By Aimable Twahirwa;

Kigali: In a move to promote relevant new technologies with the aim to strengthen food security, a team of researchers from Kenya, Rwanda, Tanzania and Uganda have jointly developed an innovative technique of exploiting locust masses as possible sources of human food or feed for livestock production.

With the total cost of $ 80,514 USD allocated during the implementation phase, researchers have developed a ground-breaking tool using Roof Park Greenhouses (RPGs) technique to conduct experimental feeding studies with locusts on the use of feed mixtures composed of storable feed materials commonly used in livestock production.

The project was part of a five-year, US$15 million initiative launched in 2015 to help science granting councils (SGC) in 12 African nations.

Roof Park Greenhouses

Based on the investigation, the research team from four academic institutions namely Egerton University (Kenya), the College of Agriculture, Animal Science and Veterinary (CAVM) of the University of Rwanda, University of Makerere (Uganda) and Sokoine University of Agriculture (Tanzania) found that the new type of greenhouse kit provide a stable, controlled environment for locust mass-rearing.

It has long been a challenge for researchers to conduct experimental feeding studies with locusts using traditional laboratory practices until they come up with new greenhouse approach that allowed them to start extracting chitosan, a type of fiber taken from the exoskeleton of insects and which is mainly used for food processing industry and pharmaceutical production.

Chitosan has also a number of commercial and possible biomedical uses. In medicine, it is useful in bandages to reduce bleeding and as an anti-bacterial agent, it said.

As the existing mass-rearing protocols are based on fresh, non-storable feed materials, the study was the first to explore the possibility of having a system out of the laboratory environment, said Dr. Didace Ndahimana, referring to the situation in Rwanda.

Dr Ndahimana is a senior researcher at the College of Agriculture, Animal Sciences

and Veterinary Medicine, of the University of Rwanda.

Edible food resources

To further assess the impact of locusts on food security, Agriculture and food researchers from various academic institutions across East African Community (EAC) have focused on the system development and analyzing its efficiency and the risk of zoonosis which may result in the transmission of the disease at the human-insect interface.

“Insects such as locusts are considered edible food resources with sufficient nutrients for both human and animals, but their nutrient composition and safety evaluation are key,” Dr Ndahimana told ‘Science Africa’ in an exclusive interview.

Insects as food and feed, in particular as a new and sustainable source of high-quality protein, have been attracting the attention to food science across East Africa where researchers have started to conduct trials of locust products value addition.

“The significance of the discovery is that a system for the measurement of greenhouses gases emitted during insect rearing has been developed, and setting is underway to conduct measurements” said Ndahimana who is also a senior lecturer in Food and Nutrition at the University of Rwanda

Research collaboration

In the initial experiment, it has also been discovered that locusts convert high protein diets very efficiently into body mass, yet certain diet formulations revealed nutritional limitations.

Commenting on the findings to ‘Science Africa’, the senior Rwandan researchers also stressed that it would be helpful if the project gets a second phase funding so that the locust mass rearing system prototyping can be completed to the model deliverable to food and feed industries.

Thanks to the collaboration between Egerton University of Kenya and its associated private company SAGALA Parks, the smart greenhouse monitoring system has been

tested where it is currently being optimized to be used for business purpose.

Most of the collaborations between different academic institutions under the new research project focusing on locust mass rearing, a number of junior researchers from each country have been granted scholarship to pursue their Master's degree on specific clusters of the project.

"When the Rwandan student will return back home after completing learning in assessing greenhouse emissions of mass locust thanks to this collaboration, the country will get benefit from this expertise," Dr Ndahimana said.

For months, locust stretching tens of kilometres in length and breadth has blighted central and eastern Africa.

Now the new research collaboration seeks to explore nutritious benefits that these insects may contribute to food security across the region.

In its latest update released in March this year, the Food and Agriculture Organization (FAO) of the United Nations aid the threat from locusts currently remains high in East Africa. (END)