

# REGIONAL CONFERENCE FOR AFRICA

## INFORMATION DOCUMENT ON *“THE PROGRAMME AGAINST AFRICAN TRYPANOSOMIASIS” (PAAT)*

### 1. Introduction

1.1 Tsetse-transmitted trypanosomiasis is a disease unique to Africa affecting both humans and animals. This disease occurs in about 10 million km<sup>2</sup> in 37 sub-Saharan countries corresponding approximately to one-third of Africa's total land area, and threatens an estimated 50 million people and 48 million cattle. Trypanosomiasis has a severe impact on African agriculture; estimated annual losses in cattle production alone are in the range of 1.0-1.2 billion dollars. To this, we have to add the indirect negative effects engendered by trypanosomiasis on total crop production. The disease influences where people decide to live, how they manage their livestock and the intensity of crop agriculture. The combined effects result in changes in land use, environment and affect human welfare and increase the vulnerability of agricultural activity.

1.2 FAO has identified the reinforcement of agriculture as a key element in the fight against poverty and the improvement of food security in developing countries. The need to promote agriculture, health and food security, as prerequisites to poverty reduction, was highlighted during the World Food Summit held in 1996 in Rome. The need to reduce poverty is particularly felt in the tsetse infested areas of sub-Saharan Africa. In this region half of the population suffers from food insecurity. Approximately 85% of the poor are located in rural areas and more than 80% of the population depends on agricultural production for their livelihood.

1.3 An essential element of the programmes aiming to reduce poverty is the effective co-ordination among agencies and institutions working for the same goal.

### 2. The Programme Against African Trypanosomiasis (PAAT)

2.1 In order to respond to the need to achieve concerted efforts among the different agencies in the fight against tsetse and trypanosomiasis (T&T) in people as well as livestock, the Programme Against African Trypanosomiasis (PAAT) was endorsed in November 1997 by the FAO Conference. The Programme seeks to combine the forces of FAO, WHO, IAEA and OAU/IBAR in order to:

- ensure an harmonious, sustainable approach towards improved human health and sustainable socio-economic and agricultural development of tsetse-infested areas;
- promote and coordinate international alliances and efforts assisting in harmonised interventions against T&T; and
- achieve integrated trypanosomiasis control in Africa.

Through its activities, PAAT seeks to depict the policy framework, strategies and guiding pest management principles encompassing:

- socio-economic factors of trypanosomiasis control;
- impact of trypanosomiasis on African agriculture;
- community participation;
- drug management;
- integration of control techniques;
- environmental concerns.

### **3. The Pan-African Tsetse and Trypanosomosis Eradication Campaign (PATTEC)**

3.1 Further to the above development of PAAT, OAU has, more recently, undertaken to initiate the Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC). This initiative was first endorsed by the OAU Heads of State and Government Summit in July 2000, in Lome, Togo. Subsequently, a first outline for the planned implementation of PATTEC was approved at Summit held in July 2001 in Lusaka, Zambia.

3.2 In its concept note, PATTEC highlights the ultimate objective as eradication of tsetse and trypanosomiasis from Africa. With a view to pursue this objective, PATTEC will undertake the organisation and coordination of the campaign, and mobilise the necessary human, financial and material resources to do so.

### **4. Strategy development**

4.1 PAAT is primarily concerned with the development and application of science-based standards for assessing the economic, social and environmental benefits and costs of tsetse and trypanosomiasis (T&T) management. Its studies and analyses balance human needs in terms of food security and livelihood sustenance with the preservation of natural resources and prevention of environmental degradation. Thus, interventions against T&T are placed in the broader context of poverty alleviation and food security, with enhanced livestock-agricultural development guiding the process of strategy development. Much discussion within PAAT has focused on prioritising tsetse intervention(s), integrated into the overall agricultural production scheme, in selected, well demarcated areas. This principle has

meanwhile become recognised as the *conditio sine qua non* for success. The integration of T&T intervention into the general process of agricultural development and production provides the opportunity to maximise the benefits for the rural poor while minimising the negative effects on the environment. It will thus contribute to sustainable pest management in targeted farming systems, and enhance the opportunities for adoption by livestock owners/producers.

4.2 In order to deal comprehensively with the magnitude and complexity of the T&T problem within the context of national and regional action plans for poverty-alleviation, multidisciplinary efforts are progressively replacing the technology-based approaches of the past.

## **5. Broadening the pest management perspectives: an integrated approach**

5.1 Trypanosomiasis affects both humans (sleeping sickness) and animals (nagana). As mentioned above, apart from the negative effects on animal health and production, trypanosomiasis influences where people live, keep their livestock and grow crops and, therefore, land use. Across the tsetse-infested sub-continent, different levels of soil fertility and agro-eco-zones exist, associated with distinct farming systems and local mixes of social, cultural and economic development patterns. Pressures exerted on one of the elements of the agro-ecological systems affect the whole system and this needs to be factored into the pest management approach.

5.2 Although technology for T&T control will continue to advance, this, in itself is unlikely to provide what is required in order to mount viable T&T intervention programmes. When designing sustainable pest management strategies considerations must be given to the entire dimension of the problem.

5.3 While accepting that the identification of suitable areas to be cleared from T&T is a complex undertaking, the following criteria were established by PAAT for setting priorities:

- animal trypanosomiasis is a major constraint to mixed farming system development;
- area-wide tsetse control induces a fairly rapid improvement of the situation;
- the area has the potential for sustainable upgrading of agricultural productivity levels.

5.4 The rationale for selecting these criteria was that unless the agricultural landscape is in a process of transformation, in particular where this concerns a change towards crop-livestock integration, there is little point in propagating area-wide tsetse control. The reasons for this are linked to changes in land-use. Human population growth augment land pressure and, in tsetse affected areas, this alters the biophysical/rural environment to the extent that the landscape becomes less suitable to tsetse fly survival.

5.5 When it comes to the concrete preparation of tsetse control programmes, recognition must be given to the fact that the impact of expanding cropping areas, game hunting, fuelwood collection and other anthropogenic landscape alterations differs from place to place and according to the various tsetse species involved. An understanding of the process of tsetse habitat fragmentation/isolation therefore forms a key component to the formulation of viable

agricultural programmes. The process of fly habitat changes by anthropogenic factors is most pronounced in situations where land pressures are relatively high. However, in these areas tsetse encroachment often constrains crop-livestock integration since draught power for cropping cannot be adequately exploited by resident farmers.

5.6 Therefore, in areas of moderately high land pressure, tsetse control and eventual eradication can be successful and is likely to maximise benefits in terms of sustainable agricultural development. The consequent reduction and/or elimination of T&T risk will be self-sustaining and autonomously consolidated. To achieve this, fly control should be preceded and complemented by animal health improvement schemes and packages for sustainable crop-livestock farming. Thus, tsetse may progressively disappear from the farm lands while the ensuing increase in mixed farming activity consolidates the new, low disease risk condition. Based on the foregoing considerations, identification of active mixed farming development foci is the key starting point for any T&T interventions.

5.7 From the above it is clear that successful tsetse control demands an understanding of the process of tsetse isolation and fragmentation in order to exploit the effect of land pressure. Also, allowance should be made for differences in fly ecology in the tsetse-agricultural interface for the different geographical areas, notably the contrast between in West and East Africa. The analysis of tsetse habitat fragmentation process will also be required once operations are in place, in order to secure that tsetse interventions continue to harmonise with the autonomous or spontaneous retreat of tsetse.

5.8 The benefits of tsetse control/eradication will have a cascading positive consequence on areas adjacent to those selected for tsetse control/eradication. In the buffer or intermediate zone vector control could be considered at a later stage, as soon as the agro-vector conditions are conducive. It is therefore important that the phasing of active, area-wide fly control, which aims at the gradual, progressive expansion of low disease risk zones, is guided by appropriate information on the dynamic spatial pattern of “natural”, “autonomous”, or “agricultural” control of tsetse.

5.9 A further argument for paying more attention to the natural process of fly habitat change is the relevance this has for disease management. Farmers not benefiting from large-scale tsetse control will have to rely on locally available means and tools to protect their vulnerable livestock. Insecticide applied onto animals or trypanocidal drug treatments are the main protective measures used by livestock owners but at a considerable cost and traditional farming systems often cannot economically sustain their continuous use. Less costly ways of protecting animals may take the form of avoidance of fly contact through adjusting pasture management practices. A complementary control measure, especially in West Africa, is the exploitation of trypanotolerant domestic ruminants, particularly in areas of high risk of trypanosomiasis, where tsetse control is not advisable because of unfavourable agro-climatic conditions.

5.10 Development programmes of a more general nature, not directed at T&T, may nevertheless contribute to alterations in the local agro-ecological conditions and improve the prospects for successful tsetse control programmes. Dynamic agricultural landscape change in large tracts of sub-Saharan Africa, makes disease risk highly variable from place-to-place, and the risk of trypanosomiasis may, even at village level, varies by several orders of magnitude. This phenomenon offers, therefore, prospects for a gradually expanding scheme of T&T

interventions, but would have to rely on monitoring of landscape change, and, with it, of fly habitat, fly-animal contact and disease transmission level.

5.11 Peri-urban niches of T&T also exist and, because of the site-specific environmental features here, deserve special attention. The increase in protein consumption in major cities in sub-Saharan Africa, together with the gradual but progressive process of urbanisation, have led to a major increase demand for animal products, including milk. Satisfying the demand for milk at acceptable cost through increased local production around urban centres has stimulated an intensification of animal production among smallholder livestock producers. Upgraded crossbred cattle are more vulnerable and, in terms of health and productivity, suffer more from the negative effects of trypanosomiasis than native cattle. Consequently, this particular situation around major cities in sub-Saharan Africa requires consideration of human and veterinary health, urban and marketing planning, and management of the rural-peri-urban-urban natural resources management.

## **6. Some recent achievements**

6.1 Since its inception, the work carried out through PAAT has involved both normative and institutional-strengthening activities. A series of technical meetings and workshops involving the PAAT community and PATTEC representatives was held during 2000-2001, resulting in agreement on the criteria and normative steps to follow in designing strategic plans and selection of priority areas for area-wide T&T interventions, such as in the moist savannah belt of West Africa and the Ethiopian valley systems. Geographical maps were developed depicting human and livestock population densities and distributions, crops, the T&T situation in West Africa, the possible intervention strategy and estimated benefits. Examples are provided in the Appendix.

## **7. Inter-agency collaborative entente**

7.1 The trypanosomiasis problem in sub-Saharan Africa is regarded as a priority in poverty eradication programmes. This is underpinned by the fact that PAAT and the Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC) were highlighted in the UN ECOSOC meeting in July 2001 in Geneva. There is an urgent need for harmonisation and consolidation of the different initiatives towards concerted action in T&T control planning. This requires, in addition to the acceptance of the above, normative standards and guidance in pest management, and major institutional and structural alignment in all the different cross-sectoral areas of poverty reduction.

7.2 PAAT is a partnership programme and seeks to pave the way for PATTEC. Under the umbrella of PAAT, the collective international alliance, comprising FAO, WHO, IAEA and OAU/IBAR, will work together and combine forces to arrive at concrete action for the decade to come. Plans for intervention will have to incorporate the requirement for sleeping sickness to be addressed as a matter of high priority. This highlights WHO's prominent role in enhancing field epidemio-surveillance of the human form of the disease and improved drug treatments. FAO, on the other hand, will seek to guide the land use, and agricultural and pest management dimension. In this integrated pest control concept, IAEA assists targeted use of the sterile insect technique in harmony with the eco-geographical and epidemiological factors.

OAU, through IBAR, would assume the overall ‘responsibility’ for coordination and bring the different components under one political roof.

7.3 The four agencies together would thus assist the practical implementation of selected, targeted actions in the affected countries. At the national and local level, the intervention itself should be undertaken directly by the stakeholders on the ground. PAAT-PATTEC alignment only forms a starting point, and provides the appropriate guidelines, standards and other decision support for national authorities and development partners. The challenge is to coordinate the differing strengths and priorities of the respective agencies in achieving the essential goal of effective T&T control and poverty alleviation across sub-Saharan Africa.

7.4 In summary, continuous PAAT-PATTEC harmonisation is required to make further progress and ensure that (i) the ultimate goal of poverty reduction through sustainable land use is made explicit, (ii) the programme of T&T control becomes driven by African stakeholders, (iii) the principles of integrated pest management are closely adhered to, (iv) the programme encompasses the control of both human and animal trypanosomiasis, and (v) the technical approaches adopted adhere to international scientific standards and principles.

## **8. Future plans**

8.1 FAO will organise further workshops to develop guidelines in support to T&T strategic planning that are pertinent to the different sub-Regions of sub-Saharan Africa, and across the respective eco-climatic, economic and agricultural zones. The guidelines will facilitate the preparation of sub-Regional programmes.

8.2 In the context of PAAT-PATTEC harmonisation, coordination and collaboration is sought between FAO, WHO, IAEA and OAU/IBAR will be strengthened by better definition of functions and organisational linkages.

## **9. Conclusions**

9.1 Considering the impact of T&T on agricultural and rural development human health, the current moves towards concerted action deserve the highest attention of the international community. Efforts to combat the trypanosomiasis problem in sub-Saharan Africa must be seen as a high priority for poverty reduction. Since PAAT and PATTEC have been highlighted at the highest levels within the UN System, it is now imperative to detail in more practical terms the various strategies for pest management and agricultural and human development in tsetse-infested areas. Through common efforts by the international alliance multidisciplinary forces will more comprehensively tackle the T&T problem, starting in selected, well demarcated priority areas. Special attention will be devoted to the economic, social and environmental benefits and eventual costs of T&T management. Only a comprehensive strategy of this nature will ensure a balance between the immediate human needs for food and livelihood sustenance and the requirement to sustainably exploit natural resources and eco-agricultural systems.

9.2 Vast areas of the sub-Saharan tsetse infested zone (about 10 million km<sup>2</sup>) offer considerable potential for sustainable livestock and agricultural production, but to realise this national and international policy and financial measures must focus on improving human

welfare in rural areas. As mentioned above, in tsetse infested countries 85% of the poor live in rural areas and more than 80% of the total population depends on agricultural production for their livelihood.

9.3 Therefore, from the foregoing observations, by promoting integrated T&T strategic intervention programmes, PAAT will catalyse sustainable pro-poor agricultural development.

## **10. Recommendations**

### *10.1 To Member Governments*

(i) Countries in sub-Saharan Africa infested by tsetse fly should reconsider the role and impact of T&T on human health and agricultural production, in particular with regard to their respective policies for poverty reduction.

(ii) Where appropriate, T&T intervention(s) should be included as priority in agricultural development plans as key contribution to food security and poverty alleviation.

(iii) Governments should take the lead in finalising national T&T intervention programme(s), supported by PAAT and PATTEC at the international level.

### *10.2 To International Organisations*

(i) The four international organisations FAO, WHO, IAEA and OAU/IBAR should pursue effective and efficient PAAT-PATTEC harmonisation.

(ii) The organisations should better clarify their respective roles and responsibilities with regard to the T&T intervention programmes, with a view to maximising synergies and complementarities and reducing overlap.

(iii) FAO is ideally positioned to further the formulation of normative principles and guidelines for strategic planning of area-wide T&T intervention(s). The science-based methodological approach already designed for West Africa, and widely recognised as successful, offers considerable scope for application in other areas of interest.

### *10.3 To Other Stakeholders*

(i) Awareness of the T&T problem should be enhanced through various channels and media coverage.

(ii) Greater attention should be given to involving community groups, NGOs, private sector and local public services in planning, carrying out and sustaining integrated intervention programmes.

**Appendix to “Information document on  
*‘The Programme Against African Trypanosomiasis’*”**

**People, Crops and Livestock:  
The selection of priority areas for strategic planning  
of integrated tsetse and trypanosomiasis control:  
The West Africa Case Study\***

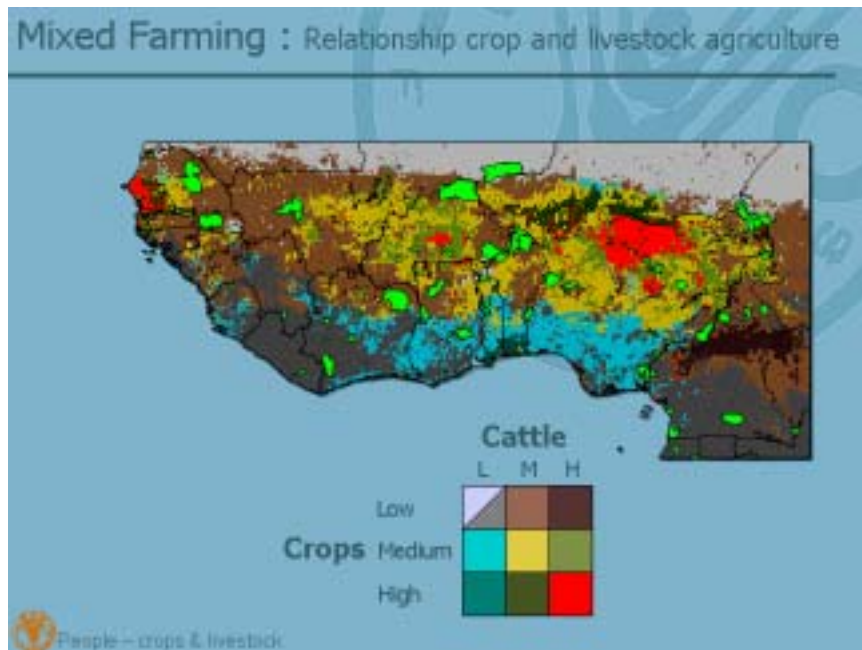
Within a given eco-geographic setting the occurrence and development of farming systems is governed by three major factors: human and livestock populations (density and distribution), and crop agriculture. These components of the farming systems and more generally of the agricultural production influence and play an important role in the selection process for priority areas where strategic, integrated tsetse-trypanosomiasis intervention is most likely to succeed and to produce economic and humanitarian benefits.

For simplicity and clarity, description of farming systems (population, crops and livestock), tsetse and trypanosomiasis distribution, and pest management decision support (tsetse vulnerability and reinvasion risk) are illustrated through a series of maps generated through the use of Geographic Information System technology. An explanatory text accompanies with each map.

\*Based on the paper “People, Crops and Livestock in West Africa: development foci and their implications for pest control” (G. Hendrickx, J. Slingenbergh, R.C. Mattioli, W. Wint) presented at international conference on “Sustainable crop-livestock production for improved livelihoods and natural resource management in West Africa”, held 19-22 November 2001, Ibadan, Nigeria.



## Map 1



- A. Low cereal and cattle intensity systems are found in two distinct bands:
- a. the dry north (light grey);
  - b. the humid southern and coastal area (dark grey).

Whilst in the north climate is a major constraint for crop agriculture, in the humid south perennial crops and forest areas (e.g. Liberia and Côte d'Ivoire) dominate.

B. Outside the forest area, the southern and coastal band is further characterised by systems dominated by cereal crops ranging from medium to high intensity cultivation (light and dark blue). In these areas relatively few cattle are found. These systems cover most of the southern parts of Ghana, Togo, Benin and Nigeria.

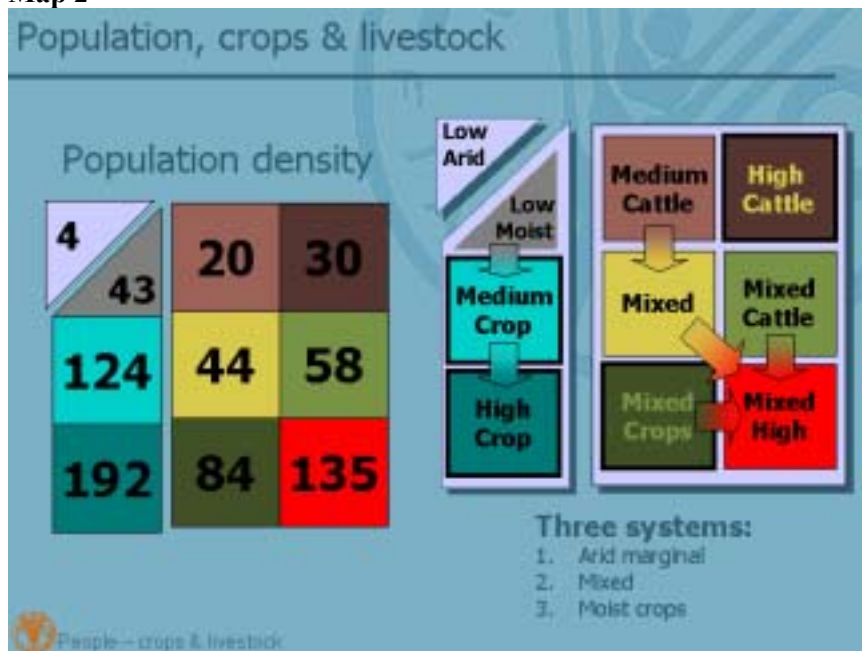
C. Mixed farming systems (yellow) where both crops and cattle coexist are mainly focused around high intensity farming areas (red) in the medium to high cropping intensity band: the Jos Plateau and close settled zone of Nigeria, Southern Niger, Central Burkina Faso (Ouagadougou) and the Dakar area in Senegal. Around these areas distinct patches of either crops or cattle dominated mixed systems are also found: the former in southern Niger (dark green: high surface – low yield mixed crop systems) and the latter more scattered in Nigeria and Burkina Faso (light green).

D. Cattle dominated systems with low cropping levels (brown) are located at the fringes of the mixed systems in the medium band. In the dryer areas they correspond to traditional pastoral areas whilst towards the south in the more humid zones stocking rates have greatly increased after the dry periods of the seventies and eighties. Most of those areas have now also been freed from onchocercosis further increasing the incoming flux of farmers. Typical "front pioneer" areas are (a) Southern Mali, Southern Burkina Faso and Northern Côte d'Ivoire, (b) North-Western Ghana and (c) North Eastern Benin.

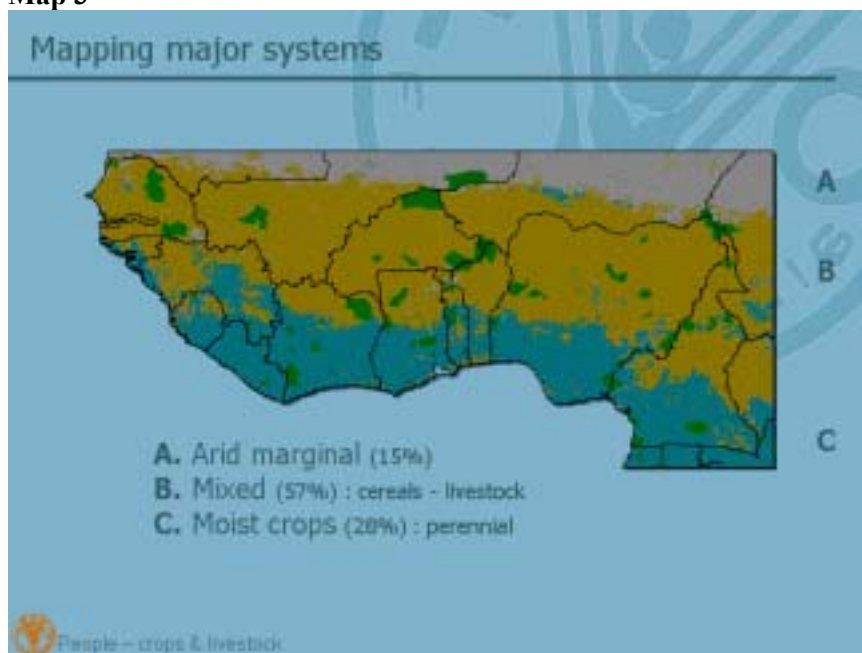
E. A distinct high density livestock system is found on the Adamawa and Mambilla Plateaux of Cameroon and Nigeria.

## Map 2 and Map 3

### Map 2



### Map 3



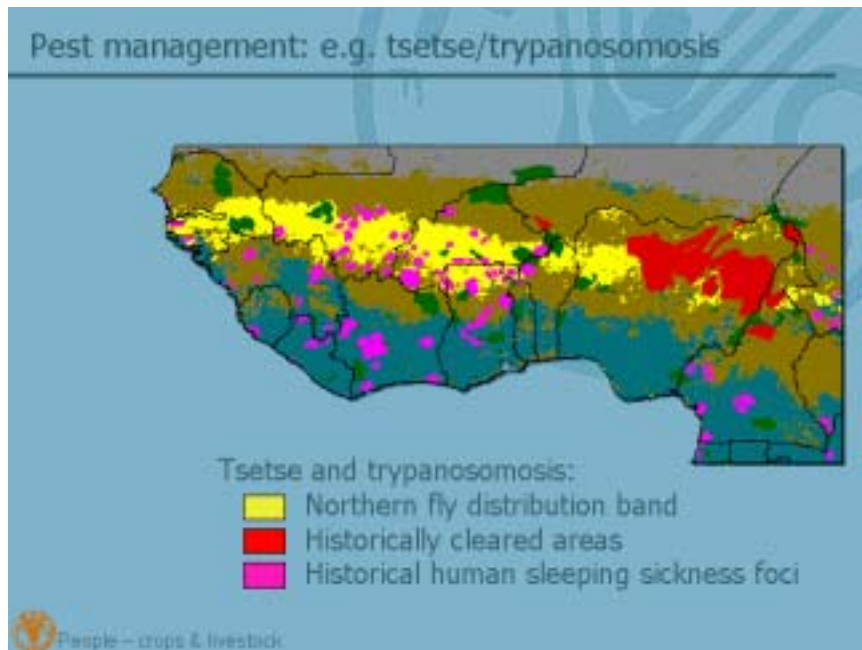
Comparison with average population densities (Map 2) confirm the distinction of three bands of dominant systems (Map 3).

A. Low intensity system in arid areas where climate is a limiting factor.

B. Complex evolving mixed systems where further population increase will result in higher agricultural intensity.

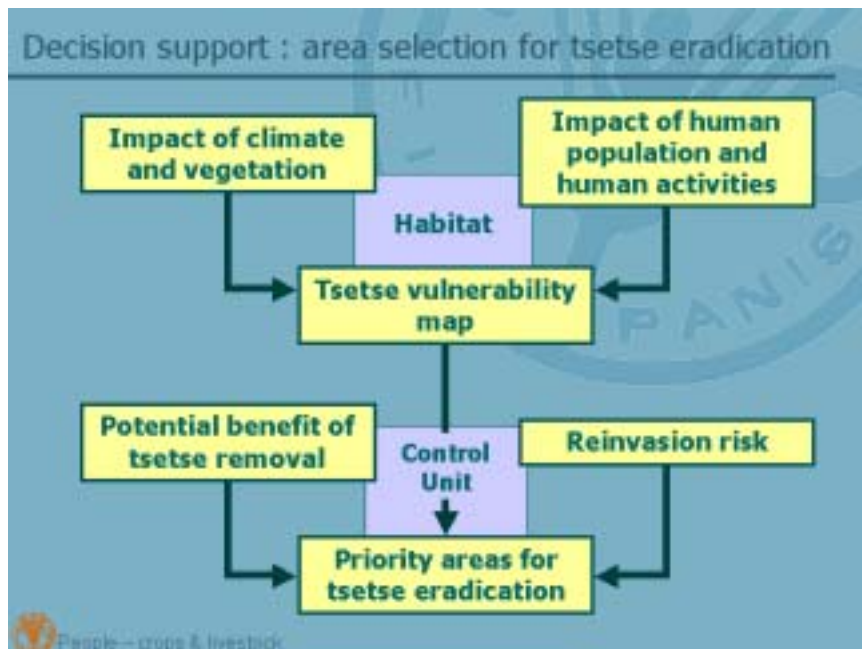
C. Crop dominated systems in the humid south where population pressures are already high, except in the forest zones and no major increase in cattle levels is to be expected as a consequence of tsetse clearance.

## Map 4



Map 4 shows how the identified systems relate to various aspects of tsetse-trypanosomiasis complex. In the area North of the fly zone, all cattle are zebu type. These animals seasonally migrate into the Northern band of the tsetse distribution area (yellow band). This northern band presents a set of opportunities of particular interest for tsetse eradication.

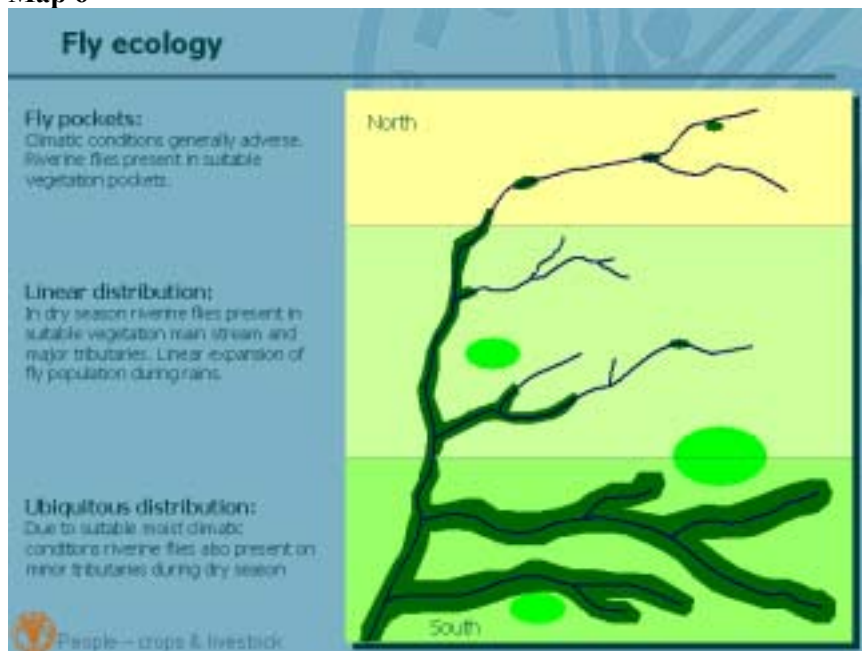
## Map 5



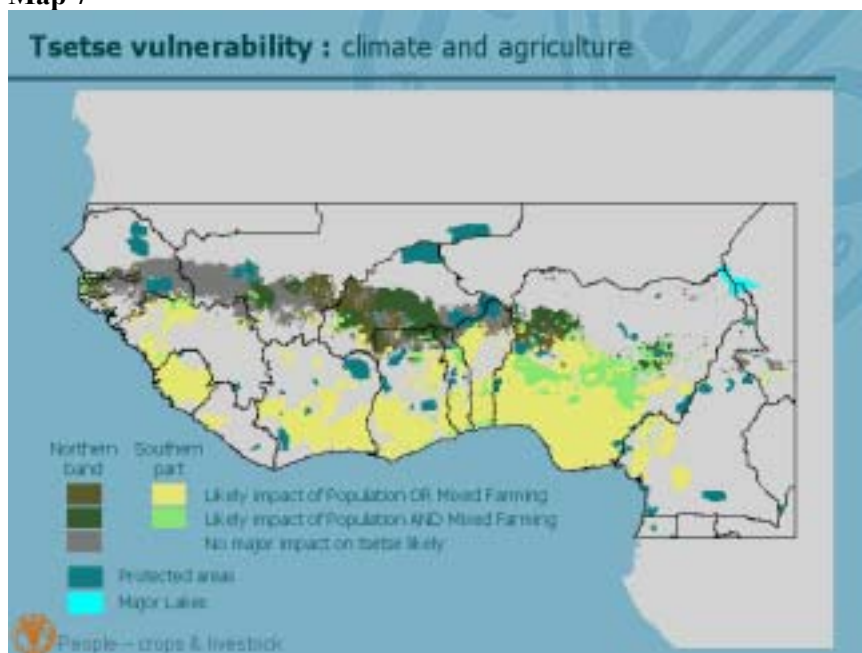
The decision support model is schematically presented in this map.

## Map 6 and Map 7

### Map 6

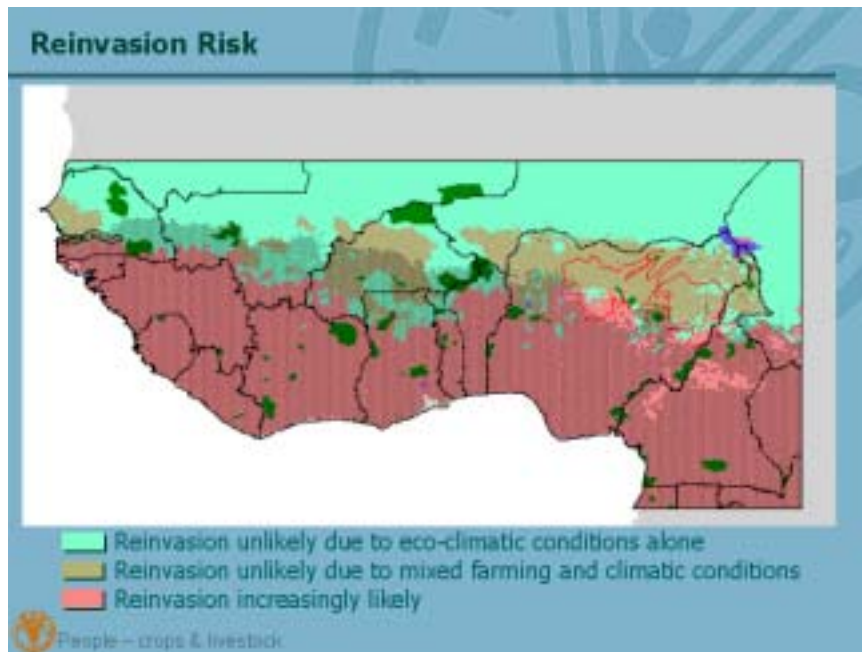


### Map 7



The band like climate patterns strongly influence tsetse ecology. From North to South, the climate becomes increasingly moist. As a result, tsetse populations are likely to be more fragmented, more vulnerable and easier to remove permanently in the North. In addition, reinvasion is less likely since gaps of adverse conditions prevent fly dispersal. By contrast, in the southern part where tsetse are widespread, high reinvasion pressure is likely to jeopardise permanent fly suppression and/or eradication attempts. In these conditions, integrated disease management techniques combining adapted grazing strategies, use of trypanotolerant breeds, veterinary follow up and vector control in hot spots/high challenge areas may be needed to achieve long-term, sustainable pest management.

## Map 8



Application of the models incorporating climatic and mixed farming patterns occurring in this area produces a prediction risk of reinvasion in West Africa.

## Conclusion

We have herewith provided an example (simplified) of the methodological approach for strategic planning of the area-wide integrated tsetse-trypanosomiasis management. This strategic approach integrates the different elements and the intrinsic forces forming and driving the evolution of the farming systems (people, livestock, crops) into a unique entity. To this, the main climatic factors influencing the systems, and affecting vector density and distribution are also taken into account. The described pest management approach allows to select those priority areas where balanced and focused actions are likely to be most successful and produce the maximum benefits for the welfare of the population while preserving the environment.