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TSETSE AND TRYPANOSOMIASIS INFORMATION

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TSETSE AND TRYPANOSOMIASIS INFORMATION

The Tsetse and Trypanosomiasis Information periodical has been established to disseminate current information on all aspects of tsetse and trypanosomiasis research and control to institutions and individuals involved in the problems of African trypanosomiasis. This service forms an integral part of the Programme Against African Trypanosomiasis (PAAT) and is jointly sponsored by the Food and Agriculture Organization of the United Nations (FAO), the International Atomic Energy Agency (IAEA), the Inter-African Bureau for Animal Resources of the African Union (AU-IBAR), the World Health Organization (WHO), the Research Department for Livestock Production and Veterinary Medicine of the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD-EMVT), the British Government's Department for International Development (DFID) and the Institute of Tropical Medicine (ITM), Antwerp.

The half-yearly periodical is prepared for publication, in both English and French editions, by the Food and Agriculture Organization of the United Nations. Each annual volume consists of two parts and an index. Subscription is free for all recipients engaged in trypanosomiasis research and control, and requests for enrolment may be sent to: Ms Maria Grazia Solari, AGAH, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy (fax +39 06 5705 5749; e-mail MariaGrazia.Solari@fao.org).

Since the value of this information service depends to a great extent on the receipt of relevant material from research workers, campaign planners and organizers and field workers themselves, readers are requested to submit news items and copies of scientific papers and reports to the Editor: Dr James Dargie, Brunnstubengasse 43, 2102 Bisamberg, Austria (tel. +43 2262 61735; e-mail j.dargie@aon.at).

We regret that we are unable to supply photocopies of the papers quoted in the periodical.

Distribution dates and copy deadlines

	Copy deadline for news items	Distribution (English and French editions)
Part 1	15 April	July/August
Part 2	15 October	January/February

The Index will be distributed as soon as possible after the completion of each volume.

ABBREVIATIONS USED IN *TTI*

AAT	animal African trypanosomiasis
a.i.	active ingredient
ACTH	adrenocorticotrophic hormone
ALAT	alanine aminotransaminase
ARI	advanced research institute
ASAT	aspartic acid aminotransaminase
AW-IPM	area-wide insect pest management
b.w.	body weight
BIIT	blood incubation infectivity test
CATT	card agglutination test for trypanosomiasis
CD_{50}	median curative dose
CNS	central nervous system
CSF	cerebrospinal fluid
DNA	deoxyribonucleic acid
ELISA	enzyme linked immunosorbent assay
HAT	human African trypanosomiasis
HCT	haematocrit centrifugation technique
GIS	geographic information system(s)
GPS	global positioning system(s)
IPM	integrated pest management
i.m.	intramuscular(ly)
i.p.	intraperitoneal(ly)
i.v.	intravenous(ly)
IFAT	indirect fluorescent antibody test
KIVI	kit for in vitro isolation of trypanosomes
LC	land cover
LCCS	land cover classification system
LC_{50}	median lethal concentration
LD_{50}	median lethal dose
LPI	livestock policy initiative
M	molar
mAEC	miniature anion-exchange centrifugation technique
MoAb	monoclonal antibody
MDGs	millennium development goals
MoU	memorandum of understanding
MW	molecular weight
NARS	National Agricultural Research Services/Systems
NGO	non-governmental organization
PAAT-IS	programme against animal trypanosomiasis-information system
PAG	PAAT Advisory Group Coordinators
p.i.	post-infection
PCR	polymerase chain reaction
PCV	packed cell volume
ppb	parts per billion (10^9)
ppm	parts per million
r.h.	relative humidity
RNA	ribonucleic acid
SARD	sustainable agricultural and rural development
SAT	sequential aerosol technique
SIT	sterile insect technique
sp(p).	species (plural)
ssp(p).	subspecies (plural)
STEP	Southern Tsetse Eradication Project
TC	technical cooperation
T&T	tsetse and trypanosomiasis
TTI	tsetse and trypanosomiasis information bulletin
UV	ultra-violet
VAT	variable antigen type
VSG	variant surface glycoprotein
WBC	white blood cell

Organizations

AfDB	African Development Bank
ANDE	Agence Nationale de Développement de l'Elevage
AU	African Union
AU/STRC	African Union/Scientific, Technical and Research Commission
BICOT	Biological Control of Tsetse by the Sterile Insect Technique
CEBV	Communauté Economique du Bétail et de la Viande
CEMV	Centre Universitaire de Formation en Entomologie Médicale et Vétérinaire
CGIAR	Consultative Group on International Agricultural Research
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement

CIRAD-EMVT	Département d'Elevage et de Médecine Vétérinaire des Pays Tropicaux du CIRAD
CIRDES	Centre International de Recherche-Développement sur l'Elevage en Zone Subhumide
CNERV	Centre National d'Elevage et de Recherches Vétérinaires
CNRS	Centre National de Recherche Scientifique
COCTU	Coordinating office for control of trypanosomiasis in Uganda
CREAT	Centre de Recherche et d'Elevage, Avétonou, Togo
CRSSA	Centre de Recherches du Service de Santé des Armées Emile Pardé
CTVM	Centre for Tropical Veterinary Medicine
DFID	Department for International Development (UK)
DSE	German Foundation for International Development
EC/EU	European Community/European Union
EDF	European Development Fund
ESTA	Ethiopian Science and Technology Agency
FAO	Food and Agriculture Organization of the United Nations
FIND	Foundation for Innovative New Diagnostics
FITCA	Farming in Tsetse Control Areas of Eastern Africa
GFAR	Global Forumon Agricultural Research
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IAEA	International Atomic Energy Agency
IBAR	Interafrican Bureau for Animal Resources
ICIPE	International Centre of Insect Physiology and Ecology
ICPTV	Integrated Control of Pathogenic Trypanosomes and their Vectors
IFAD	International Fund for Agricultural Development
IFAH	International Federation for Animal Health
ILRI	International Livestock Research Institute
INRA	Institut National de Recherche Agronomique
IPR	Institut Pierre Richet
IRD	Institut de Recherche et de Développement (formerly ORSTOM)
ISCTRC	International Scientific Council for Trypanosomiasis Research and Control
ISRA	Institut Sénégalais de Recherches Agricoles
ITC	International Trypanotolerance Centre
ITM	Institute of Tropical Medicine
KARI	Kenya Agricultural Research Institute
KETRI	Kenya Trypanosomiasis Research Institute
LCV	Laboratoire Central Vétérinaire
LNERV	Laboratoire National de l'Elevage et de Recherches Vétérinaires
LRE	Laboratoire Régional de L'Elevage
LSHTM	London School of Hygiene and Tropical Medicine
MRC	Medical Research Council
MRU	Mano River Union
NITR	Nigerian Institute for Trypanosomiasis Research
NRI	Natural Resources Institute
OCCGE	Organisation de Coopération et de Coordination pour la Lutte contre les Grande Endémies
OCEAC	Organisation de Coordination pour la Lutte contre les Endémies en Afrique Centrale
OGAPROV	Office Gabonais pour l'Amélioration de la Production de la Viande
OIE	Office International des Epizooties
OMVG	Organisation pour la Mise en Valeur du Fleuve Gambie
PAAT	Programme against African Trypanosomiasis

PATTEC	Pan-African Tsetse and Trypanosomiasis Eradication Campaign
PRCT	Projet de Recherches Cliniques sur la Trypanosomiase
RDI	Rural Development International
RUCA	Rijksuniversitair Centrum Antwerpen
SADC	Southern African Development Community
SIDA	Swedish International Development Authority
SODEPRA	Société pour le Développement des Productions Animales
TDR	UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases
TDRC	Tropical Diseases Research Centre
TPRI	Tropical Pesticides Research Institute
TTRI	Tsetse and Trypanosomiasis Research Institute
UCLT	Unité Centrale de Lutte contre la Trypanosomiase
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
UNTFHS	United Nations Trust Fund for Human Security
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
UTCC	Uganda Trypoanosomiasis Control Council
UTRO	Uganda Trypanosomiasis Research Organisation
WHO	World Health Organization

CONTENTS

SECTION A – NEWS

PROGRAMME AGAINST AFRICAN TRYPANOSOMIASIS (PAAT): REPORT OF THE 11TH MEETING OF THE PROGRAMME COMMITTEE (PC)

Foreword

The 11th meeting of the PAAT-PC was convened at WHO headquarters, Geneva, Switzerland, 24-25 April 2007. The meeting focused on (i) achievements of PAAT mandated organizations (i.e. FAO, IAEA, WHO, AU-IBAR) and AU-PATTEC, (ii) implementation of AfDB-PATTEC supported T&T intervention in six sub-Saharan countries (Burkina Faso, Ghana, Mali in West Africa and Ethiopia, Kenya, Uganda in East Africa), (iii) new PAAT partnerships (IFAH, UNIDO, FAO/IGAD-LPI).

Mr Raffaele Mattioli, convenor of the meeting, introduced Mr Lorenzo Savioli, Director of the WHO Neglected Tropical Diseases (NTD) Unit, who warmly welcomed the participants to Geneva on behalf of WHO and officially opened the meeting.

Mr A.A. Ilemobade, PAAT Chairman, welcomed the participants. He reminded them of the constitution of PAAT in 1997 as an international alliance of mandated UN agencies, supported by donors, research institutes and tsetse-affected countries. Mr Ilemobade recalled the role of PAAT in formulating a plan of action whose ultimate goal is to alleviate human suffering, reduce poverty, improve food security and facilitate sustainable agricultural production in tsetse and trypanosomiasis (T&T) infested areas. Although the ultimate goal has not changed, the strategy must, and indeed, needs to be constantly reviewed. Among the major achievements made by PAAT are the establishment of structures to coordinate resources at national and international levels, the creation of an open access Information System and the production of a variety of guidelines concerning different aspects of T&T intervention and related sustainable agriculture and rural development. As regards the implementation of intervention projects, the PAAT Chairman welcomed the release by the African Development Bank (AfDB) of the first instalments of loans and grants to the six countries involved in the first phase of the PATTEC initiative: Burkina-Faso, Mali, Ghana, Kenya, Ethiopia and Uganda. The present achievements and planned activities of these projects are central to this meeting.

Apologies were received from Mr Peter Holmes and Mr Pere Simarro who could not attend the meeting.

The meeting was chaired by Prof. A. A. Ilemobade. FAO provided secretarial assistance.

Minutes of the previous meeting

The report and recommendations of the 10th PAAT-PC meeting were taken as read and, after further deliberation, adopted.

Outcomes of the 11th. PAAT-PC Meeting

Representatives of FAO, IAEA, WHO, AU-IBAR and PATTEC reported on progress, priorities and planned activities.

FAO/PAAT – R.C. Mattioli

FAO/PAAT activities and progress on the implementation of recommendations since the 10th PAAT-PC meeting were presented.

As regards training and capacity building, several actions taken by PAAT were described. In particular, IAEA developed two e-learning modules relevant to the implementation of the SIT i.e. irradiation dosimetry and procedures for strain compatibility testing in tsetse flies. FAO, with the collaboration of IAEA, organized an Interactive Training Workshop (2-week workshop, November–December 2006) on harmonization of GIS-based decision support systems for T&T spatial targeting and on the harmonization of national information systems. Further information on this workshop, as well as on the recommendation to further expand the PAAT-IS resources, can be found below.

The use of GIS to facilitate decision-making was promoted through the publication by FAO, in partnership with DFID, of the book "Mapping the benefits: a new decision tool for T&T interventions" which links economic variables to a GIS spatial framework in order to provide new insights and reinforce the decision making process for intervention. Other activities concerned finalization of the paper "Standardizing land cover mapping for tsetse and trypanosomiasis decision making" and the initiation of the paper entitled "Global datasets for the management of the trypanosomiasis problem: an environmental approach", which reviews state-of-the-art global GIS datasets that can assist T&T decision-making.

The inclusion of policy issues related to trypanosomiasis control in the Greater Horn of Africa within the Inter-Governmental Authority on Development-Livestock Policy Initiative (IGAD-LPI) project activities was pursued at the first meeting of the National Technical Focal Points for IGAD LPI held in Djibouti, 24-29 March 2007. Also, FAO/PAAT and IGAD have agreed to cooperate in defining policy and actions against T&T in the IGAD LPI project area. In this regard a collaborative study will soon be initiated.

Inter-Agency (PAAT mandated organizations, IFAD and UNIDO) collaboration was been further strengthened through an FAO/UNIDO/IFAD/IAEA/IFAH project document that has been elaborated on Quality Control/Quality Assurance of trypanocides. FAO/PAAT has also developed a formal agreement of collaboration with the Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) and African Livestock (ALIVE, a World Bank initiative). GF-TADs and ALIVE consider PAAT as the reference platform for providing assistance in the definition of appropriate policies and scientific and technical strategies for matters related to T&T.

Progress report from AU-IBAR – M. Traoré

The main recent activity at AU/IBAR was preparation of the 29th Meeting of the International Scientific Council for Trypanosomiasis Research and Control (ISCTRC), which will be held in Angola from 1-5 October 2007. A scientific committee was established to discuss the abstracts for presentation. Serious concerns for funding have arisen, mainly related to the high costs of air tickets and daily subsistence allowance (DSA) costs for Angola. Mr Traoré appealed to meeting participants to try and find ways of overcoming these difficulties.

Issues related to the need for training were brought to the attention of the participants. Compared with the 1970s and 1980s, when a critical mass of young technicians dealing with T&T was active, today there is lack of new, young personnel adequately trained and

knowledgeable to guarantee a turnover between generations. A suggestion was made to develop "introductory training modules" to attract technicians towards the problem of T&T.

With a view to improving the effectiveness of efforts to control T&T, a need for a substantial reorganization of the links between institutions at the heart of T&T work and a wish for more "synergistic" interactions were also expressed.

Progress report from PATTEC: further African countries benefiting from AfDB financial support – J. Kabayo

The Head of PATTEC Coordination Office, Mr Kabayo, reported on plans and progress in the implementation of the PATTEC initiative. A brief reminder was given regarding the main features of the PATTEC initiative (decision of the African Heads of State, principles of the "Plan of action", activities of the "PATTEC Coordination Office", nature of PATTEC projects, the reasons behind the creation of PATTEC and its objectives). Mr Kabayo emphasized that PATTEC aims at controlling tsetse using existing means, rather than developing new drugs or new technologies.

The current status and the roadmap for the activities of the PATTEC initiative were presented. With the support of the AfDB, the first phase of multi-national tsetse eradication projects has been started in Burkina Faso, Ghana and Mali in West Africa and in Ethiopia, Kenya and Uganda in East Africa. Activities in four countries in southern Africa (Angola, Botswana, Namibia and Zambia) have also started; Botswana and Namibia are now apparently fly-free, hence focus has shifted to Angola and Zambia, where SAT operations are planned to start in May/June 2007. Operations in these two countries will need to involve also the Democratic Republic of Congo (DRC), which is currently setting up a PATTEC office. South Africa, Mozambique and Zimbabwe are planning operations with the help of IAEA. A proposal to make the Southern Africa Development Community (SADC) a T&T – free zone is on the agenda of the next Summit of SADC countries. Between October 2007 and May 2008 implementation of projects should start in several other countries (these projects should tackle transboundary areas in Rwanda, Tanzania and Burundi, in Benin, Togo, Niger and Nigeria, in Chad, Central African Republic, Cameroon and Nigeria, in Sudan and Ethiopia and in Senegal, Mali and Guinea).

The outcomes of the Special Donors' Conference on PATTEC (Addis Ababa, 2 February 2007) were briefly reported. Significantly, pledges of more than US$ 320 million) came from affected countries rather than donors. The PATTEC Coordinator highlighted the possible support to PATTEC from partners, supervision and backstopping of project implementation, field research, experts consultation and resources mobilization.

Report from WHO – J. Jannin

WHO reported on sleeping sickness surveillance and control programme.

WHO provides support to affected countries in relation to capacity building (hands-on training for staff involved in day to day control activities), surveillance and control (supply of "Card Agglutination Test for Trypanosomiasis" (CATT) reagents, accessories and equipment for screening; free drug distribution for treatments: eflornithine, melarsoprol, pentamidine, suramin; logistics to reach people at risk). Emphasis was placed on collaborations between WHO and Sleeping Sickness National Control Programmes (SSNCP) in Uganda and Burkina

Faso. Other successful WHO collaborations were developed with the Centre International de Recherche-Développement sur l'Elevage en Zone Subhumide (CIRDES) and the Institut de Recherche pour le Développement (IRD-Research Institute for Development) in West Africa, with the University of Edinburgh for its activities in Uganda and with the Institute of Tropical Medicine (ITM), Antwerp on development of new diagnostic tools. The good relationship between WHO and PATTEC was acknowledged, but the need for a closer collaboration with national PATTEC representatives for the control of HAT was stressed.

Progress in dealing with the disease was reviewed. Only three countries report more than 1,000 cases a year (DRC, Angola and Sudan) and evidence suggests that the epidemic in DRC is finally under control. At continental level, three percent of cases are caused by *Trypanosoma brucei rhodesiense*, therefore the main effort must target *T. b. gambiense*.

Mr Jannin also reported on the activities of the Neglected Tropical Diseases (NTDs) Control group aimed at raising the awareness on NTDs. A new agreement signed in November 2006 with Sanofi-Aventis has allowed US$ 25 million to be mobilized for the control of trypanosomiasis and other diseases.

Report from IAEA – A. Robinson

The Agency contributes to international efforts against the T&T problem through three major mechanisms, (i) assistance to "normative" activities; (ii) research and methods development; and (iii) technical cooperation.

The Agency's standpoint and activities for tsetse area-wide integrated pest management (AW-IPM), under regular review as part of Tsetse: the Way Forward (TTWF), were reported. The guiding principle of the Agency's participation is the phased-conditional approach. One of the recommendations of a recent meeting under the Agency's TTWF process was the development of a paper outlining the principles for assessing the feasibility of creating tsetse-free zones. CDs on sampling locations for tsetse in relation to population genetics were distributed together with a GIS tutorial. A draft of the letter to the AU Commissioner is under debate highlighting the need for realistic objectives, implementation plans and budgets for AW-IPM tsetse programmes.

With regards to research and methods development, at the FAO/IAEA Laboratory at Seibersdorf and through coordinated research projects (CRPs), the increasing difficulty in obtaining isotopic radiation sources was mentioned. However new developments in X-ray radiation were mentioned together with the fact that the Agency will purchase an X-ray machine for evaluation at Seibersdorf. Recent data at Seibersdorf on UV irradiation have indicated that it may be an alternative for blood irradiation. The following summary on recently completed, ongoing and new CRPs was also presented:

- The CRP on tsetse genetics was completed and the results published in peer reviewed journals. The data on *G. pallidipes* revealed substantial substructuring in populations;
- The CRP on quality assurance related to tsetse rearing will hold its third meeting in Nairobi, Kenya, 7-11 May 2007;
- A CRP on tsetse symbionts and pathogens was initiated in 2007; and

- A new CRP on the integration of population genetics and GIS for livestock pests will probably be started in 2008.

With regards to technical cooperation, the Agency continued to contribute directly to addressing the objectives of the Pan-African Tsetse and Trypanosomiasis Eradication Campaign (AU-PATTEC) through the implementation of one regional, and nine national Technical Cooperation projects in Botswana, Burkina Faso, Ethiopia, Kenya, Mali, Senegal, South Africa, Uganda and the United Republic of Tanzania. The support was largely through provision of training to Member State personnel; expert services and equipment. Under the regional project, two regional training courses are in preparation in Uganda (tentative dates: 30 August-8 September 2007) on the principles of collecting and processing of tsetse flies for population genetic and morphometric analyses and in Senegal (tentative dates: 5-30 November 2007) on principles of entomological baseline data collection. It is also planned to hold a 3 day satellite workshop (13-15 September 2007) prior to the upcoming ISCTRC meeting in Luanda, Angola, on pre-SIT area-wide tsetse suppression.

PAAT Information System: progress and training activities – G. Cecchi

Mr Cecchi reported on the activities carried out since the last PAAT-PC meeting in the framework of the IFAD-funded project "Strengthening the Information System of the Programme Against African Trypanosomiasis".

The full revision of the PAAT web site has been completed and the gaps in information dissemination have been filled (GIS resources and metadata, manuals and papers). An off-line version of the web site was produced on CD-ROM. The integration of PAAT-IS with other web-based tools and resources (e.g. FAO GeoNetwork-FAO's Spatial Data and Information Portal) has been consolidated.

The draft paper "Standardizing land cover mapping for T&T decision making", which will be published in the PAAT Technical and Scientific Series, was presented in its finalized version. The paper provides methodologies and tools to assist T&T affected countries through the process of customization of readily available, high resolution land cover datasets (FAO-Africover project) for improved tsetse habitat mapping and trypanosomiasis decision-making. The paper also explores the relationship between multi-purpose land cover maps and tsetse habitat on different spatial scales.

Information was provided concerning a 2-week Interactive Training Workshop convened to support decision-making and information management in T&T intervention projects held at FAO Headquarters in Rome from 27 November-8 December 2006. This was attended by 20 participants, including representatives from affected countries, FAO staff and international experts. The Workshop dealt with the availability and utilization of global, national and local GIS datasets, data standardization and dissemination. The outcomes of the Workshop were highly valued by participants, who recommended continued support from PAAT in the fields of GIS, Information Systems management and decision making for T&T intervention.

Following the recommendations made at the Workshop, a draft paper was developed entitled "Spatial datasets for the management of the trypanosomiasis problem: an environmental approach". This provides a review of state-of-the-art geospatial datasets available in the public domain that can assist sounder T&T decision-making. A few examples of data utilization were also included.

Lastly, the aim, scope and preliminary results of an FAO-WHO collaboration for improved HAT data management and mapping were presented. It is believed that GIS and Data Base Management Systems (DBMS) can help to improve spatial targeting of interventions against HAT.

Veterinary trypanocides: the quest for essential similarity - J. Tettey

Mr Tettey, of the University of Strathclyde, UK remarked that the key principles for good drugs are: quality, safety and efficacy. He pointed out that 15 percent of all drugs on the market are fake, exceeding 50 percent in some areas of Africa and Asia. Major problems related to trypanocidal drugs concern low quantity of the active compound, inefficient molecules or commercialization of chemicals from unlicensed producers. The value of this market, in sub-Saharan Africa, exceeds US$ 35 billion/year with veterinary drugs far ahead of human drugs.

For trypanocides, no harmonized, updated monographs are available, the last one dates back to 1965, although 35 million doses are administered per annum (corresponding to US$ 35-40 million), with a significant increase in number of manufacturers since 1995. In some formulations, additional products are included, for example vitamins are added to diminazene aceturate. The results are that there is an inconsistency of chemicals on the market. It should be remembered that production of drugs involves combining components in exact proportions.

A pilot study concerning diminazene involved 11 countries, 102 samples (17 brands) from government, private veterinary clinics, pharmacies and markets. 65 percent of samples showed results that were outside the 5 percent tolerance limits. A similar study for another drug (isometamidium) gave equally negative results.

The most urgent actions to overcome these problems were identified as follows: definition of standard requirements for quality, safety and efficacy, definition of specifications for trypanocides, development of robust and reproducible methods of analysis, transfer of techniques to user laboratories in Africa, and quality control of user laboratory activity.

Update on FAO-IAEA-UNIDO-IFAH collaboration on quality control/quality assurance of trypanocides - R. Mattioli, D. Tezera, F. Van Gool

Although promising signs have recently been received from FAO, negotiations to officially formalize the collaboration (i.e. Memorandum of Understanding, MoU) between FAO and IFAH on Quality Control/Quality Assurance (QC/QA) of trypanocides are still ongoing within FAO. Despite the pending nature of the MoU, however, some activities supported by IFAH, on QC/QA of trypanocides have been carried out by Strathclyde University (see previous section) and the Joint FAO/IAEA Division.

A project proposal to assist African countries in obtaining standardized laboratory equipment for executing tests on QC/QA of trypanocidal drugs was jointly developed by FAO and UNIDO, with inputs from IFAD, IAEA and IFAH. The proposal was subsequently approved by UNIDO.

Mapping the benefits of T&T options in East Africa: a regional proposal – A. Shaw

As part of its contribution to the seven countries of the Inter-Governmental Authority on Development (IGAD)'s Livestock Policy Initiative, FAO's Pro-poor Livestock Policy Initiative (PPLPI) is committed to helping strengthen decision-making capacities and informing policy in a number of fields, including T&T control. In this context it is proposing to adapt the "Mapping the Benefits" approach from West Africa to the countries in the IGAD region most affected by trypanosomiasis.

It has estimated that some 16.5 million cattle, nearly 20 percent of the region's population, live in tsetse infested areas. The methodology involves defining and mapping cattle production systems, modelling their output and population growth in the absence and presence of trypanosomiasis and thus calculating the potential benefits from its removal. These are then applied to the cattle population in each system to allow the production of financial maps. Work has started on defining the production systems in the IGAD region.

Harmonizing methods for assessing socio-economic and environmental impacts of T&T control in context of PATTEC activities - J. Maitima

The major drawbacks in past environmental and socio-economic impact assessments in tsetse control projects were identified as follows: lack of consistency in approaches and methods among projects, great emphasis on impact analysis and little attention given to impact mitigation, lack of a framework for stakeholder involvement.

The peculiarities of PATTEC initiative (area-wide approach, regional projects, emphasis on rural development) call for harmonization of methodologies, which will result in the adoption of a common general framework and similar indicators. This should guarantee the same level of standards across regions and provide comparable results.

The draft document entitled "A methodological guide for assessing environmental and socio-economic impacts of tsetse and trypanosomiasis intervention" was presented. It contains tools for environmental, economic and social impact assessments, as well as methods for scenario analysis. For the environmental impact assessment, the levels of analysis concern individuals, populations, communities, ecosystems and landscapes. For the economic impact assessments the levels concern mainly the direct and indirect effects of the disease at the herd level, farm/household level, sector, national, and international levels, including the economic evaluation of environmental impacts of trypanosomiasis interventions. For the social impact assessments, beneficiaries and structure of societies are considered. With regard to the technical option analysis for T&T interventions, the following methods are reviewed: participatory approach, integrated quantitative modelling and computer simulation. The guidelines also describe how to select tools according to the available technical skills, financial resources and time to carry out the analysis.

Country policy workshops are planned in all the six countries involved in the first phase of the PATTEC initiative. Participants will include as many government officials as possible, other decision makers and the PATTEC Steering Committee. During the workshops policy briefs, framework paper, guidelines, interactive CDs and other relevant background documents will be presented and distributed.

Update on the project "Stamp out Sleeping Sickness in Uganda" – I. Maudlin

In central Uganda, HAT of the *rhodesiense* type has recently moved northwards round the Lake Kyoga, to Soroti district, mainly due to movement of cattle carrying human infective trypanosomes.

The project "Stamp out Sleeping Sickness" is a public-private partnership for control of zoonotic HAT in Uganda, with the contribution of Industri Kapital (VC), CEVA Santé Animale, COCTU (Coordinating Office for the Control of Trypanosomiasis in Uganda), WHO, Ministry of Health, Ministry of Animal Industries and Fisheries, University of Makerere (Veterinary School) and the University of Edinburgh–Centre for Tropical veterinary Medicine (CTVM). The project aims to eliminate the disease by breaking the transmission cycle. 220 000 cattle in a high risk zone were treated with trypanocides. Other measures taken were stopping market introduction of cattle, reinforcement of the government policy for point of sale and treatment, selected application of insecticide on cattle to avoid re-infection and, sensitization of the population.

The results of project activities indicate that the proportion of cattle with human infective trypanosomes has fallen from 20-25 percent to 3 percent. Insecticide spraying activities are still ongoing.

Progress of national strategies and strategic integrated approaches for tsetse and trypanosomiasis (T&T) intervention and related sustainable agriculture and rural development (SARD) in priority areas: country reports

Reports on countries benefiting from AfDB support for T&T intervention were presented by representatives of Burkina Faso, Ethiopia, Ghana, Kenya, Mali and Uganda.

Ethiopia – T. Alemu

After a brief introduction to show the geographical location of the project area, Mr Alemu updated the audience on the latest development concerning tsetse mass rearing facilities. The colony of *Glossina pallidipes* has been successfully established and its size has reached 110 000 units, with a growth in pupae production of 22 000/week. Adult fly mortality is below one percent. The colony is ready for the transition to mass rearing. An embryonic colony of *G. fuscipes fuscipes* has been established through shipment of flies from the Zoological Institute of the Slovak Academy of Sciences in Bratislava, Slovakia. The construction work of a new insectary is 98 percent complete.

The field operations of the STEP project, using a phased approach and existing conventional methods of tsetse suppression, is progressing around villages and livestock areas by means of targets (density 4/km^2) and cattle treatment (20 percent of livestock) with pour-on formulations. With regard to monitoring and reporting, standardized procedures were adopted; entomological monitoring is being conducted using 2 traps/km² around villages and livestock areas, while disease monitoring is conducted on 1 300 km^2. Active community involvement is being pursued through awareness-raising activities among village leaders, livestock owners, trained professionals, technicians and the general public.

The loan provided by AfDB (US$14.6M for a period of six years) and inserted in the on going STEP project will soon disburse an initial advance. The joint Ethiopian Government/FAO/IAEA project, funded by the Government of Japan (US$ 1.7M), through the United Nations Trust Fund for Human Security (UNTFHS), in support of STEP activities started. Initial supplies were received through the IAEA procurement procedure, while the

purchase of substantial field materials including vehicles was finalized through the FAO procurement procedures and consignments are expected in the next few weeks.

Kenya – P. Olet

Kenya targeted tsetse eradication from about 92 000 km^2. In the first phase an area of 24 000 km^2 will be covered, comprising the Lake Victoria basin, the Lake Bogoria region (North Rift) and the Meru/Mwea region (Central Kenya). After slight delays due to the disbursement of funds from AfDB, implementation started in the area of Lake Victoria.

Initial results in the area of the Ruma National Park are promising. Approximately 1,000 targets were deployed within the Park and the number of flies captured per trap per day (FTD) was reduced from 78.4 to 0.5 within 4 months using targets treated with 0.6 percent deltamethrin. Fly suppression activity is ongoing. To ensure that tsetse flies do not reinvade the park, livestock are being sprayed by communities outside the park. Material will also be provided to communities to make traps/targets for monitoring and control. Radio programmes to raise communities awareness will be on air from May 2007. Another achievement has been the commissioning of PATTEC offices; computers were purchased and networked, internet and wireless telephone services were made available and the Project Coordination and Management Unit (PCMU) is now fully functional. Drawing from the experience of previous projects carried out in the same area, concern was expressed with regard to the risk of reinvasion.

For the future, a scale-up in the installation of targets is planned and actions aimed at promoting improved livestock and crop agriculture (e.g. restocking in certain areas) are foreseen. To avoid reinfestation, plans for adjacent areas should be in place in phase two of the PATTEC initiative. A concept note for targeting the tsetse belt in the costal regions of the country is also ready.

Uganda – L. Semakula

The AfDB funded "Creation of sustainable T&T free areas in East and West Africa: the Uganda component" is foreseen to be executed in three phases. The area that will be targeted in the first phase is a vast crescent around the Lake Victoria. The project is implemented by the Ministry of Agriculture, Animal Industry and Fisheries and coordinated by COCTU with the support of the PCMU.

Major advancements were made in the procurement of equipment, with evaluation of tender documents completed by March 2007. Terms of reference for recruitment of consultancies for entomological, parasitological, socio-economic, environment and land use management baseline data collection were developed and submitted to AfDB for approval. Because of the nature of the HAT problem in Uganda, a medical expert was included in the project management team.

As regards the tsetse mass rearing, under financial year 2006/07 the Ugandan Government committed US$ 340,000 for expansion of the tsetse mass rearing seed colony facility at Tororo. Completion of the works is expected in May 2007. The facility will have a holding capacity of approximately 350 000 breeding females (actual colony size estimated at 12,000 units). The capacity of the mass rearing facility in Kaliti (Ethiopia) to supply *G. f. fuscipes* for the project in Uganda has not yet been clarified. Therefore, the Government of Uganda is making a request to the AfDB to use part of US$ 4.2 M available in the project for sourcing flies from Ethiopia to construct a medium tsetse mass rearing facility to complement

Kaliti's efforts. To this aim, job descriptions for critical technical staff (entomologist and laboratory technicians) required for the tsetse mass rearing facility have been made and recruitment will be done in July 2007.

In relation to the project implementation, the baseline data collection will be undertaken during the second half of 2007. Tsetse suppression using the live-bait technique in areas where cattle are available, as well as limited tsetse trapping are ongoing.

In order to address the problem of the possible merger between the two forms of HAT (*gambiense* and *rhodesiense*), Government developed a public-private partnership with CEVA Santé Animale Internationale Kapitale, Cooper Uganda Ltd. Makerere University and Centre for Tropical Veterinary Medicine, Edinburgh. More than 190 000 head of cattle, representing 86.4 percent of the total population in the interface districts of Kaberamaido, Dokolo, Amulata, Apac and Lira, were treated with isometamidium. In Dokolo and Kaberamaido treatment was given to 60 000 head, corresponding to 100 percent of the local cattle population. Diminazine treatment was used in the other three districts. As a result, the average prevalence of Animal African Trypanosomiasis (AAT) was reduced from 34 percent to 0,4 percent (0 percent in some areas) after the first treatment.

The major tsetse suppression method to be implemented in 2008 will be the Sequential Aerosol Technique (SAT) with deltamethrin. During the PATTEC Special Donors Conference in February, 2007, in Addis Ababa, the Government of Uganda made a commitment of US$ 3.0 M to be used for aerial spraying operations.

Burkina Faso - Issa Sidibe

The AfDB-funded project in Burkina Faso will target an area of approximately 96 000 km^2 across the Mouhoun and Bani river basins, which were subdivided into five intervention blocks. The foreseen duration of the project is seven years. The sequence of actions will be as follows: surveys, suppression and eradication, each taking one year.

Activities for the construction of a tsetse mass rearing facility are ongoing with the technical support of the IAEA.

The requirements for the baseline data collection were identified during a workshop held in October 2006. It is foreseen that the collection of parasitological, environmental, land use and socio-economic data would start in May-June 2007. In September it is scheduled to begin the entomological surveys. The project is also active in raising awareness among the project beneficiaries and the planning and management of reclaimed T&T free areas.

With respect to sleeping sickness, Burkina Faso is not considered to be a high risk area. However, the return of approximately 360 000 citizens of Burkina Faso who worked in the HAT endemic zones in Côte d'Ivoire caused worries about a possible surge in HAT cases in southern Burkina. Active surveillance carried out by IRD, CIRDES and PNLTHA (Programme National De Lutte contre la Trypanosomiase Humaine Africaine) did not confirm such worries, even though the situation needs further investigation.

Ghana - Charles Mahama

The Ghanaian component of the PATTEC initiative is financially supported by the AfDB and the Government of Ghana. Following the AfDB loan approval in December 2004, the first disbursement took place in April 2006 and the last one is foreseen for December 2011.

This first phase of the project will cover an area of approximately 20 000 km^2 in the Upper West Region of Ghana, which borders Burkina Faso. Consultants for the parasitological, entomological, socio-economic and integrated land cover/environmental baseline survey were recruited. Human resources and equipment needs for the insectary of the Ghana Atomic Energy Commission (GAEC) were assessed. A report concerning GIS and Spatial Epidemiology was produced for the establishment of a DBMS. Pesticides, drugs, traps and field equipment were supplied.

Capacity building was pursued through information campaigns and raising awareness in 75 communities and extensive training of senior and junior personnel. During a workshop on monitoring and evaluation tasks, responsibilities and a system for information flow among stakeholders were defined.

The major constraint identified in this initial phase of the project was the slowness of the procurement process. The following steps in the implementation of the project will be the execution of the baseline data collection and analysis (second half of 2007) and the initiation of suppression activities. Closer collaboration with Burkina Faso and Mali will be sought.

Fields in which support will be necessary were identified as follows: delineation of a realistic target area using the information generated from baseline studies; harmonization of land cover/land use classification, synchronization among bordering countries of suppression and eradication activities to prevent re-invasion, exploration of the desirability and feasibility of the application of SAT.

Mali - Aligui Djiteye

Mr Djiteye provided ample information regarding past T&T intervention projects in the country. The ongoing AfDB-funded project concerns an area of approximately 37 000 km^2, of which 15 500 km^2 are in the Niger river basin (peri-urban zone of Bamako) and 20 000 km^2 in the Bani river basin at the border with Burkina Faso. The project also receives financial support from the Government of Mali.

The baseline data collection and analysis should clarify the distribution and population dynamics of tsetse flies. Furthermore, studies on animal and human trypanosomiasis prevalence, socio-economic context, and environmental impact will be carried out. Utilization of remote sensing imagery to map land cover/land use are foreseen.

Farming communities' involvement has been actively pursued through the creation of tsetse and trypanosomiasis control groups at village level, regional information and sensitization meetings and community workshops. 455 people, approximately 5 per village, were trained in traps impregnation, installation and surveillance.

The option of using an SIT component in the implementation of the project is being explored. In this regard, collaboration with IAEA and CIRDES is already taking place.

General discussion

One of the major issues which emerged from the general discussion was the need for the six countries involved in the first phase of the PATTEC initiative to develop realistic and detailed workplans and budgets, which should address the delicate question of the timing of operations. In a broader perspective, the need to strengthen the managerial component of the projects was also stressed from different sides. The scientific background of most of the

project managerial staff calls for targeted capacity building actions aimed at endowing project coordinators with the tools necessary for managing such complex interventions.

The usefulness of stronger coordination and interaction among the six national projects was also widely acknowledged; in particular, overlaps and duplications should be avoided and technical cooperation reinforced. These actions will contribute to increased harmonization, cost savings and ultimately to more effective interventions.

Some concerns were expressed about the possibility of re-invasion after completion of the tsetse elimination interventions. Even though intervention areas were selected in an attempt to minimize the risk of re-invasion, actions aimed at monitoring and controlling reinvasion will have to be carefully planned and put in place.

Closing

Mr Ilemobade heartily thanked all participants for their contributions. Thereafter, he declared the meeting closed. Mr Mattioli reminded members that the next PAAT-PAG meeting will be held in Luanda, while the next PAAT-PC meeting will be in Vienna. He thanked Raquel Mercado, Maria Grazia Solari and Giuliano Cecchi for their role in making the meeting a success.

Recommendations

The following recommendations were discussed and agreed to:

Due to the large size of the AfDB funded projects currently implemented in six countries, there is an urgent need for better coordination of technical/operational aspects at national and regional levels. The meeting **recommends**:

- The strengthening of structures at regional and sub-regional levels both to facilitate coordination, especially in the timing of cross-border operations and to avoid duplication of efforts, for example, in commissioning baseline studies many of which could be undertaken using common terms of reference at regional levels.

Action: PATTEC, involved countries.

2. PAAT recognizes the importance of project managers having appropriate managerial skills to ensure the timely realization of project objectives. This would involve a judicious mix of topping up the management competencies of technical staff through appropriate training and of bringing in specialized management skills. The meeting **recommends**:

- That PATTEC give high priority to pursuing this urgent need for expert management inputs as the implementation phase of the projects takes off. PATTEC may seek the support of PAAT and other mandated agencies.

Action: PATTEC.

3. Considering that the PAAT Information System is currently not entirely exploited by PATTEC member countries and endorsing the recommendations made at the Interactive Training Workshop on GIS and Information system management (FAO-Headquarters, Rome, 26 November-8 December 2006), the meeting **recommends** that PATTEC and PATTEC countries:

- Make good use of PAAT-IS as tool to share and harmonize the information generated during project activities;
- Build a community of GIS and IS specialists dealing with T&T intervention. Appropriate skills should be identified and capacity building should be pursued; and
- Give existing, national GIS service centres additional training to handle T&T issues.

Actions: PATTEC, PAAT, member countries.

4. PAAT recognizes the need to address manpower requirements of T&T affected countries, especially at the operational level, for intervention. The meeting **recommends**:

- That PATTEC member countries identify and train a younger generation of personnel for T&T interventions.

Actions: PATTEC, AU-IBAR, PAAT and mandated organizations.

5. PAAT appreciates the contribution of IFAH and recognizes the need to curb the growing occurrence of fake and sub-standard trypanocidal drugs in the African market. It therefore, **recommends**:

- To develop standardized specifications provided by authorized bodies;
- To strengthen capacity of regulatory bodies to enforce adherence to specifications by suppliers; and
- To train and equip existing laboratories, on a regional basis, to conduct quality assurance tests according to specifications provided by authorized bodies and agreed upon by countries.

Actions: AU-IBAR, FAO, IFAH, UNIDO, IAEA.

6. PAAT takes note of the discussion and debate on options for the more appropriate techniques and best combinations of techniques for tsetse suppression and tsetse elimination in different agro-ecological settings and the lack of consensus on their use, despite the extensive scientific literature available. The meeting **recommends**:

- That the various entomological experts work towards achieving a consensus on which technique or combination of techniques is best adapted for which situation, defining their limitations and establishing clear entomological guidelines in a single document, ideally in the form of a paper in the PAAT Technical and Scientific Series.

Action: PAAT.

7. PAAT notes that the issue of re-invasion is still a major concern to all the PATTEC countries. The meeting **recommends**:

- That the risk of re-invasion be comprehensively assessed (e.g. at the time of baseline entomological surveys) and that measures be put in place aimed at minimizing this risk in a sustainable manner.

Action: PATTEC, AfDB-funding benefiting countries.

8. PAAT recognizes the efforts being made by all the AfDB-funded projects in the context of socio-economic data collection and impact analysis. It is **recommended**:

- That criteria and methods be harmonized across countries to facilitate comparisons and avoid duplication of efforts. It is suggested to discuss this matter again at the next PAAT-PAG meeting.

Action: ILRI, FAO.

ACTIONS TAKEN BY FAO/PAAT ON THE RECOMMENDATIONS OF THE 11th PAAT-PC MEETING

RECOMMENDATIONS	**ACTIONS TAKEN**
1 Due to the large size of the AfDB funded projects currently implemented in six countries, there is an urgent need for better coordination at national and regional level of technical/operational aspects. The meeting **recommends**: • To strengthen the structures at regional and sub-regional levels both to facilitate coordination, especially in the timing of cross-border operations and to avoid duplication of efforts, for example in commissioning baseline studies many of which could be undertaken using common terms of reference at regional levels.	**Action**: PATTEC, beneficiary countries involved in the implementation of AfDB projects. • FAO/PAAT participated in the "Regional meeting of National Coordinators", convened by IAEA in July 2007. The meeting acknowledged and recognized the role of PAAT and its mandated organizations in guiding and setting principles for T&T interventions and coordination at international level. • The meeting requested the assistance of PAAT in harmonizing database systems and training in data management and analysis. In this regard, the PAAT-IS is a major tool where information (including datasets) is created, harmonized and shared among partners, stakeholders and PAAT-IS users. Examples are the standardization of land cover mapping for T&T decision making (paper in press), the Global Datasets for African trypanosomiasis management where global geospatial GIS datasets are reviewed, criteria for selection of datasets described, including data access and applications within T&T intervention.

RECOMMENDATIONS	ACTIONS TAKEN
	FAO/PAAT initiated the FAO GeoNetwork for the PAAT community. The GeoNetwork allows creation of groups of users (networks) to facilitate GIS data sharing within the community.
2 Considering that the PAAT Information System is currently not entirely exploited by PATTEC member countries and endorsing the recommendations made at the Interactive Training Workshop on GIS and information system management (held at FAO Headquarters from 26 November-8 December 2006) the meeting **recommends** that PATTEC and PATTEC countries: • Make good use of PAAT-IS as tool to share and harmonize the information generated during project activities; • Build a community of GIS and IS specialists dealing with T&T intervention. Appropriate skills should be identified and capacity building should be pursued; • Provide existing national GIS service centres with additional training to handle T&T issues.	**Action**: PATTEC, beneficiary countries, PAAT. • FAO/PAAT created the group "PAAT Information System" which allows metadata and GIS datasets to be generated, edited and posted, and through FAO GeoNetwork to create groups of users to facilitate data sharing within the community (In this regard, a paper was published with the title "The role of FAO GeoNetwork in a multinational development programme: the case of PAAT", OSGeo Journal, English and French versions). • In March 2008, experts met at the FAO/IAEA Joint Division to elaborate a detailed programme for a GIS training course for tsetse control personnel. The foreseen period to hold the course is the last quarter of 2008. • A paper soon to be published in the PAAT Technical and Scientific Series deals with "GIS datasets and methods for an environmental approach to African trypanosomiasis".
3 The meeting recognizes the need to address manpower requirements of T&T affected countries, especially at the operational level, for intervention. The meeting **recommends**: • That PATTEC member countries identify and train a younger generation of personnel for T&T interventions.	**Action**: PATTEC, AU-IBAR, PAAT and mandated organizations. • The issue of training has been partially dealt with in Point 3 (i.e. GIS training course for tsetse control personnel). • Training has been provided to staff of the STEP within the framework of the Ethiopian Government IAEA/FAO joint project GCP/ETH/072/UNJ (funded by the UNTFHS/Japanese Government). • Staff involved in T&T planning and field operations are encouraged to make good

RECOMMENDATIONS	**ACTIONS TAKEN**
	use of training manuals produced by PAAT and its mandated organizations. These manuals (hard copies) have been made available to African colleagues. They are also available in electronic format and can be downloaded from the PAAT website. • FAO/IAEA Joint Division continues to provide regular training in tsetse mass rearing, SIT and related matters.
4 The meeting appreciates the contribution of IFAH and recognizes the need to curb the growing occurrence of fake and sub-standard trypanocidal drugs in the African market. The meeting **recommends**: • To develop standardized specifications provided by authorized bodies; • To strengthen capacity of regulatory bodies to enforce adherence to specifications by suppliers; • To train and equip existing laboratories, on a regional basis, to conduct quality assurance tests according to specifications provided by authorized bodies and agreed upon by countries.	**Action**: AU-IBAR, FAO, IFAH, UNIDO, IAEA. • Actions on this recommendation have been slowed pending the official signature of the MoU between FAO and IFAH on QC/QA of trypanocides. In April this year IFAH communicated to FAO the imminent signature of the MoU. • FAO committed itself to enlarge the MoU to anthelmintics, antibiotics, insecticides and acaricides. • FAO approached UEMOA to seek its involvement in the FAO-IFAH initiative and partnership. • Also, FAO and IFAH approached OIE to stimulate its interest in this initiative.
5 The meeting takes note of the discussion and debate on options for the most appropriate techniques and best combinations of techniques for tsetse suppression and tsetse elimination in different agro-ecological settings and the lack of consensus on their use, despite the extensive scientific literature available. The meeting **recommends**: • That the various entomological experts work towards achieving a consensus on which technique or combination of techniques is best adapted for which situation, defining their limitations and establishing clear entomological guidelines in a single document, ideally in the form of	**Action**: PAAT. • Some action has been undertaken in the past (e.g. a paper has been published in the PAAT Technical and Scientific Series "Integrating the sterile insect technique as a key component of area-wide tsetse and trypanosomiasis intervention"). • In June 2007, IAEA published a book entitled "Area-Wide Control of Insect Pests: from Research to Field Implementation", where various case studies related to tsetse control/elimination campaigns in different agro-ecological scenarios are reported. Lessons can be learned from the reported case studies and adapted to specific agro-ecological conditions.

RECOMMENDATIONS	ACTIONS TAKEN
paper in PAAT Technical and Scientific Series.	• The need remains to have a comprehensive (all inclusive), updated publication on entomological guidelines.
6 The meeting notes that the issue of re-invasion is still a major concern to all the PATTEC countries. The meeting **recommends**: • That the risk of re-invasion be comprehensively assessed (e.g. at the time of baseline entomological surveys) and that measures be put in place aimed at minimizing this risk in a sustainable manner.	**Action**: PATTEC, AfDB-funded benefiting countries. • The developed and agreed PAAT-PATTEC criteria and guidelines for the selection of priority areas for T&T intervention are robust tools to assist the countries in the selection of area(s) where the chances of success are highest and risk of tsetse re-invasion minimal. • The flow chart inherent to the phased conditional approach, developed by FAO/IAEA for T&T intervention is a further tool supporting the feasibility (and planning) of field T&T intervention with the aim of increasing the chance of success and minimizing the risk of failure, hence considering the risk of re-invasion.
7 The meeting recognizes the efforts being made by all the AfDB-funded projects in the context of socio-economic data collection and impact analysis. It is **recommended**: • That criteria and methods be harmonized across the countries to facilitate comparisons and avoid duplication of efforts. • It is suggested to discuss this matter again at the next PAAT-PAG meeting	**Action**: ILRI, FAO. • In-house FAO/PAAT-IGAD LPI collaboration on analysis and compilation of livelihood zones and production systems in the Horn of Africa. This collaboration involves socio-economic analysis of farming systems. The methodological approach could be adapted and adopted by other T&T affected countries. • In collaboration with colleagues of Botswana, Burkina Faso, Ghana, Uganda, CIRAD/CIRDES, FAO/PAAT is preparing and harmonizing global GIS datasets and methodologies for planning, managing and evaluating T&T interventions. Also this collaboration considers the socio-economic aspects of T&T interventions.

Other actions related to and/or supporting the PAAT-PC recommendations included:

Technical and scientific support to advance the planning process for intervention and support to planners, policy makers, researchers, and the technical and development community

Publications

- Two issues annually of the Tsetse and Trypanosomiasis Information (TTI) bulletin.
- PAAT-T&S papers in the pipeline:

  i. Linking sustainable agriculture and rural development strategies with sleeping sickness control (Cattand et. al., final stage);
  ii. PAAT brochure entitled "On Target Against Poverty – The Programme against African Trypanosomiasis 1997–2007 and the Millennium Development Goals of the United Nations (final stage);
  iii. Standardizing land cover mapping for T&T decision making (Cecchi et al., in press);
  iv. GIS datasets and methods for an environmental approach to African trypanosomiasis (Cecchi, Mattioli, in preparation);
  v. Global geospatial datasets for African trypanosomiasis management: a review (Cecchi, Mattioli with contributions of Mahama, Mugeny, Kgori, Motsu, Koudougou and Guerrini);
  vi. "Global datasets for the management of the T&T problem: an environmental approach" (Cecchi et al., final stage);
  vii. Creating, harmonizing and sharing the information: the role of PAAT and its Information Systems (Cecchi, Mattioli), presented at ISCTRC. Luanda, Angola, October 20O7;
  viii. Matching land cover and tsetse habitat (Cecchi et al.), presented at the GisVet Conference, Denmark, August. 2007;
  ix. The role of FAO GeoNetwork in a multinational development programme: the case of PAAT. *OSGeo Journal*, **2**: 20-24 (in English and French); and
  x. The PAAT Network: empowering African partners in the fight against African trypanosomiasis (Mattioli); Keynote address at ISCTRC, Luanda, Angola, Oct. 2007.

Projects

- IFAD funded project supporting the PAAT Information System, ended in July 07 and was officially closed in December 2007. A new project proposal entitled "Pro-poor integrated packages to enhance policy and decision making against the African animal disease burden in sub-Saharan Africa" has been submitted. The PRODOC passed all technical and financial screening and is awaiting the signature of IFAD's president for final approval;
- "Development of innovative site-specific integrated animal health packages for the rural poor" project proposal submitted in February 2008 to IFAD. The PRODOC was well received. We have been requested by IFAD to revise and finalize the PRODOC; and

- UNTFHS – Japanese Government funded project in the Southern Rift Valley to support and complement STEP activities on going.

Meetings and partnership initiatives

- FAO/PAAT participated in the annual NTTAT meeting, OIE Headquarters, Paris, May 2007. PAAT activities were presented;
- FAO/PAAT participated in the "Regional meeting of National Coordinators, IAEA Headquarters, Vienna, July 2007;
- FAO, IAEA and WHO convened the 13th PAG meeting at WHO Headquarters, Luanda, September 2007;
- FAO attended ISCTRC Executive Committee meeting and the ISCTRC Conference, Luanda, October 2007. Keynote address on networking and a paper on PAAT IS were presented;
- FAO participated in the Steering Committee and Technical Advisory Committee meetings of STEP–Ethiopia;
- FAO participated in the 3rd Meeting of the Regional Steering Committee of the FAO/OIE Global Framework for Transboundary Animal Diseases (GF-TAD) for Africa (FAO Rome, April 2008) and the 9th ALive Executive Committee meeting (FAO Rome, April 2008). FAO/PAAT activities were presented;
- On going FAO/WHO collaboration on mapping human African trypanosomiasis in sub-Saharan Africa;
- On going in-house PAAT/IGAD LPI collaboration on "Mapping the benefits of T&T removal in the IGAD region" and on analysis and mapping of livelihood production systems;
- FAO-IFAH partnership on QC/QA of trypanocides formally agreed;
- Collaboration with ITM (and possibly with CIRAD) on T&T epidemiological modelling and generating continental maps of disease risk levels (under discussion); and
- Collaboration with ITM for an assessment of the cost-effectiveness of community-based tsetse control operations and their impact on poverty alleviation and food security for small scale farmers.

NEWS FROM THE PATTEC FRONT

Each issue of TTI will in future contain a column (entitled "News from the PATTEC Front") describing progress in the process of implementing the objectives of the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC). To set the scene, this first account, submitted by the PATTEC Coordination Office, describes the background and summarizes the events and activities that have punctuated the story of Africa's war against trypanosomiasis since the start of the PATTEC initiative.

Background

During the Summit held in Lomé, Togo in July 2000, African Heads of State and Government adopted a decision urging Member States to act collectively and embark on a Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC) aimed at eradicating trypanosomiasis from Africa, in the shortest time possible. The decision by the African leaders to embark on the PATTEC initiative not only underscores the seriousness and significance which African Governments attach to the tsetse and trypanosomiasis problem, but also defines their readiness to assume primary responsibility in implementing the objectives of the initiative. The decision marked a significant departure from past practices, where the direct involvement in, and ownership of, tsetse and trypanosomiasis control activities by governments in the affected African countries was negligible. Within the framework of this historic decision, the Commission of the African Union was charged with the task of initiating and coordinating the activities of the campaign and is required to report to the Summit of the African leaders every year on the progress made.

The PATTEC initiative seeks to generate commitment, mobilize support and sustain the action necessary to effectively address the tsetse and trypanosomiasis problem. This will be accomplished through emphasizing the strategic importance of the ownership, leadership and direct involvement of African governments in mobilizing the human, organizational and financial resources required to initiate and sustain the necessary intervention programmes. The trans-boundary nature of tsetse infestation and trypanosomiasis prevalence imparts a multi-national character on the PATTEC initiative, which in turn calls for maximum inter-state co-operation and co-ordination for effective intervention action.

The PATTEC concept and Plan of Action

A Plan of Action, which outlines the approaches and methods by which the process of implementing the decision to eradicate trypanosomiasis is organized and executed, has been developed. It proposes tackling individual zones of tsetse fly infestation, applying principles of the area-wide approach and utilizing appropriate tsetse suppression methods, integrated to maximize their combined effect to achieve tsetse eradication. By successively and systematically tackling individual areas of tsetse infestation, while preventing re-invasion into treated areas, it will be possible to sequentially create an ever-expanding tsetse-free zone, and thus ultimately eliminate the disease. The PATTEC Plan of Action was endorsed and referred for implementation to relevant offices in the affected countries. Various development partners and stakeholders active in tsetse and trypanosomiasis control also adopted the Plan within the framework of their declared support for PATTEC. Many countries have now developed their national strategies and prepared proposals for the implementation of the

PATTEC initiative. Based on information on the level of mobilization to implement the objectives of PATTEC compiled by the PATTEC Coordination Office from the affected countries, the 37 countries affected by tsetse and trypanosomiasis can be categorized in four groups, viz:

- Two countries (Botswana and Namibia) that recently succeeded in achieving tsetse and trypanosomiasis-free status
- Ten countries, comprising Angola, Burkina Faso, Ghana, Guinea, Kenya, Ethiopia, Mali, Senegal, Uganda and Zambia where the execution of activities to eradicate tsetse has actually started.
- Fifteen countries, which have prepared plans or declared their intention to embark on tsetse eradication activities, namely: Benin, Burundi, Cameroon, Central African Republic, Chad, Gambia, Ghana, Malawi, Mozambique, Nigeria, Rwanda, South Africa, Sudan, Tanzania and Togo
- Ten countries where there are still no reported arrangements to initiate tsetse eradication activities, comprising Congo, Cote d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Gabon, Guinea Bissau, Liberia, Sierra Leone, Niger and Somalia. However, in some of these countries activities aimed at treating human African trypanosomiasis are being undertaken with the support of WHO.

The PATTEC Coordination Office

Within the framework of the decision by the African Heads of State and Government to embark on the PATTEC initiative, the Commission of the African Union was assigned the task of initiating and coordinating the activities of the campaign. In the context of this assignment, the Commission of the African Union established the PATTEC Coordination Office at the Commission Headquarters in Addis Ababa, to help in the initiation and coordination of activities to implement the PATTEC initiative.

The activities of the PATTEC Coordination Office include the translation of the PATTEC Plan of Action into definitive programmes of work, aiming to achieve tangible demonstrable results in a given time frame. While the individual affected African countries execute the actual intervention activities, the PATTEC Co-ordination Office serves to initiate, coordinate, harmonize, guide, support and sustain the activities of the PATTEC initiative. Through contact with affected countries, national and international organizations and other partners, the Office helps to bring together the political, financial and technical components of the tsetse and trypanosomiasis eradication campaign. The Office also takes a leadership role in the development of work programmes, preparation of project proposals, training of personnel involved in intervention activities, preparation and dissemination of publicity and public information on the PATTEC and designing proposals for exploiting tsetse-free land. The PATTEC Coordination Office maintains contact with country Focal Points in each of the affected countries and generally serves to remind affected countries and partners about their individual and collective obligations in the PATTEC initiative.

Consultations with stakeholders and partners

In the past 5 years, visits were made by the African Union Commission (PATTEC Coordination Office) to 32 of the 37 tsetse-affected countries for consultations with relevant government officials, national experts and other stakeholders aimed at generating commitment for the implementation of PATTEC and drumming up action. These visits routinely included meetings with the relevant key Ministers and other senior officials, notably those concerned with Livestock, Agriculture, Health, Finance, Foreign Affairs and Rural Development. In several cases the delegation from the Commission was granted audience with the President of the respective countries to discuss issues of PATTEC and sometimes also with the First Lady and other dignitaries in the country. Meetings with such high profile personalities were instrumental in creating awareness and generating commitment among decision makers and thus attracting attention to PATTEC, followed by support and facilitation for action.

Visits were also made to Africa's development partners, including the African Development Bank, BADEA, IFAD, USDA, USAID, World Bank and DFID; as well as the technical partners, including IAEA, WHO, FIND, FAO, ILRI, ICIPE, CIRDES and ITC for discussions on the plans and mechanisms for supporting African countries in the implementation of PATTEC.

Technical meetings, workshops and project development

The PATTEC Coordination Office has been involved in project identification, preparation and appraisal. A number of technical planning workshops were organized for groups of national experts and senior policy officials to discuss proposals for implementing PATTEC, develop modalities of cooperation in executing tsetse eradication projects in tsetse belts across national boundaries, discuss plans and strategies for project development and execution, analyse implementation protocols, appraise project proposals and review progress. Resulting from such work, a multi-national project proposal to create sustainable tsetse and trypanosomiasis-free areas in six countries located in East and West Africa was prepared and submitted to the African Development Fund with a request for funding. Other workshops and project proposals were prepared for a number of country groups, including: Ethiopia and Sudan; South Africa and Mozambique; Angola, Botswana, Namibia and Zambia; Burundi, Rwanda and Tanzania; Benin, Burkina Faso, Niger, Nigeria and Togo; Cameroon, Central African Republic, Chad and Nigeria; Malawi, Mozambique, Zambia and Zimbabwe. These project proposals are being used to mobilize resources and serve to define and evaluate the work and inputs required to eradicate trypanosomiasis in the identified project areas.

Resources mobilization

The PATTEC Coordination Office played a key role in mobilizing support from the African Development Bank, which provided support to six countries (Burkina Faso, Ethiopia, Ghana, Kenya, Mali and Uganda) worth US$ 70 million in soft loans and grants, in the first phase of the AfDB-supported PATTEC Programme. More support has also been secured from other partners, including US$ 90 000 from the WHO to support the preparation and dissemination of publicity and public information materials; US$ 250 000 from the USA State Department in the form of a contract to ILRI to support research in the development of procedures for identifying, avoiding and mitigating any negative impacts created by the process or

consequence of trypanosomiasis eradication; US$ 450 000 from the Leverhulme Trust in the form of a grant to a network of research scientists conducting morphometric analysis for assessment of the extent of isolation of tsetse populations and investigating optimal methods for tsetse suppression in different tsetse habitats; the International Atomic Energy Agency, which has recently pledged over US$ 2 million per year to support African countries in their efforts to implement PATTEC; the WHO which has successfully mobilized over US$ 25 million from the private sector to provide free trypanocidal drugs and diagnostic tools for sleeping sickness. In addition, the PATTEC Coordination Office signed a MoU with the Latin American Network for Research and Control of Triatominae (ECLAT) concerning the establishment and management of a joint Trypanosomiasis Vector Control and Research (TVRC) Foundation, a charity registered in the USA as a 501(c) (3) charitable foundation designed to seek funds in support of trypanosomiasis research and control activities. Also, a donors' conference jointly organized by the AU Commission and the African Development Bank, which was held on 2 February 2007 and attended by over 250 people from 39 countries and realized over US$ 350 million in pledges and expressed commitment, and within the framework of the MoU signed between the AU Commission and the Foundation for Innovative New Diagnostics (FIND), the PATTEC Coordination Office will receive support worth US$ 850,000 over the next three years to advance advocacy work on trypanosomiasis eradication.

Publicity and public information materials

The PATTEC Coordination Office has prepared publicity and public information leaflets and newsletters, brochures, T-shirts, caps, posters and pamphlets, whose value in explaining and advancing the causes and purposes of the PATTEC initiative is well appreciated. The Office has also produced a uniform, which was endorsed by the ISTRC in September 2005 for use by field personnel in PATTEC projects all over Africa to signify the unity and mentality of fighting the same war in all countries.

Conclusion

The process of implementing PATTEC has started in several countries and is gathering speed. A previously neglected disease is slowly becoming one that is currently attracting attention and receiving support. Resources mobilized from Africa's development partners or provided by affected countries have enabled a number of countries to initiate action, and two countries, Botswana and Namibia have recently been rendered tsetse and trypanosomiasis-free. The Presidents of the two countries were each presented with the newly introduced "African Union Trophy of the Last Tsetse Fly" during the African Union Summit held in Addis Ababa in January 2007. PATTEC now provides a good example of the functional cooperation between African countries to solve a common problem within the framework of the African Union. The war against trypanosomiasis has begun; and every six months, throughout the years to come, "News from the PATTEC Front" will provide information about the progress in this war. So, watch this space!!!

REPORTS AND RECOMMENDATIONS FROM THE 29th MEETING OF THE INTERNATIONAL SCIENTIFIC COUNCIL FOR TRYPANOSOMIASIS RESEARCH AND CONTROL (ISCTRC), LUANDA, ANGOLA 1-5 OCTOBER 2007

Reports from International and Regional Organizations

Food and Agriculture Organization of the United Nations (FAO)

This report was published in Volume 30 Part 2 of TTI, pp. 16-18.

African Development Bank (AfDB)

The AfDB recognizes trypanosomiasis as a major debilitating disease affecting both humans and animals. Trypanosomiasis also impairs socio-economic development and livelihood of entire rural communities, limits land use and, hence having a negative impact on agricultural production and frustrating efforts to attain food security and reducing rural poverty. The social and economic consequences of the disease are enormous. FAO reports indicate that if trypanosomiasis were to be eradicated, 40 percent of the population in sub-Saharan Africa would benefit and 55,000 deaths per year from sleeping sickness would be avoided.

The AfDB decided to provide assistance to the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC). In this initial phase, the Bank supports six sub-Saharan countries, i.e. Burkina Faso, Ghana, Mali in West Africa and Ethiopia, Kenya, Uganda in East Africa. Funds provided amount to approximately US$ 70 million in soft loans and grants and are intended to create tsetse and trypanosomiasis free areas in well demarcated parts of these six countries. The success of this initial phase will greatly enhance the plans and efforts of African countries aimed at improving human and livestock health, eradicating poverty and increasing food security through improved agricultural and livestock production.

PATTEC programme would require the sum of US$ 3 billion within the next 15 years. In line with PATTEC's road map, to accomplish the task of T&T eradication on the African continent, countries are grouped to ensure that the attack will be efficient and sustainable. Based on this principle, the next set of countries proposed includes Angola, Zambia, Tanzania, Rwanda, Burundi, Benin, Chad, Democratic Republic of Congo, Niger, Nigeria and Togo. The estimated cost is projected to be about US$ 467 million. The Bank started the preparation of multinational project to assist the above countries. At the jointly organized AfDB/AU donors' conference, held in Addis Ababa, February 2007, AfDB showed the intention to further support PATTEC by pledging to commit US$ 75 million under the upcoming ADF XI replenishment. The sum of US$ 392 million constitutes the financial gap in the next five years to which PATTEC will require the support of African member countries and the international community.

The Bank renews its commitment to combat the disease to enable the people to improve their livelihood. However, this noble objective will require the concerted efforts and commitment of member countries, international organizations, donors, research institutions, all stakeholders and the benefiting rural communities.

International Atomic Energy Agency (IAEA)

The IAEA has continued to provide assistance to African Member States in the peaceful use of nuclear and related techniques for the reduction of poverty and the enhancement of sustainable rural and agricultural development. Of particular importance has been the further development and transfer of the sterile insect technique (SIT) as an additional control tactic for the creation of tsetse-free zones as part of an area-wide integrated pest management (AW-IPM) approach.

The IAEA concurs with other partners that the T&T problem is one of the major root causes of rural poverty in sub-Saharan Africa. In this regard, the Agency provides support to the implementation of the PATTEC Plan of Action through one regional and ten national technical cooperation projects in Botswana, Burkina Faso, Ethiopia, Kenya, Mali, Senegal, south Africa, Uganda, the United Republic of Tanzania and Zimbabwe. Under these projects, the IAEA implemented technology transfer to the Member States in the areas of feasibility assessment, capacity building and pre-operational support on the SIT for tsetse, through the provision of training, expert services and equipment. In collaboration with FAO and WHO, IAEA has continued to offer coordinated assistance to the six countries, Burkina Faso, Ethiopia, Ghana, Kenya, Mali and Uganda.

The Agency believes that AW-IPM approach is the best strategy that can lead to sustainable tsetse-free areas, but it is by no means a guarantee for success. IAEA, in collaboration with other partners, has developed a set of pre-requisite conditions for successful AW-IPM T&T interventions. In addition, IAEA is not promoting the use of SIT in all tsetse projects and in all circumstances. SIT is just one of several techniques that should be used only in areas where it has comparative advantages and where other techniques alone can not lead to complete elimination of targeted tsetse population(s).

The IAEA recognizes that the creation of tsetse-free zones will require a concerted action by many partners over many years, including appropriate policy, institutional and technological interventions and substantial human resources and financial commitments. A phased conditional approach, whereby support to a next phase will be subject to achieving pre-agreed milestones in the previous years is essential. The Agency also puts high importance on the Member States' ownership and that the development of an overall road map for the creation of tsetse-free zones is formally a matter of the Member States. Respecting this, the IAEA is placing more and more emphasis on the principle of national and regional ownership and international harmonization, solidarity and prioritization. In doing this, the IAEA will continue to provide support that lies within its mandate and therefore limited to aspects that are relevant to the "SIT- packages" i.e. SIT has to be applied in the context of multidisciplinary efforts aiming at sustainable agriculture and rural development. Therefore, enhanced partnerships with other UN agencies and other organizations, institutions and stakeholders will be essential to attain the overall objective.

The IAEA will continue to provide support to the PATTEC initiative for the concerned Member States. In this respect, several activities have been implemented and range from the production of normative and technical guidelines, provision of training and human resource development, funding Coordinated Research Projects (CRPs) and Technical Research Contracts, development and production of manuals, models, databases and textbooks to assist and facilitate the programming, the implementation and the day-to-day decision making in tsetse intervention programmes.

The Agency will continue to assist its Member States in enhancing the effectiveness of their activities by strengthening not only their human resources and infrastructures, but also leveraging financial resources required to intervene against T&T with the aim at developing an environment conducive for improved human well-being through sustainable agriculture and rural development.

World Health Organization (WHO)

During the period 1997-2006, the *gambiense* form of the disease, which represents 97 percent of the total sleeping sickness cases reported at continental level, declined due to intensified control activities on the human reservoir. The role of an animal reservoir is minor in the transmission process of this disease form. A decrease was also observed in the number of new cases. Conversely, intervention activities, supported by WHO, of the *rhodesiense* form (accounting for 3 percent of total cases) and focusing mainly on the human reservoir were insufficient to control the disease. Therefore, in countries endemic for *T. b. rhodesiense* infections, an integrated human and animal disease, and vector control approach should be adopted and should rely on close collaboration between human and veterinary health services and include an entomological component to ensure successful control of the *rhodesiense* form.

The worrisome scenario described during the World Health Assembly in 1997 has been dramatically improved. In addition to the political will at the highest level, capacities for surveillance and control in the endemic countries have been strengthened through capacity building based on training by "learning by doing" of staff involved and provision of equipment for screening, diagnosis and treatment, facilitated by WHO financial and technical support. WHO also secured production and distribution of drugs through public-private sector partnerships. These actions have resulted in 69 percent reduction of cases in the last ten years. Unfortunately, with low number of cases detected, there is a shift in country priorities leading to reduced attention to sleeping sickness. A similar situation occurred 50 years ago with a subsequent resurgence of sleeping sickness cases. To avoid this experience, a cost-effective sustainable sleeping sickness surveillance and control is the challenge of the immediate future. This sustainability can only be achieved through an integration of surveillance and control activities within reinforced health systems. The approach should foresee specialized teams and health systems working together. Health staff should be sensitized and trained to be able to integrate sleeping sickness surveillance and control in the day-to-day activities and supported by teams of specialists/experts in monitoring and evaluation to ensure performance quality.

Technical bottlenecks for the implementation of the above strategy are the availability of a sensitive and specific diagnostic test, cheap and easy to perform under field conditions and to be used at any level of the health system, and a new oral drug, cheap, safe and easy to administer, able to cure both stages of the disease.

During an informal consultation (May 2007), endemic countries concluded that (i) the elimination of the disease is possible, (ii) the participation of the national health system is necessary to sustain surveillance and control, (iii) the development of new diagnostic tools together with simple and adapted drugs is crucial to guarantee the effective participation of health structures, (iv) the maintenance of a specialized national central structure is required for coordination and overall necessary technical assistance, (v) the support of WHO to

endemic countries must be maintained for the implementation of the different measures required to achieve the objective of the sustainable elimination of the sleeping sickness public health problem.

In order to pursue the decline of the number of sleeping sickness cases, effective surveillance and control will continue to require appropriate human resources, adequate control activities, effective reporting, awareness, advocacy for priority ranking and for fund raising. Research and Development must be maintained and priorities must be driven to provide adequate tools for a sustainable elimination of the disease. In this regard, WHO is ready to take up the challenge and continue to lead country support and coordinate the work of all the involved actors.

Centre International de Recherche-Développement Sur L'Élevage en Zone Sub-Humide (CIRDES)

Several projects, funded by various donors (e.g. UEMOA, CORAF/AfDB, BMZ, the Wellcome Trust) have been implemented since the last ISCTRC. The Centre is in the process to strengthen its capacities in biotechnology techniques (molecular genetics, diagnostic tools), human resource development on trypanosomiases and their vectors, technology transfer and information dissemination.

Research activities focus on tsetse and trypanosomiasis, ticks and cowdriosis, disease epidemiology, evaluation of disease risk factors, disease/vector ecology, integrated disease control (also in peri-urban areas), genetic markers for trypanosomiasis resistance/susceptibility in animals. In addition to animal trypanosomiasis, sleeping sickness (the human form of the disease) is also among the research themes of CIRDES. Most of the research actions are carried out in partnership in the West African region. Major CIRDES partners are IRD/CIRAD France, WHO and LTTRN. The expansion of partnerships has allowed the Centre to increase its critical mass in terms of scientific personnel and to diversify, reinforce and complement research activities. It is worth mentioning that the research teams of CIRDES provide also a constant support to disease control field-based actions in the West African sub-region and to the AfDB-PATTEC funded project in Burkina Faso.

Human resource development and training focused mainly on trypanosomiasis and their vectors. Most of the trainees were from the West African region. The training activities benefited from the support of IAEA. The foreseen collaborations of CIRDES with IRD France, ITM Belgium, Bill and Melinda Gates Foundation, EU and Belgian Development Cooperation will provide further support to develop sustainable regional capacity.

International Centre of Insect Physiology and Ecology (ICIPE)

ICIPE's mission is to improve the well being of the peoples of the tropics through research and capacity building in insect science and its application. This is done by addressing the interlinked problems of poverty, low agricultural productivity, poor health and degradation of the environment. The Centre tackles these issues through its operative Research and Development paradigm, addressing human, animal, plant and environmental health, by integrated pest and vector management (IPVM). Another important constraint is capacity,

both human and institutional, to solve developmental problems. Therefore, each of ICIPE's projects includes an important capacity building component.

The Animal Health Division's goal is to improve livestock health and productivity. A full research continuum, from strategic to adaptive research and finally to technology development and transfer through strategic partnerships is pursued. Research and experience in tsetse and ticks have generated technologies, which enables farmers to undertake better ecological management of major disease vectors, help in intensifying and diversifying small holders farming systems to generate more cash income and enhance food security. Emphasis has been on developing environmentally safe methods. In tsetse, the Centre has considerable experience in community mobilization, empowerment and organization for undertaking T&T control in different agro-ecosystems and animal husbandry practices. Capacity building at all levels of society is an integral part of all Division activities. Several post-graduate student, technicians and farmers have been trained in research and control from different African countries in order to ensure sustainability of vector control activities. A key element in ICIPE's strategy will continue to be to develop, introduce and adapt new tools and strategies for arthropod management that are environmentally safe, affordable, appropriate, socially acceptable and applicable by the targeted end users with full community participation.

The Centre's accomplishments in capacity building are well known. ICIPE has trained 200 PhD scientists and 150 MSc students through the African Regional post-graduate Programme (ARPIS) in insect science in collaboration with 32 African universities. Over 15,000 farmers and some 2,000 extension workers have been trained in IPVM.

In order to ensure sustainability of vector control, the Animal Health Division continues to undertake capacity and capability building at all levels including service providers, practitioners, technicians, community health workers and managers of control operations. The Division helps communities in the establishment of organizational, management and financial community structures.

As the only international institute working primarily on arthropods, ICIPE has the comparative advantage in addressing the complex cross-cutting challenges of tsetse and trypanosomiasis. The Centre will continue to develop new and strategic partnerships for managing the enormous vector and disease burden that Africa bears.

UNICEF–UNDP–WORLD BANK–WHO: Special Programme for Research and Training in Tropical Diseases (TDR)

The TDR mission is "an effective global research effort on infectious diseases of poverty in which disease endemic countries play a pivotal role". Human African Trypanosomiasis (HAT) is among the diseases considered by TDR as major cause of poverty in sub-Saharan Africa.

Major research work on African trypanosomiasis should focus on developing new and improved tools for treatment and diagnosis of Human African Trypanosomiasis (HAT), providing new knowledge, tools and strategies for vector control, and strengthening capacity of African scientists and institutions to address country research priorities.

Research on new and improved drugs relates mainly in optimising use of available drugs (i.e. eflornithine-niflurtimox for late stage and pentamidine for early stage of

gambiense infections). Concerning diagnosis, novel and improved diagnostic tools should be developed and bio-banks of well characterized specimens should be established to facilitate assay development efforts. TDR is about to prepare reference standards (set of rules) for the evaluation of HAT diagnostics. Also, it is foreseen to commission a systematic review of HAT diagnostic research.

In vector research, TDR promotes the development and testing of novel methods for improving HAT vector mass-trapping system, and to support the generation and exploitation of *Glossina* genome sequence data. Expected outputs that relate to this research theme range from improved odour baits and odour release system, improved large scale tsetse mass trapping methods and publication of tsetse genome sequence data.

Training objective focuses on empowering scientists from disease endemic countries and provide them opportunities for Masters, PhDs, grants for new graduates, organizations of short courses and seminars through strengthening HAT consortium. The training activities should lead to increased leadership skills to, inter alia, plan and manage research, apply research best practices, negotiate role in partnerships, apply research results into policy.

TDR will continue to work along its three main objectives: stewardship, empowerment and research on neglected disease priority needs, with the ultimate goal of empowering scientists from disease endemic countries through capacity strengthening.

International Livestock Research Institute (ILRI)

ILRI's mandate is to reduce poverty and make sustainable development possible trough livestock-related research. Four main thematic areas are addressed: (i) targeting research and development activities; (ii) enhancing access to market opportunities; (iii) securing assets through biotechnology; and (iv) livestock systems (people, livestock and the environment). Main partners in the research programme implementation are national, regional and international institutions. Collaborations with civil society, NGOs and private sector have also been established.

Research on trypanosomiasis concerns mainly molecular genetics and breeding for trypanotolerance, managing trypanocide resistance, socio-economics and environmental monitoring of tsetse and trypanosomiasis control programmes, and sustainable land management in tsetse-freed areas. The trypanosomiasis research package is carried out mainly in the East and West African regions. Research on environmental and socio-economic impact assessment has generated a framework and guidelines for assessing the impact of T &T interventions. This work was done in collaboration with AfDB-PATTEC funded projects. The framework and guidelines are now being field-tested in Kenya with the support of Kenya Government. Additional financial contributions are expected from the National Institute of Health (NIH), Michigan State University to identify linkages between climate, land use, land cover, socio-demographic factors and tsetse distribution. The UNEP/GEF financial assistance will support research to identify and apply best practices to sustain land and forest productivity in tsetse-freed areas.

Twenty years of work in the formerly tsetse-infested Ghibe valley in the Southwest of Ethiopia have recently been transformed into community-driven livestock disease control via the successful formation of animal health "cooperatives". The farmer-to-farmer knowledge transfer is now paving the way for community-based schemes for livestock disease control.

Eastern Africa Network for Trypanosomiasis (EANETT)

EANETT is a network comprising of institutions in five countries (Sudan, Uganda, Kenya, Tanzania, Malawi) undertaking research and control of tsetse and HAT. The network was inaugurated in 2000 and is supported by the Swiss Development Cooperation. Three main research priority areas have been identified: (i) determination of prevalence, extent of spread and risk of overlap of *T. b. rhodesiense* and *T. b. gambiense* in selected areas of Eastern Africa; (ii) isolation and characterization of melarsoprol refractory *T. b. gambiense* and investigation of host and parasite factors involved in relapses; (iii) transmission studies to assess the risk of spread of *T. b. rhodesiense* and *T. b. gambiense* sleeping sickness foci in Eastern Africa by *Glossina* spp.

Capacity building, through training, information and provision of technical equipment is also among the activities of EANETT. Particular attention is devoted to improve laboratory facilities for research and diagnosis. Human resource development focuses on transfer of technology and promotion of MSc and PhD programmes. The Network has also organized technical workshops and scientific conferences in East Africa. Links and collaborations have been established with WHO, PAAT, MSF/DNDi, ITM in Belgium, Yale University in USA and PATTEC.

Organisation de Coordination pour la Lutte Contre les Endémies en Afrique (OCEAC)

In line with the WHO principle of the elimination of sleeping sickness, the OCEAC has established the sub-regional programme against HAT in Central Africa. This Programme, under the OCEAC coordination, comprises all relevant actors and stakeholders involved in fighting HAT in the sub-region. The strategy for the elimination of sleeping sickness based on four pillars: (i) strengthening of surveillance activity in 26 known sub-regional foci, with particular attention to the transboundary foci; (ii) the establishment of a network of passive surveillance, with the support of 26 health agents trained in disease diagnosis and treatment; (iii) anti-vectorial intervention in suspected residual hot-spots; and (iv) the development of operational research aiming at make available to the operators simple diagnostic methods and treatment schemes adapted to field conditions. These four pillars of activity are spread over eight years. The final objective of sleeping sickness elimination in Central Africa is foreseen in 2014-2015.

Foundation for Innovative New Diagnostics (FIND)

Control of HAT relies on diagnosis and treatment of infected individuals. At present, none of the diagnostic tests in use for sleeping sickness has been produced commercially. Available tests suffer from inadequate sensitivity and specificity. Therefore, there is a need to develop diagnostic tools that are accurate and applicable in endemic regions.

FIND is an independent Swiss Foundation dedicated to the development of diagnostic tests for poverty related infectious diseases of public health importance. The FIND tuberculosis programme has been used as a model to develop a rigorous and systematic approach to the needs-driven development, evaluation and demonstration of diagnostic technologies. This is done in partnership with academic and research institutes, and with biotechnology companies in the private sector to ensure eventual access to affordable tools in the public sector of developing countries.

HAT diagnostic is a vertical programme within FIND, alongside other disease-specific diagnostic development projects. The HAT programme benefits from active scouting of technologies and the development of technology platforms that can serve multiple diseases. Since its launch in early 2006, with a grant of US$ 9.8 million from the Bill and Melinda Gates Foundation, the HAT programme, executed jointly with WHO, has established links with industry, academic and research institutes in developed and endemic countries.

FIND is currently screening a large number of antigens obtained from laboratories around the world to develop a sufficiently sensitive and specific serological test which should guide treatment without the need for a confirmatory test. For molecular diagnosis, a highly sensitive, specific, simple and potentially cheap molecular test, based on isothermal amplification for DNA, is expected to complete its feasibility very soon. In addition, FIND has invested in the development of a more accurate method for staging HAT and follow up treatment. A number of projects have been initiated, which range from improvement of existing tests, marker validation, to discovery research.

With the concerted efforts in T & T control that are evident today, elimination of sleeping sickness is a distinct possibility.

Recommendations

The meeting:

1. **Welcomes** the ongoing efforts, activities and achievements of the international organizations and institutions in support of national projects/actions and PATTEC initiative in tackling the tsetse and trypanosomiasis problem (T&T) in sub-Saharan Africa;
2. **Notes** that the problem posed by T & T is vast and complex and that the complexity derives from its medical, veterinary, agricultural and rural development dimensions;
3. **Acknowledges** the existence of criteria and guiding principles for the selection of priority areas for T & T interventions in the context of Sustainable Agriculture and Rural Development (SARD) and human health;
4. **Acknowledges** the research efforts made to support T & T programmes in disease endemic countries and to strengthen capacity to undertake appropriate research;
5. **Notes** that to eliminate the disease, there is critical need for country commitment in order to mobilize all available resources and to establish effective transboundary integration;
6. **Notes** the need for a phased-conditional approach in the implementation of area-wide integrated pest management (AW-IPM) (i.e. moving to the next phase will only happen when achievement have been made in the previous phase);
7. **Notes** that various prerequisites have been identified for the successful planning and implementation of tsetse AW-IPM (i.e. availability of accurate, recent baseline data; quality assurance of the sterile males, in case SIT is incorporated; autonomous and independent management structures; adequate funding, resources and expertise;

continuity in the implementation of all project components; independent programme review; and commitment of all stakeholders.

Recommends that:

1. The policy and the strategy implemented be comprehensive and beyond the entomological and parasitological aspects. It needs to be oriented towards:
    - Food security and poverty alleviation;
    - The conservation and protection of the environment; and
    - Capacity building and institutional strengthening for enhanced decision making capacity.
2. Efforts and activities of international organizations should be directed to the harmonization of research strategies, for production of tools for T & T field programmes for policy makers and advisors, planners, scientific and technical staff.
3. Efforts should be made by countries with endemic Human African Trypanosomiasis (HAT) to involve as much as possible the health systems (in particular primary health care system) in the surveillance, control and appropriate research for HAT. Sleeping sickness national programmes or specialized bodies at national level should be maintained to monitor and provide appropriate support to the integration process.
4. An integrated vector, human and animal disease control approach should be adopted relying not only on human health but also setting a multisectoral approach including veterinary and entomological services. Coordination between these different services is needed to ensure successful control of both forms (*gambiense* and *rhodesiense*) of the disease.
5. Efforts should be made to strengthen research capacity in T & T through training and empowering the disease endemic countries (DECs) to lead and direct research needs in countries.
6. Projects use the document "Assessing the feasibility of implementing AW-IPM" to clearly assess the status of project implementation and to assess which next steps to take.
7. Projects ensure that the prerequisites identified for the successful planning and implementation of tsetse AW-IPM are in place before embarking with the operational phase of the project.

Recommendation on PAAT

The ISCTRC notes with appreciation the continued contribution of PAAT and its organs in moving forward the fight against T & T through the provision of guidelines for assessing the feasibility of creating T & T free zones, vital information and decision-making tools, publications, access to PAAT information system and harmonization of GIS-based decision support.

Council urges PAAT to continue to support, in increasing measures, T & T interventions in the spirit of increased agricultural production, poverty reduction and sustainable rural development.

PATTEC and Country Reports

Moderator: T.K Phillemon-Motsu

Rapporteur: C.I. Mahama

The session on country reports was preceded by a keynote presentation on the "Pan African Tsetse and Trypanosomiasis Eradication Campaign" (PATTEC). The presenter, Dr John Kabayo, who is also the Coordinator of the campaign, expressed satisfaction at the level of commitment and dedication tsetse-infested countries have demonstrated in the fight against tsetse and trypanosomiasis. There was, in his view, widespread support for PATTEC and that this was evident in the plans that are currently being put in place by affected countries for tsetse eradication. Dr Kabayo reminded participants that the declaration made by African Heads of State and Government in Lomé in 2000, to eradicate tsetse and trypanosomiasis from the continent, was based on the realization that the economic and social losses caused by the disease are colossal and that there can no longer be any justification for prolonging the suffering of the majority of Africans. He reminded participants that past control efforts failed due to their uncoordinated nature and also to the fact that they were not sustained. The new approach supported by PATTEC therefore, is the systematic removal of tsetse on an Area-wide basis and in a sustained manner. Where a group of countries have identified a common zone of intervention, tsetse and trypanosomiasis eradication projects can be jointly executed. Countries in East Africa (Ethiopia, Kenya and Uganda) and West Africa (Mali, Burkina Faso and Ghana) received funding from the African Development Fund to support the creation of tsetse-free zones in those countries.

Dr Kabayo informed the meeting that other countries in West, Central and Southern Africa are in the process of developing projects for the creation of tsetse-free zones. The main responsibility of the PATTEC Coordination Office, based at the AU Commission in Addis Ababa, is to drum-up action and assist to mobilize resources for the sustenance of the activities of the campaign and to continually remind African countries of their individual and collective obligations to the objectives of the campaign. He informed the meeting that PATTEC has high profile recognition, to the extent that a report on the status of the campaign is submitted to African Heads of State and Government at their annual summits. The presenter urged all affected countries to include T & T in their national development priorities and called on scientists to give support to the campaign through the provision of technical and scientific advice that would facilitate the removal of tsetse and trypanosomiasis from the Continent in the shortest possible time.

Seventeen countries presented their reports. The first set of country reports was given by the respective representatives of Burkina Faso, Ghana, Mali, Kenya and Uganda. A presentation from Ethiopia could not be made because the representative could not attend the conference. Under the guidance of the PATTEC Coordination Office, existing baseline biological and socio-economic and environmental information was packaged by the six countries to develop projects that enabled them obtain loans from the African Development Bank to create tsetse and trypanosomiasis-free zones. The projects started in 2006 and will end in 2011. The countries planned baseline studies between 2007 and 2008. These studies

are aimed at improving on existing information and providing decision support for tsetse and trypanosomiasis eradication. The presenters informed the meeting that the choice of techniques for tsetse eradication would be determined following baseline studies. PATTEC was exploring the introduction of the Sequential Aerosol Technique for tsetse suppression and plans were advanced in the recruitment of consultants for assessing its feasibility.

Other country reports were from Somalia, Democratic Republic of Congo, Botswana, Mozambique, Zimbabwe, Angola, Guinea, Benin, Togo, Tanzania, Sudan and Zambia. The countries reported the occurrence of both Animal trypanosomiasis and Human African Trypanosomiasis. Countries in Central and Southern Africa focused mainly on sleeping sickness situation. It was generally observed that effective and sustained treatments often lead to significant decline in disease prevalence and that resurgence occurs when surveillance and control are relaxed. Certain countries notably Benin, Togo, Angola, Tanzania, Sudan and Zambia were gathering baseline data that would enable them prepare project documents for funding by development partners. These efforts were being coordinated by PATTEC. The presentation by Botswana demonstrated the successful application of the Sequential Aerosol Technique (SAT) initiated and funded by the Government.

During the discussion, participants urged the countries to integrate activities carried out by Veterinary Services and the Ministry of Health, with regard to the control and or eradication of tsetse and trypanosomiasis. There was a general consensus that all methods for the elimination of tsetse and trypanosomiasis be explored and used as and when necessary. There was also a call on International Organisations and the Private Sector to continue providing support to the current effort being made by tsetse affected countries.

Recommendations

Following the general concern that the situation of tsetse and trypanosomiasis in many countries has worsened in the last decade and appreciation on the progress made by AU-PATTEC in the creation of awareness and the mobilization of human and financial resources towards the eradication of tsetse and trypanosomiasis, the meeting commended concerted and sustained action for the realization of the objective of the campaign and recommends to AU-PATTEC to:

1. Support countries implementing tsetse and trypanosomiasis eradication programmes to develop bankable projects for submission to development partners.
2. Ensure that projects developed are based on sound information and are Regional in character.

and recommends countries to:

1. Continue to accord high priority to the removal of tsetse and trypanosomiasis in their effort to promote Sustainable Agricultural and Rural Development.

2. Harmonize, coordinate and integrate, as much as possible, plans and efforts aimed at eradicating tsetse and both Human and Animal African trypanosomiasis.

Glossina Biology and Control

Moderator: William Shereni

Rapporteur: Mweemba Hamukombwe

Five papers were presented during this session covering population genetics, use of insecticide-treated mosquito nets in zero-grazing units, restricted application of pesticides to cattle and on the prediction models for tsetse densities. Results on tsetse genetics were presented and their usefulness in the understanding of tsetse ecology was demonstrated. Genetic differences between tsetse fly populations separated by physical barriers were presented as an important factor in the establishment of area-wide projects.

Two innovative tsetse control techniques on the use of insecticide-treated nets were presented under varying ecological settings in West and East Africa. Enormous reductions of tsetse flies resulting in the corresponding lowering of trypanosomiasis incidences were recorded in trials involving the use of insecticide-treated mosquito fences to protect livestock in Ghana and the confinement of goats in zero-grazing units using polyethylene nets. Studies in Ghana demonstrated the effective reduction of *G. p. palpalis* and the successful protection of pig-pens in tsetse infested areas. The technique was also successfully used in Guinea in an integrated tsetse control campaign programme. In Kenya, goats were protected against trypanosome infections through the use of 1 percent deltamethrin sc treated polyethylene nets in zero-grazing units.

The fourth paper was on the restricted application of pesticides in foot baths. The treatment of cattle lower legs in foot baths offered a valuable technique for the simultaneous control of tsetse and ticks.

The final paper was on the need to adapt PAAT-IS tsetse distribution models through the use of the high resolution landsat (30 m x 30 m pixels) and spot (10 m x 10 m pixels) satellite imagery. The high resolution maps were useful particularly in making population density predictions in riverine areas.

Recommendations

1. Taking into consideration the limited number of research papers on tsetse biology and control during the 29th ISCTRC conference, the conference calls upon research and academic institutions, scientists, governments and donors to put more resources to strengthen and enhance research. Research should however be focused on the constraints to effective implementation of PATTEC initiative programmes to improve the field operations.
2. Studies on tsetse genetics should be promoted to develop a tool for the development of PATTEC projects based on a better understanding of differences between tsetse fly populations geographically separated by physical barriers and therefore important in designing area wide operations.
3. Further research is required to assess the efficacy of insecticide treated nets in extensive livestock production systems. The technique needs to be further optimized to determine under which conditions animals can be maximally protected. Specifications of the nets and insecticides dosages need to be standardised to ensure proper usage. Similarly, the restricted use of insecticide on animals needs to be further

optimised taking into consideration the behaviours of different tsetse species and the possibility of tick resistance against the pesticides applied.

4. Low technology and low cost techniques that can easily be integrated at the farmer level such as the use of insecticide-treated nets and the restricted application of pesticides to cattle are recommended for use in the peri-urban and other areas with high human population to improve health and productivity of improved stock especially during the implementation of PATTEC projects.

5. There is need to adapt PAAT-IS tsetse distribution models to local situations using high resolution satellite imagery (Landsat or spot images) in the collection of baseline data especially in riverine areas to predict tsetse densities and distributions in areas that are proposed for PATTEC Projects.

Human African Trypanosomiasis (HAT)

Moderator: Perr Simarro

Rapporteur: Consantin Miaka Mia Bilenge

Nine presentations were made in the two sessions that were allocated to the theme. One presentation dealt with bio-informatics, three on epidemiology, two of which were related to the implementation of control programmes, their challenges and perspectives. Four presentations dealt with treatment while the last one was about genetics. Five papers were presented as posters.

The presentation on bio-informatics demonstrated how this area can contribute to, among other things, the search for new molecules requiring extensive *in vitro* and *in vivo* clinical tests for their use.

Among the three presentations on epidemiology, one dealt with achievements of the programme in three phases, with successes reported from Yei, in Southern Sudan for more than five years, by the international NGO, Malteser. However, the withdrawal of this NGO after the emergency phase could pose a serious problem for the continuity of the control activities, with the risk of a possible resurgence if the Government and local partners do not get involved on time. The second one is about Mali whose real epidemiological situation is unknown due to the lack of effective interventions. The third one was based on the need to identify risk factors for the transmission of HAT that have to do with human-fly contact in the urban settings, such as the city of Kinshasa, in order to better conduct an integrated control programme and inform strategies.

Out of the four presentations on the subject of treatment, the first one dealt with Phase III of confirmation of the effectiveness and tolerance of pafuramidine (DB 289), which is a new oral drug used in the treatment of sleeping sickness in its primary phase involving 250 patients among whom there were pregnant and breastfeeding women from six different centres, one of which was in Angola, four in DRC and one in Southern Sudan. The second presentation demonstrated the problem of the 14 percent failure rate in the treatment of *T. b. gambiense* type Trypanosomiasis using DFMO (difluoromethylornithine) as a monotherapy in patients monitored in North-western Uganda. The third one demonstrated the success of preliminary results of clinical tests using a combination of nifurtimox at 15mg per kg per day every eight hours for ten days and eflornithine 400mg per kg per day every 12 hours for

seven days for the advanced stage. The fourth presentation was based on the retrospective consideration of the treatment of intermediate phase infection in Angola, (6 to 20 white blood cells in the CSF), using pentamidine, a 19 percent reinfection rate was observed.

The presentation on genetics demonstrated the existence of a genetic diversity in *T. brucei* in two countries (Côte d'Ivoire and Guinea). Studies on the genetic variability of trypanosomes and their vectors should be encouraged. The IGGI initiative (International *Glossina* Genomics Initiative) will result in significant progress because of sequencing of the *Glossina* genome.

In addition to the papers that were presented, a keynote address highlighted successes and constraints in pharmaceutical industry with emphasis on identification and development of new drugs.

Recommendations

1. The session recommends that bio-informatics be made part of the same network as other partners who are involved in *in vivo* experimentation in order to speed up the process of the development of new drugs against trypanosomiasis.
2. The Government of Southern Sudan should put in place a facility for the coordination and organisation of HAT control.
3. Countries that use DFMO in monotherapy should put in place drug efficacy programmes for this product.
4. The presence of PATTEC in Mali should facilitate the updating of the epidemiological and trypanosomiasis situation to facilitate the planning of joint activities.

General Recommendations

1. ISCTRC recommends that the establishment of PATTEC in all countries serve as an entry point for the organization of integrated control programmes (AAT, HAT, LAV).
2. ISCTRC recommends that the DRC be accorded the appropriate support by the international community, all international and financial organisations, given this country's epidemiological situation (scope of the problem, high HAT prevalence, massive presence of *Glossina* and of AAT) and its geographical situation, given that it has common borders with nine countries.

African Animal Trypanosomiasis

Moderator: Solomon Haile Mariam

Rapporteur: Mamadou Lamine Dia

The presentations that were made during this session can be categorized as follows:

- A keynote presentation on animal trypanosomiasis
- Two presentations on diagnosis of the disease
- Four presentations on the epidemiological status of animal trypanosomiasis, two of which focused on camel *Trypanosoma evansi*
- Four presentations on drug resistance

- One presentation on trypanotolerance markers
- One presentation on vectors

The keynote address provided an overview of past, current and future control and research strategies, a synthesis of the current situation regarding animal trypanosomiasis control and the analysis of perspectives of various control options. In conclusion, the long-term vision must focus on the eradication of tsetse flies to eliminate human and animal trypanosomiasis

With regard to diagnosis, the first presentation dealt with standardised analysis in search of new molecular targets based on purified proteomes and secretomes for two sub-genus, i.e. *Trypanozoon* and *Nannomonas* obtained from bloodstream trypanosomes. The second presentation in this category was on inhibition ELISA with the assistance of a recombinant antigen whose apparent specificity (97.3 percent) and sensitivity (84.4 percent) are excellent. Both presentations were in the experimental phase and need to be validated.

Four presentations were made on the epidemiological situation of animal trypanosomiasis in concerned countries. Two papers were on bovine trypanosomiasis in the Kachia grazing reserve (Nigeria). From the presentations, it emerged that bovine trypanosomiasis constitutes a real challenge in the grazing reserve where *T. vivax* was dominant. The other report was on the cross-sectional surveys conducted in South Darfur State outside the tsetse belt where *T. vivax* infection prevalence was very high and inside the tsetse belt where *T. congolense* infections (58.5 percent) was higher when compared with *T. vivax* infections (17.9 percent). Two presentations in this category pertained to trypanosomiasis in camels in 4 countries (Algeria, Morocco, Mauritania and Tunisia) and camel calves in Kenya.

Four presentations discussed drug resistance. Two of these were on the development of molecular tools for the rapid detection of *T. congolense* and *T. b. brucei* resistance to isometamidium and diminazene. A presentation was made on the seasonal variation and risk factors in the context of drug resistance in Sikasso (Mali). From a parasitological perspective, the study revealed the existence of heterogeneity in the evolution of the disease. In some villages significant variation in treatment failures (resistance) to diminazene was observed during rainy seasons. The objective of the presentation on the modelling of productivity of trypanocides under the risk of drug resistance in West Africa was to determine if the use of the drugs is characterised by path dependency. The results on isometamidium in all epidemiological conditions and diminazene in high disease prevalence and subsequently high drug resistance reveal a sub-optimal use of the two molecules.

The presentation on trypanotolerance seeks to detect quantitative trait loci controlling trypanotolerance in a backcross of N'Dama and Boran.

The presentation on vectors highlighted the use of screens and traps by the community as a means to control trypanosomiasis.

Recommendations

1. The session noted that during the 28th ISCTRC meeting, thirty presentations were made on human trypanosomiasis and very few on animal trypanosomiasis. During the 29th Conference, was a change with more presentations animal trypanosomiasis with emphasis on drug resistance. In countries like Sudan, it was revealed that drug

resistance was also reported in camels. Drug resistance should therefore be the subject of further investigations in order to address its causes and develop regimes for those that have been identified.

2. It is vital that farmers receive advice on the use of trypanocides which have two aspects: one facilitates an increase in the livestock productivity to encouraging farmers to continue using trypanocides and the other aspect is reduce mortality of livestock from overdoses.
3. Concerning *T. evansi* infections, it is proposed that investigations be conducted on the equine family and livestock that are sensitive to this parasite.
4. The ISCTRC commends the effort of WHO for its special recognition and advocacy to bring HAT to the level of HIV/AIDS, malaria and tuberculosis. Similar advocacy on AAT will assist the PATTEC programme to have access to the Global Fund. The sensitization must be strengthened at national and regional levels. ISCTRC should play a role in increasing advocacy.
5. Following the effort that is being made to eradicate tsetse in many countries in Africa and noting that some countries may have achieved this goal, ISCTRC was called upon urgently to initiate development of guidelines for International protocol to declare reclaimed land tsetse free. This could be achieved in collaboration with other partners.

Socio-Economics, Environment and Land Use/GIS

Moderator: Hippolyte Affognon

Rapporteur: Joseph Maitima

Papers scheduled for oral presentation in this section were five but only two were presented. Twelve others were to be presented as posters and are reported in the posters section. In addition to the two papers presented, a very informative keynote paper was presented that set a stage for a very interactive plenary discussion.

The recommendations generated in this session were according to the conclusions made in each of the papers presented and in response to the discussions during the plenary. There was sufficient time for discussions on the papers presented.

The issues that dominated plenary discussions in this session were:

- The need a political framework to support tsetse and trypanosomiasis interventions;
- The need for T & T interventions to be pro-poor and focused on poverty;
- The need for T & T interventions to be participatory especially with the rural communities and be user and environmentally friendly;
- The need for integrating trypanosomiasis interventions into the social paradigms of the rural poor; and
- Mainstreaming environmental and socio-economics impacts assessment in tsetse and trypanosomiasis eradication campaigns with emphasis on base data, development of appropriate indicators.

Recommendations

1. The conference recognizes the need for developing a political framework to enhance the success and sustainability of T & T interventions to solve the problems of T&T and that such framework should involve all stakeholders including the rural communities;
2. The conference recommends that T & T interventions be focused on improving rural livelihoods, improving access to markets for livestock and livestock products, and market chains;
3. The conference recommends that the methods for assessing economic and environmental impacts of T & T interventions must employ modern techniques including use of modern predictive models and adopt more holistic approaches that link with other economic sectors;
4. The conference recognizes the need for developing pro-poor public policies to create an enabling environment for the participation of rural communities in T & T interventions and private sector involvement;
5. The conference recognizes the importance of trypanotolerance in the search for ways to reduce risks or losses caused by trypanosomiasis and recommends further research on how this can be exploited and applied. Further the meeting recommends efforts to conserve trypanotolerant livestock to prevent them from going extinct; and
6. The conference recommends that T & T interventions practitioners should be more proactive in making vector control more attractive to livestock keepers and by recognizing the role played by trypanocidal drugs as a first line of defence in the fight against trypanosomiasis, the meeting recommends more work to be done on how to improve the use of drugs.

Poster Session

Moderator: Issa Sidibé

Rapporteur: Joyce Daffa

Two sessions were allocated to posters and one hour plenary at the end of the presentation to facilitate discussion. There were 24 posters displayed out of 53 listed or expected for the conference. Format guideline and themes were well adhered by all presenters i.e. introduction followed by objective, materials and methods, results and conclusion.

The majority of them were large with, visible or readable fonts, nice colours and well illustrated. However few posters carried too much detail, making quick reading and comprehension difficult. The different themes and related sessions are given in the following table.

THEMES	TITLE	POSTERS PRESENTED	NOT PRESENTED	TOTAL	PERCENT PRESENTED
I	PATTEC and Country reports				
II	*Glossina* Biology and Control	4	12	16	25
III	Human African Trypanosomiasis (HAT)	5	4	9	56
IV	Animal African Trypanosomiasis (AAT)	12	5	17	71
V	Socio-economics, Land use & Environnent	3	8	11	27
	TOTAL	24	29	53	45

Discussion

The meeting noted that posters were given less attention compared with oral papers. Apparently the general perception is that if the presented abstracts are selected for posters then they may not be interesting or important. It also appears that some sponsors prefer oral presentations to posters.

The meeting appealed to institutions and sponsors to give opportunity to presenters, especially young scientists to prepare posters for them to learn and gain experience for international meetings. Some presenters indicated their intention to present a poster on submission.

The Council Secretariat was requested to consider setting up a competition among posters to attract and motivate young presenters by giving prizes.

Conclusions

- From papers on *Glossina* biology, two posters were on genetic structure or diversity of *Glossina* and its implication on the control. The majority of the papers on this theme were focused on repellents, except one on the ability of tsetse flies to acquire an infection of the second trypanosome species.
- All the posters on sleeping sickness were related to diagnosis: B cells methods, centrifugation technique and Loop Mediated Isothermal Amplification (LAMP). The first two posters provide data on potential early stage detection and, the LAMP of DNA is in validation process.
- Regarding AAT control, farmers' capacity building for AAT Management and Environment was recommended by most presenters. This will allow livestock owners to have improved and quality animal husbandry practices to reduce drug resistance. Other animals have been surveyed in Sudan to assess the importance of *T. evansi* in camels and in donkeys.
- The need for a study on strategic environmental, socio-economic assessment and baseline surveys prior to conducting T & T control/eradication was emphasized.

Recommendations

1. It was observed that two consecutive sessions in day two were not enough for participants to visit all posters so as to be able to comprehend materials for discussion and recommendation. Day four is probably better for poster sessions to give more time for reading.
2. The Council welcomes the continued improvement of Poster sessions and recommends the provision of appropriate poster room to encourage authors including young scientists to explain their presentations to the participants fully. Action: ISCTRC Secretariat and hosting member nation.
3. In order to further encourage increased participation in the Poser sessions, Council recommends that prizes be awarded to the three best posters during the Conference and that the Private Sector be approached to sponsor such prizes. In this case, clear guidelines for poster selection should be worked out and agreed upon. The details should be included in conference announcement. Action: ISCTRC Secretariat.

Networking Session

Chairperson: A. A. Ilemobade

Rapporteur: M. Vreysen

Networks are an interconnected group or system having the same interest and objective and working together towards its achievement. A good example of a network that functions properly is the Programme Against African Trypanosomiasis (PAAT). PAAT is a specialized, comprehensive network that is composed of four mandated organisations i.e. AU-IBAR, FAO, IAEA and WHO who constitute the secretariat. PAAT aims at networking and coordinating international alliances towards harmonized interventions against T & T both in human and animals, to promote partnerships, dialogue and assistance, to encourage and enhance multi-stakeholders' initiatives, and to build consensus on common agricultural policy in T & T affected areas.

Networking for T & T is needed in view of the magnitude of the problem and the fact than none of the specialized international organisations can cope with all aspects of the T & T problem. The root problem that the international organisations are called upon to help solve is poverty, under nourishment and food insecurity. Therefore, strategies are needed that are comprehensive to positively impact the roots of the causative effects on poverty posed by T & T, and hence the need for a good functional network.

PAAT, as a unique international forum, also promotes open access to high-quality information for the 37 T & T affected countries. In that respect, the recently upgraded PAAT Information System provides new tools, methodologies and datasets for the benefit of all stakeholders. The use of GIS techniques, the sharing and exchange of spatial datasets through the creation of meta-documentation and the integration with other web-based resources (e.g. FAO GeoNetwork) has been advanced. Standardized, high-resolution land cover maps of eight T & T-affected countries, based on the FAO Africover dataset, have been produced in support of tsetse habitat mapping. In addition, global spatial datasets have been reviewed, selected and analysed to facilitate their use, capacity building and harmonization have been pursued through workshops and training courses. Finally, the PAAT Information System offers renewed and novel opportunities for knowledge sharing for all stakeholders and

provides an ideal institutional, scientific and technical framework for information dissemination with a still largely unexploited potential.

Another example of a functioning network is the HAT Platform. The platform aims at providing assistance in the attempt to remove several obstacles such as the delays in obtaining authorisation for clinical trials, the need for adapted expertise, and the need for appropriate methodologies for clinical trials.

The discussion topics focused on the following: (i) various networks are in place, but it was suggested that several of these networks are not working properly, and their operations need to be urgently optimised, (ii) the importance of networks was underlined to make each stakeholder understand "who is doing what", (iii) the need for better communication within the network, the importance of a common purpose within each of the networks, the importance that the members of a network have complementary expertise, and the importance of a bottom-up approach were emphasized, and (iv) networks need to make sure that they can be reached and that they can be used by all stakeholders to the maximum.

Recommendations

The ISCTRC recognizes:

- The work of the Programme Against African Trypanosomiasis (PAAT) in networking and coordination within the international community; and,
- The achievements concerning the development of harmonized intervention against T & T both in humans and animals.
- The advisory role of PAAT for policy and technical issues for T & T management and in assisting Member States and PATTEC in planning implementation of field T & T programmes and operations.

The ISCTRC recommends:

1. To further strengthen the coordination, communication and information networking activities of PAAT;

2. That member countries and regional networks increase the dialogue and exchange of information with other networks, in particular PAAT, with a view to promote consensus in common agriculture and human and animal health policy in T & T affected countries; and

3. That the existing networks are strengthened through more active participation and improved dissemination of technical and scientific knowledge and through increased sharing of relevant datasets.

Capacity Building

Moderator: Rajinder Saini

Rapporteur: Victorin Codjia

Dr. Grace Murila in her keynote address highlighted the Research Capacity Strengthening being undertaken by KARI-TRC with funding from WHO-TDR. Dr. Saini presented the training needs assessment undertaken for six PATTEC countries (Burkina Faso, Mali, Ghana, Ethiopia, Uganda and Kenya).

The main points arising out of the discussion were:

- An acute shortage of well-trained and experienced staff at all levels in T&T affected countries for the implementation of large-scale area wide T & T control/eradication programmes;
- Capacity of scientists and managers in vector and disease research in Africa was limited;
- A coherent and targeted programme for building capacity was lacking;
- That African scientists need to be trained in modern cutting edge techniques in molecular sciences and in GIS;
- Further R & D is needed to develop new innovative tools for sustainable surveillance and control of HAT;
- The necessity to train more lab technicians and medical assistants for control of HAT;
- Available training manuals need to be reviewed for appropriateness and adopted;
- Lack of funding and necessity of attracting more funds from national systems and other international donors and institutes;
- Need to implement comprehensive training programmes urgently; and
- To involve all stakeholders for developing and implementing research and training programmes.

Recommendations

Recognizing the shortage of well trained and experienced staff in the region, and the need to expedite the implementation of large-scale area wide T & T control/eradication programmes, the session recommends;

1. That the shortage of scientists and managers in vector and disease research in Africa needs to be urgently addressed;
2. That African scientists need to be trained in cutting edge techniques in molecular sciences and in GIS;
3. That further R & D is needed to develop new innovative tools for sustainable surveillance and control of HAT;
4. The major role played by laboratory technicians and medical assistants in the reduction of HAT cases in the last ten years should be more widely recognized; and
5. The need for specific training modules and manuals.

Noting with appreciation the capacity building efforts of International Organizations like FAO, IAEA, WHO, the International Research Institutes like ICIPE, ILRI, CIRDES, CIRAD, National Institute like KARI-TRC and continental projects like PATTEC among others, the session recommends:

1. A more coordinated, focused and holistic approach is needed for capacity building in African countries, so that trained manpower can be built at all levels based on needs assessments for each country;
2. Steps should be taken to strengthen the institutional capacity of African countries in research and in undertaking large-scale control /eradication programmes;
3. There is an urgent need to continue training of middle and senior staff in implementation of the control programmes especially for PATTEC countries;
4. Senior staff to be trained in projects management;
5. There is an urgent need to produce training modules and manuals and refine existing ones for use by technical staff implementing PATTEC activities;
6. WHO HAT Surveillance and Control Programme should continue enhancing the capacity of health workers in disease diagnosis and management, for people living in remote rural areas where the disease is endemic;
7. WHO/TDR is requested to continue its approach of enhancing the research capacity of African scientists;
8. National systems to ensure that the required capacity to undertake large-scale control programmes exists and is optimally used; and
9. That resource mobilization for capacity building is given priority.

THE INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

Publication of Manuals and Guidelines

Rodriguez, L. C., Kshatriya, M., Mugatha & S. Maitima, J. M., (2007). A conceptual framework for integrated impact assessment of tsetse and trypanosomiasis interventions. *ILRI Manuals and Guides No. 5,* 37 pp., ISBN 92-9146-213-6. Report to the US State Department and the AU's PATTEC. Available from ILRI through contact with j.maitima@cgiar.org.

At the heart of any effort to foster sustainable development, lie scientific analysis and the application of scientific knowledge. Providing scientifically correct and appropriate information that respond to and anticipate the needs of policy makers and other stakeholders is essential when addressing issues from the plight of widespread poverty, global changes and environmental degradation. Attainment of the Millennium Development Goals (MDG) can not be possible without sufficient client technological progress and improved policies to address the global challenges that face the resource poor regions of the world. Coupled with efforts to increase agricultural productivity, natural resources management (NRM) has become one of the cornerstones of research and development within the national, sub-regional and international agricultural research systems. The Consultative Group on International Agricultural Research (CGIAR) has devoted significant resources into this area of research. Development investors, policy makers and researchers alike are keen to assess and evaluate investments in NRM. In the past, progress has been limited by the lack of scientific calmly valid ways to evaluate the complex environmental outcomes associated with these interventions that need new methods and techniques to enhance their effectiveness. Understanding of how the interventions affect environmental and socio-economic systems

and pathways is crucial in order to sustain the benefits of these developments and safeguard the destiny of our future generations. Impact analysis must become more problem-focused, and apply an interdisciplinary approach to sustainable development issues in order for science to become more policy relevant.

This document focuses on these needs and synthesizes a framework for evaluating the impacts of tsetse and trypanosomiasis interventions. The need to eradicate or eliminate the problem of trypanosomiasis and at the same time promote sustainable utilization of land on which millions of poor families depend, are real concerns for the future of 37 countries of Africa that are faced with this problem. An understanding of how the interventions affect all the other systems that contribute to attainment of the desired goals is now a matter of urgency.

In the past numerous efforts to control trypanosomiasis, have been made largely focusing on reduction of the abundance and distribution of the vector. However, all gains made through these control efforts have always been short lived due to resurgence of fly populations and disease prevalence in the controlled areas. Based on the experience of past control failures to sustain low tsetse populations, the African Union is now promoting the elimination of the tsetse flies in order to eradicate the disease from the continent through the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC) with government resources and the support from the African Development Bank and other development agencies

Eradication has costs and benefits that need to be evaluated in order to estimate the viability of the investment and the sustainability of the interventions. All interventions on tsetse control and eradication have expected environmental and socio-economic implications depending on the approach used and the place where the control is undertaken, so the direct and indirect effects of the T&T interventions should be evaluated across the natural, social and economic systems in order to properly estimate the costs and benefits of the eradication campaign.

These natural, economic and social systems are dynamic and complex systems, thus they exhibit non linear behavior and spatial and temporal lags in their response to T&T interventions, making it difficult to estimate their direct impacts on an individual system. In addition environmental, economic and social systems are linked and interdependent. In consequence, interventions on the natural systems can have indirect effects on the economic sector and human societies and in a similar way impact on the economy or society can have indirect effects on the natural environment. Understanding of how the natural, economic and social systems are inter-linked and inter-dependent is necessary in order to identify the direction of the flows and the magnitude of indirect effects of T&T interventions to estimate with higher accuracy the cost and benefit t of the eradication campaign, identify areas where further interventions are needed to avoid negative feedbacks and design strategies to mitigate adverse effects across systems.

Considering the complex nature of the involved systems, their inter-linkages and feedback mechanisms, assessing the impact of T&T interventions could be a difficult task. The challenge is to understand and quantify how the interventions directly affect the environmental, the economic and social systems, and how the indirect effects of an intervention implemented on one system spread through the others affecting their processes and modifying the flow and direction of the linkages between them. Such assessments require

first a conceptual framework to help in mapping out the main cause effect relationships and response patterns.

Integrated impact assessments serve to provide decision makers with better information on the extent to which different trypanosomiasis interventions affect the target population and the magnitude of the effect of the interventions on the welfare of the intended beneficiaries. It is currently recognized that environmental, economic and social systems interchange flows of material and energy and the links and processes among these systems are evident at different temporal and spatial scales. It is expected, therefore, that the direct or indirect effects of the trypanosomiasis interventions on a given system might affect the quality or quantity of the flows of matter and energy to the other systems, finally having an impact on human wellbeing.

These impacts can be evaluated following a series of logical stages described in this framework and applying a set of different methodologies which are summarized in this document. The results of the integrated impact assessment can be used to prioritize actions, justify interventions, evaluate the attainment of the objectives of the programme and provide information of the pathways through which observed impacts have occurred. The results can also be used to develop mitigation and monitoring plans for undesired impacts, provide adequate policies, improve management strategies and spread the results among target groups.

Maitima, J. M., Rodriguez, L. C., Kshatriya & M. Mugatha, S., (2007). Guidelines for assessing environmental and socio-economic impacts of tsetse and trypanosomiasis interventions, 183 pp., ISBN 92-9146-212-8. Report to the US State Department and the AU's PATTEC. Available from ILRI through contact with j.maitima@cgiar.org

Tsetse-transmitted trypanosomiasis in both people and domestic animals is a critical constraint to economic development in Africa. Economic losses have been estimated at over US$ 1.3 million dollars annually. In addition, about US$ 30 million per year is estimated to be spent on prophylaxis and treatment. The Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC), has designed an extensive programme in support of the eradication of tsetse and trypanosomiasis in sub-Saharan Africa, through a range of vector and disease management techniques integrating suppression, and eradication technologies. These interventions are likely to have significant environmental and socio-economic impacts that will be felt far beyond the target organisms, populations and regions where they will be implemented. It is therefore important that the design and implementation of PATTEC project activities lead to sustainable development outcomes. Sustainable development interventions need to be based on scientific evidence. To be useful for decision making, such scientific evidence must be relevant and responsive to the needs of policy and other decision-makers who are looking for practical research and development options to reduce poverty through sustainable land management.

Improved technologies, policies, and institutions are central in efforts to control tsetse and trypanosomiasis. Alternative control strategies have direct and indirect impact on the environment as well as on livestock keepers and other poor people who depend on livestock for their livelihoods. Understanding the direct and indirect environmental and socio-economic impact of alternative control strategies is important to sustain livelihood benefits, enhance long term livestock and crop productivity and safeguard the integrity of the natural

resource base for use by future generations. Careful evaluation of project impacts that provides timely information to decision makers is an important strategic input in the design and implementation of PATTEC investments. Given the multi-dimensional impact of project interventions, it is important that impact is assessed from inter-disciplinary perspectives for the results to have practical policy relevance and operationally useful.

This book responds to the expressed needs of decision makers and impact assessment practitioners who are looking for strategic guidance and practical information for evaluating the impacts of tsetse and trypanosomiasis interventions. It synthesizes information on key challenges in assessing impacts of natural resource interventions and provides a conceptual framework for assessing impact as well as guidelines and methods for assessing environmental, economic, and social impacts of project interventions. It also provides information on integrated approaches for assessing impacts. Practical advice is provided on the appropriateness, data needs, and resource requirements for each method that is described. The diversity of the methods and tools described in the book makes it a key reference source for the design, implementation, and evaluation of PATTEC projects.

New Tsetse Project: A Dynamic Ecological Simulation Model of Tsetse transmitted Trypanosomiasis in Kenya.

The overall goal of this new four year project being implemented with funds from the US National Institute of Health (NIH) is to examine, build, and test a predictive model that defines the relationships between climate change, land use and land cover change, social systems, and ecological disturbance on the ecological distribution of tsetse flies and African Trypanosomiasis or sleeping sickness across Kenya. This study will employ an interdisciplinary team to develop and deploy an innovative advanced special simulation system, "ATcast"–African Trypanosomiasis Forecasting system that integrates dynamic multi- scale multi-agent models, geographic and epidemiological methods, and a regional climatic mode. The information produced will directly benefit on going tsetse suppression programmes and make a substantial understanding of broader patterns of human-environmental impacts, ecologically related changes, disease emergence, transmission, prevention and control.

This project is being implemented in collaboration with Michigan State University and ILRI's specific contribution will include:

1. Research on the dynamics of savannah vegetation in relation to climate change:
    a. Analysis of the spatial and temporal trends in climate variables, and the responses of people, livestock, and wildlife to changes in rainfall and temperature;
    b. Development of a typology of savannah vegetation based on climate and soil GIS variables, and literature review; and
    c. Collect land use and cover ground-truth data
2. Model validation of tsetse distributions:
    a. ILRI will coordinate and support in conjunction with the MSU team field work to two sites identified by the model.

3. Analysis of how agro-pastoral livelihoods are affected by altered climate and how households and communities respond by altering their livelihood system and land management decisions.
    a. Contribute to an understanding of how communities and households respond, and how their land management has evolved by developing a timeline of changing land management in relation to the livelihood system, and by discussing how coping strategies to climate change have evolved with key informant interviews.
4. Share the research results and scenarios with policy makers, communities, scientists and others, to contribute towards research and development planning to sustain pastoral and agro-pastoral lands and livelihoods
    a. Write journal articles and produce other informational materials; and
    b. Conduct feedback workshops at the community and at the national level.
5. Contribute to the project's inter-institutional collaboration by hosting project workshops