Address to the 32\textsuperscript{nd} ISCTRC meeting, Khartoum, Sudan, 8 September 2013

HE, Honourable Commissioner of Rural Economy and Agriculture, Director of AU-IBAR, Chairman of the ISCTRC Executive Committee, honoured guests, Ladies and Gentlemen.

On behalf of the IAEA and its joint Division with the FAO, I would like to thank the organizers of the 32\textsuperscript{nd} ISCTRC meeting for the opportunity to present the current status of our work in support of PATTEC and Member States’ efforts to control the problem of trypanosomosis.

In resolutions in both 2011 and 2012, the General Conference of the IAEA has expressed its appreciation of the importance of livestock development in rural communities affected by tsetse flies and trypanosomosis (T&T) as a pathway out of poverty and hunger and a basis for food security and socio-economic development.

The IAEA in consultation with its international partners, particularly FAO and WHO, maintains close interaction with AU-PATTEC and provides, based on the existing memorandum of understanding with the AU, assistance to the six current national PATTEC projects in Burkina Faso, Ethiopia, Ghana, Kenya, Mali and Uganda. Currently, the IAEA supports the AU-PATTEC Plan of Action through two regional technical cooperation (TC) projects in Africa and six national TC projects in Chad, Ethiopia, Senegal, Uganda, Tanzania and Zimbabwe. In the past two years the IAEA provided assistance, in the form of training, expert services and equipment, to 17 T&T affected Member States. The IAEA also continues to cooperate with FAO, WHO and other partners in the Programme Against African Trypanosomosis (PAAT), as a means to synergise their support to Member States’ T&T efforts.

Following close consultations with PATTEC, FAO, WHO and several national PATTEC coordinators, the IAEA organized two regional training courses on ‘Standardized Collection and Processing of Tsetse Flies for Molecular Tsetse Population Genetic and Morphometric Analyses’ and on ‘Standardized Entomological Monitoring, Data Collection and GIS-aided Data Processing as needed for Area-wide Integrated Pest Management campaigns against the Tsetse and Trypanosomosis Problem’ in 2012 in Nairobi and in Bobo-Dioulasso, respectively.

The Insect Pest Control Laboratory of the Joint FAO/IAEA Division in Seibersdorf has developed an integrated management system for the tsetse salivary gland hypertrophy virus that hampers the mass-rearing of \textit{Glossina pallidipes}, one of the economically important tsetse fly species. A combination of virus management tactics, such as an anti-viral drug and a modified feeding regime, was successfully validated at the IPCL and transferred to the tsetse rearing and irradiation centre of the Southern Tsetse Eradication Project (STEP) at Kality, Addis Ababa, Ethiopia. The adoption of this virus management system has already reduced the prevalence of the salivary gland hypertrophy virus in the \textit{G. pallidipes} colony at Kality to nearly 7 per cent, approximately one-third of the prevalence recorded in 2012.
The IAEA has been providing support to the Ethiopian STEP Project for the last 15 years through national and regional TC projects. Reviews carried out in 2012 and 2013 involving the Ethiopian Government, FAO, the IAEA and other partners concluded that STEP has made good progress. Government support for this project remains strong, with the Ethiopian Government allocating a budget of 25 million Birr (~ USD 1.4 million) for 2012-13 and with a request for 45 million Birr for the fiscal year 2013-14.

Area-wide activities in Ethiopia have resulted in the suppression of *Glossina pallidipes* tsetse populations over most of the 25 000 km² of the project in the Southern Rift Valley, thereby protecting livestock from nagana. The resulting substantial reduction of the T&T problem has already led to an increase in productive livestock and opened up opportunities for sustainable agricultural and rural development, benefitting thousands of farmers. To ensure that these gains are preserved, the IAEA in the past year provided Ethiopia with a senior expert who assisted with the planning and implementation of field activities designed to keep the tsetse population under control.

Control operations included sequential aerial insecticide spraying for the suppression of tsetse populations in 5 000 km² of national parks and other high density areas, which reduced the target fly populations by more than 90 per cent, and selective ground tsetse suppression was expanded to cover more hot-spots in the project area. Despite the success of these activities, the results make clear that the SIT will be required to achieve full tsetse eradication in many of these areas.

SIT field operations continue in Ethiopia’s Deme Basin with the aerial release of between 30 000 and 60 000 sterile male *Glossina f. fuscipes* on a weekly basis starting in April 2012. Releases of the second species, *G. pallidipes*, were initiated in August 2012 and the IAEA has provided expert services to assist in intensifying entomological monitoring.

In Uganda, collaborators have made progress with the standardized collection and processing of field data. Tsetse suppression activities are under way in parts of the *G. f. fuscipes* belt in the country. As the STEP mass-rearing facility in Ethiopia appears to be in a position to produce substantially more sterile male flies of this species than required for the SIT operations in the STEP project area, Ethiopia and Uganda entered into negotiations for the procurement of sterile males for an SIT feasibility demonstration in a small pilot area in Lake Victoria in Uganda.

The IAEA continues to support Senegal in implementing the pre-operational phase of an AW-IPM campaign that includes the SIT to create a zone free of *Glossina palpalis gambiensis* in close collaboration with other partners, namely CIRDES in Bobo-Dioulasso, Burkina Faso, FAO, the Institute of Zoology, Slovak Academy of Sciences, the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), and the US Government via the peaceful uses initiative (PUI). The PUI funding is being used to validate, in the field, methods developed by the IPCL, Seibersdorf, in support of the project in
Senegal. Activities include the refinement of tsetse mass rearing techniques, the long distance transport of tsetse pupae, ground and aerial release systems for sterile male tsetse flies and the provision of other support to tsetse SIT operations in West Africa. The results are expected to benefit several AU-PATTEC tsetse control and eradication programmes in Africa and to contribute to agricultural development and food security.

Trial releases in four pilot areas using weekly shipments of sterilized male \textit{G. p. gambiensis} pupae from CIRDES (since 2011) and the IZ-SAS (since 2012) to Dakar showed excellent survival, dispersal and mating competitiveness of the sterile male flies that were irradiated and transported in the late pupal stage. Following a positive evaluation from an external review in May 2012 the Senegal tsetse project initiated pre-release suppression activities in the central part of the target area, while the northern part of the target area was covered with area-wide releases of sterile males.

The third coordination meeting of the regional project in Africa was held in Pretoria, South Africa, in November 2011, and was hosted by the Onderstepoort Veterinary Institute (OVI). Scientists from the OVI, the Department of Veterinary Services, KwaZulu Natal (KZN), the Ministry of Agriculture, Mozambique and the Eduardo Mondlane University, Maputo, Mozambique, as well as Dr Hassane Mahammat attended the meeting. Two tsetse fly species, \textit{G. brevipalpis} and \textit{G. austeni}, exist in large parts of KZN and the trypanosomosis prevalence averages around 19\%. In Mozambique, preliminary veterinary surveys of about 2'000 cattle revealed a trypanosomosis prevalence of about 15\%, which confirms the need for intervention measures. However, to develop an appropriate intervention strategy, further entomological and veterinary baseline data surveys will be needed to collect essential data. The Department of Agriculture, Environmental Affairs and Rural Development and the KZN Ezemvelo Wildlife have signed a formal document endorsing a programme to eradicate tsetse from KZN.

The IAEA continues to manage Coordinated Research Projects in T&T including ‘Applying GIS and Population Genetics for Managing Livestock Insect Pests’ and ‘Improving SIT for Tsetse Flies through Research on their Symbionts and Pathogens’. During the RCM at CIRDES, participants benefitted from practical tutorials and working sessions on the use of free open source software (FOSS) for geographic information system (GIS) aided field work and a standardized spatial platform to be linked with open-source GIS software has being developed for use by the CRP participants.

The CRP on tsetse symbionts and pathogens studied interactions between tsetse flies and their symbionts. The tsetse salivary gland hypertrophy virus was characterized and classified, enabling the development of strategies to effectively manage the virus in tsetse mass rearing. The CRP also resulted in a better understanding of the tsetse flies’ nutritional ecology and of tsetse-pathogen interactions that could lead to improved mass-rearing procedures and control methods. The results of this CRP have been published this year in a
special edition of the Journal of Invertebrate Pathology. A new CRP on ‘Enhancing Vector Refractoriness to Trypanosome Infection’ started this year.

In conclusion, tsetse and trypanosomosis remains a major obstacle to rural development in significant parts of Africa. In several areas that are currently not subjected to intervention measures, tsetse fly species are spreading. As no new methods have emerged to eradicate the various tsetse species in an area-wide and sustainable manner, the Sterile Insect Technique (SIT), as part of an integrated pest control approach, maintains its appeal as a unique and environmentally friendly nuclear application. Yet there remain challenges, including the establishment of appropriate management structures to deal with such complex and logistically demanding programmes, the development of the SIT for different species with different biologies, and the adaptation of each project to unique ecological and socio-economic conditions and requirements needed for success. The Joint FAO/IAEA Division remains committed to helping member states achieve their goals of controlling trypanosomosis in an integrated and sustainable manner through bilateral projects and collaboration with PATTEC and other partners.

Finally on a personal note, many of you will know my colleague Udo Feldmann who has worked in the Joint Division for more than 30 years. Udo is about to retire and his successor designate, Rafael Argilles, is present in this meeting. If anyone wish to meet him to get to know him they are welcome.