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icipe BY NUMBERS (OCTOBER – DECEMBER 2020)

8

PhD graduates from 5 African countries

27

peer-reviewed journal articles published

120

mentions in print and online media

2,251

social media mentions



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



***icipe* marks the end of 2020 with a sense of gratitude and humility that in one of the most difficult years in recent history, we were still able to advance our mandate and vision.**

Dear Friends and Colleagues,

The year 2020 has been a true test of the human spirit. Across the world, the COVID-19 pandemic has caused immense upheavals in every aspect of our existence, the worst being enormous loss of life. The crisis has also thrown livelihoods, plans, hopes, dreams and aspirations into disarray. We empathise with those that have borne the brunt of this pandemic and the many for whom this might well be a lost year. And we also appreciate the brave soldiers, frontline workers and numerous unsung heroes, who have worked tirelessly to ensure the world's survival.

At *icipe*, we are humbled and grateful that against many odds and in the middle of the turmoil we have made commendable progress in many aspects. For example, we were able to celebrate our 50th anniversary with a range of activities throughout the year, culminating in a highly successful hybrid event on 20 November 2020. The official commemoration of the Centre's golden jubilee was important: it was an occasion to contemplate the power of visionary thinking, of science and of movements of support and partnerships. *icipe*'s milestone was a much-needed beacon of hope, and a time for the Centre to re-dedicate itself to the mission of transforming livelihoods with insect science.

The [Research Highlights](#) and [Recently Published](#) sections of this publication stand as testaments of this resolve. They capture advances in our research and development (R&D) activities and in generating new

knowledge over the past several months. The [Recently Funded](#) and [Awards](#) sections show the trust of national, regional and global communities in *icipe*, demonstrated through continued investment and recognitions of the Centre's achievements. Most significantly, *icipe* has recently been awarded the [Food Planet Prize](#), the largest accolade of its kind in the world. The progress in [BioInnovate Africa Programme](#), one of Africa's largest regional innovation-driven science initiative and the [Regional Scholarship and Innovation Fund](#) are a further illustration of our contribution to building Africa's capacity for socio-economic evolution.

Against this background, *icipe* joins a determined world in envisioning a transformative recovery beyond the COVID-19 pandemic, bound by the slogan 'Building Forward Better'. This tenacity is closely linked to the United Nations Decade of Action, launched in 2020 to accelerate achievement of the 2030 Agenda for sustainable development. The Director General's [Thought Leadership](#) column is a must-read that focuses on the strong role that insect science will play in these two sets of goals. This view is very much at the heart of the recently launched *icipe* [Vision and Strategy \(2021-2025\)](#).

As we move forward, we are most thankful that we can count on your continued partnership and support.

Stay safe.

I wish you happy holidays.



Dr Segenet Kelemu
Director General, *icipe*

Building Forward Better With insect science



Insect science will play a vital role in a transformative recovery from the COVID-19 pandemic.

The global community has adopted the slogan 'Building Forward Better', as a way of envisioning a transformative recovery from the COVID-19 pandemic. The underlying philosophy is that rather than return to the status quo, we can create a more equitable world: one that is built on a sustainable foundation; is gender just; and is devoid of human capital, and digital gaps. This resolve is closely linked to the United Nations Decade of Action, launched in 2020 to accelerate achievement of the 2030 Agenda for sustainable development. With less than 10 years to go, it is clear that although progress has been made, the sustainable development goals (SDGs) are not advancing at the required speed or scale. While, the COVID-19 pandemic has further affected advances of the SDGs, it has also made their achievement even more urgent and necessary. Backed by 50 years of evidence and a resolute commitment to our mandate, *icipe* believes that insect science will be vital in Building Forward Better, while also contributing to the attainment of the SDGs, as outlined in the following categories.

Health systems



The COVID-19 pandemic has increased impetus for strengthening health systems across the world. It has also shown the reciprocity between diseases; and that even the most serious health crisis can be tackled if there is concerted, sustained and coordinated global and multi-sectoral effort. In Africa, attempts to reinforce health systems will be futile without intensified attention on vector-borne diseases; ailments transmitted by blood-feeding arthropods like mosquitoes, ticks and fleas. Managing such menace will relieve the continent's health systems of one of their hugest burdens, while also accruing a range of economic benefits.

This focus will also contribute to stronger research infrastructures, as well as scientific basis for understanding and addressing other diseases. *icipe*'s malaria and neglected tropical diseases programmes stand as testaments of these sets of outcomes. Further, certain insects can serve as valuable neuroscience models for unravelling conditions, illnesses and disorders in people, for example learning, memory, addiction, chronic pain, among others. Insects can also be a source of novel antibiotics to counter antimicrobial resistance.

Food systems



The pandemic has revealed the inability of our food system to withstand shocks, stipulating the urgent need to re-shape it to better serve people and the planet. Insects impact all aspects of the food system including farming, waste management and inputs, while also interacting with other key systems like energy, trade and the health of people, animals and the environment. *icipe*'s success in the development and use of environmentally friendly, accessible and affordable tools to control crop pests and livestock disease vectors vividly indicates that it is possible to improve agricultural productivity without harming the Earth. The Centre has also demonstrated that the beneficial insect biodiversity can be sustainably harnessed for essential services like pollination and natural control of pests. And *icipe*'s innovative, groundbreaking research on insects for food and feed and other uses (INSEFF) illustrates the latent promise of insects in the transition to greener agriculture, for example in recycling of wastes; in the production of organic fertilizers and pest control products; and as an alternative, more affordable and nutritious source of food for people and livestock.



icipe's 4Hs thematic approach, which uses insects as a cross cutting factor, presents an ideal format for holistic integration of science and technology into socio-economic development.

Diversified economies



The pandemic has been a wake-up call for income and economic diversification in Africa. Measures put in place to contain the crisis left numerous people jobless, placing livelihoods at risk. There is need to generate massive, diverse, lucrative and inclusive opportunities, with the most vulnerable at the centre. Over the years, *icipe* has proven that science-led strategies can spawn ingenious employment and income generation opportunities, benefitting all sections of society, including women and youth.

Our bioprospecting, and bees and silkmoths initiatives, have transformed livelihoods of people living in fragile environments and natural resource-rich ecosystems. Through INSEFF, we have witnessed the emergence of small- and medium-scale, insect-based enterprises that are producing a range of innovative products for people and livestock. These ventures will also support the production of novel, high value products such as insect oils, enzymes and pharmaceuticals.

Digital transformation

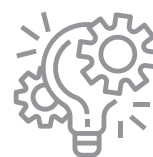


Over the past several months, the world has been forced to rapidly embrace digital transformation to support day-to-day operations, bolster science preparedness and inform decisions around the pandemic. But there is awareness that digital transformation could enhance inequalities, and efforts must be made to make it ethical and human-centric. This includes collection and use of quality, timely, reliable and inclusive data, which is sensitive to gender and other diversities.

icipe's Data Management, Modelling and Geo-Information (DMMG) unit, aims to develop the next generation of decision-making tools, models, software and mobile phone applications for crop, pest and disease management. Using this platform, the Centre has generated a superior model that employs a “systems thinking” approach to capture diverse elements and components of the

COVID-19 pandemic. Most other methods focus on single system components, without integrating linkages and complexities in the disease's transmission. The *icipe* model visualises interrelationships among numerous variables and allows exploration of causal links enabling potential measures to mitigate the economic impact of the pandemic. The model is generic and can be applied to other diseases.

Mainstreaming science and innovation



One positive aspect of the COVID-19 pandemic has been the elevated recognition of science and technology as core cogs of human survival and development. Alongside, Africa's capacity in this area has become evident. For example, in several African countries, scientists have been involved in genome sequencing, clinical testing, and in seeking innovative ways to apply African knowledge to the pandemic. A recent study by World Health Organization Regional Office for Africa (WHO-AFRO) shows that of 1000 new or modified technologies developed worldwide to target different areas of the COVID-19 response, Africa accounts for 12.8% of the innovations.

What is needed now are frameworks to bolster the continent's talent and leadership in science and technology. *icipe's* African Regional Postgraduate Programme in Insect Science (ARPPIS) stands as an outstanding model towards this goal. Moreover, *icipe's* 4Hs themes approach, supported by the Centre's interdisciplinary strategy, presents an ideal format for holistic integration of science and technology into socio-economic development.

Significantly, the Centre has been mandated to host and manage two landmark initiatives that will no doubt have an impact in Building Better Forward: the [Regional Scholarship and Innovation Fund](#) (RSIF) of the Partnership for Skills in Applied Sciences, Engineering and Technology (PASET) and [BioInnovate Africa Programme](#), one of the most significant regional innovation-driven science initiatives on the continent.



(l-r) Mr Daniel Kottut, Deputy Director, UN & Multilateral Affairs, Ministry of Foreign Affairs, Kenya; Ambassador Valentin Zellweger, Ambassador of Switzerland to Kenya, Burundi, Rwanda, Somalia and Uganda; Dr Segenet Kelemu, Director General, *icipe*; Ambassador Raychelle Omamo, Cabinet Secretary, Ministry of Foreign Affairs, Kenya; Hon. Peter Munya, Cabinet Secretary, Ministry of Agriculture, Kenya; Ms Katrin Hagemann, Deputy Head of Delegation, European Union Delegation to Kenya; Mr Harry Kintai, Principal Secretary, State Department for Livestock.



Dr. Thomas Oertle, Regional Director of Cooperation, Horn of Africa, Embassy of Switzerland in Kenya

On 20 November 2020, *icipe* celebrated its 50th anniversary under the theme ‘Insects for Life’, in a hybrid event combining in-person and virtual participation, in observance of COVID-19 safety protocols. The centrepiece of the occasion was a recorded address by His Excellency, Hon. Uhuru Kenyatta, President of the Republic of Kenya, who also launched *icipe*’s Vision and Strategy for 2021-2025. Other esteemed speakers included: Hon. Peter Munya, Cabinet Secretary, Ministry of Agriculture, Livestock, Fisheries and Cooperative, Republic of Kenya; Ambassador Raychelle Omamo, Cabinet Secretary for Foreign Affairs, Republic of Kenya; with remarks from Prof. Dr. Bill Hansson, Chair, *icipe* Governing Council; Dr Segenet Kelemu, Director General & CEO, *icipe*; and uplifting video messages from our donors and collaborators. We thank everyone who participated in the event, whose diverse, colourful and captivating elements are curated on this [link](#).

Quote to live by

“I challenge *icipe*, to, in the next 50 years, herald seminal research work in the fields of science and innovation for the greater benefit not only of Africa but of all mankind.”

His Excellency, Hon. Uhuru Kenyatta, President of the Republic of Kenya.

Camel odour coding

icipe continues to build a body of neuroethology knowledge, as a foundation for the development of environmentally safe, species-specific control strategies for pests and disease vectors. A recently published study aimed to understand the interaction between camels and *Stomoxys calcitrans*, blood-sucking flies that transmit various pathogens to the animals. The researchers investigated the coding of odours that are present in the four main sources in the camel: breath, body (skin), urine, and dung. The studies also found odours that activate most neurons and elicit strong behavioural response in the flies. This knowledge forms a more rigorous approach to identify odours that are potent attractants for the flies. [Paper link](#)

COVID-19 model

icipe researchers have developed a holistic model framework to better understand inter-relationships between the diverse elements and components of the COVID-19 pandemic. Most other methods focus on single components, such as health and contagion; and do not always integrate the linkages and complexities in disease transmission; nor provide interaction and feedback mechanisms between the components. The *icipe* model is novel in its ability to show interactions among contagion, vaccination, healthcare, and the economy. The approach used is generic and can be applied in both developing and developed countries. [Paper link](#)

Low-cost technology for organic fertilizer

icipe has developed a low-cost technology for recycling agro-industrial waste using black soldier flies, to produce high-quality frass organic fertilizer. This follows earlier studies by the Centre that clearly demonstrated the potential of such fertilizer as an environmentally safe, more affordable and sustainable option for increased crop production. Among other attributes, the technology shortens the compost maturation period, and results in increased seed germination, which implies that the compost generated is free of phytotoxic substances. [Paper link](#)

Model for nsenene

A model developed by *icipe* researchers will enable prediction of potential regions in Africa where the long-horned grasshopper, *Ruspolia differens* could become permanently established in future. Popularly known as nsenene, the grasshopper is among the most consumed edible insects in the continent. Recent *icipe* studies have also flagged the grasshopper as an ideal candidate for mass rearing for high quality oil production. The newly generated tool will enable environmental conservation, and sustainable harvesting of the insect, counter to the currently seasonal and unreliable mode. It also complements mass rearing protocols developed by *icipe* for the grasshoppers. In effect, this knowledge could contribute to elevating nsenene from a periodic snack, to its rightful role as sustainable addition to food and nutritional security, and income generation. [Paper link](#)

Wildlife loss and disease risk

Research by *icipe* and partners shows that wildlife loss can lead to counter-intuitive outcomes for disease risk in people. In simulated large-scale experiments, the researchers investigated the effects of wildlife loss on the abundance and feeding behaviour of mosquito vectors, and consequences for vector-borne disease transmission. Using Rift Valley fever, a zoonotic disease that affects livestock and people, as a model, the studies established that large herbivore loss resulted in a marked decrease in abundance, and reduced survival of *Aedes mcintoshi*, a key mosquito vector of the disease. This scenario also shifts *Ae. mcintoshi* blood feeding from animals to people. However, the potential of disease transmission in people doubles in the presence of wildlife, despite an elevated human biting rate in the absence of wildlife. [Paper link](#)

IVM validity

The validity of using integrated vector management (IVM) for mosquito and malaria has been demonstrated in two *icipe* studies. The [first study](#), reports that in Nyabondo, western Kenya, where there is intense all-year round malaria transmission, combined use of long-lasting insecticide treated nets and screening of house eaves with mosquito-proof wire mesh reduced malaria cases by between 63% and 100% compared to when long-lasting insecticide treated nets (LLINs) were used on their own. The [second study](#) shows that in Tolay, Ethiopia where malaria prevalence is generally low, the disease was reduced by a further 50% when usage of (LLINs) was supplemented with the application of *Bacillus thuringiensis israelensis* (Bti) in mosquito breeding habitats.

Ticks and wildlife

Tick-borne pathogens are a major constraint in livestock–wildlife interfaces, and a threat to public health in Africa. Findings of research conducted by *icipe* around Ruma National Park, a protected wildlife area close to the shores of Lake Victoria, Kenya, highlight the need for proactive surveillance, to investigate the prevalence and composition of the pathogens in wildlife–livestock interfaces. [Paper link](#)

Push–pull and aflatoxin

The Push–pull technology has been confirmed to effectively reduce pre-harvest aflatoxin and fumonisin contamination of maize through reduction in stemborer and fall armyworm damage, and thus, diminished ear rot infections caused by the fungi that produce these mycotoxins. [Paper link](#)

Stemborer knowledge

The maize stemborer *Busseola fusca*, is a widespread crop pest in Africa that has been the focus of biological research and intensive management strategies. *icipe* and IRD have expanded current molecular understanding of this species, as well as the list of potential target genes for future crop loss mitigation. [Paper link](#)

Nematodes and enset

A recent study by *icipe* and partners has demonstrated the threat posed by nematodes to enset, a starch staple crop (related to the banana family), that is of unique importance in Ethiopia, where it underpins much of the food supply in the south and southwestern regions of the country. The research represents the most extensive assessment of nematodes on enset to date, and it shows the pests to be correlated with altitude (temperature). In some cases, the nematode population densities found in this study were the highest yet recorded on the crop. The research identifies the major source of infection to be planting material, enabling efforts to address the challenge at the root. [Paper link](#)

Bee gut microbiota

While the honey bee, *Apis mellifera*, is considered a model for gut-microbiota host interaction studies, a gap exists in understanding how the microbiome differs regionally, including sampling from the tropics and in particular from Africa. *icipe* has conducted the first comprehensive characterisation of the gut microbiota of honey bees from sub-Saharan Africa. The study shows the gut microbiota to be highly conserved in the tropics compared to other latitudes, although there are specific and interesting diversities that are affected by the local environment. [Paper link](#)

Boost for *icipe* malaria reduction efforts

Following discovery by *icipe* scientists that a microbe named *Microsporidia MB* found in mosquitoes is capable of blocking transmission of malaria from mosquitoes to people, *icipe* has been awarded a USD 2.2 million grant by Open Philanthropy (www.openphilanthropy.org). The funds will be used to investigate how the microbe can be spread between mosquitoes, with the goal of using the naturally occurring *Microsporidia MB* for effective and sustainable malaria control. The *icipe* study will be the first in a long time that could open new avenues for widespread control of malaria. [Read more](#)

Total control of *Tuta absoluta*

In a landmark move for tomato production in Africa, *icipe* and partners have released a parasitic wasp that will naturally control the invasive and highly destructive *Tuta absoluta*, a tomato leafminer that was detected for first time in Africa in 2008 and has since spread rapidly across the continent. The wasp has been imported by the Centre from Peru, the native home of the pest, and this is the first time it is being introduced outside its origin.

Edible insects standards

Three standards developed by *icipe* for edible insects have been approved and declared national standards by the Kenya Bureau of Standards (KEBS), and are now available for use. The standards have been published vide Kenya Gazette Notice No. 10268 (pg. 4884), dated 4 December 2020. They are: KS 2921:2020 – Production and handling of insects for food and feed – Code of practice; KS 2922-1:2020 Kenya Standard – Edible insects – Specification – Part 1: Edible insects' products; and KS 2922-2:2020 Kenya Standard – Edible insects – Specification – Part 2: Products containing edible insects.

One Health and COVID-19

The COVID-19 pandemic has impacted most R&D initiatives, including those focusing on the control of other diseases. In line with *icipe*'s One Health approach, researchers have found a way to advance activities while also supporting COVID-19 containment. For example, teams working on integrated vector control, and on the ecology and risk factors for tungiasis (jiggers), are setting up tippy taps – simple, inexpensive and effective innovations – to enable collaborating communities adhere to COVID-19 hygiene protocols. Alongside, the researchers are holding open-air clinics to disseminate accurate information on the pandemic.

UPSCALE-ing push-pull

The push-pull integrated pest management programme team in collaboration with 17 R&D partners in Africa and Europe, have launched a five-year project titled: Upscaling the benefits of push-pull technology for sustainable agricultural intensification in East Africa (UPSCALE). *icipe* and Leibniz University Hannover, Germany, are co-leading the initiative, aimed to enable targeted implementation and prediction of push-pull effectiveness and resilience under current and future climate conditions.

Third generation push-pull

A new, third generation version of the push-pull technology has been developed, for better tolerance to drought and improved control of *Striga* weed, stemborers and fall armyworm. The adapted version retains the basic principles of the technology: suitable chemistry in terms of ability to attract and repel stemborers; *Striga* suppression; proficiency in improving soil fertility, moisture retention and organic matter; and added value, for example in provision of high-quality fodder. The selected, farmer preferred companion plants are *Desmodium intanum*, an excellent seed yielder and *Brachiaria* variety Xaraes, which is resistant to red spider mites and produces higher biomass.

PCN resistant lines

As part of ongoing efforts to sustainably tackle the invasive potato cyst nematodes (PCN), the Nematology Group in partnership with the International Institute of Tropical Agriculture (IITA), has begun screening potato genotypes from the germplasm collection at the International Potato Center (CIP), for PCN resistance. In addition, new lines with such quality and which resemble Shangi, eastern Africa's most popular potato cultivar, have been received from United Kingdom, and are undergoing field assessments and proving popular with farmers and consumers. A comprehensive analysis of this research is available [here](#).

Push-pull intercrops production

Under the Advocacy for Agroecology (A4A), and the Integrated Pest Management (IPM) for East Africa projects, the *icipe* Ethiopia Office continues to enhance the dissemination and adoption of the push-pull technology. Recently, field day and farmer trainings on *Desmodium* seed collection, were held in Gurage Zone, Southern Nations, Nationalities, and Peoples' (SNNP) Region, with about 55 participants, including beneficiary farmers, development agents and other stakeholders. Other sessions on technical support on harvesting techniques of forage seeds, pre-test surveying, and data collection, forage management and proper usage were conducted in SNNP and Sidama Regional State.



Tafese Masho, a farmer from Gurage Zone, SNNP Region, Ethiopia, who is participating in the *icipe*-led Advocacy for Agroecology (A4A) Push-Pull Seed Production project, pictured with his *Brachiaria* seed harvest, during a recent field day.

Graduates

Eight *icipe* PhD scholars from Kenya, Nigeria, Tanzania, Togo and Zimbabwe, graduated or defended their theses during this period. Registered in universities across Africa, the students advanced knowledge on diverse topics across the Centre's 4Hs thematic areas including: understanding of the chemo-ecological mechanisms of stemborers; strategies to manage rice stemborers in irrigated low land rice ecosystem in Tanzania; rice blast disease in upland rice in Tanzania; use of space-borne observations to monitor *Striga* weed infestation in eastern Africa; Huanglongbing (HLB) disease (destructive menace of citrus) and its vectors; and identification of pest resistant amaranth germplasm. The studies also focused on the risk of yellow fever and dengue fever transmissions in Northern Kenya, and on bee research, through further understanding of the linkage between landscape and pollination. [Read more](#)

Basic Crash Course Nematology

The annual Basic Crash Course Nematology (BCCN), a one-week course organised annually by *icipe*, International Institute of Tropical Agriculture (IITA), and International MSc in Agro- and Environmental Nematology, University of Gent, Belgium, took place between 14 to 18 December 2020. This year, the course was only open to Kenyan participants (with the exception of one participant from Benin), and it is limited to a maximum of 11 participants, in adherence to COVID-19 pandemics restrictions. BCCN provides basic training in methods to quantify, qualify and process plant-parasitic nematodes in crops, with an introduction to beneficial nematodes, indicators of soil health and nematodes for biocontrol of insects (entomopathogenic) nematodes.

REGIONAL SCHOLARSHIP AND INNOVATION FUND (RSIF – www.rsif-paset.org)

COVID-19: challenges, lessons learnt and resilience

In a recently [published article](#), three female RSIF PhD scholars on international sandwich placements in Korea and USA, discuss the impact of COVID-19 pandemic on their personal lives and research journeys, as well as their immense resilience. While the COVID-19 pandemic is affecting all scientists in general, women scientists, especially those with young families, are uniquely affected. The article

is in line with one of RSIF's mandates, which is to ensure that women scientists enter and thrive in PhD programmes. It also fits in with RSIF's broader goal of guaranteeing that all its 82 scholars are able to circumvent the challenges related to the pandemic. As the RCU of RSIF, *icipe* is providing support to scholars in various ways, including online training assistance, and psychosocial support on issues like mental health. RSIF is working with partner universities and students towards timely progression in research and overall course completion.

Recently published articles by RSIF scholars

Scholar: Jean Nepomuscene Hakizimana (Rwanda)



Registered in: Sokoine University of Agriculture, Africa Center of Excellence for Infectious Diseases of Humans & Animals in Southern & Eastern Africa (SACIDS)

In the context of enhancing understanding of the transmission and spread of African swine fever to formulate science-based control policies and support development of vaccines, the study describes a virus of the disease, showing high genetic similarities with other strains previously described in domestic pigs, wild suids, and soft ticks in East Africa. These findings indicate a possible common wild source and continuous circulation in domestic pigs in the region.

[Paper link](#)

Scholar: Sylvia Wairimu Maina (Kenya)



Registered in: Sokoine University of Agriculture, Africa Center of Excellence for Infectious Diseases of Humans & Animals in Southern & Eastern Africa (SACIDS), currently on research placement at Korea Institute of Science and Technology.

The study updates knowledge on glucosinolates, sulfur-containing compounds found in cruciferous vegetables like broccoli, Brussels sprouts, and kale, which play an important role in human and animal health (disease therapy and prevention), plant health (defense chemicals, biofumigants and biocides), and food industries

(preservatives). The research also presents factors that affect the natural occurrence and biological availability of the compounds, supporting increased harnessing of their therapeutic values. [paper link](#)

Scholar: Noel Gahamanyi (Rwanda)



Registered in: Sokoine University of Agriculture, Africa Center of Excellence for Infectious Diseases of Humans & Animals in Southern & Eastern Africa (SACIDS), currently on research placement at Korea Institute of Science and Technology.

This study identifies natural products that are effective against drug-sensitive and drug-resistant *Campylobacter* strains. The bacteria is one of four key global causes of diarrhoeal diseases, and the most common bacterial cause of human gastroenteritis in the world. The identified products can be exploited by the food processing industry and poultry farms to control this specific bacterial, and other foodborne pathogens. [Paper link](#)

Research and innovation Grants

RSIF has recently awarded 14 research and innovation grants: six PASET-RSIF Research Awards, granted competitively to faculty personnel engaged in PhD training in selected African Host Universities (AHUs); six PASET-RSIF Institutional Innovation Capacity Building Program (ICBP) Grants, towards creating a conducive environment for university-industry partnerships; and two PASET-RSIF Cooperability Grants, awarded to faculties of AHUs with an aim of encouraging public-private partnerships.

REGIONAL SCHOLARSHIP AND INNOVATION FUND (RSIF)

Grantees include:

Nelson Mandela African Institution of Science and Technology (Tanzania)

Thematic area: Minerals, Mining and Materials Engineering

Project title: Solar-assisted heat pump dryer with energy storage for drying biomaterials

Nelson Mandela African Institution of Science and Technology (Tanzania)

Thematic area: Minerals, Mining and Materials Engineering

Project title: Fluoride removal from drinking water using capacitive deionization

Bayero University, Kano (Nigeria)

Thematic area: Climate Change

Project title: Do-It-For-Yourself Adaptation: New Pathways For Community Flood Risk Communication

University of Rwanda (Rwanda)

Thematic area: ICTs including Big Data and Artificial Intelligence

Project title: Real time Assessment of the indoor air pollution in Sub-Saharan households (Case study: Rwanda rural and urban areas)

University of Nairobi (Kenya)

Thematic area: Energy Including Renewables

Project title: Research and Development of Photovoltaics based on Lead-Free Perovskite Solar Cell Technology

University of Ghana (Ghana)

Thematic area: Food Security and Agribusiness

Project title: Building Resilient Agribusiness Practitioners through Design Thinking Approach

The African University of Science and Technology (AUST) Nigeria

Thematic area: Minerals, Mining and Materials Engineering

Project title: Strengthen and expand the innovation capacity of AUST through AUSTInspire and create a functional Industry Advisory Board.

Bayero University, Kano (Nigeria)

Thematic area: Climate Change

Project title: Initiatives for Sustainable Food Security Innovations in the Drylands

Sokoine University of Agriculture (Tanzania)

Thematic area: Food Security and Agribusiness

Project title: Innovative Biosystems for Self-sufficiency in Molecular Biology Reagents in Africa

University of Ghana (Ghana)

Thematic area: Food Security and Agribusiness

Project title: Institutional framework to enhance the Agri-innovation ecosystem within the University of Ghana

University of Port Harcourt (Nigeria)

Thematic Area: Energy Including Renewables

Project title: Strengthening Institutional Infrastructure for an Innovation Ecosystem

University of Nairobi (Kenya)

Thematic area: Energy Including Renewables

Project title: Capacity Building for University-Industry Business Technology Transfer

University of Rwanda (Rwanda)

Thematic area: ICT Including AI and Big Data

Project title: Smart Bee Hiving Technology

Université Félix Houphouët-Boigny (Côte d'Ivoire)

Thematic area: Climate Change

Project title: Sustainable and innovative yam production in Ivory Coast through post-harvest pest control

MORE YOUNG ENTREPRENEURS IN SILK AND HONEY (MOYESH) PROJECT

On 17 and 18 November 2020, the MOYESH team participated in *Cultivate Africa*, a virtual event organised by the Africa Union Commission in partnership with Hallpax. With over 1,400 participants, the forum facilitated multi-stakeholder dialogue, to galvanize partnerships for a sustained and effective response to the impact of the COVID-19 pandemic on food security and nutrition and food systems. The MOYESH project is aligned to ongoing efforts to alleviate youth unemployment or underemployment in Ethiopia and is being implemented by *icipe* primarily in partnership with Ethiopia Jobs Creation Commission (JCC) and the Mastercard Foundation's Young Africa Works in Ethiopia initiative.

Field activities including site monitoring, community sensitisation and inputs distribution, for apiculture and sericulture; and familiarisation meetings with key stakeholders (youth, community, local government officials and private actors) were conducted in the Oromia region.

Between 26 and 29 October, the MOYESH project held its Progress and Planning Workshop in Addis Ababa, Ethiopia. The workshop brought together 45 staff from four regions (Amhara, Oromia, SNNP and Tigray) and one national programme, to review progress, evaluate key achievements, identify current challenges, lessons learned and develop a solid and robust plan for the second year.



Abdul Kerim Bedaso, Chairman, Fetina-Writu and Friends Youth Enterprise, East Showa Zone, Oromia Region receiving the silkworm rearing moutage from MOYESH project team).

Eastern African Bioeconomy Conference

The first Eastern African Bioeconomy Conference, co-organised by *icipe*, BioInnovate Africa Programme, the East Africa Science and Technology Commission (EASTECO) and partners, was held virtually from 21 – 22 October 2020. The forum brought together 400 regional, continental and global participants including high-level policymakers, academia, scientists, innovators, funders, investors, business professionals and the media. ([Conference website](#) and [conference recordings](#))

Key recommendations and outcomes

The Conference backed an Eastern African Regional Bioeconomy Strategy developed by EASTECO and partners with support from BioInnovate Africa Programme, and proposed that:

- A plan should be developed for the implementation Strategy, and to facilitate its adoption by individual eastern African countries.
- The digital economy should be integrated into the Strategy.
- The Eastern African region could support the extension of the regional bioeconomy strategy approach to other regions of Africa.

An Eastern Africa Bioeconomy Observatory portal was launched to serve as a knowledge repository, and to enable monitoring of advances in bioeconomy in the region. The BioInnovate Africa Fellows Alumnae Network (BA-FAN), an affinity-based community of women scientists, networking and actively collaborating on biological based research and innovation activities in Eastern Africa, was announced.

Global Bioeconomy Summit 2020

In growing recognition of BioInnovate Africa's international importance, the Programme and EASTECO were the official Eastern Africa representatives at the third Global Bioeconomy Summit (GBS) 2020, held on 16 – 20 November 2020. Julius Ecuru, Manager, BioInnovate Africa, who serves on the International Advisory Council of GBS, was a speaker in the plenary session of the event. This high-level participation amplified the region's voice, and indeed that of the continent, in shaping the global bioeconomy agenda. The key message was that a sustainable bioeconomy should be underpinned by innovation, thus, it is vital to invest in the development sustainable industries, create employment and increase household incomes. ([GBS 2020 website and recordings](#))

RECENTLY FUNDED

Donor: Swiss Agency for Development and Cooperation (SDC), Ethiopia

Project title: Promoting trypanosomosis management technologies with pastoral and agro pastoral communities in Borana, Ethiopia

icipe researcher: Tadele Tefera

Collaborators: National Institute for Control and Eradication of Tsetse Fly and Trypanosomosis; and Yabello Pastoral and Dryland and Agricultural Research Centre, both in Ethiopia

Donor: Open Philanthropy

Project title: SymbioVector (SMBV)

Project: Development and implementation of a transformative and sustainable strategy for malaria control in Africa using symbiont-based transmission blocking - Symbiont Infection and Transmission Biology (SMBV-ITB)

icipe researchers: Jeremy Herren, Juan Paredes, David Tchouassi, Daniel Masiga, Sunday Ekesi, Henri Tonnang

Collaborator: Steven Sinkins, University of Glasgow, UK

Donor: European Commission, Marie Skłodowska-Curie Actions, Research and Innovation Staff Exchange (RISE)/H2020-MSCA-RISE-2020 /led by Agricultural University of Athens, Greece

Project title: Training next level scientists and researchers to develop highly selective and safe insecticides (CypTox)

icipe researchers: Baldwyn Torto, David

Tchouassi, Trizah Koyi

Donor: CIRAD, the French Agricultural Research Centre for International Development

Project title: IMPRESS: netting technology

icipe researchers: Saliou Niassy, Emilie Deletre

Donor: Danida Fellowship Centre through University of Copenhagen, Denmark

Project title: HEALTHYNSECT - Insect Farming for Health and Livelihoods

icipe researchers: Chrysantus Tanga, Fathiya Khamis

Collaborators: University of Copenhagen, JKUAT, JOOUST & Makerere University

Donor: Foreign, Commonwealth and Development Office (FCDO) through Palladium International Limited

Project title: Improving Market Systems for Agriculture in Rwanda (IMSAR) - Innovating the Feed Market: Commercialising Black Soldier Fly for animal feed in Rwanda

icipe researcher: Chrysantus Tanga

Collaborators: University of Rwanda; Rwanda Development Board; Agri-Business Solutions Ltd (Abusol Ltd), Rwanda; and Minimex Ltd, Rwanda.

Donor: IMPAXIO GmbH, Zürich, Switzerland

Project title: Ethiopia Post Harvest Loss

Study

icipe researcher: Menale Kassie

Donor: Norwegian Agency for Development Cooperation (Norad)

Project title: Combating Arthropod Pest for Better Health, Food and Climate Resilience (CAP-Africa) - RAF-3058 KEN-18/0005 - New research components

icipe researcher: Chrysantus Tanga, Juan Paredes, Daniel Masiga, Menale Kassie, Kiatoko Nkoba, Segenet Kelemu

Collaborators:

Kenya: Egerton University; Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenyatta University; University of Nairobi; Jaramogi Oginga Odinga University of Science and Technology (JOOUST); Kenya Agricultural and Livestock Research Organization (KALRO); Kenya Bureau of Standards (KEBS); InsectiPro Ltd; Sanergy Ltd; and Treasure Feeds Ltd.

Belgium: Nicolas J. Vereecken, Agroecology lab, Université Libre de Bruxelles; and Maria Pozo, Department of Biology, Faculty of Science, KU-Leuven.

Donor: Danida Fellowship Centre through University of Copenhagen, Denmark

Project title: HEALTHYNSECT - Insect Farming for Health and Livelihoods

icipe researchers: Chrysantus Tanga, Fathiya Khamis

Collaborators: University of Copenhagen, JKUAT, JOOUST, Makerere University, Uganda

RECENTLY FUNDED

Growing investments in RSIF

icipe has been awarded a Euro 4.2 million grant by the Organisation of African, Caribbean and Pacific States (OACPS), through the European Union financed ACP Innovation Fund for Accelerating inclusive green growth through agri-based digital innovation in Western Africa (AGriDI). The partners in this initiative are: Agropolis Foundation, Gearbox Pan African Network and University Abomey-Calavi, Benin. The funds will be sub-granted competitively to support co-development and adaptation of digital technologies with end users, especially the private sector, women and youth, and for the development of policies to stimulate digital innovation.

AWARDS

External awards and recognitions



Prof. Dr. Bill Hansson

The Royal Swedish Academy of Agriculture and Forestry (KSLA) Gold Medal has been awarded to Prof. Dr. Bill Hansson, Chair, *icipe* Governing Council.



Dr Segenet Kelemu

icipe Director General, Dr Segenet Kelemu has been appointed as a member of the newly created Council of Economic Advisors to the Government of Ethiopia, announced by the Office of the Prime Minister of Ethiopia.

icipe wins Food Planet Prize

icipe has been awarded the prestigious, USD 1 million [Curt Bergfors Foundation Food Planet Prize](#), from about 650 global nominations, in recognition of the Centre's pioneering research and development (R&D) activities on insects for food, feed and other uses. The Centre will share the prize with [Sanergy](#), a Kenya/United States based organisation. Currently the largest accolade of its kind in the world, the Food Planet Prize acknowledges ground-breaking initiatives that offer solutions to tackle the Food Planet Challenge; the need to keep a rapidly growing world population alive and well-nourished – without destroying the Earth.

TWAS Award

Menale Kassie, Head, *icipe* Social Science and Impact Assessment, has been awarded the TWAS Siwei Cheng Award in Economic Sciences. He has been recognised for advancing our understanding of the process and impacts of multiple-technology adoption in complex social and agricultural environments in sub-Saharan Africa. Honours awarded by TWAS and its partners are among the most prestigious given for research in the developing world. They recognise outstanding achievements and contributions to science, and acknowledge the best work of scientists from the global South.

Journal Editors

Baldwyn Torto (Head) and David Tchouassi (Scientist), Behavioural and Chemical Ecology Unit, have been appointed co-Specialty Editors (Vector Biology) of the newly launched *Frontiers in Tropical Diseases*. [Read more](#)



Baldwyn Torto



David Tchouassi



Menale Kassie

icipe Staff Awards

Outstanding Employee of the Year Award



Nebiyu Solomon
Program and
Administration Manager
icipe Ethiopia Office

Outstanding Principal Scientist of the Year Award



Samira Mohamed
Senior Scientist
Plant Health Theme

Outstanding Support Staff of the Year Award



Emily Kimathi
Data Management,
Modelling and Geo-
information (DMMG) unit

Outstanding Team of the Year Award

icipe@50 Committee

Outstanding Publication(s) of the Year Award

Tamiru, A., Paliwal, R., Manthi, S.J., Odeny, D.A., Midega, C.A.O., Khan, Z.R., Pickett, J.A., & Bruce, T.J. (2020) Genome wide association analysis of a stemborer egg induced “call-for-help” defence trait in maize. *Scientific Reports*. <https://doi.org/10.1038/s41598-020-68075-2>

Herren, J.K, Mbaisi, L., Mararo, E., Makhulu, E.E., Mobegi, V.A., Butungi, H., Mancini, M.V., Oundo, J.W., Teal, E.T., Pinaud, S., Lawniczak, M.K.N., Jabara, J., Nattoh, G., & Sinkins, S.P. (2020) A microsporidian impairs *Plasmodium falciparum* transmission in *Anopheles arabiensis* mosquitoes. *Nature Communications* 11, 2187. doi: [10.1038/s41467-020-16121-ya](https://doi.org/10.1038/s41467-020-16121-ya)

icipe Governing Council Student Awards Winners

Best published science paper

Winner

Emily Kajuju Kimathi (MSc, Kenya)



Paper: Kimathi E., Tonnang H.E.Z., Subramanian S., Cressman K., Abdel-Rahman E.M., Tesfayohannes M., Niassy S., Torto B., Dubois T., Tanga C.M., Kassie M., Ekesi S., Mwangi D. and Kelemu S. (2020) Prediction of breeding regions for the desert locust *Schistocerca gregaria* in East Africa. *Scientific Reports* 10, 11937. <https://doi.org/10.1038/s41598-11020-68895-11932>. IF 3.998

First runner up

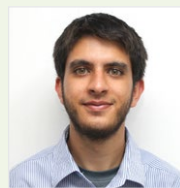
Juliet Akoth Ochola (MSc, Kenya)



Registered in: Kenyatta University, Kenya
Paper: Ochola J., Cortada L., Ng'ang'a M., Hassanali A., Coyne D. and Torto B. (2020) Mediation of potato–potato cyst nematode, *Globodera rostochiensis* interaction by specific root exudate compounds. *Frontiers in Plant Science* 11, 649. <https://doi.org/10.3389/fpls.2020.00649> <https://doi.org/10.3389/fpls.2020.00649> IF 4.407

First runner up

Akbar Ganatra (PhD, Kenya)



Registered in: Egerton University, Kenya
Paper: Becker J.M., Ganatra A.A., Kandie F., Mühlbauer L., Ahlheim J., Brack W., Torto B., Agola E.L., McOdimba F., Hollert H., Fillinger U. and Liess M. (2020) Pesticide pollution in freshwater paves the way for schistosomiasis transmission. *Scientific Reports* 10, 3650. <https://doi.org/10.1038/s41598-41020-60654-41597>. IF 3.998

Best science poster

Winner

Mary Wanjiku Chege (MSc, Kenya)



Registered at: Jomo Kenyatta University of Agriculture and Technology (JKUAT)
Poster title: Gut symbionts reduce immune response activation and protect the honey bee, *Apis mellifera*, against opportunistic pathogens
Supervisors: Juan Paredes (icipe); Johnson Kinyua (JKUAT)

First runner up

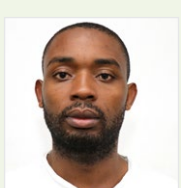
Francis Sengendo (MSc, Uganda)



Registered at: Makerere University, Uganda
Poster title: Improving efficiency and profitability of light trap for harvesting edible grasshoppers *Ruspolia differens* in Uganda
Supervisors: James Egonyu and Subramanian Sevgan (icipe); Chemurot Moses (Makerere University)

Second runner up

Kevin Kidambasi Ogola (MSc, Kenya)



Registered at: Jomo Kenyatta University of Agriculture and Technology (JKUAT)
Poster title: Xenodiagnosis potential and vectorial competence of camel ked (*Hippobosca camelina*) in disease transmission.
Supervisors: Joel Bargul (icipe/JKUAT); Jandouwe Villinger (icipe)



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
- Grand Challenges Canada (GCC)
- Innovate UK
- Innovative Vector Control Consortium (IVCC), through Wageningen University
- International Atomic Energy Agency (IAEA)
- International Centre for Genetic Engineering and Biotechnology (ICGEB)
- International Fund for Agricultural Development (IFAD)
- IRD, Institut de Recherche pour le Développement, France
- JRS Biodiversity Foundation, directly and through Royal Museum for Central Africa (RMCA)
- 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)
- Open Philanthropy
- R. Geigy Foundation, Switzerland
- Research Institute of Organic Agriculture (FiBL), Switzerland
- Rockefeller Foundation
- Royal Society of Tropical Medicine and Hygiene, UK
- Russell IPM Ltd, UK
- The Royal Society, UK
- The Stichting IKEA Foundation
- Scottish Funding Council through University of Glasgow
- Swedish Research Council through the Kungliga Tekniska Högskolan (KTH)
- Swedish University of Agricultural Sciences (SLU)
- Swiss National Science Foundation (SNSF)
- SWITCH Africa Green
- United Nations Environmental Programme (UNEP)
- USAID—United States Agency for International Development
- 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.

For more information on these and other topics, please visit our

Website: <http://www.icipe.org> or contact us through our

Email address: icipe@icipe.org

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