

**NATIONAL STRATEGY DOCUMENT FOR THE CONTROL OF ANIMAL
TRYPANOSOMOSIS AND TICK-BORNE DISEASES IN NIGERIA**



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FOREWORD

With a population of over 200 million, Nigeria has an estimated 20.1 million head of cattle, 44.5 million sheep, 78.1 million goats and 7.9 million pigs, Nigeria is a privileged area for pastoral activity.

Despite the numerical, genetic and animal production potential of Nigeria, the expanding livestock sector is facing diverse challenges which includes, poor genetics, inadequate feeding, poor husbandry practices and health constraints. One of the major health challenges is Animal Trypanosomosis and Tick-Borne Disease (AT & TBD).

In Africa, it is estimated that 50 million cattle and 270 million small ruminants are exposed to animal trypanosomosis, resulting in the death of 3 million head of cattle, the loss of approximately one million tonnes of milk and 500,000 tonnes of meat each year. In sub-Saharan Africa alone, in 2011, the trypanocides market was valued at more than 18 million USD. The impact of trypanosomosis and tsetse flies has led countries to mobilize partners to fund an impressive number of projects in Africa. In Nigeria, the impact of AT&TBD has been recorded.

Tick-borne diseases (TBDs) remain a limiting factor in cattle breeding. Various experiments have made it possible to calculate the loss of live weight of cattle depending on the specie of ticks involved: cattle live weight loss is estimated to be between 55 and 76 g per engorged female of *Amblyoma variegatum* and 30 engorged females of *A. maculatum* induce a loss of 1 kg of body weight. These losses do not only concern meat and milk production but also leather.

In Nigeria 60% of tsetse infested land areas would have been suitable for livestock or mixed agricultural development. Greater parts of the best watered and most fertile land areas are tsetse infested, while large areas of good grazing, mostly, the sub-humid zone, could have been immediately utilized by pastoralists if freed from tsetse. It is estimated that 30% of cattle in Nigeria are continuously expose to the risk of trypanosomosis. The cost doses of trypanocidal drugs used in Nigeria is estimated to be in excess of N12 million per annum. It has been estimated that N10.64 billion is lost annually in cattle alone in the northern states, apart from more than N912.0 million spent annually in the importation of trypanocidal drugs. Losses in livestock due to the disease are estimated at N29 billion annually nationwide. The annual loss in meat production alone due to

trypanosomosis is put at N5 billion. This excludes losses in milk and mixed agriculture where traction and manure play vital role. In African agriculture, animal provide more than 80% of the traction power.

The development of this strategy document for the control of Animal Trypanosomosis and Tick-Borne Diseases is a welcomed development in the annals of our great country. It is hoped that this strategy will hopefully chart the beginning of a roadmap towards a conscious and meaningful control and eradication of AT & TBDs in the country.

DR MOHAMMAD MAHMOOD ABUBAKAR
Honourable Minister of Agriculture and Rural Development, Abuja.
January 7, 2022

ACRONYM

AGH	African Government Heads
AT	Animal Trypanosomosis
AU/IBAR	African Union Inter-African Bureau for Animal Resources
CVO	Chief Veterinary Officer
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization
FMARD	Federal Ministry of Agriculture and Rural Development
FCT	Federal Capital Territory
GDP	Gross Domestic Product
HMA	Honorable Minister of Agriculture
M & E	Monitoring and Evaluation
NAQS	Nigeria Agricultural Quarantine Service
NASS	National Animal Sample Survey
NCC	National Coordinating Committee
NITR	Nigeria Institute for Trypanosomosis Research
NVRI	Nigeria Veterinary Research Institute
OAU	Organization for African Unity
OIE	World Organization for Animal Health
PATTEC	Pan African Tsetse and Trypanosomosis Eradication Campaign
SSA	Sub-Saharan Africa
TCE	Technical Committee of Experts
VCN	Veterinary Council of Nigeria

EXECUTIVE SUMMARY

According to the National Animal Sample Survey (2018), Nigeria livestock population figure is put at cattle 20.1 million, goats 78.1 million, sheep 44.5 million, pig 7.9 million and poultry 233.3 million. The full development of the potential contributions of livestock species to our national food security and economy has been adversely hampered by the preponderance of diseases. Animal trypanosomosis and tick born-diseases, among other diseases, have been a challenge to livestock production in Nigeria over the years. Tsetse flies and the disease it transmits, trypanosomosis, remain an enormous disease challenge in Nigeria where the impact continues to be manifest in disease burden, increased level of poverty and decreased agricultural productivity. The impact also includes denying humans and livestock of potentially rich arable and pastureland. The disease is a threat to Nigerian's livestock population shown by stock mortality and depressed productivity, which may be of meat, milk, reproduction or traction. The challenges that the elimination or control of tsetse fly and trypanosomosis pose as well as the opportunities to develop appropriate intervention technologies are discussed in this presentation.

Ticks on the other hand adversely affect livestock hosts in several ways: they contribute to unthriftiness and anaemia by exsanguination; they damage hides and subject livestock to secondary infection; they cause toxicoses and paralysis by the injection of their salivary secretions; and, most importantly, they transmit pathogenic agents that cause diseases, many of which result in debility and death. Of the many tick-borne livestock diseases, four are of particular concern: bovine anaplasmosis, bovine babesiosis, theilerioses, and heartwater. The economic impact of ticks and the diseases they transmit is enormous. Not only is the annual global cost of ticks and tick-borne diseases estimated to run to thousands of millions of naira, but also mankind is deprived of a significant amount of animal protein that cannot be replaced from other sources

The problem of AT & TBDs is not only a problem in Nigeria, but in the West African sub-region and some parts of Africa. The ECOWAS RAHC, Bamako, Mali is willing to support 8 countries within the sub-region Nigeria inclusive, to control AT & TBDs.

The general objective of this national strategy is to develop a control for animal trypanosomosis and tick-borne diseases by proposing priority actions to be carried in Nigeria.

1.0 INTRODUCTION

Animal trypanosomosis and Tick-Borne Diseases (AT & TBDs) are parasitic diseases that causes serious economic losses in livestock from anemia, loss of condition and effects on reproduction. Losses in cattle are especially prominent. Animals other than livestock, including dogs, can also be affected.

Trypanosomosis is a significant challenge for livestock health and economic performance in Nigeria, West Africa and sub-Sahara Africa (SSA). It is caused by the trypanosome parasite that causes nagana in domesticated animals and sleeping sickness in humans. Livestock production plays an important economic and socio-cultural role in the livelihoods of rural households, such as food and nutrition supply, and source of draught power, employment income, soil fertility, and capital accumulation. In Nigeria, livestock production accounts for 70% of total household income across all livestock production systems. Nigeria also houses over 100 million livestock keepers who live below US\$ 2 per day. The dependence of farmers on livestock for livelihood makes them vulnerable to various diseases, including trypanosomosis. Estimates show that 75% of the country's livestock population are found in tsetse-fly-infested areas and are at risk of trypanosomosis.

Animal Trypanosomosis reduces milk and meat production with a resultant drop in income of livestock farmers. It indirectly affects land use by reducing the draught power productivity of oxen. Because of the risk of trypanosomosis, farmers avoid productive tsetse-fly-infested areas, which might need to be used in the face of high population growth.

In Sub Saharan Africa, Animal Trypanosomosis is estimated to cause 3 million deaths of cattle with an annual direct economic loss of US\$ 1–1.2 billion in cattle production. Accounting for indirect economic losses, SSA may lose up to 4.75 billion of GDP per year. It has been estimated that N10.64 billion is lost annually in cattle alone in the northern states of Nigeria. Achieving the Sustainable Development Goals (SDGs) needs to address the livestock sector's constraints, one of the key sources of livelihood for poor people. Given that SSA is one of the world's regions where food insecurity and malnutrition are widespread, controlling trypanosomosis is one potential avenue to improve livelihood. To avoid economic losses from trypanosomosis and further increase the

livestock sector's productivity, the African Union (AU) established the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC) in 2000. Through the PATTEC, the AU envisions a continent with no trypanosomiasis. It assists countries by providing financial, policy, and institutional support to reduce the impact of trypanosomiasis. Multilateral institutions, such as the Food and Agriculture Organization (FAO), collaborate with the AU by providing technical and financial support to eradicate the disease. Even though these institutions spent a significant amount of financial and non-financial resources, trypanosomiasis remains a threat to Nigeria, ECOWAS sub-region and Sub-Saharan Africa. Various tsetse fly and trypanosomiasis controlling techniques have been used in the past. Treating sick animals using trypanocides is one of the most commonly used approaches. Also, preventive measures that target the tsetse fly vector itself are widely used in various communities. These measures include clearing the habitat of the tsetse fly. Despite the initial successes of using these approaches, with few exceptions, Nigeria, the ECOWAS sub-region and Sub-Saharan Africa has not still been able to control trypanosomiasis. Drug resistance is one of the challenges facing livestock producers. Low quality and counterfeit drugs further worsen the problem of resistance to trypanocides. Even though rearing trypanotolerant breed of animals seems promising, the proportion of animals with the required level of resistance is small, and importing these breeds to other production contexts proved difficult. Clearing forests and vegetation, killing game animals, and pesticide spraying are not environmentally friendly and are also not compatible with the SDGs, emphasizing balancing development outcomes and environmental sustainability.

The development of this strategy document marks another bold attempt to control AT & TBDs in Nigeria and the ECOWAS sub-region.

2.0 LIVESTOCK SECTOR

The agricultural sector in Nigeria is a major catalyst for economic growth and livelihoods, currently employing about 70 percent of the active population in the country. According to a National Agricultural Sample Survey, the livestock population in Nigeria is projected to consists of cattle 20.1 million, goats 78.1 million, sheep 44.5 million, pig 7.9 million and poultry 233.3 million (NBS, 2018).

Livestock sector is an integral part of agriculture and vital to the socio-economic development of the country; contributing about 3-4 percent to the Gross Domestic Product (GDP) and 15 percent to the agricultural value added (FMARD, 2016). The sector also plays a critical role in employment and income generation, and it is a major provider of food. It is worth noting that actual demand for livestock products (beef, mutton, chevon, pork, milk and eggs) are higher than production indicating importation of these products to meet demand. For example, current supply of beef in Nigeria stands at 200 metric tons as against the demand of 360 metric tons, with a shortfall of 160 metric tons. Beef accounts for about 45 percent of the total meat consumed in Nigeria. It is the most popular amongst animal protein sources apart from fish. To meet its shortfall, the country depends on its neighbours (Niger, Cameroun, Chad, Sudan, Burkina Faso), where up to 30 percent of all cattle slaughtered are obtained through formal live cattle trade.

2. 1 Livestock Production Systems

Livestock production can be grouped into three, they are:

2.1.1 The Pastoral (Fulani or extensive system) – In this production system livestock are kept on pasture where they are fully exposed to sunshine, rains, etc, least protection from the environmental hazard is given to the animals. It is cheap in terms of feeding; capital investment is relatively lower because housing and equipment are minimal or absent. The disadvantage of this system is that animals are exposed to environmental hazards such as parasites, and harsh weather condition.

2.1.2 Semi-intensive system -This system combines controlled grazing and feeding in stalls with adequate housing. Animals are kept partly indoors and partly on pastures. This system combines the advantage and disadvantages of both extensive and intensive systems.

2.1.3 Feedlot or intensive system – This system involves continuous housing and zero grazing. Animals are raised indoors throughout on concrete or hard floor that can be easily cleaned on a daily basis. Housing is more elaborate with adequate shelter, shade and pen space. Here parasite problem is greatly reduced. Feeding cost is higher than under extensive and semi-intensive system, and

involves use of crop residue utilization, Agro-industrial by-products, concentrates, etc. Other costs include housing, water and veterinary care.

2.2 Livestock Value Chains

The Livestock value chains are dominated by direct transactions between producers and livestock traders. These traders resell live animals to others who mostly supply butchers, processors, supermarkets, butcheries and cooked beef, mutton, chevon and pork sellers in restaurants and streets. Development actions, when they exist at government level, are more often related to disease control and genetic improvement through government owned centers or programs.

Some livestock are good in converting agro-industrial by-products, crop residues and concentrates; while the pig is better in converting concentrates and household waste into quality animal protein. Average carcass yield for the Nigerian Cattle, Sheep, Goats and pigs are 123.7 kg, 12.1 kg, 15.1 kg and 46.0 kg respectively. The short cycle, prolificacy, ability to survive on wide range of feed, and high carcass yield compared to ruminants are all comparative advantages of pig production.

2.3 Livestock Sector Growth

The development of the livestock sector depends on the ability of stakeholders to participate in the solutions that address the main constraints to animal production and marketing. Constraints in animal production are interrelated and need an integrated approach that combines health, genetics, feeds, husbandry practices and organization at producers' and policy levels. In order to meet the demand for protein by the growing human population in Nigeria, short cycle species production is essential. Statistics over the last decades show that the livestock sector has immense growth potential and the current actors in the sector need to be proactive in ensuring that the potential will be realized.

To conserve and provide improved seed stock of indigenous breeds of cattle, sheep, goats and pigs in their ecological zones of adaptation, the Federal Government of Nigeria in the late 1970s- 1980s established the Cattle Breeding and Multiplication Centre (Fun Funa, Niger state); Cattle Breeding and Multiplication Centre, (Adada, Enugu State) Fashola Ranch, (Fashola, Oyo state); Goats Breeding and Multiplication Centre (Shaki, Oyo State) Sheep Breeding and Multiplication Centre, Ladamawa

and Fumen, in Katsina state; and Pig Progeny Multiplication Centre, Okpuje, Nsukka, in Enugu State. These projects could not be sustained by government and have been leased out to private investors under public private partnership. The most common indigenous breeds of cattle are Sokoto Gudali, White Fulani, Black Muturu, Red Bororo while the exotic include the Friesian, Simmental, Guarnensey breeds. Indigenous breeds of Goats include the Red Sokoto Goats, Kano Brown and the West African Dwarf Goats. Balami, Yankasa and Wadara are the common indigenous breeds of sheep. Indigenous pigs are no longer common, however upgrades from exotic breeds (Landrace, Duroc, Large White) and crosses are well adapted in Nigeria. Well-adapted breeds of these animals should also be selected for breeding programs tailored for improved productivity.

For a successful livestock industry, it is critical to;

- 1) develop the capacity of producers' organizations in production, husbandry and health;
- 2) promote technical and managerial skills among individual producers; and
- 3) promote multi-stake holder partnerships at local, district, state and national levels.

All these actions require a proper policy of assisting livestock producers to improve production, management, secure their outputs and strengthen their position within the value chains. Producers' knowledge on the key biosecurity measures should be enhanced to safeguard against major infectious diseases that include AT & TBDs. It is therefore a priority for key stakeholders to support investment to improve farmers' livelihoods that results in improved food security too.

Nigeria is plagued by major infectious animal diseases and parasites affecting livestock development. The development of the livestock sector is also inhibited by poor quality, in addition to food deficiency and low performing production systems as well as lower productivity of these animals. Therefore, addressing animal health constraints to the sector, especially the prevention and control of AT & TBDs, is considered to be a major priority.

3. 0 ANIMAL TRYPANOSOMOSIS IN NIGERIA

3.1 Tsetse and Trypanosomosis in Nigeria

Eleven (11) species of tsetse flies are found in Nigeria, infesting approximately 75% of the country's landmass. From latitudes 4-12° N, covering all the agro-ecological zones of the country. These, especially, *Glossina palpalis palpalis*, *G. tachinoides*, *G. morsitans submorsitans* and *G. longipalpis* are of great economic importance. Other biting muscidae have been incriminated in the mechanical transmission of the disease. Figure 1 below is Map of Nigeria showing geographical distribution of Tsetse.

3.2 Trypanosomosis in Livestock

Animal trypanosomosis is considered the second most important livestock disease after infectious diseases, and remains a major obstacle to livestock production in Nigeria. Over 16 million cattle are at the risk of continuous exposure to the risk of contracting trypanosomosis in all the agro-ecological zones of Nigeria. The most important species of trypanosomes affecting livestock in Nigeria are *Trypanosoma vivax*, *T. brucei brucei*, *T. congolense* and *T. simiae*.

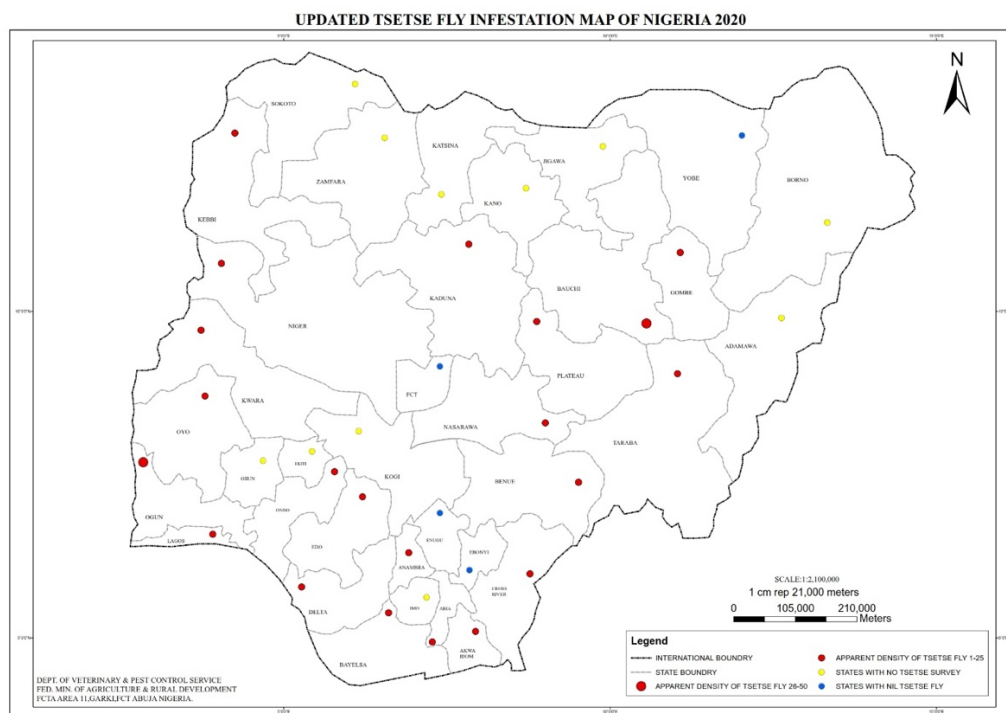


Fig 1: Map of Nigeria showing Tsetse infested States

Source: VPCSD (2020): Veterinary and Pest Control Services Department of the Federal Ministry of Agriculture and Rural Development, Abuja

3.3 Economic importance of Tsetse and Trypanosomosis

In Nigeria 60% of tsetse infested land areas would have been suitable for livestock or mixed agricultural development. Greater parts of the best watered and most fertile land areas are tsetse infested, while large areas of good grazing, mostly, the sub-humid zone, could have been immediately utilized by pastoralists if freed from tsetse. It is estimated that 30% of cattle in Nigeria are continuously exposed to the risk of trypanosomosis. It has been estimated that N10.64 billion is lost annually in cattle alone in the northern states, apart from more than N912.0 million spent annually in the importation of trypanocidal drugs. Losses in livestock due to the disease are estimated at N29 billion annually nationwide. The annual loss in meat production alone due to trypanosomosis is put at N5 billion. This excludes losses in milk and mixed agriculture where traction and manure play vital role. In African agriculture, animals provide more than 80% of the traction power.

3.4 Past and Present Control Efforts

In view of the enormity of the socio-economic impact of tsetse and trypanosomosis on human health, livestock and agricultural production in Nigeria, control has become inevitable. Vector control through ground and aerial continuous application of insecticides, bush clearing, integrated control using traps, insecticides impregnated screens and targets and sterile insect Technique (SIT) have been employed. These efforts led to reclamation of 20,000 square kilometers tsetse infested land areas in the north-west corridor. The parasite has been controlled in the past through the use of trypanocidal drugs. One of the major constrains in controlling the disease is lack of a suitable vaccine. Furthermore, while the proper use of trypanocidal drugs can be highly effective for controlling the disease, no new drug had been produced over the last 65 years. Thus, in Nigeria, the problem of Animal trypanosomosis is escalating and will continue to do so over the next decade unless more active steps are taken to control the disease.

3.5 Global Advocacy for the Control of Animal Trypanosomosis and Tick-Borne Diseases

Following global advocacy, the United Nations and African union leaders have now realized that poverty alleviation and food security are central objectives in the development agenda of the continent. Unfortunately, the realization of this agenda is being hampered by the inability of Africans to exploit the agricultural sector, especially the immense livestock resources, whose productivity is critical to the reduction of poverty, due to tsetse and trypanosomosis (Pattec, 2014)

3.6 Declaration of PATTEC

The African Union (AU) Heads of states and Governments in July 2000, made a declaration through its decision AGH\Dec. 156[xxxvi] that led to the formation of the PATTEC in 2001. The main reasons for this declaration were:

- (i) Failure in tsetse control efforts by individual countries to achieve eradication
- (ii) Pressure from their countries due to continuous negative impact of tsetse and trypanosomosis
- (iii) The realization that only an integrated approach by African countries can solve the problems of tsetse and trypanosomosis. The cardinal objective of the PATTEC initiative is total eradication of tsetse and Trypanosomosis from the continent of Africa using environmentally friendly methods of control.

Therefore, member states were urged to act collectively and rise to challenges of eradicating tsetse and trypanosomosis once and for all from their countries and Africa at large. The Commission of African Union was charged with the responsibility of drumming up support, commitment, action and coordinating activities of the PATTEC initiative.

3.7 Trypanosomosis control Efforts by ECOWAS

Within the framework of the Regional Dialogue and Investment Project for Pastoralism in the Sahel and Coastal Areas of West Africa (PREDIP), the ECOWAS Regional Animal Health Center has received funding from the European Union to implement component 4 of PREDIP, which aims to support the control of transboundary animal diseases in West Africa (COMATAO) in eight (8) ECOWAS Member States. The RAHC organized the regional strategy development workshop on

Animal Trypanosomosis and Tick-Borne Diseases from 17 to 21 May 2021 in Ouagadougou, Burkina Faso. The objective of this workshop was to formulate a regional strategy and to propose priority actions to be implemented against animal trypanosomoses and tick-borne diseases in member states.

3.8 Control of Trypanosomosis in Nigeria

The Control of Trypanosomosis in Nigeria involves both the control of the vector and the parasite. Controlling the vector could be by any or a combination of the following:

- i. Using Traps (both vertical and longitudinal traps).
- ii. Capture nets (Impregnated with screens and targets).
- iii. Sterile Insect Technique:

Controlling the parasite involves the use of drugs such as:

- i. Diamenazene aceturate
- ii. Isometamedium chloride
- iii. Suramin
- iv. Melarsoprol
- v. Eflornithine

These drugs are readily available in the Nigerian markets and are therapeutic or prophylactic, or combination in action.

4.0 TICK-BORNE DISEASES IN NIGERIA

4.1 Common Tick types in Nigeria

There is a long history of studying ticks and tick-borne diseases in Nigeria mainly due to their significant impact on peri-domestic animals, including herds and service dogs. Classic studies were conducted to determine the distribution of ticks and tick-borne pathogens across the country; they relied on the morphological identification of ectoparasites and detection of pathogens through examination of hemolymph smears and other laboratory staining techniques.

The Ixodid ticks of four hard tick genera—including *Amblyomma*, *Rhipicephalus*, *Hyalomma*, and *Haemaphysalis*—are commonly known and collected from animals in Nigeria. Furthermore, the argasid soft tick, *Ornithodoros moubata*, is known to attack humans and transmits etiologic agents causing human relapsing fever and African swine fever. As in other tropical countries, the brown dog tick, *Rhipicephalus sanguineus*, is the most reported tick in Nigeria. This is mostly due to its high feeding preference for domestic dogs and its ability to survive on other vertebrate hosts. It has been reported to occur in all regions in the country but most frequently in the southern regions of the country in contrast to the northern region where *Rhipicephalus (Boophilus) decoloratus* and *Amblyomma variegatum* occur more frequently.

4.2 Tick-Borne Diseases

During the first 10 years of its existence, the Department of Parasitology and Entomology of the Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria, confirmed or described for the first time the occurrence of 25 different tick-borne parasites of domestic animals in the northern part of the country. Most of these organisms occur as inapparent infections but may serve as complicating factors in any adverse host condition. Several TBDs are known to be endemic in Nigerian cattle, including anaplasmosis (*Anaplasma marginale* mainly), babesiosis (*Babesia bigemina* and *Babesia bovis*), cowdriosis (*Ehrlichia ruminantium*) and theileriosis (*Theileria mutans* and *Theileria velifera*)

4.3 Economic Importance of Ticks

Ticks of domestic animals directly cause poor health and loss of production to their hosts. Ticks also transmit numerous kinds of viruses, bacteria, and protozoa between domestic animals. These microbes cause diseases which can be severely debilitating or fatal to domestic animals, and may also affect humans. The medical and economic importance of ticks has long been recognized due

to their ability to transmit diseases to humans and animals. Ticks cause great economic losses to livestock, and adversely affect livestock hosts in several ways.

Among ecto-parasites, ticks are very important and harmful blood sucking external parasites of mammals, birds and reptiles throughout the world (Furman and Loomis, 1984). The medical and economic importance of ticks had long been recognized due to their ability to transmit diseases to humans and animals.

4.4 Past and present Tick Control Efforts

Arsenic dips were the first effective method for controlling ticks and tick-borne diseases, and were used in many parts of the world for over 50 years before resistance to the chemical became a problem. With a Taktic plunge dip or spray cattle are treated five times 21 days apart. This type of approach will actually reduce tick numbers on your farm, allow a long break from treatment over summer and has been proven to be the most effective for productivity.

4.5 Present Ticks and Tick-Borne Diseases control efforts in Nigeria

The control of Tick and Tick-Borne Diseases in Nigeria involves both the control of the vector and the parasite. Controlling the vector could be by any or a combination of the following:

- i. Pour-ons such as Organochlorides e.g., Cypermethrin, Cypermil
- ii. Ivermectin.
- iii. Tick baths using chemicals such as Diazinon and Amitraz.

Controlling the parasite involves the use of drugs such as:

- i. Diamenazene aceturate
- ii. Isometamedium chloride
- iii. Imidocarb (Imizol)
- iv. Novidium Chloride

5.0 ANIMAL TRYPANOSOMOSIS AND TICK-BORNE DISEASE CONTROL EFFORTS BY ECOWAS

5.1 Control of Animal Trypanosomosis and Tick-Borne Diseases in West Africa

The workshop to develop a regional strategy for the control of Animal Trypanosomosis (AT) and Tick-Borne Diseases (TBD) in the West African sub-region was held from 17th to 21st May 2021 and was followed by another workshop to validate the earlier developed document. The validation meeting was held from July 6th- 8th, 2021 in Ouagadougou, Burkina Faso. At the workshop, Nigeria was represented by two technical officers from the Department of Veterinary and Pest Control Services at no cost to the Ministry.

In line with ECOWAS Animal Health and Welfare Strategy 2021 – 2025, priority action plan and activities for short - term implementation were identified during the workshop. Member States were encouraged to provide budget lines for the operationalization of the action plan and activities while ECOWAS may provide additional support.

5.2 Control of Animal Trypanosomosis and Tick-Borne Diseases in Nigeria

In line with ECOWAS Animal Health and Welfare Strategy 2021 – 2025, priority action plans and activities for short - term implementation 2023-2027 (5 years) were identified during the workshop and are adopted as priority action plans for Nigeria. The action plan is as shown in Table 1.

Table 1: Priority Action plans and Activities

Priority Action	Activities
Priority action 1 Institutionalise the control against AT and TBD in regional livestock development strategies and in policies, regulations, professional training, development programmes and projects	<ul style="list-style-type: none">• Promote the approval of national guidelines for the control AT and TBD in the 36 States & FCT• Identify and support multi-stakeholder engagement, dialogue and collaboration• Harmonisation of national projects and programmes
Priority action 2 Establish the status of AT and TBD and their control in Nigeria	<ul style="list-style-type: none">• Conduct a baseline study to establish the status and control of AT and TBD in 36 States & FCT• Taking stock of control methods and equipment available in 36 States & FCT• Conduct Gap Analysis on the control of AT and TBD.

<p>Priority action 3 Strengthen capacity to combat AT and TBDs at all national and regional levels</p>	<ul style="list-style-type: none"> • Training of staff on vector and disease diagnostic methods • Training of livestock famers on best management practices • Promote technical and scientific information, guidelines, best practices, technologies and innovations • Promote new tools for tsetse and tick control - (traditional medicine, combined vector control strategy)
<p>Priority actions 4 Set up a Monitoring and Evaluation system</p>	<ul style="list-style-type: none"> • Put in place a framework to effectively monitor and evaluate the progress of the action plan at regional and national levels. • Resource mobilisation • Develop M & E Tools • Conduct Monitoring of field activities on bi-annual basis

6.0 STAKEHOLDERS AND DECISION TREE ANALYSES

6.1 Stakeholders analysis

Table 2.0: Stakeholders analysis

Key stakeholders	What is their interest	Level of interest	Power of influence	Action
Transhumance Pastoralists (Nomads)	Survival and productivity of their animals/means of livelihood	Very High	Low	Reporting to appropriate authorities
Agro-pastoralists	Survival and productivity of their animals, means of livelihood/farming	High	Low	Reporting to appropriate authorities
Commercial Cattle Farmers	Survival and productivity of their	Very High	Very High	Lobby policy makers

	animals/means of livelihood			
Institutional Farms	Productivity and research	Very High	Moderate	Training, research and disease reporting
Community Leaders	Welfare support, livelihood & conflict resolution	Very High	High	Lobby policy makers
Livestock Merchants	Commercial interest, value of animal and livelihood	Very High	Very High	Awareness creation
Transporters of Live Animals	Delivering of healthy animals/livelihood	Medium	Low	Movement control
Cattle Processors	Healthy animal and animal products	Very High	Low	Disease reporting
Commodity Associations	Survival and productivity of their animals/means of livelihood	Very High	Very High	Lobby policy makers and advocacy
Commercial Cattle Feed Producers	Healthy animals and market share	Medium	Low	Disease reporting
Public Veterinary Services	Prevention & Control of Trypanosomosis and Tick-Borne Diseases	Very High	Medium	Lobby, advocacy, capacity building, Policy formulation, Disease Reporting
Private Animal Health and Husbandry Service Providers	Prevention & Control of Trypanosomosis and Tick-Borne Diseases	High	Medium	Advocacy, Policy formulation, Disease reporting.
Financial Institutions (CBN,	Support livestock farmers with soft loans and	High	High	Financial support

BOA, NIRSAL, BOI, NAIC, etc.)	insurance cover in case of disease outbreaks			
Nigeria Agricultural Quarantine Service (NAQS)	Control of Trypanosomosis and Tick-Borne Diseases	Very High	Very High	Enforcement of Legislation, lobby and advocacy
Relevant Professional Associations	Promoting animal health	Very High	High	Advocacy and political will mobilization
Research Institutes (NITR, NVRI) & Academia	Research and good animal health	High	High	Diagnosis and policy support
Security Agencies - Police, Army, Civil Defense	To have healthy animals	High	Very High	Lobby and advocacy.

7.0 ANIMAL TRYPANOSOMOSIS AND TICK-BORNE DISEASES PROBLEM TREE ANALYSIS

Table 3.0: Trypanosomosis and Tick-Borne Diseases Problem Tree Analysis

Problem Tree	Objective Tree	Result Chain
<p>Effect</p> <p>Animal Trypanosomosis (AT) and Tick-Borne Diseases (TBD)</p>	<p>General objective</p> <p>Prevention, control and eradication of AT & TBDs in the country</p>	<p>Impacts</p> <ul style="list-style-type: none"> • Reduced disease incidence in Nigeria • Improve livelihood • Prompt response in disease outbreaks
<p>Core problem</p> <ul style="list-style-type: none"> • Weak animal disease surveillance and reporting system 	<p>Specific Objective</p> <ul style="list-style-type: none"> • Strengthen AT & TBDs surveillance • Improve disease reporting system 	<p>Outcome</p> <ul style="list-style-type: none"> • Coordinated and holistic implementation of National AT & TBDs contingency plan

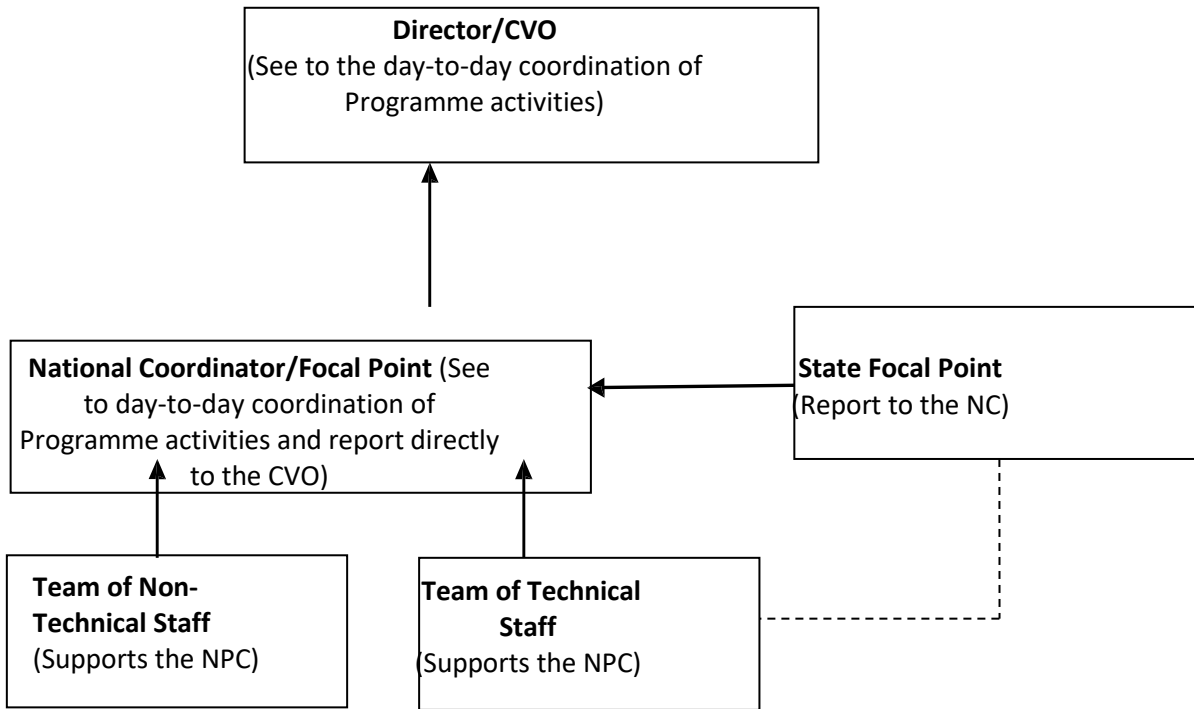
	<ul style="list-style-type: none"> Enhanced vaccination coverage 	
<p>Causes</p> <ul style="list-style-type: none"> Lack of sustainable compensation policy Poor cross border collaboration in disease control Insufficient logistic and co-ordination Lack of synergy between animal health and veterinary service providers Poor collaboration between public and private animal health and veterinary service providers Poor funding mechanism between the tiers of government on disease prevention and control 	<p>Strategies</p> <p>Improve Insurance awareness, availability and coverage</p> <p>Strengthening cross border collaboration with neighboring countries on animal movement and disease control</p> <p>Inter-States/Intra-States movement of animals</p> <p>Improve network and coordination among the key stakeholders</p> <p>Improving collaboration between private and public animal health practitioners</p> <p>Improve funding mechanisms</p>	<p>Outputs</p> <ul style="list-style-type: none"> Developed National Contingency Plan for the prevent, control and eradication of AT & TBDs in Nigeria Enhanced robust regional collaboration
<p>Why (Causes)</p> <ul style="list-style-type: none"> Poor political will Poor economic prioritization of AT & TBDs on livelihood and wealth of the nation. Lack of sanitary mandate program for private 	<p>Activities</p> <ul style="list-style-type: none"> Strategic lobbying of political offices, relevant policy makers and influential stakeholders Targeted awareness creation 	<p>Activities</p> <ul style="list-style-type: none"> Participatory approach to disease prevention, control and eradication using the concept of Private Public Partnership

veterinary & animal health services provides	<ul style="list-style-type: none"> • Development of a national working document on AT & TBDs 	
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8.0 Coordination Management and Partnerships

A command structure, with clearly spelt out responsibilities, for the management of the project will be established. The Institutional Framework and Command Structure for the Animal Trypanosomosis and Tick-Borne Diseases project will be in line with existing structure of the national veterinary services namely, a vertical approach with central coordination. This structure has been successfully used in the past for various disease control programme of government. The institutional framework to be put in place will provide leadership, effectiveness, efficiency and decorum in the implementation of the project.

At the apex of the structure will be the Director/Chief Veterinary Officer of Nigeria (Federal Department of Veterinary & Pest Control Services) with the support of the National Coordinator/Focal Point of the project who will see to the day to day running of the programme activities and report directly to the Chief Veterinary Officer of Nigeria (CVON). The National Coordinator will be supported by a team of technical and non-technical staff who will be responsible for various components of the project. A similar structure will be established at the States and LGA levels to handle issues at those lower levels.



In the area of laboratory diagnostics, the NVRI and NITR will be properly networked with all 11No VTH and specialized private laboratories spread across the Country. Basic and secondary field sample testing and diagnosis will be mainly carried out by the regional laboratories located in the VTHs while tertiary testing, analysis and confirmatory diagnoses will be conducted at the central laboratory at the NVRI. Field samples and test results collected at the VTH level will be further processed to the central laboratory who in turn will submit reports of tests and results to the National Coordinator's office.

National Coordinating Committee (Steering Committee) under the Chairmanship of the Honourable Minister of Agriculture (HMA) will be set up. Other members of the NCC include the Director/Chief Veterinary Officer of Nigeria, States Directors of Veterinary Services (2 per geo-political zone), Head of the Central NVRI and NITR laboratories, Desk Officer PATTEC , the Nigerian Agricultural Quarantine Service (NAQS); with the National Project Coordinator/Focal Point as Committee Secretary.

Animal Trypanosomosis and Tick-Borne Diseases Technical Committee under the Chairmanship of the Chief Veterinary Officer of Nigeria (CVO) will be put in place with membership drawn from States Directors of Veterinary Services (2 per geo-zone and different from those in the Steering Committee) on rotational basis, Universities, Laboratories, Producers Associations, Development Partners, Animal Husbandry Services, NAQS, Nigerian Veterinary Medical Association and Veterinary Council of Nigeria (VCN). The National Coordinator will provide the secretariat of the Committee.

9.0: BUDGET FOR THE CONTROL OF TRYPANOSOMOSIS AND TICK-BORNE DISEASES IN NIGERIA

A five (5) year budget for Animal Trypanosomosis and Tick-Borne Diseases Control in Nigeria is shown on Table 4 below..

Table 4.0 A five (5) year budget for Animal Trypanosomosis and Tick-Borne Diseases Control in Nigeria

S/N	DESCRIPTION	AMOUNT (N)	RESPONSIBLE
1	National AT & TBDs Committee meetings (4 meetings/year)	200,000,000.00	FGN
2	Trainings: a) Sample collection, packaging and shipment b) Advocacy, sensitization/awareness creation c) Refresher course for Lab personnel on testing of AT & TBDs d) Data collection and management e) Early disease detection, reporting and simulation exercises f) Field Officers on Geo-mapping of AT & TBDs hotspots g) Monitoring & Evaluation (M&E)	250,000,000.00	FGN, STATES; & DONORS, Private organizations
3	a). Delineation of AT & TBDs hotspots across the country States and FCT	200,000,000.00	FGN, STATES; & DONORS
4	a) Procurement of assorted drugs for the treatment of Animal Trypanosomosis (lump sum) b) Procurement of assorted drugs for the treatment of Ticks Borne Diseases c) Procurement of assorted chemicals for 18 States & FCT for the control of Ticks @ N4,000,000 each d) Aerial Control of Tsetse flies (Lump sum, see annex) e) Ground Control of Tsetse (Lump sum, see annex) f) Procurement of 20No. Project vehicles (4WD Hilux) g) Cold chain equipment (10Nos. refrigerators, 250 Nos. Coleman boxes etc.) h) Consumables (Needles, cotton wools, Disinfectants, Permanent markers, Alcohols, PPEs etc.) – Lump sum i) Motorized sprayers: 70 pieces @ N400,000.00 each j) Knapsack sprayers: 150 pieces @ N37,500.00 k) Blue Biconical Traps: 200 pieces @ N 25,000 l) Screens and Traps: 1,000 pieces @ N 4,000 m) Deltamethrin 10%: 15,000 Litres @ N 9,500	50,000,000.00 35,000,000.00 80,000,000.00 205,200,000.00 288,887,500.00 1,400,000,000.00 60,600,000.00 5,000,000.00 10,000,000.00 28,000,000.00 5,625,000.00 5,000,000.00 4,000,000.00 142,500,000.00	FGN, STATES; & DONORS
6	Laboratory & diagnostics Kits a) Sample collection consumables (sampling bottles, etc.) b) Transportation of samples from the 18 States & FCT to the National Reference Lab (NITR, Kaduna) c) Laboratory/diagnostic kits d) Laboratory Reagents e) Field samples storage equipment (10Nos. Deep freezers,) f) Logistics (transportation, field allowances, coordination)	2,000,000 50,000,000 10,000,000 10,000,000.00 30,000,000 20,000,000	FGN, STATES; & DONORS

7	Animal Health Communication (meetings, promotional materials, awareness creation, etc.)	50,000,000	"
8	Socio-economic Impact Assessment	25,000,000	"
9	Regional Cross border collaboration/Meetings	50,000,000	"
10	Central coordination, monitoring and evaluation	75,000,000.00	"
11	Contingencies (Lump sum)	329,161,250.00	
	TOTAL	N3,520,773,750.00	

9.0: RESOURCE MOBILIZATION

Animal Trypanosomosis and Tick-Borne Diseases (AT & TBDs) are endemic, the funding for this project is expected to come from these sources:

- i. Public/Government sources (FGN, States & LGAs)
- ii. International sources – donor agencies (AU/IBAR, ECOWAS, OIE, FAO, etc.)
- iii. African Development Bank
- iv. World Bank
- v. Private sources (Producer Associations, other Non-Governmental Organizations, etc).

The private sector, including private veterinary practitioners, will be sensitized and mobilized to support the implementation of the Project. Their areas of support and participation will be clearly defined.

The line Ministries responsible for Livestock and Veterinary Services at the Federal and States levels will be encouraged to provide adequate funds for the successful execution of the Project in their annual budget allocations specifically dedicated to the control and eradication of AT & TBDs.

The private sector, including private veterinary practitioners and para-professionals will be sensitized and mobilized to support the implementation of the project. The areas of support and participation will be clearly defined.

In addition, international agencies will be engaged for funding of some aspects of the project. Already some international donor organisations such as the OIE, FAO, AU-IBAR and ECOWAS have indicated interest in funding some aspects of the project.

On her part, the Nigerian government will continue to cater for the recurrent and overhead costs for running the project.

10.0: MONITORING AND EVALUATION

The programme team, with technical support from relevant agencies, will develop the M&E plan for the AT & TBDs programme. During this process, participatory work sessions will be conducted. The M&E plan will focus mainly on addressing target indicators.

Monitoring will focus on the management and supervision of activities, seeking to improve efficiency and overall effectiveness of project implementation. The team will continually collect information on actual implementation of project activities and compare this information with set goals and objectives as indicated in the workplan. The monitoring process will also be geared towards delivery of quality outputs in a timely manner, to identify problems and constraints (technical, human resource, and financial), to make clearly defined and practicable recommendations for corrective actions, and identify lessons learned and best practices for scaling up. Performance evaluation will assess the project's success in achieving its set goals and objectives.

The key indicators for the project implementation include the following:

1. Appointment of a National Focal Point
2. Setting up and inauguration of a Technical Committee of Experts (TCE)
3. Setting up and inauguration of National AT & TBDs Coordinating Committee (NPCC)
4. Production, validation and activation of National AT & TBDs Control Strategy document
5. Assessment of actual prevalence of the disease in Nigeria
6. Number of Field personnel trained
7. Number of samples collected for Laboratory analysis
8. Number of cattle, small ruminants and pigs treated against AT
9. Number of cattle, small ruminants and pigs treated against TBDs
10. Number of trained surveillance agents
11. Number of trained veterinarians and veterinary para-professionals

12. Number of targeted surveillance carried out annually
13. Number of laboratory staff trained
14. Number of field staff trained on samples collection, packaging and transportation to the laboratories
15. Number of IEC Materials distributed
16. Number Aerial Operations carried out for Tsetse control
17. Total kilometers of Aerial Operations carried out for Tsetse control
18. Number of sensitization and advocacy programmes conducted
19. Number of farmers trained on specific areas of interest
20. Number of monitoring and evaluation missions and activities carried out

Annex 1

BUDGET FOR VECTOR (TSETSE) CONTROL

1. AERIAL CONTROL OPERATIONS

A. Procurement of Flight Hours

S/N	STATE	FLIGHT HOUR	UNIT COST	AMOUNT
1	Sokoto, Kebbi, Zamfara	70	570,000	39,900,000
2	Kwara, Niger, Kaduna	50	570,000	28,500,000
3	Nasarawa, FCT, Plateau, Benue	70	570,000	39,900,000
4	Oyo, Ondo, Ogun, Osun	80	570,000	45,600,000
5	Enugu, Imo, Delta	50	570,000	28,500,000
6	Adamawa, Taraba	40	570,000	22,800,000
	SUB- TOTAL			205,200,000

2. MOP UP VIA GROUND CONTROL

S/N	ITEMS	QUANTITY	UNIT COST	AMOUNT
1	Motorized Sprayers	70 pieces	400,000	28,000,000
2	Knapsack Sprayers	150 pieces	37,500	5,625,000
3	Personal Protective Equipment	150 sets	25,000	3,750,000
4	Blue Biconical Traps	200 pieces	25,000	5,000,000
5	Screens and Targets	1000 pieces	4,000	4,000,000
6	Deltamethrin 10% EC	15,000 Litres	9,500	142,500,000
7	Staff Allowance	For Surveillance and Control	Lump Sum	100,000,000
	SUB-TOTAL			288,875,000
	GRAND TOTAL			N494,075,000.00

11.0 References

FMARD, 2016:

NBS, 2018: National Bureau for Statistics Report 2018.

PATTEC, 2014: Pan African Tsetse and Trypanosomosis Eradication Campaign, Nigeria. Printed by the Nigerian Institute for Trypanosomosis Research, Kaduna, Nigeria.

VPCSD (2020): Veterinary and Pest Control Services Department of the Federal Ministry of Agriculture and Rural Development, Abuja