



STOCKHOLM CONVENTION

SUCCESS STORY #9

WORKING WITH PARTNERS TO IMPROVE THE LIVELIHOODS OF MILLIONS IN AFRICA

**Specific innovation and expanding opportunities
brings fundamental change**

The key to the success of the Basel, Rotterdam and Stockholm (BRS) Conventions is that they are implemented on the ground through partnerships with like-minded organisations. There is no greater example of this than in the collaborative work undertaken with the International Centre of Insect Physiology and Ecology (*icipe*). The Stockholm Convention Regional Centre (SCRC) Kenya is hosted by *icipe*, and based in Nairobi. It promotes a '4H Paradigm' that encompasses human, animal, plant and environmental health. It works towards improving the livelihoods of millions of people in Africa and enables smallholder farmers, on whom most agricultural activity in Africa depends, to access appropriate technologies and strategies to address existing and emerging constraints.

icipe and SCRC Kenya's primary objective and an important objective as an SCRC is to research and develop non-chemical alternatives to the use of hazardous pesticides. The focus is on environmentally friendly pest and vector management strategies

that are effective, selective, non-polluting, non-resistance inducing, and which are affordable to resource-limited rural and urban communities.

The results have been transformative. Some successful examples include:

'Push-Pull' is an innovative cropping technology developed over the past 20 years. Push-Pull involves intercropping cereal crops with insect repellent legumes in the *Desmodium* genus, and planting an attractive forage plant such as Napier grass or *Brachiaria* as a border around this intercrop. The intercrop emits a blend of compounds that repel ('push') away stemborer moths and Fall armyworm, while the border plants emit semiochemicals that are attractive ('pull') to the pests.

The technique is deliberately designed to include critical sections of society; the majority of those adopting this technology are women. Push-Pull has also been demonstrated to be an appropriate

alternative for people living with disabilities, as relatively little labour is needed once the pilot programme has been established. It should also be noted that approximately 25% of all Push-Pull farmers are young people.

Crucifer pest management: Previous R&D initiatives into plant health had resulted in the establishment of an effective biological control strategy for diamondback moth (DBM) on crucifers in east Africa. Further efforts therefore focused on expanding this biological control strategy to other eastern and southern Africa countries in partnership with a diverse network of National Agricultural Research and Extension Systems (NARES). As a crop grown under diverse climatic conditions across the altitudinal gradient, Crucifer grown on higher ground was found to be vulnerable to climate change and could experience increased pest pressure of DBM, with a corresponding decrease in the efficiency of natural enemies. The focus was on adaptation measures through release of lowland parasitoids, *Cotesia vestalis* in the highlands and promotion of integrated pest management (IPM) strategies for other emerging pests of crucifers.

Tsetse repellent technology: Tsetse flies are one of the main constraints for agro-pastoralism, food security and overall development in Africa. It is estimated that the annual cost to east Africa alone exceeds US\$ 2.1 billion. Tsetse also have significant implications for land use and crop production in Africa. Because of their adverse impact on animal draught power, the flies are one of the main reasons why 80% of the continent's arable land is tilled by hand.

Furthermore, tsetse infestation has turned huge portions of Africa's fertile landscape into 'green deserts' that lie uninhabited and unused. Control of the flies with synthetic insecticides is difficult, expensive, ineffective and harmful to people, animals and the environment, and fly re-invasions remain a major problem. SCRC Kenya, *icipe* and partners have developed a series of environmentally friendly tools and strategies for the control of tsetse and trypanosomiasis, among them the innovative tsetse repellent collars. This technology is based on research which investigated chemical cues from the waterbuck (an animal that is common in tsetse habitats but is not readily fed upon by the insects), and found certain compounds with the capacity to repel tsetse flies. A blend of these chemicals has been packaged in innovative dispensers which, when worn as collars around the neck of cattle, essentially make cattle unattractive to tsetse flies. Due to improved health, the traction power of protected oxen was enhanced and farmers in the trial ploughed 73% more land than before, thus increasing their crop production with yields surpassing household needs.

The technology has also been evaluated for riverine tsetse flies that transmit human sleeping sickness, showing a reduction of approximately 30%. The repellent collars technology can also be integrated into other tsetse control tactics, to enhance fly suppression and to develop much needed efficient barriers to stop flies from re-invading tsetse control areas.

Bee health: Honeybees are a major animal resource in Africa, supporting millions of household livelihoods. Surveys have clearly indicated the presence of parasites and pathogens in selected regions across the continent. *icipe* has been implementing a range of initiatives in bee health, primarily through the establishment of the African Reference Laboratory for Bee Health headquartered in Nairobi, with satellite stations in Burkina Faso, Cameroon, Ethiopia and Liberia, and a training site in Madagascar. This state-of-the-art facility, a partnership with the African Union Inter-African Bureau for Animal Resources (AU-IBAR), provides a platform for monitoring and preventing bee diseases and pests in Africa. In May 2017, *icipe* was officially designated as an OIE Collaborating Centre for

Bee Health in Africa by OIE – World Organisation for Animal Health (the intergovernmental organisation responsible for improving animal health worldwide). This designation is highly significant as it formally recognises *icipe*'s role as a hub for bee health Research and Development and expertise in Africa and globally.

Capacity Building and Institutional Development (CBID) Programme

icipe considers building the capacity of individual researchers, institutions and communities in Africa as integral to its research and sustainable development activities. A key focus of *icipe*'s CBID Programme is the postgraduate (MSc and PhD) training of young researchers to acquire the skills and research experience in insect and related sciences to engage effectively in science-led development and develop collaborations. Major achievements include:

- A significant postgraduate training programme to build the capacity of African researchers, with 269 new scholars joining the postgraduate programmes and 75 PhD scholars and 106 MSc scholars graduating in 2013-2017;
- Committed to advancing excellence in science through gender equity, with women being 43% of scholars joining *icipe* in 2013-2017, 39% of scholars who graduated and 49% of ongoing scholars;
- The postgraduate programmes have an Africa-wide impact, with 92% of postgraduate scholars in 2013-2017 representing 21 African nationalities;
- Holding more than 290 training courses, workshops and other training events for more than 12,000 research scholars and scientists, research and development collaborators, farmers, extension workers, and other stakeholders;
- In addition, the Push-Pull Programme trained more than 150,000 persons in 2013-2017, including farmers, extension workers, agricultural experts, school pupils and other stakeholders in Kenya, Uganda and Ethiopia.

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