

CAMPAIGN LAUNCHED TO ELIMINATE TSETSE FLY

A new campaign, the Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC), to control the deadly tsetse fly in Africa, has been launched by the Organization of African Unity (OAU), with the support of UN agencies. At a meeting in February 2002 Assistant Secretary-General of the OAU Ambassador Lawrence Agubuzu pledged that the OAU would be at the forefront of this fight against the tsetse fly

A root cause of poverty in Africa

The tsetse fly affects as many as 500,000 people in sub-Saharan Africa with sleeping sickness, and kills 3 million livestock animals every year. The tsetse infests 37 sub-Saharan African countries – 32 of them among the 42 most Heavily Indebted Poor Countries (HIPC) in the world. Nearly 45,000 new cases of sleeping sickness were reported in 1999. The scale of death from the current epidemic of sleeping sickness is unknown but in some villages in the Democratic Republic of Congo 90% of residents suffer from the disease.

Much of Africa's best land – particularly in river valleys and moist areas, where the potential for mixed farming is good – lies uncultivated, while tsetse-free areas face collapse from overuse by humans. The impact of the tsetse on livestock is worsening as the fly's range expands and the resistance of the parasite it carries strengthens.

In a study funded by the UK Department for International Development (DFID), the researchers estimated that the tsetse fly's annual cost to agriculture in Africa totals \$4.5 billion. Freedom from the tsetse would offer the agricultural opportunities to much of sub-Saharan Africa to own productive livestock and increase their food supply and income.

Despite various drastic efforts over the past 100 years to eradicate the tsetse fly, most of the time it has recovered.

OAU takes up the challenge

In 2001, the OAU recognised the huge and increasing impact that tsetse-transmitted trypanosomiasis were having on rural development in sub-Saharan Africa. They declared 2001 the year of tsetse control and inaugurated PATTEC to coordinate activities among member states and seek international support for a major campaign to overcome poverty in SS Africa through the elimination of trypanosomiasis.

Leading global organizations fighting poverty and disease, the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO) and the International Atomic Energy Agency (IAEA), are supporting PATTEC. Major pharmaceutical companies and US foundations are committing funds to assist WHO in combating sleeping sickness and through WHO, PATTEC's public partners have recently been invited by a pharmaceutical company to identify their needs to fight tsetse and nagana. The United Nations Economic and Social Council (ECOSOC), the priority setting body for the world organization, has acknowledged that creating tsetse free zones will be a valuable step towards reducing rural poverty.

Zanzibar breakthrough

In 1997 the Zanzibar island of Unguja was declared free of the tsetse after conventional methods reduced their numbers and the release of hundreds of thousands of infertile male flies into the wild clinched its success. Since the program to control and eradicate the tsetse began, milk production has tripled, local beef production has doubled and the number of farmers who fertilize crops with manure has multiplied 5-fold. Fears that tsetse elimination would have a harmful environmental impact on the island's biodiversity have been unfounded.

This success showed that tsetse eradication is achievable and provided the impetus for new thinking about areawide control of tsetse using a variety of methods, with sterile insect technique (SIT) for the *coup de grace*.

An integrated areawide campaign

The Zanzibar breakthrough – after a joint program between the government of Tanzania, the IAEA and FAO – was achieved using SIT, in combination with applying insecticide to the backs of cattle and setting insecticide impregnated traps to reduce the tsetse population.

It is this combination of intervention techniques which is behind PATTEC. Initially techniques ranging from the sequential aerosol technique ((SAT), the use of pour-on and other insecticide formulations on livestock, artificial baits and trapping are used to reduce the tsetse population to a low level and then SIT is used as a simple, final mop-up tool.

“The PATTEC campaign involves areawide control of tsetse in a phased operation, using a variety of techniques, with SIT as the *coup de grace*”

SIT introduces hundreds of thousands of male flies, sterilised with gamma irradiation into the breeding population of a target region from a specially outfitted plane. The sterile males are able to mate and produce sperm, but the eggs in the female do not develop. The infertile males compete with fertile flies to mate with females. However, once a female tsetse fly mates with an infertile male, she stores the sperm in her abdomen and joins them with the 5-8 eggs that she will produce over the course of her lifetime. SIT is a standard tool in the successful control of the Mediterranean fruit fly in Argentina, Chile, Mexico and California, and the melon fly in Japan, and it eradicated the

TSETSE CONTROL

New World Screwworm in the United States, Mexico, Central America and Libya.

The valleys of Ethiopia, the cotton belt in West Africa, and a region in southern Africa, starting with the Okavango Delta, will be the initial areas where the control program is to be conducted. A study of the benefits of removing the tsetse from Southern Ethiopia, commissioned by the IAEA and undertaken by the Imperial College of Science and Technology in the UK, estimated the return on investment to be between 33–43%.

Prospects

“Permitting more African farmers to own livestock and maximize their contribution to agricultural activities would have a profound impact on hunger and poverty in the continent, providing them with milk and meat and enhancing crop production – elements of mixed farming that are difficult to achieve in tsetse infested zones. Even the poorest of the poor, for whom the risk of livestock ownership is too hazardous with the tsetse, would benefit”, says Peter Salema, deputy director of the joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture. “Only by refocusing our efforts on rural areas in order to enhance agricultural production, thereby allowing the poorest farmers to earn income, can many other poverty reduction processes succeed.”

“Africa is now ready to combat the tsetse fly,” said Salema. “It is a root of poverty in sub-Saharan Africa, a devastating problem that has been allowed to fester because there was a perception it could not be solved, and because it is a problem of the rural poor.”

“The solution to the tsetse is within our reach,” said John Kabayo Regional Coordinator of PATTEC, based in Addis Ababa, Ethiopia. “Now Africa has to take full ownership of the campaign, but it will need assistance,” he said. “The key will be political perseverance by Africa and securing financial support.” He said that PATTEC owes a major debt of thanks to the IAEA, which has fostered its development and encouraged the use of SIT as one of the tools integrated into the process of creating tsetse free zones.

Opposing views

There has been considerable criticism of the PATTEC initiative and its likelihood of success in some developed countries and in some international research institutions, and there are different views on which techniques should be applied and when.

The view of the International Centre of Insect Physiology and Ecology (ICIPE), for example, is that much greater consideration must be given before embarking on such an expensive and possibly fruitless venture. While ICIPE is fully aware of the need to deal with the tsetse/tryps problem, given the enormous suffering it causes, there are questions that need to be answered, such as the need to

re-examine why the Nigerian and Tanzanian SIT projects carried out some years ago failed. Were the lessons gained from these unsuccessful experiments taken into account when designing this new PATTEC programme?

Although there has been the more recent project of applying SIT to tsetse in Zanzibar, extrapolation of the approach from this small and unique island situation to the entire continent could be misleading. We must ask ourselves in Africa how the larger proportion of over 10 million square kilometers of tsetse-infested regions can best be targeted. It may be that SIT might work in some selected regions, but only if effective barriers are deployed to prevent re-invasion, a phenomenon which prior experience has shown *always* occurs.

There is also the question of what to do about the multiple species of tsetse in a given locale. In such situations, it will be necessary to release sterile males of each of the species present, thus raising the cost of the SIT exercise. (And, there are at least 22 species of tsetse, several of which often cohabit a given region.)

ICIPE is of the opinion that a more sensible and realistic approach to the tsetse problem would be to *manage* the flies, rather than to attempt to totally eradicate them. The US\$ 20-30 billion required for an SIT tsetse eradication programme for the whole of the continent is simply not available, and beyond the reach of African countries. This view has also been expressed by Clare Short, Secretary of State for International Development (DFID), who said in the British Parliament that while the “aims of the campaign are laudable... our analysis – shared also by the EC – is that it will not be possible to eradicate flies from Africa”. Such a large amount of money might be better spent in addressing other development issues such as HIV/AIDS, TB and malaria, for instance. Tsetse and trypanosomiasis control needs to be farmer-led, locally available and economical, and thus ultimately sustainable, rather than creating new dependencies and indebtedness. It is more realistic to set achievable goals using a bottom-up approach and that can be attained in a reasonable timeframe and within reasonable funding expectations.

Such an approach is being successfully applied to control maize stemborers, another group of devastating pests that account for losses of 3.9 million tonnes of grain annually, enough to feed 39 million people, using simple biological control and habitat management methods.

For further information see the websites:

http://www.iaea.org/worldatom/Press/P_release/2002/prn0202.shtm

<http://www.fao.org/PAAT/html/home.htm> and links therefrom

<http://www.who.int/inf-fs/en/fact259.html>

<http://www.africaonline.co.zw/vet/tsetse.html>

<http://www.healthubs.com/trypanosomiasis/> and links therefrom

<http://www.icipe.org>