Tsetse-transmitted trypanosomoses are a family of parasitic diseases unique to Africa and affecting both humans and animals. The diseases occur in about 9 million km² in 39 sub-Saharan countries, corresponding to almost one-third of Africa’s total land area. Trypanosomoses cause a severe economic impact on African livestock-agriculture production and they pose a sizable burden on public health. In affected countries, the disease causes an estimated annual loss of US$4.5 billion and greatly constrains socio-economic development. The overall impact includes restricted access to fertile and cultivable areas, imbalances in land use and in the exploitation of natural resources, and insufficient growth and diversification of crop-livestock production systems. The economic impact of tsetse-transmitted trypanosomoses is compounded by the impact on human health and by complex socio-cultural and food insecurity dimensions. It is therefore no coincidence that out of the 39 tsetse-infested countries, 32 are Low-Income Food Deficit Countries and 29 are Least Developed Countries.

The control and elimination of human and animal trypanosomoses would significantly contribute to increased productivity of land and livestock, improved human health, and reduced poverty in rural Africa.

Given the sub-continental scale of the problem and considering its complex and dynamic medical, veterinary, agricultural, environmental and rural development dimensions, Member States of the Food and Agricultural Organizations of the United Nations (FAO) have recognized the need to establish focus and direction in the fight against tsetse and trypanosomoses. This is pursued under the Programme against African Trypanosomosis (PAAT), established by the 29th FAO Conference (Resolution 5/1997). PAAT forms the umbrella of an international alliance for inter-agency collaboration, whose Secretariat comprises FAO, the International Atomic Energy Agency (IAEA), the World Health Organization (WHO) and the African Union, through its Inter-African Bureau for Animal Resources (AU-IBAR). Within PAAT, FAO deals with the constraints trypanosomosis poses to agricultural and animal production, rural development and food security; WHO has responsibilities over the human form of the disease and the related public health issues; IAEA focuses on the development and integration of the sterile insect technique as a component of area-wide integrated pest management.

Within the remit of their respective mandates and competencies, members of the PAAT secretariat have provided for over 15 years joint technical assistance to countries affected by African trypanosomoses. PAAT also supports the African Union - Pan African Tsetse and Trypanosomosis Eradication Campaign (AU-PATTEC). PATTEC was established in July 2000 by a decision of the Heads of State and Government of the Organization of the African Unity – now AU, aiming at the progressive creation, expansion and maintenance of tsetse-free areas.

PAAT is a broad international forum and seeks to bring together all those concerned with the tsetse and African trypanosomosis research and control. PAAT thus provides international expertise on various aspects of tsetse and disease management, and the associated issues of land use, environmental protection and sustainable livestock-agricultural and socio-economic development. The support provided by the PAAT alliance to tsetse-affected countries translates into coordinated actions and collaboration at
the international, regional and national levels.

The PAAT information system (PAAT-IS), plays a crucial role in global health surveillance, integrating human, livestock and vector data. PAAT-IS comprises web-based resources, maps, monographic technical and scientific publications as well as a biannual bulletin focusing on news and scientific advances in the field of tsetse and trypanosomoses. The present communication provides examples of two ongoing internationally coordinated initiatives: the Atlas of Human African Trypanosomiasis (HAT, also known as sleeping sickness) and the Atlas of tsetse and African Animal Trypanosomosis (AAT, also known as nagana).

The Atlas of HAT is an initiative launched by WHO in 2007, and jointly implemented with FAO. Its primary aim is twofold: first, to map – at the village level – all cases of sleeping sickness reported from endemic areas in sub-Saharan Africa and all active screenings (start year: 2000); second, to build the capacity at country level for optimal utilization of the tool and for its regular update. Input data from health authorities, non-governmental organizations (NGOs), research institutes and reference hospitals diagnosing travellers in non-endemic countries, are systematically collated by WHO. These data are subsequently harmonized and georeferenced, thus enabling a range of mapped outputs and epidemiological analyses to be conducted.

Since its launch, the Atlas of HAT has delivered a wide range of spatially-explicit information products, including: (i) maps of HAT distribution and risk at the continental, regional, national and focus level; (ii) continental maps of health facilities involved in the treatment and surveillance of the Gambianse form of HAT; and (iii) global maps of HAT in non-endemic countries. Mapped outputs from the Atlas of HAT are freely available in the WHO website. At the same time, WHO and FAO conduct capacity building activities for HAT-affected countries to use the Atlas for guiding disease control operations.

The Atlas of HAT has become a worldwide reference for practitioners, scientists and policy makers involved in the control and elimination of HAT. In particular, WHO member states, experts and partners have recognized the Atlas as a crucial tool for planning, executing and monitoring the process of HAT elimination.

In 2010, the success of the Atlas of HAT prompted FAO to launch the Atlas of tsetse and AAT, which aims to assemble, analyse and disseminate up-to-date and comprehensive information on the occurrence and distribution of tsetse and AAT. This Atlas is a FAO-led initiative jointly implemented with IAEA. At a continental level, the Atlas relies on data published in the scientific literature. Epidemiological information is extracted from publications, georeferenced, and entered in a database. Animal trypanosomal infections are captured in terms of presence/absence, prevalence and number of infected animals; data are also recorded on survey period, diagnostic method, sample size, animal species, animal breed, age range, sex and husbandry system, recent or ongoing interventions against tsetse, and the use of trypanocidal drugs.

In the vector component, the occurrence of tsetse species (Genus: Glossina) is recorded in terms of absence/presence, apparent densities (flies/trap/day) as well as total number of flies captured; information is also retained on the type of trap, attractant, number of traps and duration of trapping. As we write, the methodological development of the Atlas of tsetse and AAT has been completed, and preliminary results for the AAT component are available for Ethiopia, Kenya and Uganda. For the same three countries preliminary results for the tsetse component will also be available shortly.

In addition to developing the continental Atlas of tsetse and AAT, FAO and IAEA also support affected countries in setting up national Atlases. Support is provided through training courses, technical assistance and backstopping, as well as the provision of templates for data management. National Atlases can benefit from a vast amount of unpublished data that are not directly available for the continental initiative.

The mapping and related training initiatives carried out within PAAT contribute to providing evidence for a One-Health approach to the control of tsetse-transmitted trypanosomases. Geo-spatial epidemiological data enable integrated analyses of the human, livestock and vector components. The increasing availability of remotely-sensed data also enables environmental and climatic information to be easily integrated in the control or elimination of neglected tropical diseases. Beyond the specific technical achievements, PAAT also embodies the potential of inter-agency collaboration within the United Nations system and other international institutions, which can be a powerful force for innovation and development.

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