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Ethiopia builds a fly factory to tackle the tsetse

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Armed with menacing, needle-like probes that pierce the hides of cows, goats and donkeys, tsetse flies have long been the scourge of African farmers.

The bloodsucking insects infest fertile lowland areas of sub-Saharan Africa and carry the single cell parasite, trypanosome, which attacks its victims' blood and nervous systems, slowly and painfully killing livestock. It also causes sleeping sickness in humans, killing thousands of rural Africans each year.

Now Ethiopia plans to fight back, using a combination of gallons of cows' blood and nuclear technology in a bid to eradicate the killer flies once and for all.

With technical help from the International Atomic Energy Agency, a body better known for investigating nuclear programmes in Iran, Ethiopian scientists plan to breed millions of male tsetse, sterilise them using gamma radiation and then release them into infested areas.

The first modules of a "factory" where the flies will be bred are supposed be operational within weeks.

The largest of its kind for Africa, the ambitious project could be a key to solving the Horn of African nation's land problems, caused largely by the doubling of the country's population in the last 30 years to 70m.

More than two-thirds of Ethiopians are crammed into highland areas, safe from the twin evils of tsetse and mosquitoes, while fertile lowland areas remain underpopulated, says Mulugeta Amha, head of the government-run Ethiopian Science and Technology Commission.

Remove the pests and farmers could move into previously untapped land, easing the massive burden on overgrazed highlands.

Ethiopia, one of the world's poorest countries, is regularly struck by devastating droughts, yet the government has committed 130m birr ($15m, €12.4m, £8.5m) to the 10-year pilot project, just under half its costs. It hopes donors will give the rest.

"We strongly feel that this imbalance in land resources and population settlement is one of the root causes of environmental degradation in mountainous countries like ours," says Mr Mulugeta, whose commission heads the project.

The concept is simple but the challenge daunting.

The sterile males will retain their sex drive and compete with their fertile counterparts for females once released. The female mates only once and stores the sperm in her abdomen. She can produce up to 18 maggoty-looking larvae during her three-month life.

If she mates with a sterile male, she will produce no offspring and the process of eradication will have begun.

"It is possible but it is a serious challenge," Mr Mulugeta adds.

"It is not a joke, it is a very serious project."

It is certainly no laughing matter for Africa or Ethiopia, the continent's third most populous country. Tsetse infest more than 30 African countries, costing the world's poorest continent an estimated $4bn (E3.3bn, £2.2bn) a year.

In Ethiopia more than 28m cattle, sheep, horses and donkeys are at risk, the science and technology commission says. Some 80 per cent of Ethiopia's population relies on agriculture and the government hopes the sector will be the driver of economic development.

The "factory" is in the final stages of construction on an industrial site on the outskirts of Addis Ababa. When fully operational, it will be home to a breeding colony of 10m female flies.

The scientists hope to be able to release 1m sterile males each week into blocks of a 25,000sq km pilot area in southwestern Ethiopia. It will take about 500 litres of blood a week to feed the flies.

The scientists are brimming with optimism and hope to begin test-releasing flies in 2005, working up to mass releases in 2006 or 2007.

"This project is not only for Ethiopia, it can work for east Africa," says Solomon Mekonnen, the factory manager as he walked around the site, enthusiastically pointing out what will go where, as men welded and women swept floors.

The scientists have already begun establishing a breeding colony, and have 15,000 flies about the size of houseflies at a temporary insectary next to the main site.

Fridges and freezers are packed with blood, while the flies are kept in circular plastic containers covered in mesh.

The IAEA's involvement stems from the agency's original mandate when it was set up in 1957 as the world's "Atoms for Peace" organisation.

If the project does succeed, the impact in Ethiopia could be dramatic and it would serve as a model for other parts of Africa.

"It's very important, it's going to make a huge difference if we succeed," says Andrew Parker, a research entomologist at the IAEA. But he acknowledges the task is daunting. Just establishing a colony large enough to breed the necessary number of sterile males will take several years.

There are successful precedents, however, which give the scientists hope.

In the 1990s, tsetse were eradicated from the Indian Ocean island of Zanzibar using the same method, and similar projects rid the US, Central America and Libya of new world screw worm.