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Chair, *icipe* Governing Council

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January 2020 – October 2020

## icipe BY NUMBERS

**246,000**

total number of farmers using the push-pull technology

**122**

ongoing postgraduate (PhD and MSc) scholars under *icipe* capacity building programmes

**82**

total number of ongoing PhD scholars under the Regional Scholarship and Innovation Fund (<https://www.rsif-paset.org/>)

**102**

peer-reviewed journal articles, published between 1 January 2020 – 30 September 2020

**5**

new, Africa-led innovation projects to the control and management of COVID-19, supported by BioInnovate Africa Programme (<https://bioinnovate-africa.org/>).

**100**

(approximate) cities across the world that we have virtually connected to (some multiple times)



Prof. Dr. Bill Hanson  
Chair, *icipe* Governing Council



**It is our sincere hope that you will find this publication interesting, and a source of hope and optimism as we continue to look forward to better times.**

## **Dear Friends and Colleagues,**

We live in strange times. This often quoted phrase could not be more applicable than to the year 2020. The coronavirus pandemic (COVID-19), and the restrictions, changes and guidelines adopted on national or global levels to mitigate it, have ushered in a new reality for everyone.

The resultant “business as unusual” scenario and *icipe*’s resilient and determined response to it, is the focus of the Director General’s Thought Leadership column. The piece details adjustments in institutional operations, field and laboratory based activities. The article also discusses the Centre’s efforts to contribute to African-led solutions for the disease, and to the post-pandemic thinking.

Indeed, the dynamism shown by *icipe* over the past several months is a reflection of the Centre’s unrivalled endurance throughout its 50-year journey. Over the past five decades, *icipe* has survived and thrived amidst a range of national and global turbulences. So, while the commemoration of the Centre’s golden jubilee, initially scheduled for 3 April 2020, was postponed to 20 November 2020, we have continued to celebrate this great milestone on our website and social media pages, and through a range of products, as outlined on the *icipe@50* section in this publication.

Our regular columns – Recently Funded and selected Recently Published journal articles, further demonstrate *icipe*’s vibrancy over the past several months.

We also devote a section to advances in the newly launched More Young Entrepreneurs in Silk and Honey (MOYESH) project.

The Capacity Building and Institutional Development, and the Regional Scholarship and Innovation Fund (<https://www.rsif-paset.org/>), coordinated by *icipe*), are illustrative of our distinctive efforts to nurture African leadership and capacity in insect science specifically, and more broadly in science, technology and innovation. In addition, we present highlights from BioInnovate Africa Programme (<https://bioinnovate-africa.org/>) managed by *icipe*, and one of the most significant regional innovation-driven initiatives on the continent.

Thank you for your continued partnership, and stay safe.

**Prof. Dr. Bill Hanson,  
Chair, *icipe* Governing Council**



**Dr Segenet Kelemu**  
Director General, *icipe*

# Science in the time of a pandemic

The ongoing coronavirus pandemic (COVID-19) has had exceptional impact on science. Against the background of an expectant and anxious world, scientists working directly on the disease have had to provide rapid answers to unravel, manage and mitigate the novel virus, while upholding rigorous scientific standards. The pandemic has also had a huge impact on the broader scientific community, due to restrictions, changes and guidelines adopted on national or global levels. As a research and development institution, we have found ourselves in a 'business as unusual' scenario, but one that we believe we have responded to with resilience and determination, as discussed below.

## Institutional operations



At *icipe*, this has been a time to remind ourselves of our place as workers in the frontline of poverty alleviation. And based on this consciousness, our response to the COVID-19 situation has been purposeful; envisioned to safeguard our staff and their families, as well as our visitors, while minimising disruptions on commitments to our stakeholders, including our development partners, donors, collaborators and beneficiaries. Indeed, the coronavirus pandemic finds us stark in the middle of contributing to the battle against the desert locust devastating many parts of eastern Africa since the beginning of 2020; and the fall armyworm that arrived a few short years before it. That, alongside efforts to tackle a number of other menaces facing the continent that are within our mandate. These include tsetse flies (vectors of animal and human trypanosomiasis); as well as mosquitoes and malaria, one of Africa's greatest burden. In accordance, *icipe* has developed and instituted a package of measures around

COVID-19, informed by the best and latest evidence. A comprehensive communique is available [here](#).

## Locust control



Starting in late 2019, countries in the horn of Africa – Ethiopia, Kenya and Somalia – have been devastated by catastrophic locust swarms. *icipe* is part of a multi-agency locust control team assembled by the Ministry of Agriculture, Livestock and Fisheries, Kenya. The Centre brings to the alliance its extensive experience and capacity in biology, ecology, management, and beneficial use of locusts. Specifically, *icipe* has led the strengthening of ground surveillance of locusts; bolstered the capabilities of stakeholders (from government agencies, research partners and communities); and contributed to awareness creation regarding the menace. The Centre has also intensified basic research on locust biology, taxonomy and identification to accelerate control efforts, as well as integration of the insect in food and feed, and its use as a source of high quality oil. So far, the Centre has developed biopesticides that have been found to be effective under laboratory conditions.

## Field activities



We have been able to continue field-based activities, in strict observance of measures outlined by various governments. For example, in Kenya, we have held over 30 events involving thousands of farmers, on the management of the fall armyworm, upscaling of the push-pull technology, and development of an avocado IPM and improved pollination services. In Ethiopia, initiatives on beekeeping and silkworm farming; advancement of an

IPM for rice, maize and chickpea; and the push-pull technology, have pushed on in five regional states.

## Virtual implementation



Through virtual meetings with collaborating partners, our malaria integrated vector management (IVM) activities in eight countries in Southern Africa have proceeded effectively. In the Plant Health Theme, several need-based virtual trainings have been held for trainers-of-trainers. The Theme has also developed an innovative approach via WhatsApp, facilitating multi-directional communication among various stakeholders across five countries in Africa towards improved cereal production.

Country-level WhatsApp groups identify local issues that are then accelerated to a continental-level group aggregating lead farmers, extension officers, representatives of national research and agricultural institutes, private sector and non government organisations (NGOs) among others. The latter group has become a strong alliance network – a hub of support, solution provision, information sharing and cross-learning. Similarly exciting and effective interactions are being realised through DuduTalk, a mobile interactive platform developed by the Insects for Food and Feed team, bringing together insect farmers, researchers and value chain actors.

## Local partnerships



*icipe* has always considered partnerships central to its operations. And, during this period, our extensive network has enabled us to work remotely in the field, for example, to distribute inputs and information, and to

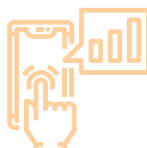
harvest produce from our field experimental sites. In fact, thanks to community owned resource persons (CORPs) in Kwale County along the Kenyan coast, tsetse control activities have been uninterrupted. The CORPs set up and monitor traps, and also transmit data electronically to us.

## International partnerships



We consider ourselves part of a global community and we have maintained and broadened our networks. Over the past several months, our teams have connected virtually to about 100 cities across the world for various purposes including: update our donors; participate in meetings and conferences; discuss activity progress; deliberate collaboration opportunities; and draft proposals.

## Remote data collection



This is exemplified by the Push-Pull IPM team that is using Open Data Kit (ODK) web tools to ensure vital monitoring of crop damage and pest populations. Using a database of farmers and their GPS locations; and farmer teachers armed with programmed tablets, pre-loaded with preformatted data templates; field data, accompanied by photographic and video images of pests occurrence and damage intensity are received on weekly basis.

## Basic research



Our laboratory-based activities have advanced in earnest. For instance, after our groundbreaking findings on the discovery of a transmission blocking symbiont in *Anopheles* mosquitoes, we have been able to collect samples and set up experiments, thus answering critical follow-up questions. The Behavioural and Chemical Ecology Unit team has generated novel data, resulting in important milestones across the Centre's four themes. And the malaria IVM team has analysed and published baseline and historic malaria data from eight partnering countries. The fruit fly IPM team has focused on boosting colonies of the pest and associated parasitoids, facilitating

release of the latter in Kenya, Mozambique and Zimbabwe.

## Research adjustments



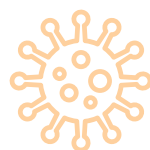
Part of the ongoing studies in the Animal Health Theme aim to understand how tsetse and biting flies see their world, and how "colour" guides the interaction between the vectors and livestock. These studies require farm visits to conduct scientific assessments on the animals. Instead, the team has made an agreement with a Kenyan-based commercial meat processor for the supply of cow hides, which then serve as livestock proxies for the studies.

## Technology development



The best example here is the remarkable progress in the development of a range of biopesticides for the invasive and highly destructive fall armyworm. We have undertaken label extension of two of our commercially available biopesticides for their use against the pest. We have also identified new and highly potent biopesticides strains from our repository of insect infecting microorganism strains, which are now under development. We recognise that this success has been due to regional cooperation, and efficiency of regulatory bodies to harmonise regulations across East Africa, even during this challenging period. [Read more](#)

## African-led COVID-19 solutions



Alongside the rest of the world, Africa must contribute to the control and management of COVID-19. Therefore, the *icipe*-managed BiInnovate Africa Programme is supporting five new innovation projects focusing on: development of diagnostic tools, being led by the Ethiopian Biotechnology Institute; validation of African medicinal plants for treatment of COVID-19, led by Tanzania Industrial Research and Development Organization; use of indigenous medicinal plants to strengthen resilience of communities to COVID-19, led by Makerere University, Uganda; production of immune boosting aromatic herb extracts, led by Gudie Leisure Farms, Uganda; and harnessing of data

science to map the impact of COVID-19 on food systems being led by *icipe*.

## Support for RSIF institutions and scholars



To enable Africa Host Universities (AHUs) and scholars transition into the digital learning warranted by the COVID-19 pandemic, RSIF has provided a range of support, for example capacity building on online training; and intensified access and optimum use of e-resources.

For the scholars, psychosocial assistance is being provided, in view of self-study from home. In these activities, we have partnered with: École polytechnique fédérale de Lausanne (EPFL), Switzerland and University Mohammed VI (UM6P), Morocco. In partnership with Worcester Polytechnic Institute, Massachusetts, USA, we have strengthened university innovation and delivery in relation to COVID-19. For example, the AHUs have received training on 3D printing, enabling them to create face masks, face shields and respirator parts for hospitals and the general public.

## Contributing to post-COVID thinking



*icipe* is joining the African and global community in contemplating the path beyond COVID-19. For example, there is an increased risk of food and nutrition insecurity due to disruptions in food and input supply systems, rise in food prices, a shift of funding priorities away from food security-related research, and loss of jobs. *icipe*'s holistic 4Hs themes approach presents an important model for investments in a "One Health" strategy, to strengthen resilience across diverse sectors in Africa, and elsewhere. The Centre is also investigating the reactions to disruptions in the informal food supply in Kenya. This knowledge will support the harnessing of such disruptive innovations for better food security. Moreover, our various teams have commenced planning and priority setting with national partners in countries in the recovery phase.

This year, 2020, marks the 50<sup>th</sup> anniversary of *icipe*. In light of the situation relating to COVID-19, the commemoration ceremony, initially scheduled for 3 April 2020, was postponed to 20 November 2020, to be held at *icipe* Duduville Campus, Nairobi, Kenya. In the meantime, we have continued to celebrate

this great milestone through our website and social media pages, and a range of products as outlined below.

As part of our golden jubilee commemoration, we have produced a special publication that provides the first comprehensive narrative of the Centre; from inception to present, and

a forecast of future goals. This report is an interesting and compelling account of the rhythm of continuation and evolution that has marked *icipe*'s journey from an audacious idea, to a globally recognised model of scientific excellence, and a transformative force in development. [Click here to download report](#)

## Insect of the month series

Our golden jubilee is embodied in the slogan: 'Insects for Life' – a dual expression of the interlinkage between *icipe*'s 4Hs thematic research approach that encompasses:

Human, Animal, Plant and Environment Health; and the unwavering commitment of the Centre to its vision and mission. In tandem, we are running an Insect of the

Month series that illustrates the intricate interlinkage between insects and livelihoods, in Africa and beyond (Visit: [www.icipe.org](http://www.icipe.org)).



Tomato leafminer, *Tuta absoluta*



Tsetse fly, *Glossina morsitans*



Yellow fever mosquito, *Aedes aegypti*



Long-horned grasshopper, *Ruspolia differens*



Camel fly, *Hippobosca camelina*



*Cotesia icipe*



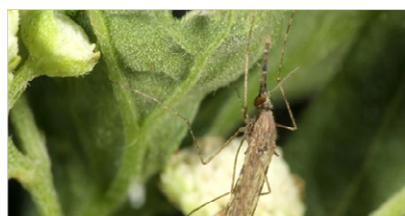
Honeybee, *Apis mellifera*



Mopane bee, *Plebeina hildebrandti* (stingless bee)



Sandfly, *Phlebotomus duboscqi*



Malaria mosquito, *Anopheles gambiae sensu stricto*



Brown ear tick, *Rhipicephalus appendiculatus*



Black soldier fly, *Hermetia illucens*

We have also generated spin off publicity around the golden jubilee, for example: '50 years of malaria' (<http://www.icipe.org/news/icipe-%E2%80%93-50-years-malaria-mosquito-research>) Bee Research and Development Activities (since 1995): (<http://www.icipe.org/news/bee-research-and-development-activities-1995>).

**Black soldier fly frass fertilizer**

Recent studies by *icipe* have clearly demonstrated the potential of black soldier fly frass fertilizer as an environmentally safe, more affordable and sustainable option for increased maize production. The first research shows that while various commercial organic and inorganic fertilizers have influence on maize plant height, chlorophyll concentrations and macronutrients uptake, black soldier fly frass fertilizer has additional and considerable impact on nitrogen use efficiency and overall crop yield. The Centre aims to continue studies to determine mid and long-term effects of black soldier fly frass fertilizer on soil health and crop protection, especially against pests like nematodes across different agro-ecological zones and cropping systems (Paper link: <https://www.frontiersin.org/articles/10.3389/fpls.2020.574592/full>). In a second study, the researchers found that topsoils in plots treated with black soldier fly frass fertilizer have more nitrogen, resulting in higher uptake of this essential mineral by crops, resulting in better yield. (Paper link: <https://www.mdpi.com/2073-4395/10/9/1395>)

**Biopesticides R4D**

*icipe* boasts one of the strongest and most effective biopesticides research-for-development (R4D) programmes in Africa. The Centre's outputs, underpinned by a large repository of arthropod pathogens, protocols for lab bioassays, field efficacy testing, and an effective public-private partnership, have significantly contributed to control of pests and vectors. Currently, three *icipe* biopesticides have been commercialised by Real IPM Ltd, Kenya, and are being used on various crops on 132,994 hectares of land in Africa. Significantly, as reported elsewhere in this newsletter, *icipe* has found effective biopesticides against the invasive fall armyworm and the desert locust. Now, *icipe* has published a comprehensive review detailing the transformation of its biopesticide development from basic, to applied research; to innovative, commercial products. The paper also presents the Centre's future biopesticides R4D thrusts. (Paper link: <https://www.frontiersin.org/articles/10.3389/fsufs.2020.563016/full>)

**Malaria transmission-blocking microbe**

In a globally acclaimed study, researchers from *icipe* and the University of Glasgow, UK, have identified of a microbe in malaria mosquitoes that is capable of blocking transmission of the disease from the insects to people. In a study published in *Nature Communications* journal (paper link: [https://](https://go.nature.com/2xwzbyl)

[go.nature.com/2xwzbyl](https://go.nature.com/2xwzbyl)), the scientists report that the microbe, which they have named *Microsporidia MB*, was found in *Anopheles* mosquitoes. The researchers established that mosquitoes carrying *Microsporidia MB* do not harbour malaria parasites either in nature, or after experimental infection in the laboratory. The research also showed that *Microsporidia MB* is passed from female mosquitoes to their offspring at high rates, and the microbe does not kill or cause obvious harm to the mosquito host.

**Insect oils**

A recent *icipe* study has provided evidence on the nutritional superiority of insects oils. These findings, which were published recently in *Foods* journal (paper link: <https://bit.ly/2Ym8Z3V>), strengthen the case for the incorporation of insects and their additives into food and animal feed. The research compared oils from two grasshopper species that are commonly consumed in Africa: the desert locust (*Schistocerca gregaria*), and the African edible bush-cricket (*Ruspolia differens*) also known as 'nsenene', and those obtained from olive and sesame. The results make the two insects ideal candidates for mass rearing for oil production, and provide an avenue for entrepreneurs in Africa to tap into the lucrative and booming global cooking oil market, expected to reach USD 130.30 billion by 2024.

**Safer use of insects**

The use of black soldier fly, *Hermetia illucens* L. for recycling organic waste into high-quality protein and fat biomass for animal feeds has gained momentum worldwide. However, proper safety measures are needed, to minimise risk of pathogen contamination along the insect-based feed value chain, through the use of insects like black soldier flies. In contribution, *icipe* researchers have completed genetic diversity studies of black soldier flies from six continents, thus unravelling genera that might pose risks to the health of people and animals. The research also investigated gut microbiome complex that has negative impact on animals and people. Based on the findings, the researchers have made a range of recommendations, for example pre-treatment of feedstocks and postharvest measures of black soldier flies. (paper link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7381391/>)

**Desert locust**

Against the background of one of the most severe desert locust outbreaks in East Africa, *icipe* researchers have identified potential breeding sites of the pest. The team

accessed 9,134 desert locust occurrence records and applied a machine-learning algorithm, and key bio-climatic (temperature and rainfall) and edaphic (sand and moisture contents) factors. The study demonstrated that vast areas of Kenya and Sudan, north eastern Uganda, and south eastern and northern regions of South Sudan as high risk regions. This information is essential for cost-effective and timely preventive measures. For example, the knowledge will enable proper targeting and stronger ground surveillance in the identified areas. (paper link: <https://www.nature.com/articles/s41598-020-68895-2>)

**Tsetse odour repellency**

Building on *icipe*'s groundbreaking findings of tsetse repellent compounds in waterbuck, the Centre has now identified the cellular and molecular mechanisms that the fly uses to detect and code the odours. Focusing on the sensory neurons and odourant receptors in tsetse antennae, the study reveals the sensors used for the interaction between the fly and the environment – the source of the repulsive odour – and ultimately the decision to avoid it. (paper link: <https://www.frontiersin.org/articles/10.3389/fncel.2020.00137/full>)

**PCN 'suicidal hatching'**

It may be possible to manage potato cyst nematodes (PCN), currently a key threat to potato production in eastern Africa, by inducing 'suicidal hatching' of the pests using naturally occurring chemicals in crop roots. These findings of a study by *icipe* and partners aimed to identify signals that can be exploited to induce hatch of PCN juveniles in the absence of host crops and thus lead to their eventual death. These signals could be used in synthetic forms to stimulate suicidal hatch of PCN in infested fields before farmers plant potatoes. Alternatively, plants that produce the chemicals but are not usually infected by PCN could be incorporated in a crop rotation system to stimulate PCN hatch, thereby reducing populations of the pest. (paper link: <https://bit.ly/30z440W>).

**Smart maize**

*icipe* and partners have discovered that certain "smart" maize varieties have the ability to defend themselves against stemborers by summoning natural enemies of the pest. The researchers have also determined the genetic markers in such plants that are associated with this "call for help", presenting strong possibilities for developing maize varieties that are resistant to the pests (paper link: <https://www.nature.com/articles/s41598-020-68075-2>).

## New scholars

In 2020, *icipe* has welcomed 23 new students. Of these, five are registered through the African Regional Postgraduate Programme in Insect Science (ARPPIS), supported by the German Academic Exchange Service (DAAD). The rest 18 scholars are undertaking studies within the Dissertation Research Internship Programme (DRIP); three PhDs, and 15 at MSc level. The scholars will be hosted within various projects being implemented by the Centre. For the e-bulletin, indicate: [Click here for more details](#)

## Doctoral supervision

Ten early career scientists: Peter Sangoro and Oscar Mbare (Human Health Theme); Shewit Kalayou and Michael Okal (Animal Health Theme); Xavier Chiriboga, David Mfuti Kupesa and Shepard Ndlela (Plant Health Theme); Amanuel Tamiru (Behavioural and Chemical Ecology Unit); Boniface Ngoka (Environmental Health Theme); and Beatrice Muriithi (Social Science and Impact Assessment Unit); participated in the Dialogue on Innovative Higher Education Strategies (DIES)/ The Centre for Research on Evaluation, Science and Technology (CREST) Online Training Course for Supervisors of Doctoral Candidates at African Universities. The online course, held between 27 July – 20 September 2020, was presented by CREST, an academic centre of Stellenbosch University in South Africa.

## Borlaug-Ruan interns

Three World Food Prize Borlaug-Ruan interns completed an intensive five-week stint within the push-pull programme. Using digital platforms, they conducted research on the impact of COVID-19 on gender roles, youth and agricultural extension services in western Kenya.

## EANBiT

The Eastern Africa Network for Bioinformatics Training (EANBiT) a collaborative network of three universities and four research institutes in Kenya, Tanzania and Uganda, coordinated by *icipe* and supported by the Forgy International Center of the National Institutes of Health

under the H3Africa Programme, held a range of activities. EANBiT fellows and the Secretariat team virtually participated, and made oral and poster presentations, in two meetings of the H3Africa Consortium. The fellows also took part in the 28th (virtual) Conference of Intelligent Systems for Molecular Biology between 13 – 16 July 2020. Between 6 July – 28 August 2020, *icipe* hosted the annual Bioinformatics Residential Training Course, virtually, for 43 students from Kenya, Uganda, Tanzania and Eshwatini. A collaboration between EANBiT MSc students and trainers led to founding of the Bioinformatics Hub of Kenya, which will develop bioinformatics knowledge and skills by creating awareness, collaboration and capacity development.

## Summer scholarships

Four students in the Nematology Research Group have been awarded summer scholarships by the Global Burden of Crop Loss initiative, aimed at enabling young scientists develop a global data-driven system to report losses to agricultural crops caused by pests and diseases. They are: Harrison Mburu, who will work on development of an appropriate tool to determine yield losses related to the potato cyst nematode (PCN) in Kenya; Judy Nyaboke Nyaribo, to evaluate the potential of non-solanaceous crops for the management of potato cyst nematodes in Kenya; Margaret Nyaboke Nyang'au, on the Management of PCN using fungal isolates and Mosioma Nehemiah Ongeso, to establish an evaluation model to generate plant parasitic interaction knowledge towards achieving nematode control.

## MORE YOUNG ENTREPRENEURS IN SILK AND HONEY (MOYESH) PROJECT

In October 2019, *icipe* in partnership with the Mastercard Foundation and Ethiopia Jobs Creation Commission (JCC), launched a USD 55,601,322, five-year initiative that aims to see 100,000 young men and women in Ethiopia secure dignified and fulfilling work along honey and silk value chains.

The MOYESH project is aligned with ongoing efforts to alleviate youth unemployment or underemployment in Ethiopia. MOYESH is being implemented primarily in partnership with Ethiopia [Jobs Creation Commission \(JCC\)](#), the Mastercard Foundation's [Young Africa Works in Ethiopia](#) initiative and several public and private sector institutions implementing similar projects and programmes, in Amhara, Oromia, Southern Nations, Nationalities, and Peoples' (SNNP)

and Tigray regional states of Ethiopia. [Read more](#)

### Partnering youth

A total of **16,926** (59% of them women), from across the four regions have been recruited so far.

### Regional launches

In January and February 2020, the MOYESH project was officially launched across its four regional states of implementation. These high profile, extremely participatory, and well publicised events, were attended by representatives of regional governments, beekeepers and silkworm growers, private sector apiculture and sericulture actors, input suppliers, technology and financial services providers, and farmer cooperative unions, among others.

### Digital information exchange service

A two-way short messaging exchange platform has been established to facilitate regular communication between the MOYESH partnering youth, small and medium enterprises (SMEs), extension staff and the project team.

The goal is to enable timely information delivery, promote business-to-business linkages, as well as trade and investment. The service aims to reach 16,926 youth in the first year, and ultimately, the target 100,000 youth by the close of the project.

## Trainings

One of the key objectives of the MOYESH project is to empower unemployed youth through training. So far, two rounds of village level training sessions have been conducted on topics ranging from entrepreneurship, life skills, beekeeping and sericulture.

- **15,276** (59% females) youth have attended entrepreneurship and life skills development trainings

- **13,685** (60.5% females) have attended beekeeping skills development trainings
- **2,487** (59.5% females) have attended silkworm farming skills development trainings
- **1044** local extension staff of partnering institutions (Livestock Extension, Technical, Vocational and Enterprise Development, Women, Children and Youth Affairs) have attended training-of

trainers (ToTs) workshops. They have proceeded to conduct village level training of partnering youth.

These youth have been organised in 1,263 business (beekeeping or silkworm farming) enterprises; they have secured legal registration and opened group bank accounts to facilitate savings and credit services.

## BIOINNOVATE AFRICA

### ANDE membership

BioInnovate Africa Programme is now a member of the Aspen Network of Development Entrepreneurs (ANDE), a global network of organisations that propel entrepreneurship in emerging markets. The Programme will have access to resources on innovation, capacity building and entrepreneurship; participate in ANDE activities; and broaden its network with innovation ecosystem actors, like social and impact investors, incubators and accelerators, and potential funders among others.



### New PAC member

Dr Silas Obukosia, Business Manager, African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD) has joined Programme Advisory Committee (PAC) of BioInnovate Africa, providing a vital linkage between the Programme and continental initiatives.

### Women and bioeconomy

Efforts to enhance participation of women scientists in the African Bioeconomy continue through the Programme's Fellowship scheme. Currently, 12 women scientists are undertaking fellowships within projects supported by BioInnovate Africa in Burundi, Kenya, Uganda, Rwanda, Tanzania, and Ethiopia. [Profiles](#)

### Eastern Africa bioeconomy conference

BioInnovate Africa, the East Africa Science and Technology Commission (EASTECO), and partners are organising the first Eastern African Bioeconomy Conference, to be held virtually on 21 – 22 October 2020. A significant milestone during the event will be the launch of the Eastern Africa Regional Bioeconomy Strategy. [More information](#)

## REGIONAL SCHOLARSHIP AND INNOVATION FUND (RSIF)

*icipe* in its role as the Regional Coordination Unit (RCU) of the Regional Scholarship Innovation Fund ([www.rsif-paset.org](http://www.rsif-paset.org)), the flagship programme of the Partnership for skills in Applied Sciences, Engineering and Technology (PASET), has undertaken the activities presented below over the past several months.

### Strengthening AHUs capacity

RSIF incorporates a network of 11 African Host Universities (AHUs); competitively and rigorously selected universities, research institutes or centres based in Africa that offer a PhD programme in any one of thematic areas identified by PASET as priority economic sectors for growth and development in Africa. One of *icipe*'s role is to strengthen the capacity of the AHUs, including in communication. In accordance, in January 2020, a proposal writing workshop was organised for over 30 representatives of AHUs and their partners.

### PhD scholars

A total of 67 young scientists who competed successfully for the second RSIF PhD scholarships have commenced their studies in various AHUs, after participating in a six-day online orientation training programme organised by *icipe* in June 2020. A comprehensive list of the scholars, including a breakdown of their countries of origin, research topics and AHUs they are registered in, is available [here](#). In addition, 116 scholars are expected to be awarded scholarships under the third call, and will commence their studies in 2021.

### New IPIs

PASET has signed memoranda of understanding (MoUs) with four International Partner Institutions (IPIs): International Livestock Research Institute (ILRI), Nairobi, Kenya; University of Greenwich, Natural Resources Institute (NRI), UK; Karlsruhe Institute of Technology (KIT), Germany; and the Global R&D Center, Seoul National University, Korea. This brings the total PASET IPIs to twelve. The IPIs are research institutes, or private sector partners that provide opportunities for RSIF scholars, at various points of their studies, to advance their research, gain new skills, and expand their networks for periods ranging from six months to two years.



## Innovation and research grants

RSIF has awarded research and innovation grants to nine AHUs to boost scientific research and innovation. Of these, six research awards will enable the AHUs to generate knowledge for developmental challenges in Africa; strengthen capacity for research and technological adaptation; bolster innovation ecosystems in universities for commercialisation of research outputs; and support national development strategies

for science, technology and innovation; and pivot public-private partnerships. Each of the grants will be implemented by AHUs in collaboration with international partners.

## Guest webinar series

RSIF has introduced a series of monthly seminars and inspirational talks aimed at creating conversation on various topical issues among students and academic faculty; and leaders in research and innovation, as well as industry partners. Guest speakers

are drawn from research organisations, academia, private sector, policymakers and the donor community. The guest speakers for October 2020 are: Jayshree Naidoo, CEO, YIEDI Ltd, South Africa; and Prof. Junseok Hwang, professor of Information Science and Technology at Technology Management, Economics and Policy program (TEMEP), Seoul National University and Director of International Technology Policy Program (ITPP).

## AWARDS

**Awarded to:** *icipe*

**Recognition:** Stockholm Convention Regional Centre (after first designation for the period 2011 – 2015, *icipe* has since received two formal endorsements for 2016 – 2019; and 2020 – 2023)

**Awarded by:** Conference of the Parties to the Stockholm Convention

**Awarded to:** *icipe*

**Recognition:** Food and Agriculture Organisation of the United Nations (FAO) Reference Centre for vectors and vector-borne animal diseases

(initially appointed for the period 2012 – 2016; then endorsed for 2016 – 2020; 2020 – 2024)

**Awarded by:** Director General of FAO, after a thorough evaluation of the degree of progress and compliance, as well as quality contributions that *icipe* has made to assist FAO in its mission of providing authoritative advice to its Members, and in particular the developing countries



**Awarded to:** Segenet Kelemu, Director General, *icipe*

**Award:** Ellis Island Medal of Honor, awarded in 2020

**Awarded by:** Ellis Island Honors Society, New York, USA

**Featured by:** UN Women among “seven women scientists you need to know and celebrate” in the context of the International Day of Women and Girls in STEM, in 2020. Link: [https://medium.com/@UN\\_Women/devoted-to-discovery-seven-women-scientists-who-have-shaped-our-world-a1b9893ccbe1](https://medium.com/@UN_Women/devoted-to-discovery-seven-women-scientists-who-have-shaped-our-world-a1b9893ccbe1)

**Appointed** an International Fellow of the Academy’s General section by the Royal Swedish Academy of Agriculture and Forestry

**Selected and featured** among five African women scientists to celebrate in February 2020, by the International Climate Change Development Initiative. Link: <https://medium.com/climatewed/celebrate-international-day-of-women-and-girls-in-science-profile-of-five-women-in-stem-e548fefae3b>



**Awarded to:** Baldwyn Torto, Head, Behavioural and Chemical Ecology Unit, *icipe*

**Award:** 2020 ESA Nan- Yao Su Award for Innovation and Creativity in Entomology.

**Awarded by:** Entomological Society of America



**Workneh Ayalew**, Project Coordinator, More Opportunities for Young Entrepreneurs in Silk and Honey (MOYESH) project,

- **Appointed** as member of the Job Advisory Council of the Ethiopia Jobs Creation Commission from February 2020 for a term of 2 years
- **Nominated** by the Minister of Agriculture to serve on the Advisory Expert Team on the Ethiopia Agriculture Sector 10 years Strategic Development Plan.

## STAFF NEWS

Over the past several months, *icipe* has strengthened its various teams. One of the most robust recruitments has been under the newly launched MOYESH project, which has boosted the

total *icipe* Ethiopia Office team to: 98 regular staff, 57 technical service providers, three graduate students, three consultants and three temporary staff. Across the Centre, newly filled positions include: two research

scientists; six business or project support officers; three research officers; one research assistant; five consultants; and nine interns.

## Funded proposals: January 2020 – October 2020

**Donor:** Biovision Foundation for Ecological Development, Switzerland  
**Project title:** Upscaling the eco-management of tsetse flies through the integration of repellent technologies and optimised trap deployment

**icipe researchers:** Daniel Masiga, Michael Okal

**Collaborators:** Kenya Wildlife Service (KWS), Department of Agriculture, Livestock and Fisheries, Kwale County (Kenya), mHealth Kenya Ltd, and Department of Veterinary Services, Ministry of Agriculture Kenya.

**Donor:** THRIVE Research Enrichment for Community and Public Engagement (RECPE) Award

**Project title:** Improvement of livestock and human health through better understanding of vector-borne zoonotic disease transmission

**icipe researcher:** Joel Bargul

**Collaborators:** Laisamis Secondary School, Marsabit County, Kenya.

**Donor:** CAB International (Cabi)

**Project title:** Global Burden of Crop Loss - summer studentship programme

**icipe researcher:** Solveig Haukeland

**Collaborators:** Kenyatta University, University of Nairobi, JKUAT, Egerton University

**Donor:** National Institute for Health Research (NIHR) – Royal Society of Tropical Medicine and Hygiene (RSTMH) 2019 Small Grants Programme

**Project title:** Evaluating attractive fabric panels impregnated with Metarhizium anisopliae against vectors of sleeping sickness.

**icipe researcher:** Naomi Riithi

**Collaborators:** KWS, and Department of Agriculture, Livestock and Fisheries, Kwale County, Kenya.

**Donor:** Government of Burkina Faso, through the Ministry of Economy, Finance and Development

**Project title:** Financial support to *icipe* for the implementation of Africa Regional Scholarship and Innovation Fund for Applied Sciences, Engineering and Technology (RSIF) project in sub-Saharan Africa.

**icipe staff:** Moses Osiru, Julius Ecuru and Rob Skilton

**Collaborators:** RSIF African Host Universities (AHUs) and RSIF International Partner Institutions (IPIs)

**Donor:** Government of Senegal, through the Ministry of Finance

**Project title:** Financial support to *icipe* for the implementation of Africa Regional Scholarship and Innovation Fund for Applied Sciences, Engineering and Technology (RSIF) project in sub-Saharan Africa.

**icipe staff:** Moses Osiru, Julius Ecuru and Rob Skilton

**Collaborators:** RSIF AHUs and IPIs

**Donor:** German Academic Exchange Service (DAAD)

**Project title:** In Country/ In Region (ICIR) Scholarship Programme 2020 *icipe* African Regional Postgraduate Programme in Insect Sciences (ARPPIS)

**Donor:** Biovision Foundation for Ecological Development, Switzerland

**Project title:** Participatory beekeeping for ecological protection of Mangrove forests in Zanzibar (ZanBee)

**icipe researchers:** Michael Lattorff, Kiatoko Nkoba

**Collaborators:** Department of Forestry and Non-Renewable Natural Resources, Ministry of Agriculture, Natural Resources Livestock and Fisheries, Zanzibar.

**Donor:** Federal Ministry for Economic Cooperation and Development (BMZ)

/ German Agency for International Cooperation (GIZ) 2019 project funding  
**Project title:** Scaling-up Climate-Smart Pest Management Approaches for Enhanced Maize and Tomato Systems Productivity in Eastern Africa (SCLAMP-EA)

**icipe researchers:** Henri Tonnang, Samira Mohamed, Menale Kassie, Subramanian Sevgan, Paul-Andre Calatayud, Saliou Niassy

**Collaborators:** National Agricultural Research Laboratories, National Crop Resources Research Institute, and Food for the Hungry Association (Uganda); Haramaya University and Send-A-Cow (Ethiopia).

**Donor:** BioInnovate Africa Programme / University of Burundi

**Project title:** Production, processing and marketing of catnip (*Nepeta cataria* L., Lamiaceae) products to prevent malaria in Eastern Africa

**icipe researchers:** Baldwyn Torto, John Bwire

**Collaborators:** Ginette Karirekinyana, Karire Products Ltd Burundi; and Prof. Tatién Masharabu, University of Burundi

**Donor:** Wellcome Trust, Research Enrichment - Public Engagement funding

**Project title:** Understanding the risks and benefits of newly developed irrigation schemes in western Kenya in the context of malaria elimination - 219974/Z/19/Z

**icipe researchers:** Oscar Mbare, Ulrike Fillingner

**Collaborators:** Durham University and London School of Hygiene and Tropical Medicine, UK; National Irrigation Board and Department of Health and Sanitation, Busia County, Kenya

**Donor:** Bill & Melinda Gates Foundation Call to Action, 2019 Grand Challenges

**Project title:** Measuring and modelling crop yield losses due to insect pests under a warming climate

**icipe researchers:** Sunday Ekesi, Henri Tonnang, Thomas Dubois, Paul André Calatayud

**Collaborators:** Josh Tewksbury, Colorado Global Hub, Future Earth

**Donor:** BMZ through Biovision Africa Trust

**Project title:** (Kenya) Knowledge Centre for organic agriculture in Africa.

**icipe researcher:** Saliou Niassy

**Collaborators:** Biovision Africa Trust

**Donor:** Research Institute of Organic Agriculture (FiBL)

**Project title:** Long-Term Farming Systems Comparison in the Tropics (SysCom): What is the contribution of organic farming to sustainable development?

**icipe researchers:** Martha Musyoka, Edward Karanja, Felix Matheri

**Collaborators:** Kenya Agricultural and Livestock Research Organization, Kenyatta University, Kenya Institute of Organic Farming (KIOF), Kenyan Organic Agriculture Network (KOAN); and Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya; and Tropical Soil Biology and Fertility Institute of the International Center for Tropical Agriculture (TSBF-CIAT).

## Funded proposals: January 2020 – October 2020 (contd)

**Donor:** H2020-2018-2020/ Sustainable Intensification in Africa-SFS-35-2019-2020/University of Wuerzburg

**Project title:** Upscaling the benefits of Push-pull technology for sustainable agricultural intensification in East Africa (UPSCALE)

**icipe researcher:** Charles Midega, Zeyaur Khan, Jimmy Pittchar, Beatrice Muriithi

**Collaborators:** Bavarian Research Alliance (Germany), Eastern Africa Farmers' Federation Society; JKUAT, Kenya Agricultural and Livestock Research Organization (KALRO), Maseno University, Kenya; Food for the Hungry Association and Rwanda Agriculture and Animal Resources Development Board, Rwanda; Inosens Doo Novi Sad (INO), Serbia; University Of Kwazulu-Natal, South Africa; Lund University and Swedish University Of Agricultural Sciences, Sweden; University of Zurich ,Switzerland; Tanzania Agricultural Research Institute (TARI); National Agricultural Research Organization (NARO), Uganda; and International Institute For Sustainable Development (IISD)

**Donor:** Future Leaders – African Independent Research (FLAIR) collaboration grant through University of Cambridge, UK; a partnership between the African Academy of Sciences and the Royal Society, UK, funded by the Global Challenges Research Fund (GCRF)

**Project title:** The potential of naturally occurring, inheritable, mutualistic viruses to enhance performance of common bean in East Africa

**icipe researchers:** Francis Wamonje, Subramanian Sevgan

**Collaborators:** John Carr, Department of Plant Science, University of Cambridge, UK (project leader)

**Donor:** French Agricultural Research Centre for International Development (CIRAD)

**Project title:** Semiochemical compounds: Service agreement collaboration between CIRAD and *icipe*

**icipe researcher:** Samira Mohamed

**Donor:** French Agricultural Research Centre for International Development (CIRAD)

**Project title:** Pest-free fruit: Service agreement collaboration between CIRAD and *icipe*

**icipe researchers:** Subramanian Sevgan, Beatrice Muriithi

**Collaborators:** Emilie Deletre

**Donor:** Biovision Foundation for Ecological Development, Switzerland

**Project title:** Intensification of push-pull technology for improved food security, nutrition and incomes

**icipe researchers:** Zeyaur Khan, Charles Midega

**Donor:** Danida Fellowship Centre led by University of Copenhagen, Denmark

**Project title:** HEALTHYINSECT - Insect farming for health and livelihood

**icipe researcher:** Saliou Niassy

**Collaborators:** University of Copenhagen, Denmark; JOOST, Makerere University, Uganda; JKUAT, Kenya

**Donor:** Wellcome Trust - International Masters Fellowship

**Project title:** Investigations into how *Anopheles*-specific flaviviruses affect arbovirus and *Plasmodium* transmission - 219672/Z/19/Z

**icipe researchers:** Joseph Muthoni, Jandouwe Villinger

**Collaborators:** Liverpool School of Tropical Medicine, UK

**Donor:** Wellcome Trust - International Masters Fellowship

**Project title:** Investigating mechanisms for disseminating the *Plasmodium*-inhibiting *Microsporidia* MB symbiont in *Anopheles arabiensis* - 219673/Z/19/Z

**icipe researchers:** Anne Wairimu, Jeremy Herren, Jandouwe Villinger

**Collaborators:** University of Glasgow, UK

**Donor:** United States Department of Agriculture - Research, Education and Economics: Agricultural Research Service

**Project title:** Identification of semiochemicals for regulation of potentially invasive pests or beneficial organisms for the control of invasive pests to the U.S. (Amendment 02)

**icipe researcher:** Baldwyn Torto

**Collaborator:** The Chemistry Research Unit, Center for Medical, Agricultural, and Veterinary Entomology, USDA-ARS

**Donor:** Wellcome Trust - Training Fellowship in Public Health and Tropical Medicine

**Project title:** Understanding the risks and benefits of newly developed irrigation schemes in western Kenya in the context of malaria elimination - 204863/Z/16/Z (COVID-19

supplement\_6 months Grant extension)

**icipe researchers:** Oscar Mbare, Ulrike Fillingner

**Collaborators:** Durham University and London School of Hygiene and Tropical Medicine UK; National Irrigation Board and Department of Health and Sanitation, Busia County, Kenya.

**Donor:** USAID Bureau for Humanitarian Assistance

**Project title:** Reinforcing and expanding the Community-Based Fall Armyworm *Spodoptera frugiperda* (Smith) Monitoring, Forecasting for Early Warning and Timely Management to protect food security and livelihoods of vulnerable communities (CBFAMFEW II)

**icipe researchers:** Saliou Niassy, Subramanian Sevgan

**Collaborators:** Rwanda Agricultural Board; Zambia Agricultural Research Institute; Ethiopia Institute of Agricultural Research; National Agricultural Research Organization, Uganda; Department of Agricultural Research Services, Malawi.

**Donor:** Kenya Climate Smart Agriculture Project (KCSAP) Competitive Grants System/led by JKUAT

**Project title:** Upscaling Insect-Based Protein-Rich Feeds for Enhanced Nutrition and Health of Fish in Kenya (INSFeedFish project (KCSAP/GA02-4/2)

**icipe researchers:** Chrysantus Tanga, Fathiya Khamis

**Collaborators:** Jomo Kenyatta University of Agriculture and Technology, Kenya Marine and Fisheries Research Institute

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## Core donors

- Swiss Agency for Development and Cooperation (SDC), Switzerland
- Swedish International Development Cooperation Agency (Sida), Sweden
- Foreign, Commonwealth & Development Office, Government of the United Kingdom
- Ministry of Higher Education, Science and Technology, Kenya
- Government of the Federal Democratic Republic of Ethiopia

## Restricted project donors

- African Academy of Sciences
- African Union
- African Women in Agricultural Research and Development (AWARD)
- AIRD (French Inter-institution Agency for Research and Development)
- Bertha Foundation
- Bill & Melinda Gates Foundation
- Bioinnovate Africa Programme
- Biotechnology and Biological Sciences Research Council, UK, through Rothamsted Research, UK
- Bayer: Science For A Better Life
- Biovision Africa Trust
- Biovision Foundation for Ecological Development, Switzerland
- Cambridge-Africa ALBORADA Research Fund
- Canadian Government through International Development Research Centre (IDRC)
- Centre for International Migration and Development (CIM)
- CIRAD – Agricultural Research for Development, France
- Cultivate Africa's Future (CultiAF) through International Development Research Centre (IDRC)/Australian Centre for International Agricultural Research (ACIAR)
- Ethiopian Catholic Church Social Development Commission (ECC-SDCBOM)
- European Union
- Federal Ministry for Economic Cooperation and Development (BMZ), Germany
- Food and Agriculture Organization of the United Nations (FAO)
- Future Leaders – African Independent Research (FLAIR)
- German Academic Exchange Service (DAAD)
- Deutsche Forschungsgemeinschaft (DFG)
- Global Challenges Research Fund (GCRF)
- Global Environment Facility (GEF)/United Nations Environment Programme (UNEP)
- Government of Côte d'Ivoire
- Government of Ghana
- Government of Rwanda
- Government of Burkina Faso
- Government of Senegal
- Government of South Korea
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- Innovate UK
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- International Atomic Energy Agency (IAEA)
- International Centre for Genetic Engineering and Biotechnology (ICGEB)
- International Fund for Agricultural Development (IFAD)
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- LEAP -Agri (A Long term EU-Africa research and Innovation Partnership on food and nutrition security and sustainable Agriculture)
- Liechtenstein Development Service (LED), Principality of Liechtenstein
- Mastercard Foundation, Canada
- Max Planck Institute
- Medical Research Council, UK
- Ministry for Foreign Affairs of Finland
- Mozilla Foundation
- National Geographic Society
- National Research Fund, Kenya
- Netherlands Organisation for Scientific Research (NWO)
- Newton Fund
- Norwegian Agency for Development Cooperation (NORAD)
- R. Geigy Foundation, Switzerland
- Research Institute of Organic Agriculture (FiBL), Switzerland
- Rockefeller Foundation
- Royal Society of Tropical Medicine and Hygiene, UK
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- The Royal Society, UK
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- Swiss National Science Foundation (SNSF)
- SWITCH Africa Green
- United Nations Environmental Programme (UNEP)
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- USAID—United States Agency for International Development's IPM Innovation Lab (Feed The Future Innovation Lab for Integrated Pest Management) of Virginia Tech, USA
- United States Agency for International Development Partnerships for Enhanced Engagement in Research (USAID-PEER) Science program with funding from National Academy of Sciences (NAS)
- United States Department of Agriculture (USDA)
- United States National Institutes of Health (NIH)
- United States National Science Foundation (NSF)
- Volkswagen Foundation, Germany
- Wellcome
- World Academy of Sciences (TWAS)
- World Bank
- World Federation of Scientists through the ICSC-World Laboratory
- World Health Organization
- World Trade Organization (WTO) – Enhanced Integrated Framework (EIF)

In realising its mission, *icipe* also benefits from extensive partnerships with research partners (including universities and research institutes in Africa and beyond), private sector partners, and communities across Africa.

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