kenya to minimise man/fly contact. Planting of high canopy trees of economic importance as fodder tree, fire wood, timber and fruit is promoted.
- Grazing patterns  
Pastoralists in arid and semi arid tsetse infested areas avoid grazing their livestock in tsetse infested forests thus reducing livestock/tsetse contact however it is difficult to enforce in drought situations.
- Insecticide impregnated zero grazing nets  
Protection of dairy cattle in zero grazing units with pyrethroid treated nets allow dairy cattle to be kept in any tsetse infected area.  
Awaits dissemination for use by individual farmers in other parts of the country.
- Sterilant impregnated targets

This involves the use chemosterilants to sterilize the insect and eventually stop reproduction.

It is under evaluation against *G. fuscipes fuscipes* in Mageta Island.

- Proper land use systems in tsetse infested areas.

### 2.1.5 Resources

The Veterinary Department, Ministry of Livestock development, has implemented tsetse and trypanosomosis control programmes. The DVS uses Zoologists to implement tsetse and trypanosomosis control programmes. Currently there is a serious shortage of this cadre of staff. Financial allocation under Head 447 has always been used to carry out tsetse control programmes but it is inadequate. Budgetary provision during the last 4 years is shown in the following table:

#### BUDGETARY ALLOCATION FOR TSETSE CONTROL IN LAST 4 YEARS

1.2.1 YEAR	1.2.2 RECURRENT VOTE (KSH)	1.2.3 DEVELOPMENT VOTE (KSH)	TOTAL (KSHS)
1998/1999	28,846,840	25,697,040	54,543,880
1999/2000	47,010,080	6,944,780	53,954,860
2000/2001	45,509,702	5,689,000	51,198,702
2001/2002	36,049,514	5,536,980	41,586,494

### 2.1.6 Challenges and constraints in Tsetse & Trypanosomosis control

Major challenges facing the livestock industry in general include effective control of diseases and pests to increase production of high quality livestock and products as prescribed by the OIE for the international markets. The country relies heavily on livestock to reduce poverty in the rural communities especially in the ASAL areas.

#### **Constraints**

The major constraints hindering the achievements of effective tsetse and trypanosomosis control in the country include:

- Inadequate policy, regulation and enforcement

Past policies created dependency on GOK as the main provider of services related to tsetse and trypanosomosis. The policies were biased towards public health and were difficult to enforce. Poisons and drugs are under the Ministry of health while the DVS controls tsetse and trypanosomosis with very little input from health ministry.

Past objectives of T&T were focussed on reclaiming tsetse-infested land for resettlement.

There are inadequate policies guiding purchasing, procurement and registration of drugs and test procedures.

Existing tsetse and trypanosomosis control policies hinder stakeholder participation resulting in low delivery, development of drug resistance and cross border spillage.

There is lack of integrated approach that would control other pests and related diseases (e.g. ticks and tick borne diseases), while improving animal husbandry, crop production and rural development. The biggest challenge therefore is to develop appropriate policies to promote the involvement of communities and create enabling environment with effective stakeholder coordination.

- Inadequate tsetse and trypanosomosis surveillance.

Monitoring and surveillance is important for effective control. The tsetse distribution needs updating incorporating GIS to provide priority areas for intervention. Baseline data on the current livestock population is lacking. DVS lacks capacity to carry out effective tsetse and trypanosomosis monitoring for timely intervention response.

- Lack of emergency preparedness

Emergency disease situation can arise by cross border spillage of disease, excessive rainfall and weather changes, which may have devastating effects on livestock and humans. The case of nagana and sleeping sickness emergencies in Western Kenya are documented. The capacity to deal with such emergencies is inadequate.

- Inadequate integrated livestock management approach

There has been inadequate sensitization and empowerment of communities to participate in T&T while appreciating the poverty levels, unemployment, lack of schooling and improper land use as adversely affecting animal health delivery. Participation of the private animal health providers has been inadequate especially in low potential and ASAL areas. There is lack of strategies for the control of both ticks and tsetse. National parks and Reserves act as reservoirs for tsetse flies reinvading controlled areas. In addition some important species like rhino are known to be susceptible to trypanosomosis meaning that KWS should be a major player in Tsetse & Trypanosomosis management with budgetary implications to the Organization.

- Inadequate human and financial resources

Funding for tsetse control has been insufficient for the purchase of drugs and insecticides and to cater for operational costs. This has constrained implementation of the existing programmes and made expansion to other needy areas impossible. Inappropriate allocation of resources and lack of transparency and accountability has affected delivery of animal health services. This has affected donor confidence. Poor motivation for staff has led to lack

of professional manpower, which is required upto, the district level in the current structure. The DVS needs a critical mass of these insect science specialists to be able to have an impact countrywide.

- Inadequate capacity for monitoring, management and coordination

The community and private sector are not adequately empowered to profitably participate in T&T. The diagnostic laboratories of the DVS both at the HQ and the districts are not sufficiently equipped and funded to contribute to effective disease control. Lack of capacity to monitor drug/insecticide usage may result in substandard products in the market. Poor motivation for technical and non-technical staff has led to shortage of professional manpower. The DVS lacks capacity to manage and mobilize resources on a proactive and multi sectored approach. Information gathering and dissemination is currently inadequate.

- Impact of HIV/AIDS

AIDS not only affects the lives of infected individuals but also the economic and social well being of the society. Resources are diverted to treatment. It increases the number of orphans widows and widowers. It increases demand on the already impoverished communities thus affecting delivery of services. The DVS lacks capacity to mobilize resources and mitigate the socio economic effects.

- Inadequate security

The arid and semi arid parts of the country which holds 75% of livestock population is characterized by its vastness, poor infrastructure and general insecurity in the region. The area has not attracted private animal health providers. The ASAL areas are faced with shortage of qualified personnel unless the security issues are adequately addressed.

- Inadequate coordination of tsetse and trypanosomosis control

There is lack of a coordinating unit or a ministerial committee to harmonize the functions of the stakeholders. Dependence levels on international donors are estimated at 90% while the actual funding level is estimated at 10%. The possibility of attracting new donors depends on increased accountability levels and a strategic plan showing priorities and willingness and commitment of stakeholders. The challenge is therefore to form the National Tsetse and Trypanosomosis Control Council (NTTC) that will mobilize adequately motivated personnel and raise funds for the various components of the plan while effectively coordinating the stakeholders.

### **3.1 STRATEGIC FRAMEWORK**

The basic principles underlying the approach taken in formulating these strategies are:

- Interdisciplinarity, to address multisectoral issues through the mobilization of contributions from all relevant disciplines within the Ministry of Livestock and Fisheries development, Headquarters and decentralized branches of the Veterinary department and ,
- Partnerships with other Government ministries, Research Organizations, International organizations, the private sector and the civil society.

A table giving information on stakeholders is contained in Annex I while the implementation matrix is shown in annex III.

#### **VISION**

Our vision is of a developed Kenya, free from trypanosomosis and with a healthy and economically empowered population

#### **MISSION**

To increase agricultural and livestock productivity through sustainable cost effective and environmentally acceptable trypanosomosis control approaches and policies.

#### **GOAL**

To create policies that will lead to the control of trypanosomosis thereby increasing incomes of the farming communities. The main strategy is the formation of the National Tsetse and Trypanosomosis control Council (NTTCC).

The other goal is to provide a framework that will serve as an effective tool for resource mobilization and coordination as well as to guide the implementation of activities.

#### **3.1.2 STRATEGIC OBJECTIVES**

The objectives of the programme will be to provide broad framework within which strategic priorities have been set and key initiatives developed.

While substantial work has been carried out in the identification of indicators, they will be more realistic at the level of the medium term plan in which projects with more specific time bound objectives will be defined.

## **A. REVIEW OF PUBLIC POLICIES AND REGULATIONS**

### **A<sub>1</sub> To review policy, legislation and enforcement**

- There is need to review or amend the animal health delivery legal framework to make it more appropriate and conducive for the enhancement of the community and private sector participation especially private vets and para vets. It will be necessary to harmonize laws that relate to animal health delivery, public health (Sleeping sickness) and policies on drug evaluation and registration with attention to drug quality assurance.

#### **Strategy elements include:**

- Provide adequate relevant legislation/policy on tsetse and trypanosomosis control
- create regulatory mechanisms to verify the compliance with the national acts on drug use
- Increase capacity for legislation/policy enforcement and supervision
- Provide guidelines for proper use of drugs / pesticides
- Provide legislation & policy on private sector
- harmonize the existing legislation on drug use and delivery in the region, for instance, through EAC,
- Develop standard testing procedures

### **A<sub>2</sub> To mobilize resources and improve utilization**

Given the number of agencies that will be involved it is important that an effective mechanism for coordinating these agencies is established and strengthened. It is expected to work closely with the planning division of the Ministry and also tap financial contributions from NGOs, private sector , donors and the beneficiaries.

#### **key strategy elements**

- Provide adequate motivation for improved delivery of services
- Mobilize Human and Financial resources for all the programmes components
- Appropriate allocation of resources to sectors of the plan

### **A<sub>3</sub> To create awareness on integrity enhancement**

#### **Key strategy elements**

- Prevent misappropriation of project funds
- Create donor confidence in the projects

## **B. IMPROVE SERVICE DELIVERY**

### **B1. To generate data by effective surveillance (Epidemiology) and adaptive research.**

#### **Key strategy elements**

- Update Tsetse distribution map of Kenya
- Conduct Livestock census in priority areas
- Conduct periodic surveys on the tsetse and disease situation
- Conduct cross sectional disease surveys for adequate strategies
- Provide demographic information to link literacy, affordability and poverty reduction
- Install and strengthen a reliable epidemiological surveillance system
- Prioritize research needs and ensure proper co-ordination of research through National Council for Science and Technology.
- Establish a reliable supply of standard biological material (tsetse flies) from a laboratory facility in Kenya; given the interest of the private industry it should be possible to recover sizeable parts of the running costs of a national breeding facility.
- Increase research efforts aiming at the identification of other strategies, aiming at the contamination and ensuing propagation of reproductive anomalies in the target populations – as is presently tried with triflumuron on Mageta island .

#### **Partnerships**

Exchange with the pharmaceutical companies will be intensified to promote testing, identifying and evaluating of promising approaches. Exchange between researchers and manufacturers of tsetse and trypanosomosis control products, will improve existing extension messages, which are to be provided with the products. Government will set standard testing procedure and ensure the testing of new products through an independent body of experts; the financial contributions of the private industry should cater for the running costs of this facility.

### **B2 To promote integrated livestock health management**

Ideally, the existing, sustainable control methods should be combined as much as possible in order to enhance their impact. For instance, grade cattle can not only be protected by the use of an insecticide-treated net, but it can also reasonably be expected that the net will have an impact on the whole tsetse population. The control effects are likely to be enhanced if indigenous cattle are treated with pyrethroids for the control of tsetse and ticks. Special attention will be given to the promotion of crush pens (where spraying of livestock with deltamethrin takes place) as rural Animal health centres.

The intensification of crop production – not just food crops but also pure cash crops like cotton – will reduce the surface of fallow areas, which are frequently constituting the main habitats for tsetse. Trypanocidal drugs are still the most widely used method for controlling the disease. Particular emphasis is thus put on efforts to avoid trypanocidal drug resistance.

## Key strategy elements:

### Strategy 1: Therapeutic treatments

- Use of an assessment model, for instance “production opportunity set to decide on best-bet strategies,
- Avoid more than four to six treatments with diminazene/year,
- Avoid block treatments,
- Treat only parasitologically confirmed or clinical cases,

### Strategy 2 : Prophylactic treatments

- Avoid the use of continuous isometamidium prophylaxis,
- Use prophylaxis only in cattle exposed to heavy challenge for a defined period, e.g. transhumance or high seasonal challenge,
- Never administer isometamidium more frequently than every three months,

### Strategy 3: Multiple drug resistance

In case of confirmed resistance to both isometamidium and diminazene :

- Stop trypanocidal drug use – except for the treatment of clinical cases,
- Maximise vector control activities,
- Use zero-grazing and/or fly proof housing where appropriate.
- Introduce trypanotolerance genotype.

### Strategy 4: Risk avoidance or reduction

- Watering animals at boreholes or dams and Change of grazing patterns can reduce tsetse challenge, for instance grazing during low tsetse activity peaks (at noon or during the night).
- Establish zero grazing units where animals are confined in pens with feed and water being brought to them to avoid contact with tsetse.

### Strategy 5: Modification of tsetse habitats

- Agricultural intensification in tsetse infested areas reduces tsetse densities by the destruction of suitable habitats.

### Strategy 6: Vector control/eradication

Tsetse vector control measures will be geared towards creation of tsetse free zones. This will be achieved through systematic and sustained campaign to eliminate the flies from individual tsetse zones/belts and promote other land use activities while sustaining operations to prevent reinvasion from the tsetse infested areas. The tsetse species in a given area will be identified and appropriate integrated tsetse control methods put in place to rid

the isolated belt of the flies. This will create ever-expanding tsetse-free zones to be used for increased livestock /crop production to fight poverty.

Selection of priority areas for control will be based on consideration of various criteria namely: -

- Social economic importance of the tsetse infestation in a given area.
- Ease of eradication of the species
- Diversity of the species present
- Degree of isolation of the species.

- Use of insecticide-treated targets

*Glossina pallidipes* and many *morsitans* group of tsetse can be controlled by odour-baited (acetone and cow urine) targets placed at a density of 4 – 5 targets/km<sup>2</sup>. The farmers are required to place the targets themselves.

*G. fuscipes fuscipes* can also be controlled using insecticide impregnated targets as has been proved through a trial carried out in Mageta Island, district of Bondo.

- Use of the live bait technique (sprays, pour ons, dips)

Treatment of livestock with pyrethroids has shown a great potential for simultaneous tick and tsetse control. Maintenance of dipping facilities has proven difficult if they were under community-based management systems. Spraying of livestock takes usually place in crush pens. This approach, using an aqueous solution of deltamethrin, is presently promoted by FITCA-Kenya in western Kenya. The farmers manage them through crush pen management committees. Use of pour ons will be encouraged in commercial ranches. Dips will be privately managed.

Efforts are now under way to transform these crush pens into rural animal health centers where various animal health services can be delivered by private animal health providers (vaccinations, de-worming, artificial insemination etc).

- Protection of zero-grazing units with insecticide-treated mosquito nets

Trials undertaken by FITCA-K in western Kenya have shown a considerable potential in protecting dairy cattle from tsetse attacks and can create tsetse free zones with an optimal number in large-scale application.

- Use of SIT (large-scale production of sterile males)

The use of sterile males is justifiable if tsetse eradication is the final, sustainable objective to create tsetse fly free zones.

It is based on the provision of sterile males produced in a large-scale rearing facility based either in Kenya or reliable supply from Tanga (Tanzania), Tororo (Uganda) or even Ethiopia. In Kenya there is at present no facility where tsetse are reared on an industrial scale. Any planned SIT-project will therefore depend on external supply of sterile males from other African countries.

- Use of targets treated with sterilizing chemicals  
New materials and products may well lead to a renewed interest in a further development of the target technology, the ultimate aim being cheaper targets with a given life span during which there is an effective release of the active ingredient (chemosterilant) killing or contaminating the alighting tsetse.

### **Strategy 7: Tsetse control in game parks and forest reserves**

Many if not all of the national parks are heavily infested with tsetse, posing a serious threat for viable agricultural production in neighbouring areas. Unless new and more effective control tools are developed it is difficult to imagine a Kenya “free from tsetse and trypanosomosis”. Game parks are not only part of the national heritage, but also constitute an important source of income from visiting tourists.

Schemes in southern Africa, like CAMPFIRE, try to compensate those farmers living in the vicinity of tsetse-infested areas where control measures cannot be undertaken.

More recently, Botswana has implemented a campaign in the Okavango Delta, using aerial application of insecticides. Botswana has however its own resources. Aerial spraying campaigns against tsetse in the National parks can be considered if funds are available since the techniques have been refined and are thus having considerably less negative impacts on the environment.

De-gazetting of some game parks (because of their small size) may already achieve a considerable improvement, eg the park of Lambwe Valley, which – despite its size – constitutes a serious threat for human and animal health.

A meeting of all stakeholders, including KWS and farmers’ organizations may yet succeed in drafting the most suitable and sustainable way of how to co-exist in adjacent park areas. Non-intrusive tsetse control methods are already available; if properly applied they could reduce the disease risk to manageable levels.

### **B3 To enhance capacity in training, monitoring/evaluation, policy enforcement, service delivery and networking.**

#### **Key strategy elements:**

- Strengthen community mobilization and participation while recognizing culture, traditions, values, attitudes and roles.
- Establish relevant institutions provided with adequate staff with required training and skills.
- Strengthen monitoring and evaluation activities for efficiency and effectiveness of program
- Ensure standardization of materials, equipment, testing and training guidelines
- Monitor the adoption rate of technology
- Monitor disease prevalence for appropriate interventions
- Periodic evaluation to keep the program on course
- Increase capacity for data analysis
- Strengthen capacity building through training and provision of supplies
- Monitor the Quality of service delivered

- Increase capacity for Environmental Impact Assessment

#### **B4 Improve security especially in ASAL areas**

Key strategy elements:

- Form, support and strengthen conflict resolution and peace committees to improve security in ASAL areas

### **C. INTEGRATION/COORDINATION OF STAKEHOLDERS**

#### **C1. To establish information center to increase collaboration and Coordination of stakeholders**

**Key strategy elements:**

- To create awareness among various stakeholders on tsetse and Trypanosomosis control
- Initiate collaboration among stakeholders
- Coordinate various sectors in tsetse control activities
- Clearly define roles of various stakeholders

#### **C2. To integrate HIV/AIDS and Gender in livestock health management**

**Key Strategy elements**

- Integrate HIV/AIDS related information into management and service delivery points
- Reduce the level of resources diversion to treatment of AIDS and other related diseases
- Reduce Poverty caused by AIDS and improve food security
- Reduce the number of orphans, widows and widowers
- Create awareness on the negative effects of Polygamy on service delivery and AIDS
- Identify Gender roles in delivery of services
- Influence laws on property ownership that are women friendly
- Affirmative action on female service providers
- Empower women to make decisions that concern livestock investments and property ownership to improve service delivery

## 4.1 PROGRAMME MANAGEMENT AND COORDINATION

The purpose of this section is to set out the key requirements for the effective management and coordination of Tsetse and trypanosomosis control programmes. It recognises that tsetse trypanosomosis control comprise only a component of the holistic approach and needs to be supplemented with land use packages that generate resources to sustain the control activities by the main stakeholders. There is need for a structure that recognises public and private sector disciplines which support holistic approaches. This requires effective management and co-ordination to synchronise the roles and participation of the diverse range of stakeholders that is preferably supported with legal framework. The policies that support the private sector and farmers will be of paramount importance with the public sector comprising government ministries effectively regulating the operations.

### 4.1.1 Structure

- Current arrangements

Responsibility of coordinating, mobilizing resources and implementation of tsetse and trypanosomosis control programmes is vested in the Department of veterinary services which to date is the implementing agency supported by Kenya trypanosomosis research institute (Ketri) on research activities. The department shall continue with this role but with more involvement of other players.

The implementation of district focus for rural development strategies brought with it coordination, staffing and financial problems as the number of districts multiplied. Planning and implementation at district level though appropriate for many development programmes limits coordination of the activities across district boundaries for a fast moving pest like tsetse. Thus the control efforts become too fragmented unless they are sustained and consolidated progressively.

- Proposed National Tsetse and Trypanosomosis Control Council (NTTCC)

The formation of a committee or council is expected to bring more involvement of partners at the national level (see stakeholder map). The role of NTTCC will mainly be policy formulation, development of guidelines and standards, resource mobilization and allocation, establishing linkages with relevant departments and sectors and providing strategic direction up to farmer level.

Initially the Ministry will reach out to the relevant stakeholders in the public sector to create a steering committee. They may include members from: Ministry of Livestock Development and Fisheries, AU/IBAR, National Science for Research and Technology, Ministry of Natural Resources and Environment. Others will be Ministry of Health, Ministry of Finance, Ministry of Planning and Ministry Lands and Settlement.

The ministries that form the committee will initiate steps for formation of the council from its members. The council will form a secretariat from the key ministries of the committees and raise resources to facilitate the running costs of its operations. The council will design its terms of reference which will be mainly on coordination,

soliciting for resources, ensuring that they are correctly used and put in place development activities that sustain achievable developments. The terms of reference should not imply direct implementation of the field activities by the council.

#### **4.1.2 Risk analysis and assumptions**

The Council will ensure sufficient planning for proposed projects to ensure their successful completion. The areas of management including procurement and distribution, organization and administrative weakness in ministries will be addressed. Projects will only be undertaken if adequate funds, proper systems and sustainability mechanisms are in place. Thus detailed socio-economical, political and epidemiological context (poverty, trans-boundary nature) will be considered. The management will ensure that effective personnel are retained developed and deployed for their effective production.

#### **4.1.3 Programme sustainability**

Sustainable rural livelihood strategies are the targets of most development agencies. These may be defined as those that comprise the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the resource base.

Dependence on handouts represents vulnerability in terms of programme sustainability. There is need for in built mechanisms for sustainability instead of wholly relying on donor support. Increase government funding for intervention programmes and their sustainability. The NTTCC will mobilize resources for implementation (cost sharing, paying for services, cess fees). Increasing involvement of the private sector will be promoted. Beneficiary communities are expected to contribute in managing and financing farmer-based programmes. The existence of adequate infrastructure and markets for products should be seen as pre-requisite for sustainability of initiated development activities. There will be need to develop and sustain internal capacity of NTTCC management unit and all its supported programmes for optimal results. Skills in policy formulation, strategic development, programme management and coordination as well as monitoring and evaluation will be required . Additional skills will be required in data analysis , advocacy and budgeting.

## 5.1 MONITORING AND EVALUATION

Successful management and implementation will depend heavily on the monitoring and evaluation. This section addresses the broader issues of monitoring inputs, processes to ensure accountability, transparency and performance. Environmental impact assessment is included in strategic objectives.

### 5.1.1 Monitoring

Monitoring will take place at all levels of the programme management and implementation. It will involve the following:

Identification of key indicators in each of the key initiatives

- Tracking the use and application of programme inputs such as funds, supplies and materials.
  - Tracking programme processes such surveillance, training, procurement and distribution.
  - Tracking of programme outputs e.g. Policies documented, Training /workshops held, Animal health providers trained, decreased disease incidences, co-ordinated demand driven research etc.
  - Assessing the quality of service provided and quality of products,
  - Acreage of tsetse fly free zones increased
  - Increased households acquiring improved animal breeds
  - Assess the No. of NGOs, CBOs, Institutions, organizations participating in Tsetse and trypanosomosis control.
  - Assess the level of interaction and coordination and support by stakeholders
- Departments within the ministry  
Ministry Agriculture  
Ministry of health  
Ministry of Finance  
Ministry of Natural resources  
Research Institutes  
International Organisations  
CBOs and NGOs  
Private firms and private animal health providers

Regular monitoring will ensure that obstacles are identified and addressed to maximise programme impact.

NTTCC will be responsible for the overall monitoring of progress against the strategic plan through the stakeholders gathering data at all levels.

Other approaches will also involve review meetings and reports.

The farmers will also be involved in monitoring through the constituencies, councils and district development committees.

### **5.1.2 Evaluation**

Evaluation will mainly focus on the impact of indicators that are in built at all levels. Financial and co-ordination aspects of the programme will also be evaluated to see the extent of objective achievements.

Data will be gathered from the monitoring reports, supervision reports, monthly, quarterly and annual reports.

There will be periodic internal and external reviews.

#### **Indicators**

Indicators that will assist in measuring programme effectiveness:

Change in the level of Government expenditure to tsetse and trypanosomosis control.

Changing number of improved animal breeds

Change in number of treated Humans and animals trypanosomosis cases

Change in the size of acreage under crop production

Change in the size of tsetse fly free zones

Change in the number of conflicts

Change in donor attitude

## 6.1 CONCLUSION AND WAYFORWARD

The strategic plan has addressed key areas in the control of tsetse and trypanosomosis while empowering the community to provide and demand quality service in mitigation of socio economic impact of trypanosomosis in the fight against poverty. A greater benefit of the project will only be realised if the private vet and paravets especially in Arid and Semi arid lands, are enabled to play more active role in provision of services while economically empowering the farmer through increased incomes to pay for the services. Many of the determinants of tsetse and trypanosomosis impact will be at the community level. It has outlined a number of priority activities whose implementation will require partnership between communities, Government ministries and departments, Non Governmental Organizations, donor agencies and the private sector.

In short term (mainly during the first year) priority activities will be to:

Share this document with all the stakeholders to identify areas of support, gaps in various intervention strategies and to provide inputs in the proposed framework.

Mobilize resources and install an appropriate structure to coordinate the implementation and monitoring of programme activities at all levels.

Conduct training and mobilization activities at all levels.

Provide policies that regulate the involvement of private sector in provision of drugs and quality services.

Capacity building at all levels including the community level and district levels to be able to provide strategic leadership, management and control.

## ANNEX II: IMPLEMENTATION MATRIX

## 1. REVIEW OF PUBLIC POLICIES AND REGULATIONS

STRATEGIC OBJECTIVES	ISSUES	RESPONSIBILITY	ACTIONS	TIME FRAME
1 Policy, legislation and enforcement review	<ul style="list-style-type: none"> <li>Inadequate relevant legislation /policy</li> </ul>	DVS/Stakeholders	<ul style="list-style-type: none"> <li>Establish council</li> </ul>	2004- 2006
		KVB / Stakeholders	<ul style="list-style-type: none"> <li>Review current legislation / policies</li> </ul>	
		KVB/Stakeholders	<ul style="list-style-type: none"> <li>Periodic review legislation / policies</li> </ul>	
	<ul style="list-style-type: none"> <li>Inadequate guidelines for proper use of drugs / pesticides</li> </ul>	Council/KVB/PCPB	<ul style="list-style-type: none"> <li>Draft ,consolidate and Disseminate</li> </ul>	2005- 2014
		Council		
	<ul style="list-style-type: none"> <li>Inadequate legislation &amp; policy on private sector</li> </ul>	NTTC/DVS NTTC /DVS	<ul style="list-style-type: none"> <li>Formulate ,Disseminate , legalise participation</li> </ul>	2005- 2006
<ul style="list-style-type: none"> <li>Inadequate standard testing procedure</li> </ul>	PCPB NTTC	<ul style="list-style-type: none"> <li>Formulation of guidelines</li> <li>Disseminate</li> </ul>		
2 Resource Mobilisation and allocation	<ul style="list-style-type: none"> <li>Inadequate motivation</li> </ul>	DVS, DPM	<ul style="list-style-type: none"> <li>Review scheme and terms of service</li> </ul>	2004
	<ul style="list-style-type: none"> <li>Inadequate resource (human, finance)</li> </ul>	Stakeholders	<ul style="list-style-type: none"> <li>Formulate project proposal on rural development</li> </ul>	2005- 2014
		Stakeholders	<ul style="list-style-type: none"> <li>Collect baseline data and information</li> </ul>	2005- 2014

	<ul style="list-style-type: none"> <li>• Inappropriate allocation of resources</li> </ul>	Stakeholders	<ul style="list-style-type: none"> <li>• Establish transparent recruitment procedures</li> </ul>	2004
		Stakeholders	<ul style="list-style-type: none"> <li>• Establish transparent procurement and purchase procedures</li> </ul>	2004
	<ul style="list-style-type: none"> <li>• High prevalence of HIV/AIDS</li> </ul>	Stakeholders	<ul style="list-style-type: none"> <li>• Formulate project proposals on rural development</li> </ul>	2005- 2014
3 Integrity enhancement	<ul style="list-style-type: none"> <li>• Misappropriation of project funds</li> <li>• Loss of donor confidence</li> </ul>	Council	<ul style="list-style-type: none"> <li>• Enforce audit procedures</li> </ul>	2004- 2014
		Council	<ul style="list-style-type: none"> <li>• Develop deterrent measures</li> </ul>	2004- 2014
		Stakeholder	<ul style="list-style-type: none"> <li>• Create awareness</li> </ul>	2004- 2014
4 Policy Enforcement	<ul style="list-style-type: none"> <li>• Inadequate enforcement</li> </ul>	Inspectorate/ KVB/DVS/ Council	<ul style="list-style-type: none"> <li>• Supervise and monitor</li> </ul>	2004- 2014

## 2.IMPROVE SERVICE DELIVERY

STRATEGIC OBJECTIVES	ISSUES	ACTIONS	RESPONSIBILITY	TIME FRAME
Research	<ul style="list-style-type: none"> <li>• Insufficient research data on tsetse and Trypanosomosis</li> </ul>	<ul style="list-style-type: none"> <li>• Updating existing data (together with farmers)</li> <li>• Continuous research</li> <li>• Documentation</li> <li>• Packaging research</li> </ul>	Research Institutions Projects Universities	2004 - 2014

Surveillance	<ul style="list-style-type: none"> <li>• Tsetse distribution</li> <li>• Livestock census</li>   <li>• Disease Situation (Trypanosomosis)</li>   <li>• Demographic information</li> <li>• Identify key verifiable data</li> </ul>	<ul style="list-style-type: none"> <li>• Survey <ul style="list-style-type: none"> <li>○ Tsetse</li> <li>}</li> <li>○ Trypanosomosis</li> <li>} GIS</li> </ul> </li> <li>• Livestock census</li> <li>}</li> <li>• Training</li> <li>• Baseline survey</li> <li>• Development of standards</li> <li>• Collect, correlate and disseminate data</li> </ul>	GoK KETRI  Community / Contracts	2004 - 2014
		<ul style="list-style-type: none"> <li>• Sensitisation</li> <li>• Recruitment of enumerators and village elders</li> </ul>		
		<ul style="list-style-type: none"> <li>• Development of questionnaire</li> <li>• Collect data from relevant organisations / departments</li> <li>• Establish fly breeding</li> </ul>		
Capacity building	<p>a) <b><u>Community</u></b></p> <ul style="list-style-type: none"> <li>• Creation of awareness</li> <li>• Culture</li> </ul>	<ul style="list-style-type: none"> <li>• Training</li> <li>• Exposure tours (within &amp; outside country)</li> </ul>	GoK, NGOs  CBOs	2004- 2006

	<ul style="list-style-type: none"> <li>• Traditions &amp; values</li> <li>• Attitude change</li> <li>• Community roles</li> </ul> <p>b) <b>Staff</b></p> <ul style="list-style-type: none"> <li>• Staff shortage</li> <li>• Specialised Training</li> </ul>	<ul style="list-style-type: none"> <li>• Train staff from other sections (local / international)</li> <li>• Recruit</li> <li>• Exposure tours</li> </ul>	GoK, NGOs Project DVS	2004- 2014
Integrated Health Management of livestock	<ul style="list-style-type: none"> <li>• Lack of Integrated pest management</li> <li>• Improper use of drugs</li> <li>• Use of counterfeit drugs</li> <li>• Therapeutic &amp; prophylactic treatments</li> <li>• Tsetse free zones</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of crush pens &amp; rural animal centres</li> <li>• Drug inspection</li> <li>• Training on use of traps/targets</li> <li>• Vaccination</li> <li>• Tick control</li> <li>• Treatment for Trypanosomosis</li> <li>• Conflict resolutions</li> <li>• Training in group dynamics and management</li> </ul>	GoK Community Private animal health providers Contracts Consultancies	2004- 2014
Security	<ul style="list-style-type: none"> <li>• Insecurity in ASAL areas</li> </ul>	<ul style="list-style-type: none"> <li>• Conflict resolution</li> <li>• Formation of peace committees</li> <li>• Exchange visits</li> <li>• Border security meetings</li> <li>• Grazing management</li> <li>• Provide watering points</li> <li>• Study cultures</li> </ul>	GoK Consultancies NGOs Communities Research Institutions	2004- 2014

### 3. INTEGRATION/COORDINATION OF STAKEHOLDERS

STRATEGIC OBJECTIVES	ISSUES	ACTIONS	RESPONSIBILITY	TIME FRAME
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Information Centre	<ul style="list-style-type: none"> <li>Lack of awareness among various stakeholders on tsetse and Trypanosomosis control</li> </ul>	1. Establishment of an information centre (Library, Website)	NTT Council	2004- 2006
		a) Sourcing of funds	NTT Council	2004- 2014
		b) Identifying a facility (based at a secretariat)	NTT Council	2005- 2006
		c) Equipping the facility	NTT Council	2005- 2006
		d) Data collection and collation	Information office	
		e) Information dissemination	Information office	2006- 2014
		f) Creating information office	NTT Council	2004
		2. Capacity building (Training)		2004- 2014
		a) Workshops	Stakeholders	
		b) Seminars		
		c) Barazas		
		d) Field days		
		e) Technical training		
		}		
Collaboration and coordination of stakeholders	<ul style="list-style-type: none"> <li>Lack of coordination among various stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Meetings</li> <li>Exchange programmes</li> </ul>	All Stakeholders All Stakeholders	2004- 2014

	<p>in tsetse control activities</p> <ul style="list-style-type: none"> <li>• Lack of clearly defined role of various stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholders analysis</li> <li>• Formation of networking task force</li> <li>• Defining and harmonising the roles of various stakeholders</li> <li>• Regional meetings</li> </ul>	<p>All Stakeholders</p> <p>NTT Council</p> <p>All Stakeholders</p> <p>Regional stakeholders</p>	
		<ul style="list-style-type: none"> <li>• Collection of feedback from stakeholders</li> <li>• Data consolidation and analysis</li> <li>• Sending feedback to the stakeholders</li> <li>• Programme review</li> </ul>	<p>M &amp; E Unit</p> <p>M &amp; E Unit</p> <p>M &amp; E Unit</p> <p>External reviews</p>	
HIV/AIDS	<ul style="list-style-type: none"> <li>• High HIV/AIDS</li> </ul>	<ul style="list-style-type: none"> <li>• Creating awareness</li> </ul>	GoK Consultancie	2004- 2014

	<p>HIV/AIDS prevalence countrywide</p> <ul style="list-style-type: none"> <li>• Diversion of resources to treatment</li> <li>• Food security</li> <li>• High number of orphans, widows and widowers</li> <li>• Polygamy</li> <li>• Poverty affecting service delivery</li> </ul>	<p>awareness</p> <ul style="list-style-type: none"> <li>• Counselling, testing and treatment</li> <li>• Training / Workshops</li> <li>• Provide prevention materials</li> <li>• Establish income generating activities</li> </ul>	<p>s NGOs CBOs Institutions</p>	
Gender Integration	<ul style="list-style-type: none"> <li>• Gender roles in delivery of services</li> <li>• Property ownership</li> <li>• Bias towards male service providers</li> <li>• Domination of decision making by males</li> <li>• Polygamy</li> </ul>	<ul style="list-style-type: none"> <li>• Identify correct players</li> <li>• Seminars / Workshops</li> <li>• Exposure tours</li> <li>• Education to change attitudes (men)</li> <li>• Affirmation action in recruitment of women in service delivery</li> <li>• Empower women to make decisions</li> <li>• Engage in income generating activities</li> </ul>	<p>GoK Consultancies Churches NGOs</p>	2004- 2014

# **ANNEX 3.4**

## **NATIONAL POLICY STRATEGY PAPER ON TSETSE AND TRYPANOSOMIASIS CONTROL / ERADICATION FOR UGANDA**

# NATIONAL POLICY STRATEGY PAPER ON TSETSE AND TRYPANOSOMIASIS CONTROL / ERADICATION FOR UGANDA.

## 1.0 BACKGROUND AND INTRODUCTION

Uganda lies astride the equator just east of the African continental divide. The country's outline is almost square and is confined between latitude 4°12'N and 1°29'S and longitude 29°34'E and 35°0'E.

The total area enclosed by the present boundaries is 241, 038 square kilometres. However, of the total surface area, 38,566 square kilometres (or 16%) is covered with water.

The annual rainfall varies from 510mm in parts of Karamoja (North-East) to 2160mm and above in Sesse Islands in L. Victoria. The rainfall is bimodal in most parts of the country, but unimodal pattern dominates the northern parts of the country. The country is divided into 7 agro-ecological zones, which include the Teso system Banana/coffee and Banana/cotton systems, the Northern and West Nile systems and the Montane and Pastoral systems.

According to the 2002 census, Uganda's human population is estimated at 26.4 million. Agriculture is the mainstay of economy, contributing 43% of the GDP, of which livestock contributes 7%. Current estimates of livestock population consist of 6.3 million cattle~ (of which 97% are indigenous breeds and only 3% are improved or exotic), 6.8 million goats, 1.1 million sheep, 1.7 million pigs, 32.6 million poultry, 55,000 rabbits and 28,576 Equidae (donkeys, camels and horses).

Uganda is one of the 37 tsetse-infested countries in Sub-Saharan Africa. It is estimated that 70% of the country is infested with eleven species of tsetse flies. These belong to the Palpalis Group, Morsitans Group and the Fusca Group. The Palpalis Group is the most widely distributed. Both Human African Trypanosomiasis (sleeping sickness) and African Animal Trypanosomiasis (nagana) are common in the tsetse- infested areas of the country

### 1.1 Human African Trypanosomiasis (Sleeping Sickness)

Human sleeping sickness disease presents two clinical manifestations, namely; the acute and chronic forms. (see maps 1 & 2)

- a) The acute form of the disease caused by *Trypanosoma brucei rhodesiense* is found in south-eastern and
- b) The chronic form caused by *Trypanosoma brucei gambiense* is found in north-western Uganda.

The human population at risk of contracting the rhodesiense sleeping sickness is approximately 3.4 million people. The number of sleeping sickness patients detected and treated in both foci is high and worrying, the attack rate being as high as 1 ,200 people per 100,000 people per annum in a number of micro foci.

## 1.2 Animal Trypanosomiasis (Nagana}

Animal trypanosomiasis in livestock is widespread throughout the country. Approximately 70% of the livestock is exposed to the risk of animal trypanosomiasis with about 40% of these in the high-risk areas. Including *T. congolense*, *T. vivax*, *T. brucei*, *T. brucei rhodesiense*, and *T. evansi*, *T. simiae*,

## 1.3 The Tsetse Situation

There are currently eleven species and sub-species of Glossina (Diptera, Glossinidae) of medical and veterinary importance in Uganda.

**Table 1: shows their distribution nationwide**

SPECIES	SPATIAL DISTRIBUTION
<b><u>Palpalis Group</u></b>	
1. <i>G. fuscipes fuscipes</i>	Mostly widely distributed throughout Uganda
<b><u>Morsitans Group</u></b>	
2. <i>G. morsitans centralis</i>	Along Uganda -Tanzania Border
3. <i>G. morsitans submorsitans</i>	Mid-Western areas
4. <i>G. morsitans submorsitans</i> , <i>ugandensis</i>	Northern region
5. <i>G. pallidipes</i>	Mid-Western areas with pockets along Uganda-Kenya border
<b><u>Fusca Group</u></b>	
6. <i>G. longipennis</i>	
7. <i>G. fusca congolensis</i>	Kotido district
8. <i>G. brevipalpis</i>	
9. <i>G. nigrofusca</i>	
10. <i>G. medicorum</i>	Semiliki
11. <i>G. fuscipleuris</i>	is a forested species

## 2.0 Current Strategies for Tsetse and Trypanosomiasis Control / Eradication

Since the mid 1986 Government has been putting in place macro-economic policies and public reforms aimed at creating enabling environment for economic development and improved delivery of goods and services. These include privatisation, liberalisation, decentralisation and democratisation. To address the problem of poverty, Government formulated the Poverty Action Plan (PEAP), which aims at improving the incomes and welfare of the poor who constitute 70% of population. In addition to the PEAP, a Plan for the Modernisation of Agriculture (PMA) was formulated and launched in 2000. PMA is holistic strategic multi-sectoral policy framework aimed at poverty eradication by transforming subsistence farmers into commercial market-oriented producers.

As a result of these policy reforms the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) under which the control of tsetse and trypanosomiasis falls, is no longer involved in direct service delivery .Subsequently, some of the functions like tsetse control have been divested to Local Governments, while clinical management of animal trypanosomiasis has been left to the private veterinarians and the provision of entomological and veterinary inputs left to the private sector. However, clinical management of the human disease is still under the central government.

Government recognises the tsetse and trypanosomiasis problem as a major hindrance to rural development and therefore ranks the control of sleeping sickness, nagana and the vector (tsetse fly) as a priority among its national programmes.

In accordance with the objectives of the multi-sectoral Plan for the Modernization of Agriculture and the African Union (AU) strategy for the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PA TTEC), a national Policy on Tsetse and Trypanosomiasis has been formulated. The policy emphasizes a systematic tsetse control and consolidation strategy that will progressively eradicate the vector and achieve complete elimination of sleeping sickness and nagana from Uganda, It has the following objectives and strategies:

### 2.1 To eliminate Tsetse Population

#### *Strategies*

- Maintain a national database on tsetse
- Institute a coordinated, effective, efficient stakeholder-led and gender responsive institutional framework for guiding, implementing, financing, monitoring and evaluating all aspects associated with tsetse eradication.

- Develop and disseminate scientifically feasible, economically viable and socially acceptable technologies for eradication of tsetse.
- Adopt community based "Area-Wide" approaches to eradication of tsetse flies using integrated interventions that are cost effective, sustainable, environmentally friendly and gender responsive.
- Build and strengthen capacity of the local administrations to effectively integrate tsetse eradication into the decentralized service delivery systems. Guide and support equitable participation of communities, civil society and private sector in tsetse eradication.
- Mobilize and equitably deploy and use resources for the eradication of tsetse flies.
- Align tsetse eradication programs with wider national policy guidelines and poverty guidelines and poverty-related programs.
- Harmonize national tsetse eradication programs internally and with regional initiatives, taking into consideration the transboundary nature of tsetse infestations.
- Enhance access and utilization of information on tsetse eradication by stakeholders at all levels.

## **2.2 To Eliminate Sleeping Sickness**

### ***Strategies***

- Maintain -a disaggregated database on sleeping sickness.
- Institute a coordinated, effective, efficient, stakeholder-led and gender responsive institutional framework for guiding, implementing, financing, monitoring and evaluating all aspects associated with sleeping sickness elimination.
- Adopt practical and strategic community-based interventions that are cost effective, sustainable, gender responsive and targeted to vulnerable groups, aimed at the elimination of sleeping sickness.
- Provide a minimum health care package for all persons afflicted by sleeping sickness.
- Develop and disseminate scientifically feasible, economically viable and socially acceptable technologies for elimination of sleeping sickness.
- Build and strengthen capacity of the local administrations to effectively integrate sleeping sickness elimination into the decentralized service delivery systems.
- Guide and support equitable participation of communities, civil society and private sector in sleeping sickness elimination.
- Mobilize and equitably deploy and use resources for the elimination of sleeping sickness.
- Align sleeping sickness elimination programs with wider national policy guidelines and poverty-related programs.

- Harmonize national sleeping sickness elimination programs internally and with regional initiatives, taking into consideration the transboundary nature of the vector and the disease.
- Enhance access and utilization of information on sleeping sickness elimination by stakeholders at all levels.

## **2.3 To Eliminate Nagana**

### ***Strategies***

- Maintain a disaggregated database on Nagana
- Institute a coordinated, effective, efficient, stakeholder-led and gender responsive institutional framework for guiding, implementing, financing, monitoring and evaluating all aspects associated with nagana elimination.
- Adopt practical and strategic community-based interventions that are cost effective, sustainable, gender responsive and especially target to endemic areas, aimed at the elimination of nagana.
- Monitor and regulate livestock movement and provide a minimum animal health care package in endemic areas during epidemics.
- Develop and disseminate scientifically feasible, economically viable and socially acceptable technologies for the elimination of nagana.
- Build and strengthen capacity of the local administrations to effectively integrate nagana elimination into the decentralized animal health service delivery systems.
- Guide and support equitable participation of communities, civil society and private sector in nagana elimination.
- Mobilize and equitably deploy and use of resources for the elimination of nagana.
- Align nagana elimination programs with wider national policy guidelines and poverty-related programs.
- Harmonize national nagana elimination programs internally and with regional initiatives, taking into consideration the transboundary nature of the vector and disease.
- Enhance access and utilization of information on nagana elimination by stakeholders at all levels.

## **2.4 To make more land available for human settlement, agricultural use and related economic activities.**

### ***Strategies***

- Adopt community-based approaches to eradicate tsetse using integrated interventions that are cost effective, sustainable, environmentally friendly and gender responsive.

- Develop and disseminate scientifically feasible, economically viable and socially acceptable technologies for maintaining tsetse-free habitats in reclaimed lands.
- Formulate guidelines that promote the profitable and sustainable utilization of reclaimed land for agricultural and other economic activities.
- Provide incentives to encourage human settlement and investment in tsetse-reclaimed areas.
- Build and strengthen capacity of the local administrations to effectively integrate sustainable land use strategies into the decentralized planning processes.
- Guide and support equitable participation of communities, civil society and private sector in maintaining a tsetse-free habitat.
- Mobilize and equitably deploy and use of resources for the maintenance of tsetse-free habitats.
- Align tsetse eradication programs with wider national land use policy guidelines and poverty-related programs.
- Enhance access and utilization of information on land use and land markets by stakeholders at all levels.

## **2.5 To improve agricultural production and productivity in tsetse reclaimed lands.**

### ***Strategies***

- Develop and disseminate scientifically feasible, economically viable and socially acceptable agricultural technologies and practices for sustainable utilization of tsetse reclaimed land.
- Provide incentives to encourage investment in tsetse-reclaimed areas.
- Guide and support equitable participation of communities, civil society and private sector in profitable and sustainable utilization of reclaimed land for agricultural and related economic activities.
- Mobilize and equitably deploy and use of resources for the utilization of tsetse reclaimed land.
- Enhance access and utilization of information on profitable enterprises and agricultural markets by stakeholders at all levels.

## **2.6 To strengthen the mandate of Uganda Trypanosomiasis Control Council (UTCC) and its Secretariat Coordinating Office for the Control of Trypanosomiasis in Uganda coordinate all multi-sectoral initiatives of tsetse and trypanosomiasis.**

### ***Strategies***

- Government to operationalize the activities of Uganda Trypanosomiasis Control Council (UTCC) and its secretariat COCTU are budgeted for and disbursed from Ministry of Finance, Planning and Economic Development and that UTCC shall operate as a self-accounting semi-autonomous body.

- COCTU shall be facilitated to conduct periodic meetings with all stakeholders and strengthen multi-sectoral approach on tsetse and trypanosomiasis at all levels.
- Conduct a detailed stakeholders' analysis to identify opportunities for sustainable linkages and determine roles and responsibilities.
- Strengthen opportunities and promote advocacy and information/ experience exchange about the importance of regional cooperation in tsetse and trypanosomiasis control and eradication programs including the NW *gambiense* and S.E *rhodesiense* endemic sleeping sickness foci.

## **2.7 To enhance, strengthening and consolidate awareness among the population about the problem of tsetse and trypanosomiasis.**

### ***Strategies***

- Identify information needs and establish appropriate communication and sensitization packages for different stakeholders and beneficiaries
- Sensitize civic and other leaders on issues pertaining to tsetse and trypanosomiasis including the potential risks based on gender roles as well as opportunities for the involvement of women in tsetse and trypanosomiasis control measures.
- Develop information communication and advocacy strategy from COCTU up to parish level.
- Re-orient the Private Health Providers and other health workers in and outside sleeping sickness endemic areas about sleeping sickness management and control.
- Identify critical gender concerns related to tsetse and trypanosomiasis in order to design appropriate gender responsive interventions.
- Establish practical interventions to target vulnerable groups in tsetse and trypanosomiasis control and eradication.
- Promote, strengthen and consolidate the involvement of the private sector in tsetse and trypanosomiasis activities and increase the dissemination and exchange of information on tsetse and trypanosomiasis program.

## **2.8. To establish and consolidate community empowerment**

### ***Strategies***

- Strengthen and support community initiatives aimed at tsetse and trypanosomiasis control and eradication.
- Develop and implement a capacity building plan.
- Regulate and monitor human and animal movements that contribute to the spread of sleeping sickness and nagana.

## **2.9. Institutional Framework**

Under the current decentralisation structures, the management and co-ordination functions is at four levels -national, district, sub-country and community. T& T eradication programs shall be developed and implemented at the four different levels.

The institutional framework shall be based on an autonomous, decentralised set- up based on community and stakeholder empowerment structures and a multitude of service providers under contractual funding arrangements.

## **2.10 Policy and Political Guidance**

The Uganda Trypanosomiasis Control Council (UTCC) shall be the National apex body made up of representatives from a wide range of stakeholders from the public and private sector service providers, political and policy analysis, and the wider community.

The Council shall be semi-autonomous, have clout for political and funding support form government and development partners, and also have powers to generate funds form facilities entrusted to it and from investments, which it will re- invest in supporting tsetse and trypanosomiasis eradication.

The Minister responsible for Agriculture shall have political responsibility for the council. There shall also e stakeholder committees at the district, sub-county and community levels.

Planning, resource allocation and monitoring and evaluation of all tsetse and trypanosomiasis eradication would strictly be under the direct management of the Council and its secretariat at the national level and the committees at the district, sub-county and community levels.

## **2.11 Administrative Co-ordination**

National programs shall be planned at a national level, focusing at problems and opportunities that have national significance, and especially dealing with strategic and epidemic situations.

Programs initiated at the lower levels shall primarily deal with activities aimed at

The Secretariat shall handle the day -to -day management of technical and administrative activities at national level, with capacity to provide leadership in strategic thinking and planning taking into account trends in wider national policy.

The technical team at the national level shall be co-ordinated by the secretariat, while those at the lower levels shall be supported by one of the technical departments mutually agreed upon.

## **2.12. Flow of funds**

Decentralized authority and responsibility implies that resources, including funds, are assigned to each level based on its allocated responsibilities. The funding mechanism shall allow direct flow of funds to the decentralized tsetse and trypanosomiasis eradication set-up and accountability will be given through the same set-up.

## **2.13. Empowerment structures**

Through democratisation and decentralisation, local authorities and a wider range of community members are gaining a stronger voice in setting priorities for government actions.

Communities shall form various interest groups and associations to ensure their voices and demands are firmly expressed for the tsetse and trypanosomiasis eradication service delivery.

Communities shall be represented in the policy and governance bodies at all levels.

## **2.14. Provision of services**

- The tsetse and trypanosomiasis eradication programme shall take recognition of the variety of organizations/agencies that can potentially participate in tsetse and trypanosomiasis control, both for funding and execution.
- There will be a minimum core of competent professionals in desired skills to plan, supervise and monitor the effective and efficient implementation of tsetse and trypanosomiasis activities at all levels.
- The involvement of various public and private institutional forms in the execution of activities shall allow the human resources and skills available for tsetse and trypanosomiasis eradication to be increased and efficiency to be enhanced by matching scientific skills with needs.
- Service providers would organize and position themselves to serve the demands and interest for efficient and effective tsetse and trypanosomiasis eradication.

In the past, efforts to control tsetse and trypanosomosis were undertaken by Uganda government, in partnership with several supportive countries and agencies, among which are: European Union, Department for International Development (DFID), Food and Agricultural Organisation (FAG), United Nation Development Programme (UNDP), World Health Organization (WHO), International Atomic Energy Agency (IAEA), the Federal Republic of Germany, African Union (AU/IBAR) and the government of France.

The control activities led to substantial reductions in the populations of tsetse flies, and the prevalence of animal trypanosomosis and sleeping sickness. Unfortunately, these successes have not proved sustainable mainly because of the inability to implement long-term tsetse control programmes that would have prevented re-invasion from un-reclaimed areas.

At present tsetse flies are controlled using an integrated approach that takes into account the ecology and disease risk of the area. For instance bait systems (trapping, use of targets, pour-ons, dipping and hand spraying) and aerial spraying have been applied in various parts of the country since independence. Several projects have focused on alleviating sleeping sickness, particularly in the traditional foci in southeast and northwestern Uganda using application of synthetic pyrethroids on livestock and pyramidal traps deployed within community based programmes.

The acute form of sleeping sickness caused by *T.b. rhodesiense* present in southeastern and north eastern Uganda is controlled through diagnosis and chemotherapy augmented with tsetse control and the treatment of cattle reservoir hosts. The chronic form of sleeping sickness present in northwest Uganda is currently being controlled through surveillance and treatment but, because domestic animals are not considered to be an important reservoir for the parasite, controlling the disease in livestock is not practiced.

On the other hand, animal trypanosomiasis is controlled directly through the use of chemotherapeutic and chemo prophylactic drugs.

### 3.0 Planned Action

The Government of the Republic of Uganda has planned to implement a programme to create tsetse free zones along the Lake Victoria Region using an area-wide Integrated Pest Management (IPM) strategy, i.e. the management and elimination of entire tsetse populations within potentially large circumscribed areas.

To attain this goal of creating tsetse free zones in Uganda, the programme intends to integrate the Sterile Insect Technique (the sequential release of sterile male flies) with other conventional control methods e.g. the Sequential Aerosol Technique (SAT), traps, insecticide pour-on in a phased and dynamic way.

The Programme area covers approximately 40,000 km<sup>2</sup> of the *Glossina fuscipes fuscipes* and *G. Pallidipes* fly belt stretching from Rakai in the south-west progressing clockwise northwards to include the Lake Kyoga basin and eastwards up to the Uganda-Kenya border (Map 1)

Demand driven research during implementation of the programme will be undertaken in close liaison/collaboration with the National Agricultural Research System (NARS) e.g. NARO, Universities, the private sector within and outside Uganda e.t.c. depending on their comparative advantage.

Extension services will be carried out using National Agricultural Advisory Services (NMDS) arrangement where it exists. In areas, which are not covered by NAADS, conventional extension services and contracting will be utilized.

The Integrated Area-wide Tsetse Eradication Programme will collaborate and compliment the efforts of such programmes like FITCA, the Livestock Productivity Improvement Project to be implemented in the cattle corridor, the World Bank / GoU funded, Lake Victoria Environment Management Project (LVEMP), the Vegetable Oil Development Project and any other projects that are addressing, health, poverty reduction in the country whether these projects are within the Ministries of Agriculture, Health or any other government ministry or organisation. This will ensure prudent utilisation of resources without duplicating efforts.

# **ANNEX 3.5**

## **POLICIES AND STRATEGIES FOR TSETSE CONTROL / ERADICATION IN THE SUDAN**

# POLICIES AND STRATEGIES FOR TSETSE CONTROL/ERADICATION IN THE SUDAN

## INTRODUCTION:

Sudan largest country in Africa 2.5 million km<sup>2</sup> extends between latitude 4° 22' North. Borders 9 countries Egypt (North) , Libya (Northwest) Chad (West) Central Africa Republic (Southwest) Uganda , Democratic Republic of Congo and Kenya (South) Ethiopia and Eritrea (East) . Red sea in the North East.

Climatic conditions are diverse. Average rainfall varies from 25 mm in the North to 1500 mm in the South. Temperature from 40 C° to 6 C° in the North and West. River Nile runs through the country from South to North, a distance of 2258 km .Six agro-ecological zones are identified, desert, semi desert, low rainfall savannah, high rainfall savannah .The country is generally flat with highlands confined to the east (Red Sea hills) and the Southwest (Jebel Marra , the Nuba and Imatong Mountains ).

Livestock population amounts to 121 million heads (33 million cattle; 45 million sheep; 41 million goats and 3 million camels). The animal production systems are nomadic, transhumant , sedentary , migratory agro pastoral sedentary irrigated crop-livestock system.

Over 80% of the livestock is kept under transhumance management. Livestock contributes by approximately 23% of the gross domestic product and 20% of foreign exchange earnings.

## TSETSE AND TRYPANOSOMES SITUATION IN SUDAN

The Tsetse flies in the Sudan occupy an area of more than 300.000 km<sup>2</sup> that include parts of the woodland savannah of the Southern States , Southern Darfor and the Blue Nile State.

Seven species of Glossina were reported to occur in Sudan ( *G. morsitans* submorsitans, *G. f. fuscipes*, *.pallidipes*.*G. trachenoides* , *G. fusca*, *G. longipennis* and *G. fuscipleuris* ).

The area infected by tsetse flies in the Sudan (300 thousand km<sup>2</sup>) is reclaimed from tsetse flies can support about 10 million head of cattle. Therefore, it was estimated that the losses in beef production alone in the Sudan due to tsetse infestation exceeds US\$ 150 million annually .There are also considerable losses due to milk production , skins ,production of small ruminants as well as the losses of animals energy as source of traction power and soil fertilizers. It estimated that 0.3% of cattle population in the Sudan die of trypanosomosis annually which is amounted to more than US\$ 25 millions. The cost of animals trypanocidals imported annually exceeds US\$ 25 millions.

The human populations under risk of contracting sleeping sickness in Sudan is estimated to be about one million persons and there is a severe disease epidemic now in Southern Sudan causing human sufferings, loss of efficiency and high degrees of mortalities. Tsetse control avail more land and pastures to cattle owing tribes and helps in minimizing tribal frictions over land and contributes to peace building in the country.

In recognition of the importance of trypanosomosis , as revealed by the TCO, a National Tsetse and Trypanosomosis Committee has been established to provide guidance and direction to institutions dealing with tsetse and trypanosomosis control, as well as to coordinate their activities.

## **POLICY AND STRATEGIC PLAN FOR TSETSE CONTROL IN THE SUDAN**

Tsetse flies represent major countries to upgrading programmes & livestock due to the considerable loses they cause .During the dry season when the density is low large numbers of the migratory herds of the North enter and stay in the tsetse belt where pasture and water are plenty. While those of the South get in contact with tsetse flies during the rainy season where migrate to the high lands avoiding the numbers biting flies and water logged conditions in the low lands and the swampy area. In recent years due to successive cycle of drought and the current civil war, the nomads were obliged to go deeper and stay longer in highly tsetse infested areas. Thus their animals suffer high levels of infection, consequently heavy losses occur due to increased morbidity, low fertility and production. The disease in domesticated animals is endemic and the frequency of drug treatments and densities of vectors influence the prevalence rate .In the tsetse belt inhabitants are enforced to keep few unproductive animals around due to the continual high challenge of trypanosomosis .

Due to abuse of trypanocides the trypanosomes have developed a high degree of resistance against most of them Recent studies conducted in migratory cattle entering the tsetse belt of Southwestern Sudan showed the emergence of serious trypanocidal drug resistance problem among these herds. Multiple drug resistance to all available trypanocides was reported to occur causing heavy losses. This situation has led to complex and serious animal trypanosomosis problems in the country and makes control of tsetse fly in the Sudan a necessity .

Data on patogenesis, host-parasite-vectors interaction, economic impact and other epidemiological parameters of tsetse and trypanosomosis in domestic animals warrant urgent consideration. This goal is currently difficult to fulfill because of several constrains which include :-

- 1- **lack** of trained personnel on tsetse and trypanosomosis aspects.
- 2- **lack** of well equipped laboratories.
- 3- **Inadequate** facilities for field work.

## **THE PROPOSED PROJECT:**

### **Objectives: -**

The present project is meant to apply suitable and sustainable integrated and environmentally friendly control strategies in the Sudan that lead to tsetse eradication, which will contribute to improvement of human welfare and upgrading their standard of living.

### **Specific objectives :**

#### **Long term objectives:**

##### **a. Capacity building:**

To create an atmosphere conducive to productive activities that will achieve the proposed goals through:-

- Training the staff to carry out research on all aspects of tsetse and trypanosomes that would eventually lead to formulation of economic effective control strategies.
- Construction of well equipped laboratories and mass-rearing units that enable the execution of the project activities.
- Establish field –work facilities for surveys and surveillance purposes.
- Create public awareness of the tsetse and diseases they transmit and to involve the communities in the project activities.

##### **b. Tsetse eradication:**

To eradicate tsetse flies from the country by using SIT techniques.

#### **Short term objective :**

- a. To up-date maps of tsetse distribution .
- b. To determine prevalence and incidence of trypanosomosis in man and animals.
- c. To study biology , ecology and population dynamics of tsetse species of economic importance.
- d. To study host-parasite-vector interaction.
- e. To evaluate the susceptibility level of trypanosomes to different trypanocidal drugs and to formulate optimal and effective chemo-therapeutic and chemo-prophylactic control measures for animal trypanosomosis .

- f. To determine the economic impacts of tsetse and trypanosomosis on productivity of livestock.
- g. To establish trypanosomes bank.
- h. To train the staff and community members on recent developments related to epidemiology , diagnosis and management of tsetse and trypanosomosis to achieve the proposed goals.

### **Area proposed for tsetse control in the Sudan :**

The localities that are proposed for tsetse control in the Sudan are:-

**One :** Bahr-El-Arab area of 40.000 -km<sup>2</sup>

**Two :** Khor-Yabus/Akobo area of 180-km<sup>2</sup>.

**Three:** Juba area-Bahr El-Jebal State, area of 100-km<sup>2</sup>

**A joint team** will be formulated with the **Ethiopians** and **FAO** task force may be involved as a mechanism through which reclamation of tsetse fly will be executed.

### **Justification for area selection :**

These localities were selected foe the following reasons:-

- a. Area one and two are found at the fringe of the tsetse belt and the fly population is under environmental pressure due to the long very hot dry season. There are well-established tsetse –field stations in those areas, while in area three the fly prevalence is naturally low although HAT prevalence is high. These areas are the dry –season grazing grounds for millions of cattle.
- b. The local people of these areas acquired the skills of raising animals in tsetse-infested areas problems .

So it is advisable to start the fly control operations in those areas.

### **The proposed control methods :**

#### **1. Tsetse control:**

##### **1-1 Traps and targets:**

Odour baited and deltamethrin impregnated traps and screens that were proved to be most cost-effective against the target tsetse species will be diploid by local communities . The screens will be diploid at a density of 4 km<sup>2</sup> .

The traps and targets will be treated with deltmethrin at a concentration of 0.3% and re-treated each 6 months by the community.

To prevent re-invasion of the controlled areas treated screens will be used in holding lines.

### **1-2 Selective ground spraying :**

The resting and breeding sites of the target tsetse species will be sprayed with deltamethrin during the dry –season to increase percentage kill of the flies.

### **1-3 Living –insecticide :-**

Cattle will be treated with deltamethrin at the recommended dose , before they enter the infested area to increase the percentage kill of those to reduce the challenge. The frequency of treatment is determined according to the level of challenge.

### **1-4 Partial bush clearing :**

Partial bush clearance to deprive tsetse shelter along rivers and around water points in order to make the microhabitat unsuitable for tsetse survival during the dry-season.

## **2. Human-trypanosomosis control :**

In a keen collaboration with Health Authorities a sustainable control campaign will be conducted and aimed at suppression of the disease in human by mean of :-

- a. Fixed-post surveillance .
- b. Active screening.
- c. Case management .
- d. Follow-up of patients after treatment.

## **3. Animal-trypanosomosis control :**

The drug strategy used will be suitable to nomadic husbandry and seasonal animal-vector-contact. The drug must be used under strict Veterinary supervision .The treatment teams will be operating from selected gathering points of cattle .

At the start of the protocol , the selection of animals to be treated will be left to owners judgment and with time they would accept the treatment of the animals in the herds with the control-team .

The selected trypano-prophylatic drug will be used to protect animals crossing or kept in tsetse belt. The prophylaxis poster dose will be applied when 5% of animals were infected.

## Plan of work :

The proposed project will be executed in three phases with a duration of 5 years.

### 1. Phase –one : Preparatory -phase (Duration 12 months): The main activities are:-

#### 1-1 Identification of participants :

- a. Veterinarians and Physicians.
- b. Biologists and Social Scientist .
- c. Technicians.
- d. Recruitment of supporting staff.
- e. Community health –workers and animals –health workers.

#### 1-2 Procurement of equipment, chemicals, reagents and supplies needed to ensure the starting of the detailed work plan.

#### 1-3 Construction of tsetse mass-rearing units in Radom Field-Station and Juba laboratory to start seed colonies for *G. morsitans submorsitans* and *G. fuscipes*

#### 1-4 Training courses and community dialogue :-

- a. **Entomological techniques** : trapping, sampling, identification, dissection, characterization, tsetse rearing, sterilization and other relevant methods.
- b. **Parasitological techniques**: Novel trypanosomosis diagnostic techniques. Trypanosomes cry preservation, characterization and *in vitro* culture techniques.
- c. **Data –base analysis**
- d. **Community empowerment** : Training and formation of voluntary community development co-ordination committees (CDCC).

#### 1-5 Initial survey and studies :-

An extensive survey will be carried out during the dry season for 2 months in the proposed control area. The monitoring will be carried out in different ecological zones to achieve the following activities:-

- a. To assess the efficacy of different trap designs for fly sampling using suitable Latin Square design and electric nets aiming to

select the most effective trap to be used surveys, and most cost-effective one to be used for control purposes.

- b. To determine the distribution limit of tsetse belt and to assess species diversity and apparent density.
  - To determine infection rates in the collected flies.
  - To collect pupae and tsetse flies from widely separated geographical areas and variety ecological zones for colonization and characterization purposes .
  - To select and identify suitable areas for executing phase-2 activities.

#### **1-6 Trypanocides- susceptibility studies :-**

Whole blood samples from naturally infected cattle will be collected and inoculated into groups of experimental animals each of 5 heads and treated at the point of infection with the trypanocides to select the most effective drugs. The treated animals will be monitored at weekly intervals for trypanosome-infection .Determination of the curative time for dosing a suitable trypanocidal will depend on the use of parasitological methods .Trypanosome isolates must be collected and preserved from relapsed animals and kept for future studies to determine the resistance level.

#### **1-7 The main outputs of the phase :-**

- a. The staff of the project will be well identified and trained.
- b. Well-equipped laboratories and colony rearing units will be established and good supporting staff, that enable the execution of the project, will be identified.
- c. The tsetse infection rates, distribution and the apparent density of the target species in the control areas will be determined using GIS .
- d. The most effective and the most cost-effective traps will be identified .
- e. Colonies of the target tsetse fly species will established.
- f. The most effective trypanocidal drugs will selected based on susceptibility levels of trypanosomes species.

## **2. Phase two : Research studies required for the project :-**

### **2-1 Applied research activities :**

#### **2-1-1 Entomological studies :**

##### **a. Population dynamics :**

Transect/trap and fly-round techniques will be used for sampling the tsetse flies for 5 days each season throughout the year in the selected study area (**Phase –1**) .The following parameters will be assessed .

- The apparent density and seasonal-relative abundance of the target tsetse species during the study period.
- Species diversity.
- Physiological characters of tsetse-population (average age, infection rates, sex ratio, animal host) in the study area.
- Vegetation habitat type of occurrence , resting ,breeding and host-fly –contact sites.
- Effect of different odours on tarp efficiency using an electric net .

##### **b. Mass-rearing and sterilization of the target tsetse species :**

Research work is needed in all aspects of fly rearing, biology, crossbreeding, radio-sterilization trails and study of the competitiveness of the irradiated males in the field.

#### **2-1-2 Parasitological studies :**

An intensive studies and monitoring surveys for trypanomosis will be carried out in the selected areas (**Phase-1**) for a period of 12 months to assess the diseases prevalence and incidence rate both in human and domestic animals.

##### **a. Animal trypanosomosis (Infection rate):**

Blood samples will be collected from selected resident herds at monthly intervals throughout the year , and also from nomadic migratory herds at time of entering of the dry-grazing area “tsetse belt” , and at regular intervals during their stay in the belt and lastly when arriving the rainy season grazing areas .The parasitological techniques (blood smears and trypanosome-concentration techniques) will be used to detect

the infection in the field and serological techniques to assess the actual prevalence rate .

Whole blood from individuals with high infection rate will be collected and cry-preserved in liquid Nitrogen and transported to Central Veterinary Research Laboratories to be kept as references for further studies .Samples collected will be characterized using PCR technique.

**b. Human trypanosomosis :**

An active surveillance for human trypanosomosis will be carried out in the selected areas (**Phase-1**) during the dry-season to assess the disease sero-prevalence rate using CATT technique.

The parasitological techniques recommended by WHO will be use to confirm the infection and to identify the clinical phase of the disease .The positive cases will be hospitalized and treated with the suitable drug.

Whole blood and sera from individuals with high infection rates will be collected and cryo-preserved in liquid Nitrogen and transported to Tropical Medicine Research Institute to be kept as references for further studies .

**2-2 Assessment of some indicators:-**

Some indicators will be assessed to evaluate the percentage control achieve and the effects of the control materials on the ecosystem of the control-area .The proposed indicators include the followings:-

- a. Relative density of the tsetse-natural enemies and the honeybees.
- b. Relative density of the biting flies and house flies.
- c. Tick infestation rate and species diversity.
- d. Susceptibility of tick species and housefly to deltamethrin.
- e. Density and diversity of certain aquatic living organisms.
- f. Insecticide-residual level in the soil and consumption-water.
- g. Sentinel herds management :

Sentinel herds will be kept at permanent tsetse challenge. A herd of about 90 heads of different cattle breeds will be kept under permanent tsetse challenge in a selected study area through the year. The herd will be divided randomly into five groups.

Group "A" will be sub-divided into 4 sub-groups each of 9 animals and treated with an insecticide at 1,2,3 and 4 weekly intervals with the recommended dose, respectively.

Group "B" of 14 animals will be treated with the prophylactic drug.

Group "C" of 20 animals will be treated with both the insecticide and the prophylactic drug.

Group "D" sentinel herd of 20 head will be treated with the suitable curative drug at point of infection to measure .

- Infection rate and
- Prophylaxis duration of the prophylactic drug

During the following-up period , the following parameters will be assessed

### **2-3 Parasitological and clinical parameters to be assessed at weekly intervals:**

- a. Trypanosomes infection rates in cattle.
- b. Number of treatments .
- c. Level of anemia in different cattle groups using PCV and Hb.
- d. Percentage morbidity and mortality .

### **2-4 Production and economic parameters to measure diseases impact and control cost benefits:**

- a. Treatment costs.
- b. Conception rate .
- c. Abortion rate.
- d. Calving rate.
- e. Growth rate.
- f. Milk yield.

### **2-5 The main outputs of the phase :-**

- a. The population dynamics of the target tsetse species will be well studied.
- b. The effect of odour-bait on fly catch and efficacy of the traps will be assessed.
- c. The trails for mass rearing and sterilization of male insect will be conducted.

- d. Human and animal trypanosomiasis epidemiology will be studied.
- e. The case-detection and treatment strategy for HAT control will be executed.
- f. The economic impact of animal trypanosomiasis under tsetse challenge and the control cost-benefits will be assessed.
- g. Bank of isolated trypanosomes will be established.
- h. A suitable integrated strategy for tsetse and trypanosomiasis control will be formulated and tested under field conditions.
- i. The participants will have adequate training in the use of applied control methods.

3- **Phase –three : Tsetse and Trypanosomiasis Integrated-Control:  
(Duration 36 months)**

**3-1 Area –wide control :**

The control methods tested (**Phase-2 section 2.2**) and proved to be effective and environmentally safe will be applied to control the tsetse and trypanosomiasis in the proposed control areas (section 4) for a period of 3 years .

**a. Control methods:**

- Insecticide baited cattle.
- Insecticide impregnated targets.
- Selective ground spraying .

**3-2 Mass-rearing:**

Mass-rearing activities to produce and secure an adequate sterile males will be carried on during the period of this phase.

**3-3 The main outputs of the phase :-**

- a. The tsetse population and trypanosomiasis prevalence and incidence rates will be reduced at a level that allows applying SIT.
- b. The mass rearing and sterilization of male insect activities will be executed to secure adequate sterile males.

#### **4- SIT application:-**

Sit will be applied when , the tsetse population density level was tremendously reduced, effective artificial barriers were made, mass-rearing activities and colonies of the target tsetse species were established, an adequate sterile males were produced and will be secured when needed and when effective prophylactic drugs were identified and will be secured for compulsory treatment of animals found in the control areas.

#### **5- Over-all expected outputs:**

- 5-1 Eradication of tsetse fly with consequent better utilization of the natural resources that lead to an increase in the national gross product (NGP).
- 5-2 Improvement of livelihood of the people in the tsetse affected areas.
- 5-3 Increase in the production of the national herd due to tsetse and trypanosomosis control.
- 5-4 Availing more land for grazing and hence minimizing tribal conflicts adding to peace building in the Sudan.