

INSTITUTIONAL PROGRAMMATIC REPORTING JANUARY – DECEMBER 2025

icipe ANNUAL CORE SCIENTIFIC REPORT



Chrysidinae sp. (Hymenoptera: Chryridoidea: Chrysididae)

"Joseph's coat of many colours."

Among the most beautiful animals in the world, the *Chrysididae* make use of nature's broad palette to paint the estimated 3000+ species in the family. It is no wonder that "jewel wasp" is one of the popular names for this family.



TABLE OF CONTENTS

LIST OF ACRONYMS	3
ACKNOWLEDGEMENT	6
OVERVIEW	7
SECTION 1: INTRODUCTION	8
1.1 Progress on <i>icipe</i> 's 2025 Strategic Institutional Results Framework	8
1.2 Advancing Women's Rights, Gender Equality, Human Rights, and Anti-Corruption.....	8
1.3 Environmental Sustainability across Operations, Infrastructure, and Research Support Systems	8
SECTION 2: ADVANCES IN RESEARCH AND DEVELOPMENT	9
2. Advances in Research for Development	9
2.1 Plant Health Theme	9
2.2 Human Health Theme	11
2.3 Animal Health Theme	14
2.4 Environmental Health Theme	16
2.5 Specific Programmatic Impact	19
2.6 Special Programme Delivery	22
2.6.1 BioInnovate Africa Programme	22
2.6.2 Regional Scholarship and Innovation Fund (Rsif) project in Sub-Saharan Africa (SSA)	24
2.6.3 MOYESH and MaYEA Projects	25
3. Directorate of Impact Delivery (DID).....	26
3.1 Private Sector Partnerships and Biocontrol Platform	26
3.2 Entrepreneurship ecosystem and youth engagement	26
3.3 Outreach, dissemination, and scaling through community relationships	26
3.4 Strategic partnerships and regional collaboration	27
3.5 Co-creation of innovation scaling projects	27
3.6 Visibility and advocacy	27
4. Publications	28
5. Integrated Capacity Building Platform (ICBP)	28
SECTION 3: STRATEGIC INSTITUTIONAL RESULTS FRAMEWORK	30
SECTION 4: PROMOTING EQUITY, INTEGRITY, AND ENVIRONMENTAL SUSTAINABILITY AT <i>icipe</i>.....	40
SECTION 5: PUBLICATIONS	49
BOOK CHAPTERS, BOOKS, AND OTHER PUBLICATIONS.....	67



LIST OF ACRONYMS

AAPCRA	Australian-Africa Partnership for Climate Responsive Agriculture
ACIAR	Australian Centre for International Agricultural Research
AGriDI	Agri-based digital innovation in West Africa
AHT	Animal Health Theme
AI	Artificial Intelligence
AICCRA	Accelerating Impacts of Climate Change Research for Africa
ALEC	African Livestock Exhibition and Congress
AOH	Accelerate One Health
ARPPIS	African Regional Postgraduate Programme in Insect Science
ARSO	African Organization for Standardization
ATHAZ	Agroecological transitions for horticulture in arid zones
BA	BioInnovate Africa
BBC	British Broadcasting Corporation
BIEB	Biobased innovation and entrepreneurship bootcamp
BRAINS	Building Equitable Climate-Resilient African Bean and Insect Vectors
BSF	Black Soldier Fly
BSFFF	Black soldier fly frass fertilizer
BSU	Bowie State University
C4RPWC	Consortium for Red Palm Weevil Control
CABI	Commonwealth Agricultural Bureaux International
CAD	Canadian dollar
CEO	Chief Executive Officer
CETCIL	Current Emerging Threats Crop Innovation Lab
CGE	Computable General Equilibrium
CGIAR	Consultative Group for International Agricultural Research
CGTN	China Global Television Network
CIAT	International Center for Tropical Agriculture
CIFF	Children's Investment Fund Foundation
CILSS	Permanent Interstate Committee for Drought Control in Sahel (CILSS)
CIRAD	French Agricultural Research Centre for International Development
CORAF	West and Central African Council for Agricultural Research and Development
DFG	German Research Foundation
DG INTPA	Directorate-General for International Partnerships
DID	Directorate of Impact Delivery
DNA	Deoxyribonucleic acid
DRC	Democratic Republic of the Congo
DRIP	Dissertation Research Internship Programme
DVS	Directorate of Veterinary Services
EASTECO	East African Science and Technology Commission
EBSCO	Elton B. Stephens
EC	European Commission
ECF	East Coast fever
EcoPM	Agro-ecological innovations for smallholder pest management
EDCTP	European and Developing Countries Clinical Trials Partnership
EHT	Environmental Health Theme
EPF	Entomopathogenic fungi
EPHI	Ethiopian Public Health Institute
EU	European Union
FIBL	Research Institute of Organic Agriculture
FSRP	Food Systems Resilience Programme
GAC	Global Affairs Canada
GALV	Global Alliance for Livestock Veterinary Medicines



GBS	Global Bioeconomy Summit
GC	Governing Council
GCF	Green Climate Fund
GDP	Gross Domestic Product
GF	Gates Foundation
GIZ	German Corporation for International Cooperation
GSC	Germline stem cells
H1-NMR	Proton Nuclear Magnetic Resonance spectroscopy
HACCP	Hazard Analysis and Critical Control Points
HHT	Human Health Theme
HR	High Resolution
HR QoL	Health-related quality of life
HRM	High Resolution Melting
HS	Polymerase Chain Reaction
IACGB	International Advisory Council on Global Bioeconomy
IBP	Integrated Biosciences Platform
ICARDA	International Center for Agricultural Research in the Dry Areas
ICBA	International Center for Biosaline Agriculture
ICBP	Integrated Capacity Building Platform
<i>icipe</i>	International Centre of Insect Physiology and Ecology
ICRAF	International Council for Research in Agroforestry
ICT	Information communication technologies
ID	Impact Delivery
IDAP	Integrated Data and Analytics Platform
IFAD	International Fund for Agricultural Development
IGAD	Intergovernmental Authority on Development
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
INSEFF	Insects for food, feed and other uses
IPER	<i>icipe</i> Periodic External Review
IPM	Integrated pest management
IPSEP	Integrated Policy and Stakeholder Engagement Platform
ISBA	Innovation Scaling and Business Acceleration
ITN	Insecticide-treated nets
ITRA	Togolese Institute of Agronomic Research
IVCC	International Vector Control Consortium
IVM	Integrated vector management
JIRA	Junior Investigator Research Award
KEMRI	Kenya Medical Research Institute
KPIT	Key Performance Indicators and Targets
LMIC	Low- and Middle-Income Countries
MaYEA	The Mass Youth Employment in Apiculture
MITA	Market for Agricultural Innovations and Technologies
MOVE	Mobile Veterinary Innovation
MOYESH	MOre Young Entrepreneurs in Silk and Honey
NIBIO	Norwegian Institute of Bioeconomy Research
NIH	National Institutes of Health
NTD	Neglected tropical diseases
OCHRA	Organisational Capacity and Human Resource Assessment
OH	One Health
ONT	Oxford nanopore technology
ORCID	Open Researcher and Contributor ID
PASET	Partnership for Skills in Applied Sciences, Engineering and Technology
PCR	Polymerase Chain Reaction



PESTEL	Political, Economic, Social, Technological, Environmental, and Legal
PHT	Plant Health Theme
Pivot-RP	Pivot Research Professional
PPP	Public-private partnership
PPT	Push-pull technology
R4D	Research for Development
RCU	Regional Coordination Unit
REDCap	Research Electronic Data Capture
RMRN	Regional Multi-Actor Research Network on Agroecology in East Africa
RPCA	Robust Principal Component Analysis
RPW	Red Palm Weevil
rRNA	Ribosomal Ribonucleic Acid
Rsif	Regional Scholarship and Innovation Fund
RTM	Rashtrasant Tukadoji Maharaj (University)
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SBH	Stingless beehive
SIRF	Strategic Institutional Results Framework
SME	Small and Medium Enterprises
SMP	Soil management practices
SMS	Short message service
SNP	Single Nucleotide Polymorphism
SSA	Sub-Saharan Africa
STIB	Sociotechnical innovation bundles
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TBP	Tick-borne pathogens
TLQI	Tungiasis-specific quality of life instrument
TPB	Theory of planned behavior
TRACE	Transforming agriculture for animal, crop and ecosystem health in the East African Rift
TSARA	Transforming food Systems and Agriculture through research in partnership with Africa
TTC	Taita Taveta County
TTU	Technology Transfer Unit
UAE	United Arab Emirates
USAID	United States Agency for International Development
USD	United States Dollar
USDA	United States Department of Agriculture
V&S	Vision and Strategy
VA	Vector Atlas
VBD	Vector-borne disease
VCAG	Vector Control Advisory Group
VIPP	Vegetable integrated push-pull
VL	Visceral Leishmaniasis
VMD	Veterinary Medicines Directorate
VOC	Volatile organic compounds
WAVE	West African Virus Epidemiology
WHO	World Health Organisation



ACKNOWLEDGEMENT

icipe gratefully acknowledges the financial and technical support of our core donors: the Government of Norway; the German Fund International Agricultural Research (FIA), commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and administered through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ); the Swiss Agency for Development and Cooperation (SDC); the Australian Centre for International Agricultural Research (ACIAR); the Swedish International Development Cooperation Agency (Sida); and the Government of the Republic of Kenya (Ministry of Education, State Department of University Education and Research).

“The views expressed herein do not necessarily reflect the official opinion of the donors.”

We also recognise our specific restricted project donors, as well as partners awarding collaborative funding to *icipe* and supporting the ongoing implementation of various research for development projects in the Centre.

©2026 — International Centre of Insect Physiology and Ecology (*icipe*)



OVERVIEW

Over the years, *icipe* has evolved into a continental engine of innovation in insect science, shaping policy dialogues, catalysing partnerships, and implementing transformative programmes designed to shift Africa's development trajectory. Through its nature-based, inclusive innovations, the Centre continues to generate measurable impact, improving food security, promoting better health, and enabling sustainable livelihoods across Africa, even as the continent navigates the converging crises of climate change, biodiversity loss, and pollution.

In 2025, *icipe* advanced significantly across the full continuum of its Research for Development (R4D) model, from discovery, proof-of-concept, and piloting to scaling. These gains have been reminiscent of the Centre's steady implementation of its *Vision and Strategy (2021–2025)*. Increasingly, *icipe*'s focus has turned toward ensuring that its science informs policy and investment decisions, translates into field-level best practices, and delivers tangible, equitable benefits for smallholder farmers and their communities.

The selected highlights below of the Centre's R4D achievements, more detailed in Section 2 (**Advances in Research & Development**), demonstrate the depth and diversity of its work:

- *icipe* advanced climate-smart and biologically based agricultural protection systems through innovations such as vegetable-integrated push-pull technology, AI-enabled pest forecasting platforms, predictive outbreak modeling, and scent- and fungi-based biocontrol strategies that reduce pest pressure, strengthen crop resilience, and improve yields for smallholder farmers.
- Research across East and Southern Africa demonstrated that adoption of agricultural technologies depends not only on technical performance, but also on behavioral, social, and market factors, highlighting the importance of context-sensitive extension systems, ICT-enabled advisory tools, stronger value chains, and business-oriented innovation ecosystems.
- Significant progress was made in next-generation malaria control through studies on *Microsporidia MB*, a naturally occurring mosquito symbiont that blocks Plasmodium transmission, alongside advances in vector mapping, climate-health risk prediction, house-screening interventions, and integrated vector management strategies that strengthen anticipatory public health responses.
- *icipe* expanded frontier research in vector biology, genomics, and disease ecology by uncovering new pathogen transmission pathways, developing mechanistic outbreak prediction models, characterizing vector microbiomes and chemosensory systems, and applying machine learning and genome sequencing to improve surveillance and control of human and animal diseases.
- Major advances in sustainable livestock and circular bioeconomy systems were achieved through black soldier fly and insect-based feed research, including studies on genomics, storage systems, feed adoption, aquafeed sustainability, insect frass fertilizers, and nutritional applications that support regenerative agriculture, waste valorization, and improved animal productivity.
- Broad ecosystem and pollinator health research strengthened understanding of honeybee forage systems, colony losses, stingless bee honey composition, invasive hive pests, and insect-associated microbiomes, while reinforcing the role of biodiversity, ecological resilience, and sustainable insect systems in food security, environmental management, and climate adaptation.

Looking to the years ahead, the newly launched *icipe* Vision and Strategy 2026 to 2030 signals the beginning of a far more ambitious chapter in the Centre's evolution, one designed to accelerate Africa's scientific leadership while expanding the frontiers of insect and arthropod science into transformative, scalable, and nature-positive solutions. Building on decades of research excellence, this new strategy positions us greatly to deepen our impact across food systems, public health, biodiversity conservation, climate resilience, and green economic transformation by translating cutting-edge science into practical, nature-based, tangible, and inclusive solutions, that improve livelihoods, strengthen resilience, unlock sustainable enterprise opportunities, and advance inclusive development across Africa and beyond.



SECTION 1: INTRODUCTION

1.1 Progress on *icipe*'s 2025 Strategic Institutional Results Framework (SIRF)

As the Centre continues to advance its mandate as Africa's principal insect and arthropod research institute, unravelling and documenting key achievements on various fronts, the SIRF has been a key tool for reporting, providing accountability to *icipe*'s strategic partners and lessons to *icipe* management during the strategic period of 2023-2027. Completing the SIRF report is a participatory process involving project staff in all themes and units of *icipe*, that relies on the review of periodic technical reports submitted to *icipe* management and strategic partners. This exercise was completed in May 2026. The 2025 SIRF report is structured in four sections: the introduction; advances in research and development; progress reporting on the achievements and targets indicated in the Centre's 2023-2027 Framework; and peer-and-non-peer reviewed publications. In comparison to the 2024 SIRF, the 2025 review period demonstrates notable improvements across several output indicators.

The details are presented in **Section 3**, which is an integral part of this report.

1.2 Advancing Women's Rights, Gender Equality, Human Rights, and Anti-Corruption

In 2025, *icipe* continued to implement impactful measures to promote women's rights, gender equality, and the human rights of vulnerable and marginalized groups. Recognizing the interconnectedness of these concepts, they are addressed jointly in the report - **Annex 1**, guided by core human rights principles: participation, non-discrimination and equality, accountability, transparency, empowerment and capacity development, and the duty to fulfil. The report details actions that reflect *icipe*'s unwavering commitment to inclusive, equitable, and rights-based development.

1.3 Environmental Sustainability across Operations, Infrastructure, and Research Support Systems

icipe maintains a rigorous approach to managing its operations in a way that minimizes adverse impact on the environment. This follows the Centre's *Environmental Sustainability Strategy*, that is anchored on driving institutional greening through data, discipline and integration.

The report appended as **Annex 2**, in Section 4, presents *icipe*'s progress in embedding environmental sustainability measures in 2025, across its various institutional operations, infrastructure, and research support systems.



SECTION 2: ADVANCES IN RESEARCH AND DEVELOPMENT

2. Advances in Research for Development

Highlights of major advances in research for development (R4D) during the reporting period are provided below.

2.1 Plant Health Theme

2.1.1 An intensified cereal push-pull system reduces pest infestation and confers advantages in high-value vegetables

Tomatoes and kales within the cereal push-pull technology (PPT) were integrated by the Plant Health Theme (PHT) with an objective to form the vegetable integrated push-pull (VIPP) system and explored the influence of this system on pest and disease management, and subsequent yield of the vegetables. Aphids and diamondback moths, the major pests in kale production, together with grasshoppers, were consistently lower in the VIPP plots. Low incidences and damage by leafminers, whiteflies and fruit flies on tomatoes were observed in VIPP plots compared to plots of tomatoes intercropped with maize (control). The severity of black rot and leaf curl on kales and leaf spots on tomatoes was less in VIPP compared to control. Good quality and high yields of tomato and kale grown in VIPP plots were recorded compared to control plots. This study demonstrated that spatial crop diversification such as integrating vegetables such as kale and tomato in a PPT can boost yield and maintain crop integrity.

(Publication link: <https://doi.org/10.1007/s10343-024-01107-3>)

2.1.2 The role of social-psychological factors in the adoption of push-pull technology by small-scale farmers in East Africa: Application of the theory of planned behavior

Push-pull technology (PPT) continues to gain relevance among smallholder farmers across the East African region in managing the constraints affecting cereal crop yields including stemborers, fall armyworm, striga weed, and low soil fertility. This study investigated the influence of social-psychological factors on the intention of adopting or increasing the land area under PPT based on the theory of planned behavior (TPB). Using a structured questionnaire, cereal growers (971) comprising PPT users and non-users were interviewed in Kenya, Uganda, Tanzania, and Rwanda. Results from this study revealed a significant positive influence of TPB conceptual elements attitudes, subjective norms, and perceived behavioral control on farmers' intentions to adopt or expand the land area under PPT. These insights underscore the need for tailored context-sensitive interventions that integrate behavioral, social, and practical considerations. Additionally, understanding the country-specific determinants allows for more targeted policy measures, extension services, and support programs that can enhance the adoption and effectiveness of PPT, ultimately improving agricultural outcomes and livelihoods of farmers in East Africa.

(Publication link: <https://doi.org/10.1016/j.heliyon.2024.e41449>)

2.1.3 Digital platform to predict pest risk in Malawi

A digital platform has been developed to predict risks of fall armyworm, cassava whitefly, African armyworm, and banana weevil using innovative machine learning and mathematical modeling approaches. These models will be integrated into Malawi's upcoming national pest early warning system, currently being developed with national partners. A preliminary test run has been conducted using *icipe's* in-house digital tools. Once operational, the system will support timely pest surveillance, rapid response, and site-specific deployment of integrated pest management (IPM) interventions. Overall, this digital platform will enhance Malawi's capacity for anticipatory action and preparedness, helping to safeguard crop productivity while strengthening national food and nutrition security.

2.1.4 Global review of role of ICT-based extension in agriculture

To assess the role of ICT-based extension in agriculture, a review article of 52 studies assessed how information communication technologies (ICTs) affect agriculture in developing countries across four outcomes: awareness/knowledge, adoption, yield, and farmer income. The most common tools are smartphone apps, basic phone ownership, and SMS, mainly applied in cereals and root crops, with limited use in cash crops and horticulture. The reviewed evidence showed that ICTs significantly improve adoption and yields but have less impact on knowledge and income. The paper notes that while nutrient management is widely promoted, integrated pest management (IPM) remains underutilized, pointing to an area of untapped potential for future extension efforts.

(Publication link: <https://doi.org/10.1080/02681102.2025.2456232>)



2.1.5 Harnessing AI while guarding scientific rigor

A recent study co-authored by *icipe* has found that machine power may invigorate underfunded disciplines such as biological control or agroecology and ultimately put agriculture on a greener track. However, generative AI should remain limited to focused tasks like data summarization, with human oversight essential to verify outputs, ensure accuracy, and guide decisions through human-in-the-loop systems. Based on an *icipe* comparative study of ChatGPT, ScholarAI, and DeepSeek, we find that while AI tools rapidly synthesize literature, they show limitations in accuracy, reliability, and consistency. Frequent hallucinations and omissions reduce trust. AI-only outputs remain unsuitable for evidence-based decisions but can add value with strong human oversight.

(Publication link: <https://doi.org/10.1016/j.compag.2025.111317>)

2.1.6 A system dynamics model for predicting African armyworm occurrence and population dynamics

The system dynamics model revealed that climatic factors, particularly temperature rise, rainfall variability, and drought, strongly influence African armyworm phenology and outbreak patterns across regions. Simulations indicated recurrent outbreak peaks linked to favourable temperature and precipitation conditions, with Kenya, Tanzania, and Zambia showing the highest population dynamics. The analysis highlighted that integrated pest management (IPM) measures, including parasitoids, predators, biopesticides, and crop diversification, can effectively reduce outbreak intensity. Overall, climate-driven feedback and adaptive IPM interventions jointly determine the magnitude and timing of African armyworm outbreaks.

(Publication link: <https://doi.org/10.1016/j.agee.2024.109378>)

2.1.7 Insights on overcoming barriers for smallholders adoption of technologies

We examined heterogeneous and unpredictable adoption patterns among Ethiopian smallholders by going beyond conventional farm-level and environmental constraints. Drawing on consumer psychology, we analysed how contextual barriers interact with farmers' decision-making. Qualitative data on legume technologies revealed barriers at three stages: negative expectations, challenges in translating intention into adoption, and constraints that limit post-adoption impact, undermining sustained use. To address these barriers, we recommend stronger focus on business innovation, including improved product design and marketing, alongside development of value chains and supportive business ecosystems that bundle technologies with complementary products and services, enabling more effective and sustained adoption. (Publication link: <https://doi.org/10.1016/j.techsoc.2025.103211>)

2.1.8 Scent of clove control deters spotted wing fruit fly

The spotted-wing fruit-fly (*Drosophila suzukii*) is an invasive pest of soft and stone fruit crops such as blueberry, strawberry, cherry and grape. In a recent study, it was found that clove (*Syzygium aromaticum*), is dominated by eugenol, a compound that repels *D. suzukii* and deters it from laying eggs on multiple host fruit crops, including apple, banana, blueberry, mango, orange, papaya, raspberry, strawberry and tomato. These findings support the development of a scent-based strategy, using clove, to manage the pest.

(Publication link: <https://doi.org/10.1007/s10340-026-02028-y>)

2.1.9 New fungal arsenal against spotted wing fruit fly

icipe has made a breakthrough in the potential development of a biopesticide to control *D. suzukii*. Through an assessment of five *Metarhizium anisopliae* isolates, we found that the already commercialized *ICIPE* 78 isolate is horizontally transmitted by donor flies, and reduces fertility of recipient females, induces significant attraction and infects healthy flies. Thus, through label extension, *ICIPE* 78 could be commercialised for use against *D. suzukii*, and potentially against other pests.

(Publication link: <https://doi.org/10.1002/ps.70576>)



2.1.10 Confirmed: leafhopper vectors ensen *Xanthomonas* wilt

We provided the first experimental evidence that the leafhopper, *Cicadella cosmopolita*, transmits *Xanthomonas vasicola* *pv. Musacearum* (Xvm), which causes Enset Bacterial Wilt between enset plants. These findings confirmed farmer observations and revealed an additional transmission pathway beyond infected planting material and contaminated tools. Enset *Xanthomonas* wilt (EXW) is a major and evolving threat to enset production in the Ethiopian highlands, a staple supporting around 20 million people. To reduce spread, we recommended the timely and complete removal of infected plants, alongside the use of disease-free planting materials and clean tools. Moreover, extension services should emphasise heightened transmission risks in areas with high leafhopper populations as part of integrated EXW management.

(Publication Link: <https://doi.org/10.1007/s10658-025-03174-2>)

2.2 Human Health Theme

2.2.1 The Plasmodium transmission-blocking symbiont, *Microsporidia* MB, is vertically transmitted through *Anopheles arabiensis* germline stem cells

Since *Microsporidia* MB blocks *Plasmodium*, knowing the exact mechanism and reliability of vertical transmission is crucial for whether it can be deployed in mosquitoes as a control tool like the use of *Wolbachia* in *Aedes*. Significant progress was made in understanding how this symbiont is vertically transmitted, utilizing advanced imaging and molecular research facilities available in the Symbiovector Research Group. The team discovered that *Microsporidia* MB infects the germarium (region of the ovariole containing the germline stem cells (GSCs) and early cystocytes). This results in its stable transfer and proliferation in developing eggs. However, the near-perfect transfer of *Microsporidia* MB into developing eggs does not always result in near-perfect infection rates in eggs that hatch from these eggs suggesting that it is lost during larval development.

(Publication link: <https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1012340>)

2.2.2 *Microsporidia* MB thrives at optimal malaria temperatures, signaling scalable deployment

Microsporidia MB, a vertically transmitted symbiont of *Anopheles* mosquitoes, shows promise for malaria control, due to its ability to block *Plasmodium* development. We assessed how temperature influences the microbe's infection dynamics, in mosquito larvae reared at 22 °C, 27 °C, 32 °C, and 37 °C. We found that higher temperatures, particularly 32 °C, significantly increased larval growth, infection prevalence and intensity of *Microsporidia* MB. Further, a temperature of 32 °C is the most suitable for mass-rearing of *Microsporidia* MB infected mosquitoes. This is the first evidence of temperature effects on *Microsporidia* MB. The findings support potential for scalable application of the microbe in malaria-endemic settings, with 32 °C being the efficient threshold for malaria transmission.

(Publication Link: <https://www.nature.com/articles/s41598-025-07414-7>)

2.2.3 *Microsporidia* MB triggers immunity boost, disrupts Plasmodium establishment in mosquitoes

Further studies by *icipe* show that *Microsporidia* MB alters mosquito biology, particularly after blood feeding, in ways that help explain its malaria-blocking effect. Before mosquitoes feed, the microbe increases activity of a hormone-related gene linked to development and reproduction. After a blood meal, the microbe triggers a short-term immune boost in mosquitoes, within 24 to 48 hours, exactly when malaria parasites attempt to establish infection. At the same time, gut microbial balance shifts and metabolism temporarily slows. By 72 hours, the immune activity in mosquitoes declines and metabolism recovers. This timing explains how *Microsporidia* MB blocks parasite establishment without causing lasting harm to the mosquito.

(Publication link: <https://doi.org/10.1186/s12864-025-12438-4>)

2.2.4 Vector Atlas (VA) malaria project

This project team developed a digital platform to show and report on malaria vector occurrences, insecticide resistance, and species-specific vector bionomics. The platform collated > 13,000 vector records in Africa, used in sophisticated models to produce maps on vector occurrence or risk. Specific filters to better visualize seasonality, or vector life stage, are in built, as well as visualizations for insecticide resistance change over time, to help optimize bed net control measures.



2.2.5 Advancing climate and health risk predictions

This project is a collaboration between the University of Cape Town and *icipe's* Integrated Data and Analytics Platform (IDAP) to improve forecasting climate and health risks. By applying climate attribution science together with advanced statistical and environmental modeling, the study quantified the share of malaria burden among children in sub-Saharan Africa attributable to climate variability and change. Preliminary findings suggest that variations in rainfall and temperature account for more than 3% of malaria incidence in children, underscoring the measurable role of climatic factors in shaping disease transmission dynamics. The outputs provide a quantitative basis to support anticipatory action, resource allocation, and adaptive health system planning in malaria-prone regions. This work strengthens the evidence base for understanding climate–health linkages and contributes to regional preparedness and broader climate resilience strategies.

2.2.6 The tale of house screens as additional intervention to curb malaria

This study published findings from a randomized controlled trial with about 300 households on the impact of house screening (HS) on malaria control. The control group received bed nets, while treatment arms combined house screening with bed nets. Results showed that house screening is effective, significantly reducing mosquito vector densities, human bite rates (2-fold) and household malaria prevalence (6-fold) demonstrating effectiveness of HS as a complementary low cost, easy to adapt tool to bed nets in the fight against malaria.

(Publication link: <https://doi.org/10.1016/j.jdeveco.2024.103407>)

2.2.7 Maximizing horizontal transmission through mating: increased mating frequency and mating competitiveness associated with *Microsporidia MB*-infected *Anopheles arabiensis* males

Microsporidia MB is a naturally occurring symbiont in *Anopheles arabiensis* mosquitoes that inhibits the development of Plasmodium. It is transmitted both vertically and horizontally, enabling its spread within mosquito populations. Currently, mating is the only known mechanism for horizontal transmission. Understanding the factors that influence *Microsporidia MB* transmission during mating is crucial for developing a malaria transmission-blocking strategy based on this symbiont.

(Publication link: <https://doi.org/10.1186/s12936-025-05354-1>)

2.2.8 A randomized controlled trial combining house screening and insecticide-treated nets reduces malaria transmission in northwestern Ethiopia

House screening (HS) of doors, eaves, and windows using wire-mesh has demonstrated potential in the integrated vector management (IVM) of malaria. However, limited epidemiological data are available to guide its implementation across different ecological settings. In a 16-month randomized controlled trial (follow-up period) conducted across three agroecological areas (dry mountain, plateau highland, and semi-arid) in Jabi Tehnan district, northwestern Ethiopia, treatment houses were equipped with HS combined with insecticide-treated nets (ITNs), while control houses received ITNs only. The intervention led to a significant 2.3-fold reduction in indoor malaria vector density, the primary entomological outcome, largely influenced by *An. gambiae* s.l. mosquitoes. Fewer blood-fed mosquitoes were found in screened houses, indicating reduced human bites, which translated to six-fold decline in malaria prevalence (0.7%), the primary epidemiologic outcome, compared to control houses (4.3%). Despite the synergistic impact of HS with existing ITNs in reducing vector densities, human bite rates, and household malaria prevalence, sustained transmission persisted, partly due to the presence of highly competent vectors such as *An. funestus* s.l. which had an overall sporozoite rate of 68%. Future research should explore the interactions between vector behavioral adaptations, ecological and social factors contributing to residual transmission, even with seemingly effective control measures.

(Publication link: <https://doi.org/10.1038/s41598-025-02943-7>)



2.2.9 Assessing the impact of tungiasis on children's quality of life

Tungiasis is a neglected tropical skin disease caused by the sand flea, *Tunga penetrans* which penetrates the skin causing considerable pain and itching. In this cross-sectional study we aimed to assess its impact on the quality of life of school children in Kenya. School pupils (198) aged 8–14 years with tungiasis were randomly selected and interviewed using a tungiasis-specific quality of life instrument (TLQI). The caregivers of each infected pupil and 199 randomly selected caregivers of uninfected pupils were interviewed using the proxy KIDscreen52 to assess their child's general health-related quality of life (HR-QoL). For the first time, this study demonstrated for children whose caregivers were depressed, tungiasis had a higher impact on their quality of life and had a lower general HR-QoL. Conversely, if their caregiver showed them affection, tungiasis had a lower impact on their quality of life. Further studies are needed to investigate the interaction of tungiasis with parenting styles, the mental health of children and their caregivers, and their effect on children's well-being. However, this evidence indicates programs aiming to control tungiasis should include activities targeting the mental health and parenting style of caregivers.

(Publication link: <https://doi.org/10.1371/journal.pntd.0012606>)

2.2.10 Model to anticipate cutaneous leishmaniasis outbreak risk in Sudan

Cutaneous leishmaniasis (CL) in Sudan is transmitted by *Phlebotomus papatasi*, whose survival depends on temperature and host availability. We developed a mechanistic, spatially explicit model integrating vector eco-physiology and host accessibility using a temperature-driven Metzler matrix. The model simulates stage-specific dynamics, adjusts fecundity by land cover, and scales persistence with livestock-based carrying capacity. It accurately captured 77% of endemic sites, with suitability near zero at 15 °C, and identified high-risk regions in southern and western Sudan. Projections for 2050 suggest expansion into central regions, while extreme warming reduces suitability elsewhere, providing a tool for anticipating outbreaks and informing proactive health planning.

(Publication Link: <https://www.sciencedirect.com/science/article/pii/S0304380025003722>)

2.2.11 Resurgence of visceral and cutaneous leishmaniasis in Kenya: The value of multisectoral approach

We investigated the emergence of visceral leishmaniasis (VL) in 2021, in Kajiado County, a newly recognized region of endemic transmission in Kenya's Rift Valley. We conducted community sensitization, medical camps and entomological surveys across eight villages; screened 100 individuals with indicative symptoms of leishmaniasis, and conducted an entomological survey. We found 10 patients of VL, predominantly in children under 15. Out of the 22 suspected cutaneous leishmaniasis (CL) cases, eight were confirmed with *Leishmania tropica*. Entomological surveys identified 4781 sandflies, with *Sergentomyia* species being most abundant. DNA of *Leishmania donovani* was detected in multiple *Sergentomyia* species and *Phlebotomus saevus*, while *L. tropica* DNA was found in *P. saevus*. This study confirmed *L. donovani* and *L. tropica* as the causative agents for VL and CL, respectively, in Kajiado. The unusual co-occurrence of both forms complicates treatment and raises concerns about potential genetic recombination. Blood meal analysis revealed a strong preference for human blood, followed by goats, indicating high human-vector contact. This study highlights the value of a multisectoral approach to outbreak responses, which resulted in the establishment of two new treatment centers in Kajiado, enhancing ongoing access to care and associated surveillance.

(Publication link: <http://dx.doi.org/10.1016/j.ijid.2025.108309>)

2.2.12 Impact of NIH-supported bioinformatics and genomics graduate trainees in Africa

Epidemiological and clinical data are expanding rapidly, increasing demand for bioinformatics and data science to improve population health. In response, the NIH, Wellcome Trust, and partners launched the H3Africa consortium in 2012 to strengthen African-led research on genetic and environmental drivers of disease. In 2017, NIH funded four graduate bioinformatics training programmes across five African universities. Over seven years, these programmes trained more than 270 scientists, with over 110 earning master's degrees and more than 20 completing PhDs. Evaluation of outcomes shows strong graduation rates, diverse career pathways, and contributions to over 110 peer-reviewed publications, highlighting the transformative role of sustained investment in African biomedical research capacity.

(Publication link: <https://doi.org/10.1093/bib/bbag046>)



2.3 Animal Health Theme

2.3.1 Machine learning predicts non-preferred and preferred vertebrate hosts of tsetse flies (*Glossina spp.*) based on skin volatile emission profiles

Tsetse fly vectors of African trypanosomiasis preferentially feed on certain vertebrates largely determined by olfactory cues they emit. Previous research established that three skin-derived ketones including 6-methyl-5-hepten-2-one, acetophenone and geranyl acetone accounted for avoidance of zebra by tsetse flies. This study tested the hypothesis that these three ketones serve as biomarkers for tsetse-flies to distinguish between non-preferred- and preferred-vertebrate hosts. Coupled gas chromatography/mass spectrometry was used to analyze and compare the skin volatile emissions of two non-preferred- (waterbuck and zebra) and four preferred- (buffalo, donkey, horse, warthog) vertebrate hosts in two wildlife parks in Kenya. A total of 96 volatile organic compounds (VOCs) were detected in the skin emissions composed mainly of aldehydes, ketones, alcohols, phenols and alkanes, which varied with the vertebrate host. Using random forest analysis, a weak correlation was found between the three skin-odor repellent ketones and non-preferred and preferred vertebrate hosts. However, results from this study indicated that the three repellent ketones plus skin background odors may be more sensitive to chemical signals for tsetse flies to discriminate against vertebrate hosts. These results contribute to understanding tsetse fly vertebrate host preferences in their natural habitat across geographic scales.

(Publication link: <https://doi.org/10.1007/s10886-025-01582-6>)

2.3.2 Bridging behavior and genomics for tsetse fly control

Tsetse flies have an unusual reproductive strategy: females give birth to live young and produce only one larva every 9–10 days. Both males and females depend on regular blood meals and search for hosts individually rather than in swarms. This low reproduction rate and solitary behavior make tsetse populations vulnerable to targeted control. In this study, we examined how color and scent influence trap effectiveness. While black and red were attractive, they were inefficient alone but performed better inside traps. Blue traps proved both highly attractive and effective. Flies showed the strongest landing response on black surfaces and the weakest on white. These findings led to the use of blue traps combined with black surfaces to maximise capture efficiency.

(Publication link: <https://doi.org/10.1038/s41576-026-00932-8>)

2.3.3 Biological control of ticks in domestic environments: Modeling the potential impact of entomopathogenic fungi on the transmission of East Coast fever in cattle

Biological control of ticks using entomopathogenic fungi (EPF) is a highly desired alternative to chemical acaricides for the control of tick-borne pathogens. For *Metarhizium anisopliae* isolates ICIZE 7, one of these EPFs, efficacy against multiple tick species has been demonstrated in laboratories and field settings. However, there is limited quantitative understanding of how EPFs can impact transmission. A deterministic model of tick–host–pathogen interactions was developed to explore how the effects of EPF on *Rhipicephalus appendiculatus* ticks may impact the transmission dynamics of East Coast fever (ECF) in cattle populations. Model results indicated that, for the explored product profiles, EPF derives most of its epidemiological impact through the delayed mortality effect. This EPF-induced mortality could not only reduce the onward *Theileria parva* transmission to cattle (both treated and untreated) but could also cause a reduction in the tick-to-host ratio and thus cattle exposure to ticks. Results from model analysis also provided insights into the potential impact of EPF when deployed at a population level and lend support to further research and development of this biological tick control tool.

(Publication link: <https://doi.org/10.1016/j.ttbdis.2024.102435>)

2.3.4 Molecular characterization of tick-borne pathogens in cattle in Kenya: insights from blood, ticks, and skin swab analyses

Ticks pose a major threat to livestock and human health in sub-Saharan Africa, with climate change and pastoral movements fueling their spread. Few studies have integrated multiple sample types to characterize tick-borne pathogens (TBPs) in cattle in Kenya. This knowledge gap hinders the development of effective surveillance and control strategies, leaving vulnerable populations and their livestock susceptible to these persistent threats. 280 bovine blood samples, 589 tick pools, and 284 non-invasive skin swabs from cattle in northern (Marsabit) and southern (Kajiado) Kenya were screened by high-resolution melting analysis and Sanger sequencing of PCR products. Results from this study indicated that *Rhipicephalus* spp. (47.1%), *Hyalomma* spp. (30.8%), and *Amblyomma* spp. (22.1%) were prevalent, with *Rhipicephalus evertsi* only found in Kajiado and *Rhipicephalus camicasi* in Marsabit.

(Publication link: [10.1186/s12917-025-05014-1](https://doi.org/10.1186/s12917-025-05014-1))



2.3.5 Tick microbiomes shaped by species, sex and tissue

We studied microbial communities in multiple tissue types, in two economically important tick species (*Amblyomma gemma* and *Rhipicephalus pulchellus*) and their cattle hosts. *Am. gemma* harboured more unique bacterial genera suggesting species-specific microbial associations. We also found distinct community structures between tick species and cattle blood. Moreover, male ticks exhibited stable microbial communities across tissues, whereas females showed strong tissue-dependent variation in richness, diversity and composition. These findings advance current knowledge on the influence of tick-associated microbiota on pathogen maintenance and transmission in livestock and the importance of tissue-specific and sex-dependent factors in vector competence.

(Publication link: <http://dx.doi.org/10.2139/ssrn.6294721>)

2.3.6 Path towards anti-microbiota vaccines against tick pathogens

We compared the microbial communities in the haemolymph, saliva, ovaries, midgut and salivary glands of individual *A. gemma* and *Hyalomma rufipes*, in dromedary camel. We found that, tick tissue significantly influences bacterial composition, with tissue-specific interactions between pathogens and endosymbionts suggesting bacterial functional specialization. We observed complex interactions between key endosymbionts and *Rickettsia pathogens* across tissues, including negative correlations with *Coxiella*, *Francisella*, and *Wolbachia* endosymbionts, and positive correlations between *Ca. Midichloria mitochondrii* and *R. aeschlimannii*, which require further investigation. The keystone taxa that we identified may serve as targets for anti-microbiota vaccines.

(Publication link: <https://doi.org/10.1186/s12866-026-04864-5>)

2.3.7 Swatting flies: Biting insects as non-invasive samplers for mammalian population genomics

In this study, a blood-feeding insect, tsetse fly, was used to target whole genome sequences of wild animals. Using pools of flies, the ability to recover genomic data from hosts was compared using the short-read sequencing (Illumina) and adaptive sampling of long-read data generated using Oxford nanopore technology (ONT). Results showed that most of the short-read data (85%–99%) was dominated by tsetse fly DNA and that adaptive sampling on the ONT platform did not substantially reduce this proportion. However, once tsetse reads were removed, the remaining data for both platforms tended to belong to the dominant host expected in the tsetse fly blood meal. Reads mapping to elephants, warthogs and giraffes, were recovered more reliably than for buffalo, and there was high variance in the contribution of DNA by individual flies to the pools, suggesting that there are host specific biases. For elephants, using short-read sequencing, over 300,000 unfiltered SNPs were identified, which were used to estimate the allele frequencies and expected heterozygosity for the population. Overall, results from this study showed that, at least for certain wild mammals, it is possible to recover genome-wide host data from blood-feeding insects.

(Publication link: <https://doi.org/10.1111/MEC.17661>)

2.3.8 Multimodal interactions in Stomoxys navigation reveal synergy between olfaction and vision

Stomoxys flies exhibit an attraction toward objects that offer no rewards, such as traps and targets devoid of blood or nectar incentives. This behavior provides an opportunity to develop effective tools for vector control and monitoring. However, for these systems to be sustainable and eco-friendly, the visual cues used must be specific to target vector(s). In this study, the existing blue Vavoua trap was modified, which was originally designed to attract biting flies, to create a deceptive host attraction system specifically biased toward attracting Stomoxys. Results indicated that Stomoxys flies are attracted to various colors, with red proving to be the most attractive and selective color for Stomoxys compared to the other colors tested. The investigation of the cattle–Stomoxys interaction demonstrated that Stomoxys flies do not prefer a specific livestock for color phenotype, despite variation in the spectrum.

(Publication link: <https://doi.org/10.1038/s41598-024-68726-8>)



2.3.9 New knowledge on sand-fly-microbe interactions

Sand flies, known leishmaniasis vectors, harbor nonobligate endosymbionts that may influence host adaptation and pathogen transmission. We screened wild-caught phlebotomine sand flies in Kenya's Rift Valley, and colonies of *Phlebotomus duboscqi*, for *Rickettsia*, *Wolbachia*, *Spiroplasma*, *Cardinium*, *Arsenophonus*, *Microsporidia*, and *Leishmania*. Sand flies in Kenya harbored six endosymbionts, including the first detection of pathogenic *R. africae* in sand flies, and gut bacteria that may influence vector competence. The frequent co-occurrence of *Rickettsia* and *Wolbachia* endosymbionts with *Leishmania* indicates nonrandom associations between symbionts and parasite infection, without implying causality. These findings reveal previously undescribed sand-fly-microbe interactions, and the need to study whether sand flies contribute to the ecology and potential transmission of African tick bite fever (ATBF).

(Publication link: <http://dx.doi.org/10.1186/s13071-026-07283-7>)

2.3.10 De Novo genome assembly and characterization of chemosensory genes in the camel ked

Hippobosca camelina (camel ked) is an obligate hematophagous ectoparasite that infests camels. Hematophagy inflicts painful bites, leading to myiasis, anemia and pathogen transmission. Control strategies for vector-borne diseases (VBDs) in dipterans closely related to *Hippobosca*, such as *Glossina*, have exploited the chemosensory system that plays a vital role in their ability to locate hosts for feeding, mates for reproduction, and predator evasion, contributing to their successful ecological establishment. Currently, there is no genome assembly for the *Hippobosca* species available in the genome database, which limits understanding of the species genetics, particularly the chemosensory system. *icipe* has closed this gap by generating whole genome assemblies for *Hippobosca camelina* and described their chemosensory system genes. This knowledge will aid molecular studies of the fly.

(Publication link: <https://doi.org/10.1186/s13104-025-07561-0>)

2.4 Environmental Health Theme

2.4.1 Insect farming for food and feed in the Global South: Focus on black soldier fly production

This study explored the current state of black soldier fly farming in the Global South, focusing on its potential for sustainable food production and organic waste management. By analyzing responses from black soldier fly producers in Africa, Asia, and Latin America, the research highlighted both the opportunities and challenges faced by this emerging industry. The findings underscored the importance of black soldier fly farming in achieving food security, reducing waste, and promoting economic development in these regions. This work is a significant contribution to animal research, providing valuable insights for policymakers, researchers, and industry stakeholders in this emerging field of animal production. Black Soldier fly farming is considered a potential gamechanger in circular economy and regenerative agriculture goals in the Global South. As part of a special issue – ‘From Farm to Feed – Harnessing Insects for Sustainable Food and Feed Systems’, supported by the Animal Consortium, this study identified key barriers to scaling and sustainability, including weak regulatory frameworks, inconsistent raw material supply, market volatility, and limited access to appropriate technologies. These findings underscored the need for stronger global collaboration and policy support to advance sustainable insect farming in the Global South.

(Publication link: <https://doi.org/10.1016/j.animal.2024.101397>)

2.4.2 The genomic landscape of black soldier fly (BSF): exploring the potential of BSF

The black soldier fly - BSF (*Hermetia illucens*) is gaining attention for its potential in waste management, animal feed, fertilizer production, and biotechnology. In this review, we provide a comprehensive overview of the BSF genomic landscape, highlighting the role of genomics in understanding its biology and improving its applications. We examine the gut microbiome and its implications for health and production efficiency, and explore how domestication shapes genetic traits. Drawing on lessons from livestock and crop systems, we propose selective breeding to enhance performance. We also assess available bioinformatics resources and genetic drivers of key traits such as feeding preferences. Overall, we show how genomics can optimise BSF use in sustainable waste transformation and circular agriculture.

(Publication link: <https://doi.org/10.1163/23524588-bja10200>)



2.4.3 Emerging storage pests of dried black soldier fly larvae product

Black soldier fly larvae (BSFL) are an increasingly important alternative protein for sustainable livestock and aquaculture systems, but storage pests such as *Tribolium castaneum* and *Necrobia rufipes* threaten product quality. This study compared their mitochondrial genomes and gut microbiomes. Both species showed typical coleopteran mitogenome structures, while their microbiomes were dominated by Proteobacteria and Firmicutes. *T. castaneum* exhibited greater microbial diversity, with dominant genera including *Staphylococcus* and *Streptococcus*, whereas *N. rufipes* was dominated by *Klebsiella* and *Synechococcus*. Notably, both pests harbored potentially harmful bacteria such as *Stenotrophomonas maltophilia*, highlighting risks linked to contaminated or poorly processed BSFL products.

(Publication link: <https://doi.org/10.1038/s41598-025-34902-7>)

2.4.4 Black soldier fly larvae meal effects on growth- and immune-related genes on broilers

In a recent study, we found that partial replacement of protein in feed with black soldier fly larvae meal (BSFLM), enhances protein synthesis, muscle growth and immunity in chicken. However, complete replacement showed signs of nutritional stress, suggesting that balanced inclusion levels of insect proteins are critical for optimal performance of the birds. Broilers fed diets combining fishmeal and BSFLM achieved the highest weight gain, feed efficiency, and carcass yield. Diets containing BSFLM significantly upregulated key immune and growth-related genes, which positively correlated with productivity.

(Publication link: <https://doi.org/10.1016/j.japr.2026.100692>)

2.4.5 Processed amaranth and finger millet enriched with cricket flour influence the functionality, microbial quality, shelf life, and consumer preference of the porridge products

Exploration of nutritious, cheap, and easy-to-prepare locally available complementary foods using different processing techniques is gaining traction globally. This study evaluated the impact of three processing techniques (roasting, germination, and fermentation) on finger millet and amaranth quality. The implications of blending processed products with 10% cricket flour on the functional properties, microbial safety, and shelf life of the porridge products were tested. Thereafter, consumer preference and acceptability of the cooked porridge products were assessed with randomly enrolled panelists of mothers (20-66 years), as primary caregivers. Results showed that powder from germinated cereal products had higher swelling power, water absorption capacity, solubility index, and emulsion capacity. Permissible bacterial and fungal loads were recorded in all the porridge products. The cricket-based flour blends, however, exhibited higher free fatty acid values than the regulatory limits of 0.4% within 3 to 6 months. These findings have demonstrated innovative ways of improving the quality of amaranth–millet porridge products supplemented with cricket flour to cater for diverse consumers.

(Publication link: <https://doi.org/10.1155/jfpp/8877620>)

2.4.6 Insect-oils as adjuvants for plant-based mosquito repellent

In a recent study, we found that insect oils can significantly improve the effectiveness and longevity of plant-based mosquito repellents, offering a sustainable alternative amid rising pesticide resistance. Oils from *Schistocerca gregaria*, *Ruspolia differens*, and *Macrotermes* spp. doubled protection time against major mosquito vectors. The most effective blend, *Macrotermes* oil with *Cymbopogon nardus*, achieved up to 3.5 hours of protection, comparable to 20% DEET. Enhanced retention of volatile compounds prolonged repellent activity, with key compounds remaining on skin for over 180 minutes.

(Publication link: <https://doi.org/10.1038/s41598-026-38831-x>)

2.4.7 Elucidating the functions of gut microbiota from two edible dung beetle species: Implications for waste management and food industry

This study investigated the gut microbial composition and functional potential of *Cetonia aurata* and *Oryctes* sp. dung beetles larvae collected from different regions in Kenya using bacterial 16S and fungal 18S rRNA genes. The findings revealed that *C. aurata* guts were dominated by Firmicutes (42.1%) and Bacteroidota (32.5%), while *Oryctes* sp. harbored more Proteobacteria (35.0%) and Actinobacteriota (11.4%). Functional pathway predictions indicated diverse metabolic capabilities, including cellulose, lignin, and nitrogen degradation through enzymes from *Bacillus*, *Proteiniphilum*, and *Pseudomonas mosselii*, highlighting potential for biowaste decomposition, pollutant detoxification, and carbon capture.



The presence of *Desulfobacterota* and *Nocardioides* suggested roles in sulfate and pollutant degradation, making these microbiomes suitable for eco-friendly waste remediation. Additionally, microbes such as *Bacillus*, *Christensenellaceae*, and *Alistipes* exhibited probiotic potential applicable to food and feed industries, with possible roles in maintaining gut health and mitigating antimicrobial resistance.

(Publication link: <https://doi.org/10.1371/journal.pone.0325756>)

2.4.8 A global review on mycotoxins in aquafeed and PESTEL-SWOT analytical framework to evaluate the sustainability and growth potential of Kenya's aquafeed sector

This study with PESTEL-SWOT analytical framework highlighted emerging opportunities in insect-based feeds, circular bioeconomy models, and regional trade, while identifying risks related to climate variability, raw material cost fluctuations, and regulatory gaps, thereby providing a strategic roadmap to guide policy, investment, and innovation toward a sustainable and resilient aquafeed sector in Kenya.

(Publication link: <https://doi.org/10.1111/raq.70081>)

2.4.9 Determinants of insect-based feed adoption among livestock farmers in Cameroon

This study found that only 18.3% of the surveyed farmers currently use insect-based feeds, while 81.7% remain non-users. Farmers' attitudes emerged as the strongest direct determinant of adoption decisions. Moreover, perceived behavioral control and subjective norms indirectly influenced feed adoption by shaping these attitudes highlighting the behavioral factors that drive innovation uptake in the animal feed sector.

(Publication link: <https://doi.org/10.1016/j.fooohum.2025.100558>)

2.4.10 Insect frass fertilizer upregulates maize defence genes and resistance against an invasive herbivore pest

Impact of amending soil with black soldier fly frass fertilizer (BSFFF) was tested on maize growth, defense gene expression, and resistance to fall armyworm, *Spodoptera frugiperda* (Lepidoptera: *Noctuidae*) through larval feeding assay. Maize plants grown in BSFFF amended soils were found to result in better growth, 0.93–2.86 t ha⁻¹ more yield, and 48% better nitrogen use efficiency than those grown using synthetic or unfertilized soils. Moreover, *S. frugiperda* larvae consumed significantly less leaf tissue from maize plants grown in BSFFF amended soils than synthetically fertilized and non-fertilized soils. Maize defense genes *pr-5*, *mpi*, and *lox-3* were highly expressed both constitutively and inductively in maize planted in BSFFF amended soils. A significant negative correlation was observed between *mpi* gene expression and larval feeding, suggesting its role in maize resistance. These findings indicated that soil amendment with BSFFF strengthens plant defense systems and positively impacts plant growth and yield, contributing to increased agricultural productivity and sustainability.

(Publication link: <https://doi.org/10.1163/23524588-00001009>)

2.4.11 Honeybee colony losses and causes during the active beekeeping season 2022-2023 in nine Sub-Saharan African countries

A first continental-scale assessment of honey bee colony losses across eastern (Kenya, Ethiopia, Rwanda, Uganda), western (Benin, Liberia, Nigeria), and central Africa (Cameroon, DRC), followed by a multi-country survey in Cameroon, Kenya, and Ethiopia, revealed that beekeepers registered colony loss rates ranging from 10% to 71%, depending on the country and region. The beekeeper-perceived causes included man-made factors (mostly theft and bushfires), climatic stress (mostly drought), absconding and pests (mostly wax moth, small and large hive beetles, ants, and novel predation by the African serval cat (*Leptailurus serval*)), and pesticide poisoning. However, most beekeepers in the study reported pest challenges, presumably because they are visible, but rarely mentioned diseases, despite the global recognition of the significance of such threats to honeybee health. Additionally, these studies revealed that beekeepers, who are trained and adopt better colony management practices such as using improved hives with movable frames and employing migratory beekeeping to forage-rich areas, experience significantly fewer losses than others.

(Publication link: <https://doi.org/10.1371/journal.pone.0322489>)



2.4.12 Geospatial atlas of honeybee forage plants and their distribution patterns in Africa and beyond

Honey bee forage plants are vital for bee nutrition, ecosystem resilience, and human livelihoods. We have compiled Africa's first continental database of 1,248 honey bee forage species from 91 families, supported by over 1.5 million occurrence records from open-access platforms. Our resource addresses critical knowledge gaps, with an interactive dashboard enabling visualization of species patterns and revealing major data gaps in Western, Central, and Northern Africa. In Southern and Eastern Africa, where data are stronger, it supports pollinator-friendly land management. Overall, the database provides a foundation for integrating climate, land-use, and ecological data to guide conservation and strengthen climate-resilient agriculture and beekeeping.

Publication link: <https://doi.org/10.1038/s41598-025-17240-6>

2.4.13 Influence of colony and hive attributes, landscape, and seasonality on occurrence of large hive beetles (Coleoptera: Scarabaeidae) in Taita Taveta County, Kenya

A large number of large hive beetles, *Oplostomus baroldi* (Witte), was observed in Taita Taveta County (TTC), Kenya, suggesting a potential threat to the apicultural industry. This study investigated the influence of colony and hive attributes, landscape characteristics, and seasonality on the occurrence of *O. baroldi* within beehives in TTC. Field surveys assessed beetle populations alongside colony strength parameters, environmental variables, and hive types using standard protocols. Findings from this study revealed significant positive correlations between beetle occurrence and colony phenotypes, such as capped brood, pollen, and honey quantities. Higher beetle populations were also observed in areas with tree cover compared to cropland, and seasonal variation was evident, with beetle populations peaking during rainy seasons.

(Publication links: <https://doi.org/10.1093/jisesa/ieaf065>; <https://doi.org/10.1007/s10886-025-01556-8>)

2.4.14 Compositional profile of honeys from stingless bees and honeybee honey from a West African country using H1-NMR spectroscopy

As a prerequisite for establishing standards for stingless beehive (SBH), ecological and evolutionary drivers of stingless bee honey variation at the global scale were established. The roles of evolutionary and environmental drivers of stingless bee honey compositional variation were disentangled using a sampling design that combines honey profiling by H1-NMR spectroscopy with the collection of honeys from honeybees and stingless bees. Results from this study showed a clear differentiation between the chemical composition and functional diversity of honeybees and stingless bee honeys, without identifying a clear continental, phylogenetic, or ecological pattern. This study provides the first global and comprehensive characterization of SBH composition.

(Publication link: <https://doi.org/10.1021/acsfoodscitech.4c00718>)

2.5 Specific Programmatic Impact

2.5.1 Accelerating Inclusive Green Growth through Digital Innovations (AGriDI) Project

The AGriDI project (www.agridi.org) ran from 1 February 2021 to 31 January 2026 under Innovation Window 3 of the Rsif. Funded by the European Union (€4.2 million) through the ACP Innovation Fund (OACPS) and implemented by an *icipe*-led consortium, the project has supported sustainable outputs, including the development of 12 integrated digital applications and platforms across five West African countries: Benin, Burkina Faso, Côte d'Ivoire, Ghana, and Nigeria. These technologies are enabling information sharing on agronomic practices, weather forecasts, market prices, and financial services, delivering over 986,100 messages (audio, SMS, video) to more than 54,000 stakeholders (including 16,822 women and 18,000 youth) across value chains such as maize, soybean, onion, and tomatoes.

A major notable short-term outcome include a reduction in fall armyworm (FAW) infestation in Northern Benin from 25% (2022) to 14% (2024) and increased farmer incomes in Ghana from USD 846 to USD 1,207 for maize producers.



2.5.2 Building Equitable Climate-Resilient African Bean and Insect Vectors Project (BRAINS) Initiative

The BRAINS project, funded by Global Affairs Canada (GAC) (CAD 20M), aims to improve low carbon, climate resilient systems and economies in the bean and insect corridors across 15 Sub-Saharan African countries by (a) enhancing climate resilience more equitably among women & youth farmers, SMEs owners, and leaders in targeted production systems of beans, fruit trees and beekeeping/insect farming, (b) bringing adoption of climate-smart agriculture technologies and nature-positive solutions that boost climate resilience to scale more rapidly across these production systems, and (c) building a pipeline of enterprises that are actively investing in carbon-neutral, climate-resilient, and gender-responsive business development in line with emerging sustainable finance and climate investment goals. The project is scaling diverse sociotechnical innovation bundles (STIBs) jointly with diverse public and private sectors partners that includes improved bean varieties, IPM innovations for fruit trees, beekeeping, insect farming, use of frass fertilizers.

In 2025, the project has reached 110,000 farmer beneficiaries (~45% women). Furthermore, over 2.7 million school children now access high iron and zinc bean varieties in their diet. Indirectly, over 10 million have been reached through diverse media outlets (radio, tv, newspaper, online) As of the first half of the second year-2025, the five-year project has reached over 530,000 beneficiaries with over 27 socio-technical innovation bundles. In addition, 15 food and feed products have been developed or optimized, 10 e-advisory services co-created and promoted, and over 50 knowledge products generated to support learning and dissemination.

2.5.3 Agro-ecological innovations for smallholder pest management (EcoPM)

The EcoPM project led by *icipe*, funded by GIZ (€2.9M) and completed in November 2025 accomplished major outputs to sustainably strengthen the resilience of smallholder maize farmers to fall armyworm infestations in Malawi, Uganda and Zambia. This was accomplished by scaling push-pull technology, parasitoids, biopesticides, and pheromone traps. So far, over 4,282 farmer demonstration plots have been established, >45% of which are run by women. Together with 827 trained agricultural advisors, 39% of which are women, lead farmers have trained more than 78,000 farmers, mostly women, around the demonstration plots on eco-friendly IPM tools to combat the fall armyworm infestation in the three target countries. Awareness campaigns reached over 2 million listeners via radio, and mass production and release of parasitoids were scaled in Uganda and Zambia. Advocacy efforts focused on integrating these innovations into national extension systems.

2.5.4 Regional Multi-Actor Research Network on Agroecology in East Africa (RMRN-EA)

Funded by the EU's DG INTPA (€ 5 M, 2024–2028), this initiative continues to support agroecological transitions in Kenya, Tanzania, and Uganda through curriculum development, capacity strengthening, validation and scaling of agroecological innovations, and policy engagement. In 2025, consortium members convened for the inception workshop, selected eight living labs, and initiated stakeholder diagnostics. *icipe* was recognized as a center of excellence in agroecology and elected to the Africa Regional Centers of Excellence (ArcX) Steering Committee.

2.5.5 Spatial analytics to elucidate visceral leishmaniasis risk and drivers

icipe and partners transformed Visceral Leishmaniasis (VL) surveillance across East Africa through the Kala-azar Mapper Project, combining digital innovation, AI, and regional collaboration. Working with the Ministries of Health in Kenya and Uganda, and engaging Ethiopia, the project has digitized VL case management via REDCap, harmonized epidemiological and vector datasets. Provisional spatial maps are placed within the DuduMapper platform — a real-time tool for visualizing cases, vectors, and environmental risks. AI-assisted data abstraction and predictive modeling now pinpoint transmission hotspots, while field teams, led by *icipe*, developed national capacity in data and *in situ* vector surveillance. These advances position *icipe* as a hub and important player in data- and evidence driven neglected tropical disease (NTD) control in the region.



2.5.6 The SYMBIOVECTOR Project

The SYMBIOVECTOR project, supported by the Gates Foundation (GF) (USD 4.5M, 2021-2027) and Coefficient Giving (formerly Open Philanthropy) (USD 5.2M, 2020-2026), is pioneering the development of novel symbiont-based approaches for blocking vector-borne disease (VBD) transmission. Focusing on *Microsporidia MB*, a naturally occurring symbiont that inhibits *Plasmodium* development in *Anopheles* mosquitoes, the initiative aims to establish sustainable, non-insecticidal malaria control solutions. In 2025, the project achieved a major milestone with the completion of a 4-year longitudinal surveillance effort across multiple endemic zones, analysing over 100,000 mosquitoes and generating the first field-based evidence of *Microsporidia MB*-mediated malaria transmission blocking. The team deployed new tools for molecular diagnostics and strain identification, while fostering intensified collaboration with national and international partners in Kenya, the UK, South Africa, Niger and Burkina Faso. This culminated in a high-level scientific meeting hosted at *icipe*'s Nguruman research station. Stakeholder engagement advanced significantly, including formative research in affected communities, dialogue with Kenya's Ministry of Health, and the WHO Vector Control Advisory Group (VCAG). The project is also investing in capacity strengthening, supporting five PhD and five MSc students (60% women) across laboratory, semi-field, and community-based field projects. SYMBIOVECTOR is positioning *icipe* at the forefront of next-generation symbiotic vector control strategies, with broad implications for malaria elimination in Africa and beyond.

2.5.7 INSEFF Programme

The Insects for Food, Feed and Other Uses (INSEFF) programme's seven active projects delivered targeted impact across circular bioeconomy, nutrition, and sustainable aquaculture and livestock systems. These include: (i) Postcode Lottery funded waste to cash eco project in converting organic waste into black soldier fly (BSF)-based feed and frass fertilizer; (ii) Novo Nordisk Foundation (NNF) funded novel foods project in promoting spirulina and mealworms to improve nutrition and livelihoods in crisis settings; (iii) IKEA Foundation funded project in scaling BSF and vegetable push-pull innovations; (iv) French Ministry of Europe and Foreign Affairs funded Bio Kenya project in supporting BSF enterprises; (v) NNF funded RefIPro project on mealworm farming in training farmers and refugees, and use of insect frass for yield gain of kale; (vi) Norad funded FASA project in developing experimental aquafeed formulations for inclusion of insect meal in tilapia and catfish diets; and (vii) EU funded INNOECOFOOD project in optimizing cricket and BSF production, and in establishing insect-rearing facilities at designated ECOHUB sites.

2.5.8 New Insects for food, feed and other uses (INSEFF) demo and R4D facilities

Modern community-based cricket rearing and training facility aimed at promoting awareness, skills development, and utilization of edible cricket and black soldier fly as a sustainable food resource has been established at the INNOECOFOOD project Ecohub site in Lunjre Village, Siaya county, Kenya. The facility will serve as a model center for demonstrating practical techniques in insect farming, processing, and consumption, while simultaneously educating local communities on the nutritional, economic, and environmental benefits of incorporating insects into their diets. The setup will integrate the Hazard Analysis and Critical Control Points (HACCP) systems thus ensuring that all products meet the highest standards of food safety and quality. The teams has also established an improved poultry research facility with an estimated capacity of 500 birds at the Duduville Campus to support ongoing and future insect-based feed trials. The facility is designed to provide an enabling environment for controlled feeding experiments, performance monitoring, and productivity assessments using insect-derived feed ingredients such as insect meals, live insects, and insect-derived oil. The poultry house is equipped with laying units, brooding and grower sections, enabling proper management of different production stages. The setup also incorporates ventilation and biosecurity features to ensure optimal bird welfare and data reliability. This represents a key milestone in strengthening research capacity to generate evidence on the nutritional performance, economic viability, and environmental benefits of insect-based feeds for poultry production. The facility will serve as a training and demonstration hub for students, researchers, and partners on sustainable poultry and circular bioeconomy innovations.



2.5.9 Digital Earth Africa Programme

On 1 April 2026, *icipe* took over the long-term ownership of the Digital Earth Africa (DE Africa) platform and services. Geoscience Australia and the interim Advisory Board has now fully approved an operational workplan and governance structure of the programme. The Platform which is fully integrated within the *icipe* Data and Analytics Platform will enhance better decision-making across many areas on the continent, including tackling and forecasting risks associated with flooding, drought, soil and coastal erosion, agriculture, forest cover, land use and land cover change, water availability and quality, and changes to human settlements. DE Africa will enable African governments, industry and decision makers to track changes across the continent in unprecedented detail. Also, the platform is launching the Africa Women in GIS (AWIGIS) technical challenge in early 2026, and mentorship was finalized in March 2026 to support female-led geospatial innovation.

2.5.10 Malaria Vector Atlas Project

The Vector Atlas project (<https://vectoratlas.icipe.org/>) has launched a comprehensive platform providing Analysis Ready Data (ARD) on malaria vector occurrences, bionomics and insecticide resistance across Africa. By centralizing and harmonizing the mostly fragmented entomological data, the platform enables high-resolution spatial modeling to support evidence-based decision making in public health.

2.5.11 Advancing responsible gender equality and inclusive AI innovations for agriculture and food systems in Africa (AI4AFS+) Project

Under the AI4AFS+ project, *icipe* is advancing responsible and inclusive AI tools, refining and scaling them across four sub-Saharan African countries to strengthen agricultural productivity, market access, and gender equity. These include a multi-disease detection tool for Nsuka Yellow Pepper in Nigeria; a web- and mobile-based cashew pest and disease detection application in Ghana; the Pest Monitoring and Surveillance of Tomato (PeMOST) system in Kenya; and a multilingual digital marketplace for indigenous vegetables in Kenya. These innovations will enhance early disease detection, improve farmer decision-making, expand market opportunities, and ensure that AI solutions are accessible and responsive to women and marginalized farmers.

2.6 Special Programme Delivery

2.6.1 BioInnovate Africa Programme

The BioInnovate Africa (BA) Programme is a regional science and innovation driven initiative, supported by the Swedish International Development Cooperation Agency (Sida), that enables scientists in Eastern African universities, research institutes, and firms to translate biologically based research outputs into practical uses in society through appropriate business models.

The framework under the ongoing Phase III contributes to Africa's innovation ecosystem, with scientists not only implementing innovation projects, but also participating in building supportive innovation ecosystems within their respective organisations and countries. With a focus on strengthening value chains for value added biobased goods and services, BA has become the largest and most active regional innovation-driven bioeconomy platform in Africa.

2.6.1.1 Progress of BioInnovate Africa projects

BioInnovate Africa, with a total budget of about USD 6.2M (2023-2026), is supporting seven regional innovation collaboration projects and implementing regional activities. The projects include:

- Biobased Products from Agricultural Waste: Biobased artemisinin supplements, biodegradable carrier from banana fibre, biofungicides for coffee wilt disease, and bio packaging from cassava waste.
- Novel Solutions for Health and Agriculture: Novel biorational products for controlling Tungiasis and Rhizobia-mycorrhizae blended biofertilizer.
- Value Addition to Food Industry By-products: Nano encapsulated bromelain from pineapple and seafood waste.

The current phase of BioInnovate Africa runs until December 2026. *icipe*, in cooperation with Sida, will continue managing BioInnovate Africa initiative, with the goal of deepening its presence in East Africa, while extending its experiences to a similar or new initiative in other regions of Africa. Sida and *icipe* will discuss the continuation of BioInnovate Africa beyond 2026.



2.6.1.2 Empowering women in science: insights from BioInnovate Africa’s cohort IV fellows

The BioInnovate Africa Fellowship for Women Scientists initiative has empowered a diverse group of female scientists in Africa through regional cooperation in bioinnovations and bioentrepreneurs. The fellowship was established in 2018 and provides opportunities to early and mid-career women scientists to work with and learn from BioInnovate Africa bioeconomy projects and networks in eastern Africa. As a result, the fellows enhance their skills, explore innovative solutions, and engage in collaborative work that addresses societal challenges in agriculture, health, and environmental sustainability.

2.6.1.3 BioInnovate Africa communications training

BioInnovate Africa organized communications training to enhance the capacity of its project implementing partners organizations to effectively communicate scientific innovations and outcomes to diverse audiences. The training was conducted for three days from 31 March to 2 April 2025. The training theme ‘Iron Sharpens Iron’ emphasized mutual learning and growth through shared experiences, peer feedback, and collaborative engagement. This training brought together participants from eight eastern African countries of Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Uganda, South Sudan, and Democratic Republic of the Congo (DRC) to co-develop and commercialize biobased products and services, thereby building sustainable bioeconomies and diversifying sources of growth for the region’s population.

2.6.1.4 Biobased innovation and entrepreneurship bootcamp (BIEB)

BioInnovate Africa organized the Biobased Innovate and Entrepreneurship Bootcamp (BIEB), 2025 to help participants package their biobased ideas into investable propositions through practical workshops, tools and experiences from peers, and experts. This inaugural BIEB was organized under the auspices of the BioVenture hub, specifically for the youth primarily early-career and/or graduate students (MSc and PhD) in BioInnovate Africa and the Regional Scholarship and Innovation Fund (Rsif) scientific network in Africa. The bootcamp enabled the participants to package their innovative biobased ideas into investable projects.

Africa’s academic and scientific communities are generating groundbreaking discoveries, but many lack entrepreneurial thinking and practical skills to translate research outputs into market-ready solutions. The bootcamp addressed this gap by equipping young early-career scientists with the tools to bridge science, enterprise and investments – thereby accelerating open innovation, creating a pipeline of investable bioeconomy projects and nurturing a new generation of entrepreneurial scientists and/or innovators poised to drive inclusive growth across the region. As such, BioInnovate Africa conducted a BIEB that spans 10 days from 28 July 2025 to 7 August 2025 under the theme ‘Making ideas investable’.

The bootcamp concluded with a grand finale of a Pitch event where each of the 20 participants showcased their packaged innovative biobased ideas to an audience of investors, scientists, private sector representatives, enterprise support organization, development partners, and policy actors invited to participate at the event. A panel of judges provided constructive feedback to each of the participants highlighting strengths and areas of improvement and/or further research topics for each of the packaged innovative ideas.

2.6.1.5 BioInnovate Africa Programme annual review meeting

Between 13 – 21 November 2025, Dr Claire Lynga, Senior Research Advisor at Sida, paid a visit to Kenya and engaged with the BioInnovate Africa Programme Management team. As part of the visit, she interacted with the BioInnovate Africa Programme Advisory Committee (PAC) members and project implementing partners.

2.6.1.6 Kenya-Sweden Bioeconomy Business and Innovation Fair

BioInnovate Africa exhibited its work at the Kenya-Sweden Bioeconomy Business and Innovation Fair (8-9 December 2025), organised by Stockholm Environment Institute (SEI) – Africa Centre. The forum focused on advancing the Kenyan bioeconomy through the development of bioeconomy cluster roadmaps and fostering partnerships between Swedish and Kenyan actors in support of industrialisation, modernisation, and scaling up of Kenya’s bioeconomy.



2.6.2 Regional Scholarship and Innovation Fund (Rsif) project in Sub-Saharan Africa (SSA)

The Rsif project is the flagship programme of the Partnership for Skills in Applied Sciences, Engineering and Technology (PASET), an Africa-led, World Bank-affiliated initiative. It offers a unique and historic opportunity for African countries to train new doctoral students in high quality PhD programmes and research awards in applied sciences, engineering and technology, in competitively selected African universities in partnership with international universities.

In 2025, major accomplishments from the Rsif programme in SSA were as follows:

- Participation in the World Bank Rsif implementation support mission in Kenya, Nigeria Rwanda.
- Rsif held a 5-day in-person orientation for Rsif cohort 6 on 25 - 29 March 2025 in Nairobi, Kenya.
- Rsif signed an agreement for DOCTAS project phase II (US\$ 1.25m over 2 years) with Carnegie Corporation of New York on 6 June 2025. Project implementation started on 1 July 2025.
- Rsif facilitated higher education policy discussions in Kenya on 12 June 2025 and Ethiopia on 26 June 2025.
- Rsif participated in the World Bank implementation support mission for Mozambique from 14-24 April 2025.
- Rsif facilitated a 3-day workshop in Maputo from 22–24 April 2025, strengthening University Innovation Ecosystems and supporting Intellectual Property (IP) Management Practices.
- Rsif signed a 2nd addendum to the agreement between the two parties on 19 August 2025 to continue managing Rsif until 31 December 2028.
- Rsif published 17 editions of the Rsif weekly electronic newsletter, and increased Rsif presence on 11 mainstream media across Africa and social media.
- A total of 83 PhD scholars have completed their doctoral programmes and of these graduates, 64 have secured professional positions as postdoctoral researchers, faculty members or researchers in institutions within their home countries, directly contributing to strengthening local research capacity.
- Rsif scholars' and grantees' publications totaled 535 (2018 – Mar 2026) and achieved 5,846+ citations and 752,245+ full-text downloads, with publications in journals of impact factor up to 19.3 (IF 2024).
- Rsif PhD scholarships have been given to 298 students (24 nationalities; 38% women) in 15 African Host Universities.
- 64 Rsif research and innovation grants have been awarded in 10 countries (total value: USD 4.3 million) of these 23 grants were awarded to Rsif alumni who are early career scientists to help them transition back to employment and promote research excellence.
- 25 technologies developed by the funded research and innovation projects in areas of work covering AI, agriculture, solar energy, bio-based products, flood risk management, and agri-engineering.
- 22 national patents registered by faculty and scholars in areas of work covering oil and gas, sustainable energy water processes, materials engineering, and agricultural engineering.
- Rsif e-newsletter reached 16,039 subscribers, and its stories achieved media presence in 10 outlets across five African countries, reaching 10 million audience.
- Rsif expanded digital engagement across all platforms, with LinkedIn growing over 70%, and also Facebook and X showing steady gains.



2.6.3 MOYESH and MaYEA Projects

2.6.3.1 MOYESH Project

Expanding youth employment in commercial apiculture and sericulture: During the Second No Cost Extension phase of the MOYESH project, a total of 803 unemployed youth (68.4% females) were recruited, engaged and trained in four programme districts. Six hundred of these are from apiculture sites in Tigray, Oromia, and South Ethiopia Regions. The remaining 203 are from the sericulture development site in Daramallo Woreda of South Ethiopia Region. All the recruited 803 youth attended the training sessions, with no dropout case reported. Based on their current performance levels and size of business operations, a total of 54 (48 in apiculture and 6 in sericulture) model youth enterprises were selected. These enterprises have offered to recruit and support at least 465 additional unemployed young women and men from within their neighborhood to establish their own small businesses in their backyards. Similarly, 12 functional marketplaces were identified for strengthening.

2.6.3.2 MaYEA Project

Community managed pesticide use (CMPU) framework development: *icipe* facilitated a national workshop (2–3 February 2026, Addis Ababa) organized in collaboration with the Ethiopian Ministry of Agriculture (MoA), which reviewed and validated the draft national guideline for scaling and institutionalizing Community Managed Pesticide Use (CMPU). The workshop built consensus on establishing CMPU as a government-led regulatory system for responsible pesticide use.

Integration of commercial apiculture into protected public lands (PPLs): *icipe* contributed to the national policy process through a Technical Committee meeting (23 January 2026, Addis Ababa) aimed at finalizing the framework for integrating commercial apiculture into Protected Public Lands (PPLs). The committee, established in 2025 and supported technically by *icipe*, conducted a series of technical reviews and consultations to refine the draft national guideline, finalize key technical components, and develop a work plan for the validation process.

APMIS (Apiculture Management Information System): APMIS was launched in November 2025 in partnership with the Ethiopian Ministry of Agriculture. The digital platform supports data-driven management of the apiculture sector by integrating information on hive distribution, honey production, market flows, and quality standards. It enhances transparency, traceability, sector coordination, and market access, while supporting productivity, quality improvement, and income opportunities for smallholder beekeepers and agribusiness actors.

Supporting national honey quality standards and certification: *icipe*, in collaboration with the Ethiopian Institute of Standards (EIS), developed a digital application to support honey quality standards and certification. The initiative aims to strengthen stakeholders' understanding of quality requirements, certification procedures, and opportunities for value addition along the honey value chain. By equipping producers, processors, and other value chain actors with the knowledge and tools needed to comply with national and international standards, the platform enhances quality assurance, and improves the competitiveness of Ethiopian honey in both domestic and export markets.



3. Directorate of Impact Delivery (DID)

3.1 Private Sector Partnerships and Biocontrol Platform

A cornerstone of the Directorate's work has been strengthening partnerships with private sector players. DID is implementing a biocontrol innovation platform where private companies contribute market insights and resources while *icipe* provides research and development of biological control solutions, such as entomopathogenic biopesticides and pheromones. This “royalty to loyalty” model fosters a mutually beneficial public-private partnership (PPP), focusing on innovations with commercial viability. In 2025, the Directorate engaged leadership from major biological control companies including Biobest, Bayer, and Elephant Vert through virtual and in-person meetings to solidify these collaborations.

Specifically:

- *icipe* organized an intellectual property retreat for the Centre's staff on 15-16 December 2025 in Kenya. The workshop increased internal capacity on research regulatory compliance, IP governance, and commercialization through lectures from the National Commission for Science, Technology and Innovation (NACOSTI), Wildlife Research and Training Institute (WTRI), and IP experts, paving the way for increased capacity and a roadmap for IP policy at *icipe*.
- A concept note with possible bioscience innovations for joint funding has been submitted to Bayer Leaps.
- The links with the private sector, including Biodiversity (service provider of pollination-related technology) and Neotex (digital tracing of cattle), were explored during the Belgian Business mission meeting on 12 November 2025 in Kenya.

The Managing Director of Russell IPM, a large biocontrol company with ongoing expansion in Africa, visited *icipe* on 9 February 2026 to discuss collaboration in developing pheromone and biocontrol products.

3.2 Entrepreneurship ecosystem and youth engagement

DID is leveraging from the longstanding BioInnovate Africa program to nurture entrepreneurship, especially among youth, through the BioVenture Hub—an early-stage incubation platform. This hub supports entrepreneurial scientists to transform bioscience research into viable businesses. Flagship strategies include “waste to cash,” which promotes affordable technologies to convert organic waste into insect-based organic fertilizers, and “skills for insect business,” offering practical training and internships aligned with *icipe*'s “Insects for food, feed and other uses” (INSEFF) program.

3.3 Outreach, dissemination, and scaling through community relationships

Community-based partnerships are a major focus, particularly through collaboration with national agricultural research systems and local stakeholders. *icipe*'s Technology Transfer Unit (ITU) was rebranded as the Innovation Scaling and Business Acceleration (ISBA) Unit, evolving into a comprehensive outreach and scaling platform. Using systemic, multi-stakeholder approaches, ISBA is co-developing and contextualizing innovations with active local engagement to ensure relevance and adoption. In 2025, a comprehensive innovation audit was conducted in collaboration with the Integrated Data & Analytics Platform (IDAP). Over 110 *icipe* innovations were assessed for their technology readiness levels, type, impact across economic, social, and environmental domains, and cost-benefit aspects. This evaluation aims to prioritize ready-to-scale innovations and package them with robust business plans and impact pathways.

Specifically:

- The ‘Regional multi-actor research network on agroecology in East Africa (RMRN-EA)’ project, funded by the DG INTPA runs from 1 December 2024 - 30 November 2028. The initiative will advance agroecology by developing curricula, strengthening research and extension capacities, validating innovations through living labs, and building policy networks, with MSc curriculum needs validated. An assessment of curricula needs for an MSc on agroecology has been validated. The capacity needs assessments for implementing agroecology with the national agricultural research and extension systems (NARES) have been kick-started. Nine living labs in three countries were identified and are currently being diagnosed through a participatory process. The RMRN-EA community of practice (COP) was launched on the Agroecology Transformative Partnership Platform in February 2026, used for multistakeholder engagements on agroecology.
- The ‘Agro-ecological management of the fall armyworm in Eastern and Southern Africa (EcoPM)’ project, funded by BMZ, from 1 December 2022 to 30 November 2025, concluded with a series of learning



workshops by GIZ. Across three countries (Malawi, Uganda and Zambia), 5,104 participatory demonstration plots were implemented, with 47% managed by women. These plots are living laboratories, directly training 118,705 farmers (>50% women) and indirectly reaching more than 2.7 million smallholders through rural radio, national platforms, and community outreach. A total of 1,073 agricultural advisors (50% women), were trained to act as trainers-of-trainers, embedding knowledge in national extension systems for continued dissemination handing over 15 knowledge products.

3.4 Strategic partnerships and regional collaboration

icipe has strengthened regional and international partnerships essential for impact delivery. It is a primary participant in CIRAD's new platform "Transforming agriculture for animal, crop and ecosystem health in the East African Rift (TRACE)," launched officially in November 2025. *icipe* also co-chairs the French initiative TSARA from 2026, focusing on transforming food systems through long-term Africa-France research partnerships. A Memorandum of Understanding (MoU) with CORAF, signed in late 2024, enables close collaboration in West Africa, including deploying insect-based feed innovations in Togo alongside ITRA. *icipe* also showcased innovations at CORAF's Market for Agricultural Innovations and Technologies (MITA) conference in Mali later in 2025.

3.5 Co-creation of innovation scaling projects

icipe is finalizing co-creation of 'Agroecological transitions for horticulture in arid zones to increase resilience of farmers, decent jobs and sustainable food systems (ATHAZ)' funded by IFAD through the DG INTPA. This project will focus on delivery innovations for irrigated horticulture systems in Botswana, Zambia and Zimbabwe.

3.6 Visibility and advocacy

The Directorate actively promotes *icipe*'s innovations through participation in major regional and global events, including the Eastern Africa Agroecology Conference (Nairobi), World Bank food systems dialogue (Malawi), CGIAR Science Week (Nairobi), and Africa Food Systems Forum (Senegal). *icipe* also hosted important delegation visits from CGIAR and Belgium's Directorate-General for Development Cooperation, bolstering visibility and stakeholder engagement.

In collaboration with CIRAD, *icipe* launched the partnership platform "Transforming Agriculture for Animal, Crop, and Ecosystem Health in the East African Rift (TRACE)", a consortium that brings together IRD, CIFOR-ICRAF, national agricultural research systems (NARS), and universities from Ethiopia, Kenya, Uganda, and Tanzania, with a focus on advancing One Health through agroecological approach. The platform was officially launched during a meeting held from 12 to 14 November 2025 in Nairobi, Kenya.

icipe showcased its innovations during the open week organized by the Kenya Agricultural and Livestock Research Organization (KALRO) from 27 to 28 February 2026, as well as at the KALRO Kilimo Biashara Expo 2026 that was held from 12 to 13 March 2026.



4. Publications

A total of 280 peer reviewed journal articles were published in 2025: with 194 attributed to *icipe* staff and Graduate Students as listed in **Annex 3** and an additional 86 attributed to Rsif Scholars and Grantees, as listed in **Annex 4**. The Centre also produced non-refereed publications and various outputs of scientific value which are detailed in **Annex 6**.

5. Integrated Capacity Building Platform (ICBP)

Building the capacity of individual researchers, institutions, and communities in Africa is integral to *icipe*'s research and sustainable development activities across the continent. The Centre's continued investment in training innovation, alumni engagement, and strategic partnerships positions *icipe* to deliver inclusive and lasting development impact for Africa.

In 2025, substantial progress was made towards strengthening scientific capacity through integrated graduate and postgraduate training, research excellence, and strategic institutional partnerships, as follows:

Capacity Strengthening: The Centre continued to make significant contributions through the training and mentorship of MSc, PhD, and postdoctoral fellows, as well as research interns. The Centre supervised a total of 162 postgraduate students, comprising 58 PhD fellows (44 through the African Regional Postgraduate Programme in Insect Science - ARPPIS, and 14 through the Dissertation Research Internship Programme - DRIP; 17 female) and 104 DRIP MSc fellows (48 female). This core training cohort was complemented by 40 research interns (23 female) actively engaged across *icipe*'s research programmes and 27 (12 female) postdoctoral fellows who contribute both to advanced research outputs and to mentorship of junior scholars (*Figure 1*). Additionally, *icipe* continued to provide oversight for 218 ongoing scholars (Cohorts 1-6; 79 female), 83 Alumni (30 female), and 23 postdoctoral fellows (6 female) who are recipients of the Junior Investigator Research Award (JIRA) under the Regional Scholarship and Innovation Fund (Rsif) (*Figure 2*).

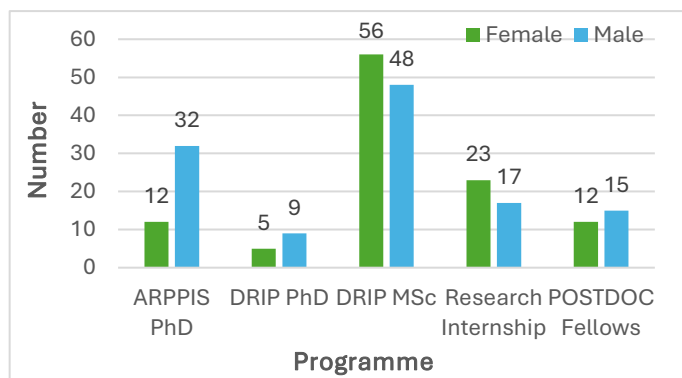


Figure 1. *icipe* Postgraduate and Postdoc Fellows, Research Interns

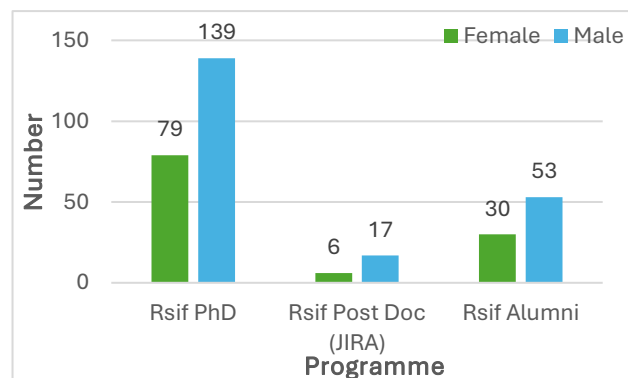


Figure 2. Rsif Postgraduate, Postdoc Fellows, and Alumni

Pursuing Gender Equity: Overall, 45% of ARPPIS and DRIP postgraduate scholars are female, with the Research and Internship Programme achieving the highest female representation at 58%. *icipe*'s postdoctoral programme maintained 40% female representation, while 37% of PhD scholars in the Rsif programme are female.

Completion Rates: 2 ARPPIS PhD, one DRIP PhD and 3 DRIP MSc scholars successfully completed their programmes, representing significant contributions to Africa's pool of highly trained insect scientists. The Rsif programme achieved an important milestone with 10 more scholars completing their studies, bringing the total number of Rsif graduates to 83 since the programme's inception.

Continental Representation: The *icipe* ARPPIS and DRIP Postgraduate, Research Internship and Postdoctoral programmes have continent-wide representation. 19 African nationalities, from East, West, Central and southern Africa, were represented in the programmes during the reporting period: Benin, Burkina Faso, Cameroon, Chad, Comoros, DRC, Ethiopia, Guinea, Kenya, Lesotho, Malawi, Mali, Rwanda, South Sudan, Sudan, Tanzania, Togo, Uganda, Zimbabwe (*Figure 3*).

Rsis continues to engage scholars from 23 African countries in East Africa (Burundi, Ethiopia, Kenya, Mozambique, Rwanda, South Sudan, Sudan, Tanzania, Uganda,), West Africa (Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Niger, Nigeria, Senegal, Togo), Central Africa (Cameroon, Chad, Democratic Republic of Congo), and Southern Africa (Zimbabwe, Malawi) (*Figure 4*).

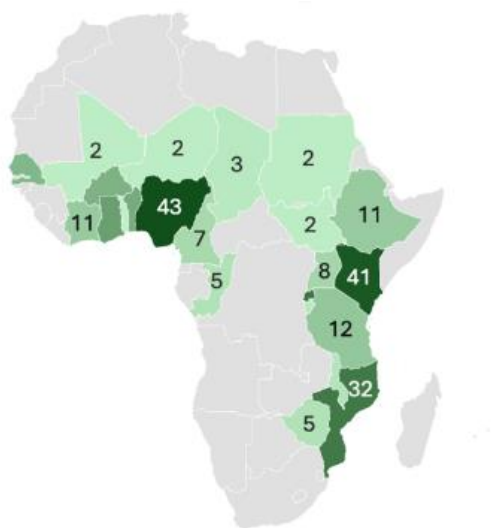


Figure 3. Diversity of postgraduates, postdoc fellows and research interns at *icipe*



Figure 4. Diversity of Rsis postgraduate scholars

New Admissions: A total of 14 new scholars were recruited across all programmes during the reporting period. Four new ARPPIS PhD scholars joined *icipe* from Burkina Faso (1), Chad (1), Kenya (1) and Tanzania (1), with women comprising 25% of this cohort. The DRIP PhD programme welcomed one new scholar from Rwanda (male). The DRIP MSc programme enrolled 9 new scholars from two countries, Kenya (8) and Tanzania (1). Women represented 78% of this MSc cohort.



SECTION 3: STRATEGIC INSTITUTIONAL RESULTS FRAMEWORK

Progress Report on *icipe*'s Strategic Institutional Results Framework for the period January to December 2025

The 2025 SIRF reports a substantial expansion in the uptake and impact of *icipe*'s innovations across Africa. Between January and December 2025, approximately **40,119** new farmers (of whom **19,013** were women) adopted *icipe*'s food security, nutrition, health, and environmentally sustainable technologies, underscoring both strong field-level penetration and meaningful progress in gender inclusion. These eco-friendly solutions were deployed across an estimated **174,442** acres, reflecting a significant scaling of sustainable agricultural practices on the continent. In terms of socio-economic outcomes, the report attributes improved food security to **95,714** individuals and estimates that **30,254** people were lifted out of poverty as a direct result of adopting *icipe*-supported interventions. When compared to the 2024 reporting period, the 2025 results indicate a clear upward momentum across key impact indicators, particularly in food security gains, poverty alleviation, and the adoption of insect-based farming systems for food and feed. The year also recorded increased recognition of staff achievements and a higher volume of partner capacity-building activities, signalling a strengthening of both internal excellence and external collaborative reach across *icipe*'s innovation ecosystem.

Beyond these headline figures, the 2025 results also reflect a deeper consolidation of *icipe*'s development model, where scientific innovation is increasingly translating into measurable livelihood transformation at scale. The breadth of adoption across multiple thematic areas, ranging from sustainable pest management and climate-resilient agriculture, to insect-based feed systems and integrated health interventions. This is indicative of a maturing pipeline from research to real-world application. More significantly, the expansion in acreage under eco-friendly technologies suggests not only wider geographic reach but also growing farmer confidence in the performance and reliability of these innovations under diverse agro-ecological conditions.

Collectively, these outcomes reinforce *icipe*'s position as a key driver of evidence-based, nature-positive agricultural transformation in Africa, while also highlighting the strengthening alignment between research outputs, extension systems, and on-the-ground impact delivery mechanisms.



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
Goal/impact	Contribution to poverty alleviation, food security, and human and environmental health	Number of poor people that escaped poverty	320,000	23,624	21,563	30,254	125,000	445,063	- Publications - Progress report		- Food security estimates are based on per capita kilocalorie consumption
		Number of people with improved food security	570,000	39,796	70,218	95,714	200,000	770,000			
		Amount of CO ₂ equivalents sequestered (tons)	3.03 million	361,243	552,734	401,782	2 million	5.03 million			
Outcome	Increased productivity, sustainability, and resilience of the agri-food systems in Africa	Equivalent volume of applied pesticides replaced (litres)	615,000	95,267	190,184	108,836	543,000	1.2 million	- Project documents and reports - Monitoring & evaluation surveys - <i>icipe</i> impact assessment surveys	- African innovations system continues to mature and grow. - Stakeholders/beneficiaries embrace program and project interventions. - Social, cultural, and	- Biting flies' traps - IPM and PPT approaches - Advanced beekeeping and sericulture - Biopesticides - Insect based feeds and fertilizers
		Number of farmers using food security, nutrition, health, and environmentally enhancing eco-friendly technologies	0.54 M [F=0.22; M=0.34]	196,160 [M=106,367; F=89,793]	83,874 [M=40,760; F=43,114]	40,119 [M=20,996; F=19,013]	1.3 M [F=0.52 M; M=0.78 M]	1.84 [F=74; M=1.14]			
		Area covered by eco-friendly technologies (acres)	190,000	300,508.8	374,384	174,442.7	680,000	950,619			- Estimates from number of adopters and market sales of biopesticide from RealIPM



Level	Expected Result	Indicator	Baseline	Achievem ent Jan 23- Dec 23	Achievem ent Jan. 24-Dec. 24	Achievem ent Jan 25- Dec 25	Target (2023- 2027)	Final target	Data sources (means of verification)	Assumption s/ Risks	Remark(s)
		Number of farmers benefiting from insect farming for feed and food	11,000	38,632 [M=14,896; F=23, 736]	4,851 [M=2305; F=2546]	6,177 [M=3,669; F=2,398]	55,000	77,000		economic factors are conducive to the introduction or continuation of R&D activities	- Black Soldier Fly (BSF) farming (insect-based feed and fertilizers) - Bee production



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
Output 1.1	Research for development technologies and products developed.	Number of technologies and products developed	42	6	0	11	20	62	- Monitoring & evaluation surveys - Projects reports - <i>icipe</i> annual reports		<u>2025 achievement</u> 1. Zygogramma (Calligrapha) <i>bicolorata</i> for Parthenium 2. BioInnovate products either at market testing or with a Minimum Viable Product: i. CIVU (Rhizobia - Mycorrhiza biofertilizer) ii. Bromecure iii. SUPPACT® iv. Jigger Gel® v. Triasper® (Biofungicide) 3. Digital Platform to predict risks of FAW, Cassava Whitefly, African armyworm and banana weevils 4. Vector Atlas (VA) 5. Digitization of Visceras Leishmaniasis (VL) surveillance across eastern Africa 6. DuduFarm® Hub to support BSF farmers 7. Mazoa Achieve® (<i>icipe</i> 78) against <i>D.Suzuki</i>
		Number of products registered (e.g., biopesticides, IPM)	34	2	0	1	10	34			1. Mazoa Achieve® (<i>icipe</i> 78) 2. Mazoa Detain® (<i>icipe</i> 7) <u>2025 achievement</u> 1. Tickoff® (Bioacaricide) at the last stage of registration in Kenya.



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
Output 1.2	One Health interventions for maximum livelihood and health impact promoted	Number of projects implementing One Health approach	7	2	1	1	2	9	- <i>icipe</i> annual reports - Project documents and reports		2025 achievement 1. SIDA awarded a second phase to Accelerating One Health Interventions for Tackling Pandemics at Source Programme (CORE FUNDING)
Outcome 2	Enhanced R&D and innovation capacity in Africa	Number of associated scientists that received recognition	154	16 [M=9; F=7]	17 [M=12; F=5]	15 [M=6; F=9]	50	204	- Document prepared for the <i>icipe</i> five years external evaluation. - <i>icipe</i> annual reports - Project reports - Capacity	- Safe and stable environment for capacity development - Donor's support <i>icipe's</i> Vision and Strategy - Donors continue supporting <i>icipe</i>	
		Number of peer reviewed publications led by students	670	153	166	112	500	1170			- Regional Scholarship and Innovation Fund (Rsif) - Integrated Capacity Building Platform (ICP)
Output 2.1	Capacities among research-for-development (R4D) partners and farmers strengthened	Number of students trained (MSc and PhD)	385 [F=180; M= 205]	71 [M=46; F=25]	90 [M=61; F=29]	77 [M=46; F=31]	232 [F=70; M= 162]	617 [F=250; M= 367]	- Project documents - Capacity		- Regional Scholarship and Innovation Fund (Rsif) - Integrated Capacity Building Platform (ICP)
		Number of farmers and youth trained.	300,000 [F=141,000; M=159,000]	117,696 [M=63,820; F=53,876]	114,757 [M=56,982; F= 57,775]	84,930 [M=43,827; F=41,102]	215,000 [F=86,000; M=129,000]	850,000 [F=340,000; M=510,000]			- Partners directly trained by <i>icipe</i> staff by also through other partners



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
		Number of other R&D partners trained in insect sciences (extension workers, experts, private sectors, etc)	70,143 [F=29,967, M=40,176]	3,869 [M=2,146; F=1,723]	5,020 [M=2,829; F= 2,191]	5,201 [M=2,837; F=2,364]	20,000 [F=8,500; M=11,500]	90,143 [F=38,467; M=51,676]	Building and Institute Development unit reports - <i>icipe</i> annual reports - Project Documents and reports		- Partners directly trained by <i>icipe</i> staff by also through other partners
Output 2.2	High quality scientific research produced	Number of citations	10,633	283	871	637	7,500	18,633	- <i>icipe</i> annual reports		
		Number of peer reviewed journal papers	961	290	306	271	750	1,711	- Document prepared for the <i>icipe</i> external evaluation		- In 2025 , 87 publications were from Rsif scholars and supervisors.



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
Outcome 3	Increased influence on global and regional insect science and 4-health policies development processes	Number of donors directly and indirectly investing in <i>icipe</i> insect science research and technologies	90	0	12	8	3	93	- Project reports - Document prepared for the <i>icipe</i> five years external evaluation. - Monitoring & evaluation surveys - <i>icipe</i> impact assessment surveys	- Key partners made and sustained. - <i>icipe</i> maintains high-level quality governance	<u>2025 entrants</u> 1. Bezos Earth Fund; 2. Department for Environment, Food and Rural Affairs (DEFRA) – Darwin Initiative, UK 3. Government of the United Arab Emirates; 4. Innovative Vector Control Consortium (IVCC); 5. Liechtenstein Development Service (LED); 6. Medical Research Foundation (MRF); 7. The British Council in partnership with the UK Department for Science, Innovation and Technology; 8. Parasitology - Africa Network (WAAVP-AN);
		Number of private sectors and institutions involved in products/technologies production and distribution (e.g., insect for feed and fertilizers)	10	11	3	4	5	15			<u>2025 Entrants</u> 1. Farm Track consulting 2. KOPPERT 3. Small Scale Farmers (local artists) 4. FLYFUL Farmers



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
		Number of countries supporting innovations funds for capacity building	9	0	5	0*	3	12			- Mainly governments that continued to support the Rsif program List of countries - Government of Benin; - Government of Burkina Faso; - Government of Côte d'Ivoire; - Government of Ghana; - Government of Kenya; - Government of Mozambique; - Government of Nigeria; - Government of Rwanda; - Government of Senegal; - Government of South Korea Additional notes *Rwanda and Kenya made additional contributions from the initial baseline support.
		Number of policies/regulations/standards adopted across countries	7	1	0	17	5	12			2025 achievement - Continental policy framework and positioning of edible insects by African Organization for Standards (ARSO) - Ethiopian One Health Strategy - Fifteen (15) harmonized African Standards on edible insects and related products



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
Output 3.1	Position papers for science-based policy making, addressing topics including the economy-wide impacts of technologies, the role of beneficial insects, ecosystem services, One Health, and the impact of insect farming on climate change produced and disseminated.	Number of economic-wide and one health impacts position papers produced on key topics	5	1	0	1	6	10	- Impact assessment surveys - Projects reports - Publications		<u>2025 achievement</u> 1. Position paper on edible insects by African Standards Organisation (ARSO).
		Number of economic-wide and one health impacts, and region wide products launching policy-oriented knowledge-sharing events	6	0	1	2	4	10	- <i>icipe</i> annual reports		<u>2025 achievement</u> 1. Launch of the Ethiopia One Health Strategy 2. East African Agroecology conference (Nairobi).
Output 3.2	Policies/regulations/standards designed to expedite the provision of 4-health technologies to farmers and other stakeholders	Number of policy/regulation/standards documents developed	7	4	0	16	5	12	- Projects reports - <i>icipe</i> annual reports - Policy/regulation/standards documents		<u>2025 achievement</u> 1. Ethiopia One Health strategy 2. Fifteen (15) harmonised African Standards on edible insects and related products



Level	Expected Result	Indicator	Baseline	Achievement Jan 23-Dec 23	Achievement Jan. 24-Dec. 24	Achievement Jan 25-Dec 25	Target (2023-2027)	Final target	Data sources (means of verification)	Assumptions/ Risks	Remark(s)
Output 3.3	Strategic policy partnerships strengthened and formed	Number of strategic policy partnerships with regional platforms formed and strengthened	5	2	0	6	2	7	- Projects reports - <i>icipe</i> annual reports - MoU		<u>2025 achievement</u> 1. Ethiopia One Health 2. A CIRAD platform “Transforming agriculture for animal crop and ecosystem health in east Africa Rift (TRACE)” 3. French initiative TSARA focusing on transforming food systems 4. CORAF enabling close collaboration in West Africa 5. AKademiya 6. Building Socio-Ecologically Balanced Landscapes in the Kakamega Forest (FEF Kakamega)



SECTION 4: PROMOTING EQUITY, INTEGRITY, AND ENVIRONMENTAL SUSTAINABILITY AT *icipe*

Annex 1 – Advancing Women’s Rights, Gender Equality, Human Rights, and Anti-Corruption

1) Achievements in Women’s Rights, Gender Equality, and Human Rights

In 2025, *icipe* implemented impactful measures to promote women’s rights, gender equality, and the human rights of vulnerable and marginalized groups. Recognizing the interconnectedness of these concepts, they are addressed jointly in this report, guided by core human rights principles: participation, non-discrimination and equality, accountability, transparency, empowerment and capacity development, and the duty to fulfil. The following actions reflect *icipe*’s unwavering commitment to inclusive, equitable, and rights-based development.

Empowering duty bearers and rights holders through capacity building:

icipe organized a high-level 2-day training workshop on Gender, One-Health, Safeguarding, and Human Right Principles, held on 27th and 28th February 2025. This workshop brought together 264 participants (123 women) from Africa, Asia, and Europe, including donors, researchers, extension officers, policymakers, developmental partners; practitioners, and farmers. The training aimed to strengthen women’s agency and promote inclusive access to and use of *icipe*’s technologies while deepening participants’ understanding of the One Health approach and its linkages with gender and agrifood systems transformation in Africa. It also built capacity on human rights and safeguarding practices, the nexus of insects and gender and one health, the economics of One Health, and gender-responsive for inclusive and ethical research and workplace environments. Key topics of the training included gender concepts and definitions, gender in the workplace, safeguarding and human rights principles, the intersection of gender and One Health, gender-responsive communication and research, gender mainstreaming tools, the role of insects in health systems, and the economics of One Health.

The AgriPath project, in collaboration with CORAF and *icipe*, also conducted a Gender Training Workshop in Yako, Burkina Faso. The four-day event convened 71 participants (55 men, 16 women) from Burkina Faso, Kenya, and Côte d’Ivoire, including national steering committee members, extension agents, and project stakeholders. Through participatory exercises and discussions, participants strengthened their capacities in gender equality, equity, mainstreaming tools, safeguarding, and gender-sensitive communication, enhancing institutional and field-level competencies to promote inclusive digital agriculture and rights-based approaches.



Dr. Mariame Maiga from CORAF delivering the training

Inclusive partnership frameworks:

icipe signed 30 sub-grants with partners, embedding clauses that promote gender equality, non-discrimination, safeguarding of vulnerable groups, and accountability. These agreements serve as practical tools for sensitizing duty bearers to uphold human rights standards and fulfill their obligations. Integrating these principles into contractual arrangements, *icipe* strengthens institutional accountability mechanisms and fosters inclusive systems that protect, empower, and ensure rights-holders participation, particularly women and marginalized populations.

Upholding rights and equality in research:

icipe upheld human rights and gender equality in its research activities by ensuring that individuals and communities actively participated in surveys, field experiments, and related studies. Such participation was entirely voluntary and based on informed consent. For every survey, data collectors read a consent statement to respondents before the interview began, clearly explaining the purpose and expected benefits of the research. All research activities conducted in 2025 engaged men, women, and youth farmers in implementing activities and through individual interviews and focus group discussions, ensuring the meaningful representation of all social groups. Where required, *icipe* also secured the necessary ethical approvals and permits from relevant authorities. Promoting voluntary and inclusive participation, particularly among vulnerable and marginalized groups, *icipe* safeguarded participants' dignity and aligned its research practices with international standards on human rights, gender equality, and ethical conduct.

2) Achievements in Anti-corruption Measures

In 2025, *icipe* actively advanced its comprehensive anti-corruption framework, reinforcing transparency, integrity, and accountability across all institutional activities. The Centre applied proactive measures in financial oversight, procurement, information sharing, and ethical compliance to uphold the highest standards of conduct.

Auditing: *icipe* maintained a strong financial management system and ensured rigorous internal and external audits of all institutional operations, projects, and programs. The Centre conducted 20 project audits. No major irregularities were found, reaffirming *icipe's* strong commitment to financial integrity, transparency, and accountability.

Due Diligence Assessments: To reduce risks of misuse or fraud, *icipe* conducted due diligence on 8 research-for-development partners before signing agreements. These assessments reviewed procurement procedures, financial health, accounting systems, auditing frameworks, and reputational standing, reinforcing the Centre's commitment to accountability. In parallel, mainstream, and sub-granting donors conducted 4 due diligence reviews on *icipe*, all confirming that the Centre met required compliance and integrity standards. All 30 sub-grant agreements signed by project partners explicitly communicated *icipe's* zero tolerance for corruption, fraud, discrimination, and non-compliance with audit obligations.

Senior Management Communication: *icipe* promoted a culture of openness and transparency through active communication and stakeholder engagement. In 2025, the Centre held eight Senior Management Committee meetings, where leadership communicated key institutional decisions with staff, including financial updates and upcoming plans. The Centre also engaged openly with partners, discussing project budgets and financial allocations during proposal development and inception stages. These practices reinforced the human rights principles of participation and accountability by ensuring that staff and partners were informed, engaged, and able to contribute meaningfully to institutional decisions that affect them.

Whistleblower Protections: To enhance institutional integrity, *icipe* promoted whistleblowing through multiple secure channels, including an online anonymous reporting mechanism. These systems enabled staff and partners to report unethical conduct, such as asset misuse, fraud, conflicts of interest, harassment, and other forms of misconduct, without fear of retaliation. In addition, the Centre has four designated safeguarding focal persons across its stations to whom staff can report any misconduct if they choose to do so. These measures reinforce the principles of accountability, non-discrimination, and empowerment, by ensuring individuals are informed, protected, and supported in raising concerns and upholding ethical standards.



Annex 2 – *icipe* Environmental Management Reporting

icipe has continued to adopt a rigorous approach to managing its operations in a way that minimizes adverse impact on the environment. The report below presents *icipe*'s progress in embedding environmental sustainability across its institutional operations, infrastructure, and research support systems. In 2025, the Centre optimised its electricity usage and water consumption, expanded solar energy deployment, improved waste management practices, and enhanced staff engagement, building on the foundations laid in previous years to further advance the key priorities under its environmental agenda.

This report applies a structured monitoring framework to assess performance against defined sustainability targets, and highlights our achievements, ongoing efforts, and areas requiring additional focus. It reflects *icipe*'s commitment to evidence-based environmental stewardship, operational efficiency, and long-term resilience as integral components of its mission and strategic plan.



Strategic Priority	<i>icipe</i> Approach	<i>icipe</i> Intervention	Status as at 31 December 2025
Reduce Greenhouse Gas Emissions from Operations	<i>icipe</i> is committed to managing and reducing its direct and indirect greenhouse gas emissions, including PFCs, from its manufacturing and other business operations, in accordance with scopes 1 to 3 of the Kyoto Protocol.	<i>icipe</i> has remained steadfast in its structured and institution-wide approach to advancing environmental sustainability and occupational health and safety through its Environmental Management Committee (EMC), which works in coordination with the Health and Safety Committee (HSC). Both bodies meet regularly and report directly to the Senior Management Committee (SMC), ensuring accountability and strategic alignment.	- The Energy Management System (EMS) installed at the Centre captures and analyses data to identify areas and opportunities of energy efficiency and conservation. The system optimises monitoring of energy usage across <i>icipe</i> facilities, as well as identifying energy leaks, which are constantly addressed through routine maintenance schedules. There has been a steady decrease of energy consumption across our campuses and field stations, resulting from ongoing energy saving initiatives. The reliance on grid Power has also steadily declined, from 2,185,000 kWh nine years ago, to 1,096,543kWh in 2025 (1,201,400kWh in 2024). - Solar supply contributed 22% of the total energy consumed in 2025, contributing a total of 607,010kWh (508,931kWh in 2024). - Tree planting remains an ongoing activity, with <i>icipe</i> planting 146 trees in 2025. <i>icipe</i> has continued to ensure that the goods procured, particularly equipment such as air conditioning units (ACs), refrigerators, and freezers are free of chlorofluorocarbons (CFCs). In 2025, <i>icipe</i> continued to phase out the old AC units running on R22 refrigerants, replacing these with 4 new ecofriendly ones in <i>Duduville</i>, and 3 in <i>iTOC Mbita</i>, that run on R134A. <i>icipe</i> also added 1 new -80°C freezer for long-term sample storage that runs on R508 & R404A refrigerants which are ozone friendly. These freezers are more energy efficient, with an energy consumption of 12.8kWh/day while being maintained at -80°C. - Printing and photocopying paper used at <i>icipe</i> is certified by the Programme for the Endorsement of Forest Certification (PEFC) as paper originating from well managed forests, free of chlorine, and also ISO 14001 certified. In 2025, <i>icipe</i> also upgraded its ERP system with the capability of attaching documents which will reduce printing, and this effort is expected to continue targeting full record digitisation. <i>icipe</i> also continues to review opportunities to shift from single-use plastic containers, and is procuring glass bottled mineral water instead of plastic bottled water.



Strategic Priority	<i>icipe</i> Approach	<i>icipe</i> Intervention	Status as at 31 December 2025
Water Management and Efficiency	<i>icipe</i> is committed to reducing water use and ensuring high standards of effluent and waste water treatment. We are also committed to identifying and managing water-related risks and opportunities, including impacts on local communities.	<i>icipe's</i> multi-faceted approach to enhancing water use efficiency and conservation across its campuses involves undertaking key infrastructural evaluations to assess the potential for rainwater harvesting, including the feasibility of damming the existing stream and collecting runoff from the Bee Health building. In parallel, there are several behavioral and operational interventions e.g. the water-efficient taps and shower heads across laboratories, office blocks, and guest facilities.	- The Water Management System (WMS) installed in 2021 captures and analyses data to identify areas and opportunities of water conservation. The system enables efficient use of the available water resources at <i>Duduville</i> campus. More efficiency has also been derived from the intelligent lawn irrigation system on the campus, that utilises programmed water supply from the available sources (priority being rain-harvested water). - A total of 75,548,000 Litres (<i>53,101,000 Litres in 2024</i>) of water was used at <i>Duduville</i> campus in 2025, representing a 42% increase YoY. This increase in consumption resulted from prolonged drought during the second, third and fourth quarters of 2025. The utility company supply contributed 36% of the total consumption, while borehole and harvested rainwater contributed 63% and 1% respectively. The water supply was subjected to quarterly testing through a government-regulated service provider to determine suitability for usage. The results obtained qualified the water in use as fit for human consumption. - At <i>iTOC Mbita</i> station, a separate channel is used for clean but unchlorinated lake-water for irrigating all experimental crop fields, which reduces the use of chlorine and ground contamination. Some fields use the more precise drip irrigation, reducing the volume of water used. High-capacity water tanks have also been installed next to the screenhouses and the experimental fields to store irrigation water and reduce the carbon footprint stemming from continuous water-pumping. - In 2025, <i>iTOC Mbita</i> station abstracted 104,063,000 Litres (<i>94,772,000 Litres in 2024</i>) of raw water from Lake Victoria. 45,723,000 Litres (<i>45,084,000 Litres in 2024</i>) were treated for domestic use; of which 45,723,000 Litres (<i>41,298,200 Litres in 2024</i>) were consumed by the station and 3,527,700 Litres (<i>3,785,800 Litres in 2024</i>) were shared with the community at minimal costs as part of <i>icipe's</i> corporate social responsibility. In addition, 58,340,000 Litres (<i>49,688,000 Litres in 2024</i>) of untreated water were utilised for irrigation. The treated water quality consistently met ISO 9308-1 standards, with a certificate of analysis being issued by the Government Chemist.



Strategic Priority	<i>icipe</i> Approach	<i>icipe</i> Intervention	Status as at 31 December 2025
Energy Management through Reduced GHG production associated with electricity use	<i>icipe</i> is committed to reducing its energy consumption and the carbon footprint of its operations through energy efficiency and conservation programs, along with the purchase of low carbon and renewable energy.	<i>icipe</i> has taken concrete steps to continuously improve energy efficiency and transition toward environmentally sustainable electricity use. <i>icipe</i> has implemented solar power systems at both the <i>duduville</i> and <i>Mbita</i> campuses, reducing reliance on conventional grid electricity. Complementary behavioral measures include staff-sensitization on energy conservation practices, such as switching off appliances and lights when not in use, and specific instructions for security personnel to turn off lighting in unoccupied office and laboratory areas at night. In addition, the Centre continues to adopt a phased approach to replacing outdated equipment and lighting with energy-efficient alternatives.	<i>icipe</i> continues to avidly advocate the use of green and sustainable energy. The installed solar panels support the main source of the Centre's electricity, reducing carbon emission and by extension, managing climate change and global warming. - The carbon savings recorded in year 2025 were derived at 87,911kgCOe (<i>74,792kgCOe in 2024</i>), while the total carbon savings realized since the commissioning of investments in solar energy supplies in 2017 were derived at 900,776kgCOe (<i>812,865kgCOe as of 31 December 2024</i>).



Strategic Priority	<i>icipe</i> Approach	<i>icipe</i> Intervention	Status as at 31 December 2025
Chemical Toxicity Management	<i>icipe</i> is committed to reducing and managing its environmental, health and safety risks, and to achieving compliance with legislative and customer requirements. We proactively review our procedures for the selection, use and substitution of chemicals based on precautionary principle.	<i>icipe</i> has a vested interest in addressing chemicals that pose severe risks due to their toxicity, persistence in ecosystems, and bioaccumulation through the food chain. The Centre has continuously provided the required scientific and technical expertise, built capacity, and supported the Convention's implementation in Africa and beyond.	<i>icipe</i> remains a designated Stockholm Convention Regional Centre in Africa, playing a pivotal role in supporting African countries to minimise reliance on hazardous chemicals and transition toward safer, sustainable alternatives. The Centre's work spans the full value chain, from scientific innovation to policy uptake, focusing on the development and deployment of non-chemical and low-chemical solutions such as integrated pest and vector management, biological control agents, and ecosystem-based approaches that reduce dependence on persistent organic pollutants (POPs). Importantly, The Centre's work also bridges science and policy, generating evidence on the environmental and health impacts of these POPs, while advising governments on regulatory frameworks and best practices. This integrated approach positions <i>icipe</i> not only as a technical support hub, but as a regional catalyst driving systemic change toward chemical risk reduction, environmental protection, and resilient, health-conscious agri-food systems across Africa. - Through targeted capacity building, <i>icipe</i> has helped to strengthen national institutions to develop and update their National Implementation Plans (NIPs), conduct inventories of POPs, and meet reporting obligations under the Convention. At the same time, it has continued to facilitate technology transfer and field-level adoption of safer alternatives, ensuring that reductions in chemical use do not compromise agricultural productivity or public health outcomes. - The Centre's previous collaborative IVM work with WHO-AFRO also continues to support the implementation of the United Nations Environment Programme (UNEP) roadmap for development of alternatives to chemical pesticides, e.g., dichlorodiphenyltrichloroethane (DDT), a POP (UNEP/POPS/COP.7/INF/7). This work continues to support elements of implementing the road map for the development of alternatives to DDT application. These include: (i) strengthening the base of knowledge for policy formulation and decision making (ii) developing and implementing IVM strategies (iii) assessing and deploying alternatives (iv) sharing experiences and scaling-up the application of non-chemical alternatives (v)



Waste Management through the 3-Rs' approach (Reduction, Recycling and Replacement)	<i>icipe</i> is committed to continuously reducing, re-using, recycling and managing waste streams from manufacturing sites, including hazardous substances, metals, packing, plastics and other non-biodegradable materials.	<i>icipe</i> continues to adopt a comprehensive and evidence-based approach to reducing its environmental footprint by referring to baseline studies on electricity, water, travel, and paper usage across its operations. Based on these iterations, institution-wide targets have been established to drive reductions in resource consumption. The measures in-progress include the introduction of paper recycling, increased segregation and recycling of glass, plastics, and electronic waste, and the safe redistribution of IT equipment to schools or certified e-waste handlers. To further minimize paper use, <i>icipe</i> has discouraged unnecessary printing, promoted double-sided printing, and removed individual office printers. Environmentally preferable alternatives have also been introduced in laboratory operations, including a shift from in-house incineration to lower-impact methods for disposing of biohazard waste. More so, the Centre utilises CFC-free cooling systems, with the environmental benefits recorded.	• Paper waste – Wastepaper is collected by a contracted firm for safe disposal through recycling. A total of 5,950 Kgs (<i>1,370Kgs in 2024</i>) of wastepaper was collected for recycling in 2025. This substantial increase in the amount of waste paper collected is due to the disposal of a large number of old files on record from both the Finance and Procurement Units, that had reached the end of the stipulated retention period. In addition, to optimize on the use of paper, most of <i>icipe's</i> printing and photocopying is done from centralized machines that ensure controlled usage with a default setting of back-to-back printing. • E-waste disposal – Obsolete and scrap electronic equipment is disposed through a contracted organization that recycles e-waste in an environmentally sound manner that is protective of public health and in accordance with all local and international environment standards and all applicable rules and regulations. In 2025, <i>icipe</i> consolidated 3,406 Kgs of e-waste from both <i>Duduville</i> and <i>Mbita</i> campuses for disposal through a provider registered with the National Environment Management Authority (NEMA). This waste included ICT equipment, phones, old lab equipment, electronic equipment and circuit boards, refrigeration components and accessories and UPSs. • Biohazardous waste disposal – In 2025, <i>icipe</i> disposed of a total of 5,840 Kgs (<i>5,592 Kgs in 2024</i>) of bio-hazardous waste from <i>Duduville</i> campus through a NEMA-registered service provider. Typically, the waste is disposed of via high-heat incineration. Disposal certificates were received from the service provider. • Composting – The Centre adopts alternative uses for organic waste from the kitchen and gardens by composting them into green manure for use in the greenhouses and experimental plots, and for research purposes (e.g., rearing insects for food and feed) and these efforts continued in 2025. In addition, there is a waste-segregation initiative to separate biodegradable waste from hazardous waste and recyclable waste. The infectious waste is disposed of through a NEMA-approved service provider, while biodegradable waste is converted into compost for fertilising gardens and experimental crop fields. • Plastic waste disposal – A total of 100 Kgs (<i>70 Kgs in 2024</i>) of plastic waste was disposed of in <i>Duduville</i> campus through a NEMA registered plastic recycling company that recycles the plastic waste into water drums and containers. • Sewage treatment system in <i>Mbita</i> – A NEMA-compliant sewage treatment system (ISO 9308-1) is installed in <i>Mbita</i>. The effluence throughput is measured using the scaled V-notch method. The system has an oxidation pond in which natural techniques, filtration and aquatic plants are used to treat wastewater. Through bioremediation, living organisms, like microbes and bacteria, are used in the removal of contaminants, pollutants, and toxins from grey water.
---	--	---	---



Strategic Priority	<i>icipe</i> Approach	<i>icipe</i> Intervention	Status as at 31 December 2025
			Living plants like water hyacinth, the Nile cabbage, and algae are used to clean up hazardous chemical contaminants through phytoremediation and photoremediation. These techniques reduce the need for chemical decontaminants, while discharging water that meets the NEMA public health and ISO-9308 standards. Effluent quality analysis is conducted by the Government Chemist quarterly per ISO standards. The Government quarterly reports issued in 2025 showed <i>iTOC Mbita</i> effluence quality to be fit to be discharged into the natural environment.
Reduced GHG production associated with travel	<i>icipe</i> is committed to managing the social, safety and environmental impacts resulting from employee, product and material transportation and logistics, in a way that increases efficiency and reduces carbon emissions.	<i>icipe</i> has implemented targeted measures to monitor and reduce greenhouse gas (GHG) emissions associated with institutional travel. This includes audits of air travel-related emissions and the total kilometres travelled by official <i>icipe</i> vehicles, forming the basis for informed mitigation strategies.	• <i>icipe</i>'s Travel Policy continues to ensure that the number of staff attending international conferences is justified and optimised for impact and sustainability. • To reduce unnecessary inter-campus travel, video conferencing facilities have been established both at <i>Duduville</i> and <i>Mbita</i> campuses, promoting virtual collaboration and operational efficiency. • <i>icipe</i> has also continued to maintain its vehicle fleet to high mechanical standards and ensures the use of quality fuel to maximise fuel efficiency and minimise emissions.



SECTION 5: PUBLICATIONS

List of Journal Articles (Peer Reviewed); Books; Proceedings and Non-Refereed Publications
(January to December 2025)

Annex 3 – List of Publications (Journal Articles – Peer Reviewed)

(Note: Author names shown in italics are *icipe* staff or Graduate Students)

PUBLISHED JOURNAL ARTICLES (194)

1. Aaqillah-Amr, M., Hidir, A., Ikhwanuddin, M., Fatan, N., Muhammad-Rahimi, R., Ning-Shahira, S., Siankhe, R., Vandenberg, G., *Tanga, C.*, & Yossa, R. (2025). Effects of insect meals on fish digestibility, blood parameters, and economic performance: a meta-analysis. *Journal of Insects as Food and Feed*, 11 (5), 833-859. <https://doi.org/10.1163/23524588-00001096>
2. Abd-Alla, A., Geiger, A., Haymer, D., Herrero, S., Jehle, J., *Khamis, F.*, Liedo, P., Malacrida, A., Njiokou, F., Mastrangelo, T., Pagabeleguem, S., Ramirez-Santos, E., Ros, V., Segura, D., Tsiamis, G., & Weiss, B. (2025). Improvement of colony management in insect mass-rearing for sterile insect technique applications. *Insect Science*, 32, 1476-1494. <https://doi.org/10.1111/1744-7917.70081>
3. *Abiya, A.*, *Kupesa, D.*, *Beesigamukama, D.*, Ngamau, C., Niassy, S., & *Tanga, C.* (2025). Frass fertilizer application enhances agronomic and economic performance of Chinese cabbage intercropped with desmodium under vertical farming system. *Scientific Reports*, 15 (1) <https://doi.org/10.1038/s41598-025-24529-z>
4. *Abro, Z.*, *Sibhatu, K. T.*, Fetene, G. M., Alemu, M. H., *Tanga, C. M.*, *Sevgan, S.*, & *Kassie, M.* (2025). Global review of consumer preferences and willingness to pay for edible insects and derived products. *Global Food Security*, 44, 100834. <https://doi.org/10.1016/j.gfs.2025.100834>
5. *Adams, B.*, *Mbarak Khamis, F.*, Ahmed Yusuf, A., & *Torto, B.* (2025). Zoophytophagous predator sex pheromone and visual cues of opposing reflectance spectra lure predator and invasive prey. *Journal of Advanced Research*, 70, 15-27. <https://doi.org/10.1016/j.jare.2024.05.005>
6. Adan, M., *Tonnang, Henri. E. Z.*, Greve, K., Borgemeister, C., & Goergen, G. (2025). Modelling the environmental and terrestrial drivers of the spread of the invasive fall armyworm *Spodoptera frugiperda* in Africa. *Crop Protection*, 192, 107133. <https://doi.org/10.1016/j.cropro.2025.107133>
7. *Adipo, M.*, *Mudalungu, C.*, Santos, C., Kimani, N., & *Tanga, C.* (2025). Insect-derived Compounds as Novel Source for Drug Discovery: A Systematic Review and Critical In Silico Analysis. *Chemistry and Biodiversity* <https://doi.org/10.1002/cbdv.202502495>
8. *Adwukba, G. R.*, *Abdel-Rahman, E. M.*, *Mudereri, B. T.*, Mutanga, O., Odindi, J., & *Tonnang, H. E. Z.* (2025). Spatiotemporal trends in *Anopheles funestus* breeding habitats. *International Journal of Applied Earth Observation and Geoinformation*, 136, 104351. <https://doi.org/10.1016/j.IJAG.2024.104351>
9. *Agboka, K. M.*, *Abdel-Rahman, E. M.*, *Salifu, D.*, *Kanji, B.*, Ndjomatchoua, F. T., Guimapi, R. A. Y., *Ekesi, S.*, & *Tobias, L.* (2025). Towards combining self-organizing maps (SOM) and convolutional neural network (CNN) for improving model accuracy: Application to malaria vectors phenotypic resistance. *MethodsX*, 14, 103198. <https://doi.org/10.1016/j.mex.2025.103198>
10. *Agboka, K. M.*, *Diallo, S.*, *Hassaballa, I. B.*, *Meltus, Q. J.*, Ahmed, K., *Tanga, C. M.*, *Landmann, T.*, & *Abdel-Rahman, E. M.* (2026). Temperature- and host-driven model of *Phlebotomus papatasi* outbreak potential under climate change in Sudan. *Ecological Modelling*, 511, 111386. <https://doi.org/10.1016/j.ECOLMODEL.2025.111386>
11. *Agboka, K. M.*, *Tonnang, H. E. Z.*, Kimathi, E., *Abdel-Rahman, E. M.*, Odindi, J., Mutanga, O., & Niassy, S. (2025). Steering conservation biocontrol at the frontlines: A fuzzy logic approach unleashing potentials of climate-smart intercropping as a component within the integrated management of fall armyworm in Africa. *Heliyon*, 11(4), e42530. <https://doi.org/10.1016/j.heliyon.2025.e42530>
12. *Agboka, K.*, *Abdel-Rahman, E.*, Kimathi, E., *Sokame, B.*, *Landman, T.*, Niassy, S., & *Tonnang, H.* (2025). Prediction of recurrent desert locust invasions under climate variability in the extended Sahara Desert: an evolutionary adaptive Neuro-Fuzzy approach. *International Journal of Tropical Insect Science* <https://doi.org/10.1007/s42690-025-01705-2>



13. Agboka, K., Ndjomatchoua, F., Guimapi, R., Rossini, L., Azrag, A., Meltus, Q., Landmann, T., Ekesi, S., & Abdel-Rahman, E. (2025). Dual Perspectives From Mechanistic and Correlative Approaches in Mapping the Distribution of the Lesser Mealworm *Alphitobius diaperinus*. *Physiologia Plantarum*, 177 <https://doi.org/10.1111/ppl.70659>
14. Agboka, K., Ndjomatchoua, F., Rossini, L., Guimapi, R., & Abdel-Rahman, E. (2025). When thermal risk indices work and when they don't: A case study of two maize insect pests. *Methodsx*, 15 <https://doi.org/10.1016/j.mex.2025.103537>
15. Agboka, K., Ngángá, A., Sokame, B., Baleba, S., Landmann, T., Abdel-Rahman, E., Tanga, C., & Diallo, S. (2025). Climate-driven potential for tularemia in East Africa: skill testing and ecological consistency of a transferred risk model. *Spatial and Spatio Temporal Epidemiology*, 55 <https://doi.org/10.1016/j.sste.2025.100756>
16. Ambele, C., Harrison, N., Chia, S., Abro, Z., Akutse, K., Akumeyam, A., & Tanga, C. (2025). Knowledge and acceptance of insects as feed source for poultry production in conflict affected regions of Cameroon. *Journal of Insects as Food and Feed* <https://doi.org/10.1163/23524588-bja10291>
17. Ambele, F., Chia, S., Nsobinyui, D., Akutse, K., Ngantu, N., Akumeyam, A., Kababu, M., & Tanga, C. (2025). Edible insects as a sustainable solution to food insecurity in conflict-ridden regions of Cameroon. *Journal of Insects as Food and Feed* <https://doi.org/10.1163/23524588-bja10213>
18. Amboka, G., Nelima, M., Midega, C., Mutiyambai, D., Feit, B., & Jonsson, M. (2025). Elevation and grassland cover shape natural enemy communities in the Kenyan maize crops. *International Journal of Tropical Insect Science* <https://doi.org/10.1007/s42690-025-01670-w>
19. Amugune, B., Tamre, R., Mogaka, D., Mbare, O., Bukhari, T., Fillinger, U., & Njoroge, M. (2025). Assessment of BG-Pro (Biogent AG) and Silver Bullet 2.1 (Lumin8) UV-Light Traps Efficiency for Surveillance of Malaria Vectors in Western Kenya. *Insects*, 16 (7) <https://doi.org/10.3390/insects16070739>
20. Anankware, J. P., Debrah, S. K., Asomah, S., Egonyu, J. P., Niasy, S., Fathiya, K., & Obeng-Ofori, D. (2025). Morphometrics, molecular, and reproductive parameters of *Rhynchophorus* morphotypes F. (Coleoptera: Curculionidae) in Ghana. *International Journal of Tropical Insect Science*. <https://doi.org/10.1007/s42690-025-01458-y>
21. Anedo, E. O., Beesigamukama, D., Mochoge, B., Korir, N. K., Haukeland, S., Cheseto, X., Nyongesa, M., Pwaipwai, P., Subramanian, S., Tenkouano, A., Kibaara, B., Tanga, C. M., Houben, D., Poveda, J., & Org, C. (2025). Unpacking the benefits of black soldier fly frass fertilizer towards nematode suppression and potato production. *Frontiers in Plant Science*, 16, 1509643. <https://doi.org/10.3389/fpls.2025.1509643>
22. Anyango, V. O., Langat, S., Mulwa, F., Mutisya, J., Koka, H., Okoyo, C., Chepkorir, E., Konongoi, S., Karanja, A., Kerubo, G., Sang, R., & Lutomiah, J. (2025). Genetic diversity of *Aedes aegypti* populations from Kisumu and Busia counties, western Kenya, and their vector competence for chikungunya virus. *PLOS ONE*, 20(3), e0289191. <https://doi.org/10.1371/journal.pone.0289191>
23. Atagong, S., Tonnang, H., Senagi, K., Wamakwa, M., Agboka, K., & Odindi, J. (2025). A review on knowledge and information extraction from PDF documents and storage approaches. *Frontiers in Artificial Intelligence*, 8 <https://doi.org/10.3389/frai.2025.1466092>
24. Atandi, J., Orage, C., Nyambura, E., Kiriga, A., Omayio, D., Saikai, K., Haukeland, S., Kisaakye, J., & Coyne, D. (2025). Banana Fibre Paper Technology: Impact of Repeated Use on Plant-Parasitic Nematodes and Yield of Potatoes and Peas. *Nematropica*, 55 (1), 44-64. <https://doi.org/10.63965/VQIN6289>
25. Azrag, A. A. G., Niasy, S., Bloukounon-Goubalan, A. Y., Abdel-Rahman, E. M., Tonnang, H. E. Z., & Mohamed, S. A. (2025). Cotton production areas are at high risk of invasion by *Amrasca biguttula* (Ishida) (Cicadellidae: Hemiptera): Potential distribution under climate change. *Pest Management Science*. <https://doi.org/10.1002/PS.8659>
26. Azrag, A., Ndlela, S., Abdel-Rahman, E., Tonnang, H., & Mohamed, S. (2025). Larval temperature variability alters reproduction and population growth in false codling moth *Thaumatotibia leucotreta* (Meyrick) (Lepidoptera: Tortricidae). *International Journal of Tropical Insect Science*, 45 (3), 1425-1438. <https://doi.org/10.1007/s42690-025-01533-4>
27. Bakthavatsalam, N., Subaharan, K., Raghavendra, A., & Subramaniam, S. (2025). Infochemicals for the Management of Thysanoptera. *Indian Journal of Entomology*, 87 (Special Issue), 104-126. <https://indianentomology.org/index.php/ije/article/view/3499>
28. Balew, S., Bulte, E., & Kassie, M. (2025). Short-run subsidies and long-run willingness to pay: Learning and anchoring in an agricultural experiment in Ethiopia. *American Journal of Agricultural Economics*, 107 (2), 655-669. <https://doi.org/10.1111/ajae.12498>



29. Belay, A., Asale, A., Sole, C., Yusuf, A., Torto, B., Abro, Z., Kassie, M., Mutero, C., & Tchouassi, D. (2025). A randomized controlled trial combining house screening and insecticide-treated nets reduces malaria transmission in northwestern Ethiopia. *Scientific Reports*, 15. <https://doi.org/10.1038/s41598-025-02943-7>
30. Biasazin, T., Miano, R., Cheseto, X., Ndlela, S., Mohamed, S., & Dekker, T. (2025). Selective lure for *Bactrocera dorsalis* based on shared palpal and antennal responses across three economically important tephritid species. *Journal of Pest Science*. <https://doi.org/10.1007/s10340-025-01898-y>
31. Binoy, C., Sureshan, P., & Copeland, R. (2025). Taxonomic reappraisal of the enigmatic genus *Propalachia* Bouček (Hymenoptera: Torymidae)—the first confirmed association with mantid oothecae and a new species from southern India. *Zootaxa*, 5728, 409–420. <https://doi.org/10.11646/zootaxa.5725.3.5>
32. Boanyah, G., Koekemoer, L., Herren, J., & Bukhari, T. (2025). Monitoring the Capacity of *Microsporidia* MB Transgenerational Spread in *Anopheles arabiensis* Populations. *Insects*, 16 <https://doi.org/10.3390/insects16121206>
33. Bobadoye, B., Nganso, B. T., Stuhl, C., Torto, B., & Fombong, A. T. (2025). Chemical ecology and management of the small hive beetle, *Aethina tumida* (Coleoptera: Nitidulidae). *Journal of Chemical Ecology* 51(1), 1–19. <https://doi.org/10.1007/S10886-025-01556-8>
34. Boddé, M., Nwezeobi, J., Korlević, P., Makunin, A., Akone-Ella, O., Barasa, S., Gadj, M., Hart, L., Kaindoa, E., Love, K., Lucas, E., Lujumba, I., Máquina, M., Nagi, S., Odero, J., Polo, B., Sangbakembi, C., Dadzie, S., Koekemoer, L., Kwiatkowski, D., McAlister, E., Ochomo, E., Okumu, F., Paaijmans, K., Tchouassi, D., Wondji, C., Ayala, D., Durbin, R., & Miles, A. (2025). Genomic diversity of the African malaria vector *Anopheles funestus*. *Science* NY, 389 (6766), eadu3596. <https://doi.org/10.1126/science.adu3596>
35. Braamhaar, D. J. M., Pellikaan, W. F., List, D., Korir, D., Tanga, C. M., & Oosting, S. J. (2025). Defatted black soldier fly larvae meal as a substitute of soybean meal in dairy cow diets. *Animal*, 19(4), 101476. <https://doi.org/10.1016/j.animal.2025.101476>
36. Brander, M., Abro, Z., Kassie, M., Mittmann, W., Stiefel, L., & Huss, M. (2025). Small policy changes can accelerate the adoption of improved on-farm storage among smallholder farmers. *World Development*, 195. <https://doi.org/10.1016/j.worlddev.2025.107118>
37. Bulte, E., Di Falco, S., Kassie, M., & Vollenweider, X. (2025). Low-quality seeds, labor supply, and economic returns: Experimental evidence from Tanzania. *The Review of Economics and Statistics*, 1–8. https://doi.org/10.1162/rest_a_01285
38. Cai, H., Xie, P., Zhang, X., Lin, Z., Xu, Z., Chen, S., Ruan, P., Akutse, K., Li, S., Lin, H., Wu, Z., & Lin, Y. (2025). Biototoxicity of essential oil of *Eucalyptus citriodora* Hook (Myrtaceae) to dust mites. *Frontiers in Plant Science*, 16 <https://doi.org/10.3389/fpls.2025.1708798>
39. Cecchi, G., Ngari, N., Paone, M., de Gier, J., Onyango, S., Barreaux, A., Thévenon, S., Solano, P., Kaye, A., Tennant, W., Tildesley, M. J., & Halos, L. (2025). Disease intelligence and modelling for progressive control of animal trypanosomosis in Africa. *Trends in Parasitology*, 41(9), 734–745. <https://doi.org/10.1016/j.PT.2025.07.003>
40. Chege, M., Wambua, M., Kilonzo, W., Subramanian, S., & Nganso, B. (2025). Seasonal and landscape-driven variations in forage resources of *Apis mellifera scutellata*: Implications for pollination sustainability and colony health in Taita Taveta County, Kenya. *Ecology and Evolution*, 15 (7) <https://doi.org/10.1002/ece3.71613>
41. Chen, I., Miller, S., Msellemu, D., Lugenge, A., Swai, J., Achee, N., Andrés, M., Bibbs, C., Chareonviriyaphap, T., Charlwood, J., Devine, G., Elman, N., Fillinger, U., Flores-Mendoza, C., Gibson, S., Govella, N., Gowelo, S., Horstmann, S., Kawada, H., Kline, D., Lloyd, A., Lobo, N., Maia, M., Mmbando, A., Moreno-Gómez, M., Morrison, A., Mponzi, W., Mwanga, E., & Njoroge, M. (2025). Volatile pyrethroid spatial repellents for preventing mosquito bites: a systematic review and meta-analysis. *Ebiomedicine*, 119. <https://doi.org/10.1016/j.ebiom.2025.105891>
42. Chen, M., Bai, T., Wang, J., Mai, D., Obiero, G., Getahun, M., Zhang, J., Dong, S., & Yan, Q. (2025). Key volatiles and ORs mediating oviposition preference for maize plants in Chinese population of *Spodoptera frugiperda*. *Journal of Agricultural and Food Chemistry*. <https://doi.org/10.1021/acs.jafc.5c03036>
43. Cherotich, C., Okoth, M., GO, A., Kariuki, S., & Omuse, E. (2025). Aflatoxin prevalence and association with maize grain physical and nutritional qualities in the informal markets in Meru County, Kenya. *African Journal of Food, Agriculture, Nutrition and Development*, 25 (2), 25861–25883. <https://doi.org/10.18697/ajfand.139.25520>
44. Chia, S. Y., van Loon, J. J. A., & Dicke, M. (2025). Heat treatment of black soldier fly frass for soil amendment enhances *Brassica rapa* growth. *Journal of Insects as Food and Feed*, 1(aop), 1–12. <https://doi.org/10.1163/23524588-BJA10250>



45. Chidawanyika, F., Mutua, B., Adan, I., & Mutiyambai, D. (2025). Testing the attractive appeal of *Desmodium* infochemicals to key parasitoids of the vegetable integrated push–pull cropping system. *Journal of Chemical Ecology*, 51 (4) <https://doi.org/10.1007/s10886-025-01622-1>
46. Chidawanyika, F., Omuse, E.R., Agutu, L. O., Pittchar, J. O., Nyagol, D., & Khan, Z. (2025). An intensified cereal push-pull system reduces pest infestation and confers yield advantages in high-value vegetables. *Journal of Crop Health* 2025 77:1, 77(1), 1–13. <https://doi.org/10.1007/S10343-024-01107-3>
47. Chisanga, B., & Kassie, M. (2025). Fall armyworm infestation, maize production and nutrition security: Evidence from Uganda. *Plos One*, 20 (12 December) <https://doi.org/10.1371/journal.pone.0336785>
48. Dewaele, K., Odhiambo, P., Vermeiren, L., Van Den Abbeele, J., & Monsieurs, P. (2025). Unraveling the miRNA landscape in tsetse fly saliva and salivary glands during *Trypanosoma brucei* infections. *NAR molecular medicine*, 2 (3), ugaf025. <https://doi.org/10.1093/narmme/ugaf025>
49. Dorigo, T., Brown, G. D., Casonato, C., Cerdà, A., Ciarrochi, J., Da Lio, M., D' Souza, N., Gauger, N. R., Hayes, S. C., Hofmann, S. G., Johansson, R., Liwicki, M., Lotte, F., Nieto, J. J., Olivato, G., Parnes, P., Perry, G., Plebe, A., Rao, I., Rezaei, N., Sandin, F., Ustyuzhanin, A., Vallortigara, G., Vischia, P. & Yazdanpanah, N. (2025). Artificial Intelligence in Science and Society: The Vision of USERN. *IEEE Access* 13: 15993-16054. <https://doi.org/10.1109/ACCESS.2025.3529357>
50. Egonyu, J. P., Labu, S., Nyangena, D. N., Khamis, F., Cheseto, X., Tanga, C. M., & Subramanian, S. (2025). Pre-harvest starvation effects on microbial load, weight loss and proximate composition of edible field cricket (*Gryllus bimaculatus*) and desert locust (*Schistocerca gregaria*). *International Journal of Tropical Insect Science*. <https://doi.org/10.1007/s42690-025-01478-8>
51. Elson, L., Otieno, B., Matharu, A., Riithi, N., Chongwo, E., Mutebi, F., Feldmeier, H., Krücken, J., Fillinger, U., & Abubakar, A. (2025). Assessing the impact of tungiasis on children's quality of life in Kenya. *Plos Neglected Tropical Diseases*, 19 (9), e0012606. <https://doi.org/10.1371/journal.pntd.0012606>
52. Emanu, O., Mendesil, E., Woyessa, D., & Tefera, T. (2025). Effects of maize–legume intercropping on soil fertility, fall armyworm and maize stem borers infestation, and maize productivity. *Psyche Journal of Entomology*, 2025 <https://doi.org/10.1155/psyc/7553234>
53. Espitia-Buitrago, P., Cotes Torres, J., Hernández, L., Cardoso, J., Chidawanyika, F., & Jauregui, R. (2025). Enhancing phenotyping accuracy for selection of *Urochloa* spp. tolerant genotypes to Red Spider Mite (*Oligonychus trichardti*). *Grass and Forage Science*, 80 (3) <https://doi.org/10.1111/gfs.70007>
54. Espitia-Buitrago, P., Cotes Torres, J., Hernández, L., Cardoso, J., Chidawanyika, F., & Jauregui, R. (2025). Enhancing Phenotyping Accuracy for Selection of *Urochloa* spp. Tolerant Genotypes to Red Spider Mite (*Oligonychus trichardti*). *Grass and Forage Science*, 80 (3) <https://doi.org/10.1111/gfs.70007>
55. Fetene, G. M., Abro, Z., Getahun, T. D., & Kassie, M. (2025). Impact of feed shortages on livestock and crop production in Ethiopia: Implications for rural poverty reduction. *European Review of Agricultural Economics*, jba006. <https://doi.org/10.1093/erae/jba006>
56. Fiaboe, K. R., Khamis, F. M., Cheseto, X., Yusuf, A. A., & Torto, B. (2025). Nanosilica supplementation in tomato increases oviposition on stems and caterpillar mortality in the tomato pinworm. *Proceedings of the National Academy of Sciences*, 122(13), e2427314122. <https://doi.org/10.1073/pnas.2427314122>
57. Fite, T., Devriese, H., Kulaneck, D., Skejo, J., Kasalo, N., Misganaw, M., Tefera, T., Villinger, J., & Husemann, M. (2025). Tetrigidae of Ethiopia: First Species Delimitation via DNA Barcoding and Description of Three New Species †. *Taxonomy*, 5 (3) <https://doi.org/10.3390/taxonomy5030049>
58. Fürstenau, B., Nyasembe, V., Mokaya, H., Kirwa, H., Guerrero, A., & Torto, B. (2025). Behavioral and physiological insights into cross-stage interactions in the desert locust. *Scientific Reports*, 15 (1) <https://doi.org/10.1038/s41598-025-08853-y>
59. Gebreyes, B., Teka, T., Tola, Y., Tamiru, M., & Kiatoko, N. (2025). The Physicochemical Properties, Biochemical Makeup, and Health Benefits of Honey Produced From Stingless Bees (Apidae: Meliponini). *Journal of Food Quality*, 2025 (1) <https://doi.org/10.1155/jfq/7570525>
60. Getange, D., Mukaratirwa, S., Bargul, J. L., Khogali, R., Ng'ela, J., Kabii, J., Masiga, D. K., & Villinger, J. (2025). Molecular characterisation of tick-borne pathogens in cattle in Kenya: insights from blood, ticks, and skin swab analyses. *BMC Veterinary Research*, 21(1), 552. <https://doi.org/10.1186/s12917-025-05014-1>
61. Getange, D., Mukaratirwa, S., Bargul, J., Khogali, R., Ng'ela, J., Kabii, J., Masiga, D., & Villinger, J. (2025). Molecular characterisation of tick-borne pathogens in cattle in kenya: insights from blood, ticks, and skin swab analyses. *BMC Veterinary Research*, 21 <https://doi.org/10.1186/s12917-025-05014-1>
62. Githumbi, M., Gitari, H., Beesigamukama, D., Sow, S., & Tanga, C. (2025). Sugarcane production in Sub-Saharan Africa: Historical trends, sustainability challenges, and the emerging role of frass fertilizer. *Sugar Tech* <https://doi.org/10.1007/s12355-025-01700-4>



63. Gómez-Brandón, M., Beesigamukama, D., Probst, M., Klammsteiner, T., Su, J., Zhu, Y., & Tanga, C. (2025). Microbial composition and bioremediation in frass fertilizers from insect-based agri-food waste valorization. *Journal of Environmental Management*, 386 <https://doi.org/10.1016/j.jenvman.2025.125774>
64. Gontijo, L., Torres, J., Abram, P., Alfaro-Tapia, A., Arredondo-Bernal, H., Biondi, A., Cloyd, R., Costamagna, A., Desneux, N., D'Ottavio, M., Furlong, M., Greco, N., Labbe, R., Hill, M., Lavandero, B., Li, T., Lomeli-Flores, J., Lucas, E., Messelink, G., Rocca, M., Rodriguez-Garcia, M., Parra, J., Peñalver-Cruz, A., Sokame, B., Thackeray, S., Urbaneja, A., Vargas, G., Zalucki, M., & Zang, L. (2025). Insect biological control: a global perspective. *Entomologia Generalis*, 45 (4), 879-904. <https://doi.org/10.1127/entomologia/3237>
65. Halliday, K., Kepha, S., Legge, H., Allen, E., Dreibelbis, R., Elson, L., Kakoi, B., Mcharo, C., Muli, S., Mwongeli, J., Njomo, D., Njoroge, M., Ochwal, V., Oswald, W., Rono, M., Safari, T., Filinger, U., Kaluli, J., Mwandawiro, C., & Pullan, R. (2025). Evaluating impacts of improved flooring on enteric and parasitic infections in rural households in Kenya: study protocol for a cluster-randomised controlled trial. *BMJ Open*, 15 (6) <https://doi.org/10.1136/bmjopen-2024-090464>
66. Hervé, M. K., Calice, M. D., Dzepe, D., Rousseau, ., Djouaka, F., Chia, S. Y., Efole, T., & Ndindeng, S. A. (2025). Black soldier fly (*Hermetia illucens*) larvae improve growth performance and flesh quality of African catfish (*Clarias gariepinus*). *Discover Animals* 2(1), 1–18. <https://doi.org/10.1007/S44338-024-00045-8>
67. Hervé, M., Lionel, G., Serge, N., Daniel, D., Chia, S., Raphael, K., Augustave, K., Rousseau, D., & Ndindeng, S. (2025). Pretreatment methods for organic waste management as feed for black soldier fly. *Cleaner Waste Systems*, 12. <https://doi.org/10.1016/j.clwas.2025.100365>
68. Ibrahim, E., Odindi, J., Wamalwa, M., & Tonnang, H. (2025). Spatio-temporal dynamics of malaria vector niche overlaps in Africa. *Ecological Informatics*, 89. <https://doi.org/10.1016/j.ecoinf.2025.103151>
69. Irungu, F., Tanga, C., Ndiritu, F., Mathenge, S., & Mahungu, S. (2025). Postharvest exposure to magnetic fields influences the activity and quantity of antioxidants in potatoes during storage. *Food and Bioprocess Technology*. <https://doi.org/10.1007/s11947-025-04027-w>
70. Iyaniwura, S., Han, Q., Yong, N., Rutayisire, G., Adom-Konadu, A., Mbah, O., Tchouassi, D., Badu, K., & Kong, J. (2025). Regional variation and epidemiological insights in malaria underestimation in Cameroon. *Infectious Disease Modelling*, 10 (4), 1103-1115. <https://doi.org/10.1016/j.idm.2025.05.006>
71. Jalloh, A., Uyi, O., Chitturi, A., Basu, S., Mutiso, J., Perier, J., Ejomah, A., Owolanke, T., Mutyambai, D., & Toews, M. (2025). Harnessing natural enemies for sustainable management of *Bemisia tabaci*: a review of the role of predators, parasitoids and entomopathogens. *Frontiers in Agronomy*, 7 <https://doi.org/10.3389/fagro.2025.1684672>
72. Kagehi, N., Beesigamukama, D., Tanga, C., Ngugi, M., Subramanian, S., & Khamis, F. (2025). Contribution of different frass fertilizer products on enhanced growth, yield and nutrient quality of Broccoli [*Brassica oleracea*]. *Frontiers in Plant Science*, 16 <https://doi.org/10.3389/fpls.2025.1613814>
73. Kanazoe, I. W., Noiset, P., Nombé, I., Héger, M., Salmon, C., Nkoba, K., & Vereecken, N. J. (2024). Compositional profile of honeys from stingless bees and honeybee honey from a West African country using ¹H NMR spectroscopy. *ACS Food Science and Technology*. <https://doi.org/10.1021/acsfoodscitech.4c00718>
74. Katchali, M., Richard, E., Tonnang, H. E. Z., Tanga, C. M., Beesigamukama, D., & Senagi, K. (2025). Mathematical and computational modeling for organic and insect frass fertilizer production: A systematic review. *PLOS ONE*, 20(1), e0292418. <https://doi.org/10.1371/JOURNAL.PONE.0292418>
75. Kazeem, S., Zwolińska, A., Mulema, J., Ogunfunmilayo, A., Salihu, S., Nwogwugwu, J., Ajene, I., Ogunsola, J., Adediji, A., Oduwaye, O., Kra, K., Jibrin, M., & Wei, W. (2025). Status and distribution of diseases caused by phytoplasmas in Africa. *Microorganisms*, 13 (6). <https://doi.org/10.3390/microorganisms13061229>
76. Kebaso, F., Diallo, S., Kibet, C., Hashim, S., Makwatta, J. O., Getahun, M., Getange, D., Entfellner, J.-B. D., & Masiga, D. (2025). De novo genome assembly, annotation, and characterization of chemosensory genes in the camel ked (*Hippobosca camelina*). *BMC Genomics*, 26(1), 668. <https://doi.org/10.1186/s12864-025-11833-1>
77. Kebaso, F., Kibet, C., Makwatta, J. O., Getange, D., Diallo, S., Hashim, S., Entfellner, J.-B. D., & Masiga, D. (2025). Data of the study: De Novo genome assembly, annotation, and characterization of chemosensory genes in the camel ked (*Hippobosca camelina*). *BMC Research Notes*, 18(1), 510. <https://doi.org/10.1186/s13104-025-07561-0>
78. Kepha, S., Legge, H., Halliday, K. E., Ochwal, V., Elson, L., Mwongeli, J., Oswald, W. E., Kakoi, B., Wambua, J., Mwandawiro, C., Fillinger, U., Pullan, R., & Njomo, D. (2025). Better floors, better health: A



- theory of change for an improved household flooring intervention in rural communities in Kwale and Bungoma counties, Kenya. *BMC Public Health*, 25(1). <https://doi.org/10.1186/s12889-025-21469-1>
79. Khan, A., Carter, R., Mpamhanga, C. D., Masiga, D., Channumsin, M., Ciosi, M., Manangwa, O., Mramba, F., Ijaz, U. Z., Auty, H., & Mable, B. K. (2025). Swatting flies: Biting insects as non-invasive samplers for mammalian population genomics. *Molecular Ecology*, e17661. <https://doi.org/10.1111/MEC.17661>
 80. Khogali, R., Bastos, A., Getange, D., Bargul, J. L., Kalayou, S., Ongeso, N., Verhoeven, J. T. P., Kabii, J., Ngila, J., Masiga, D., & Villinger, J. (2025). Exploring the microbiomes of camel ticks to infer vector competence: Insights from tissue-level symbiont-pathogen relationships. *Scientific Reports*, 15(1), 5574. <https://doi.org/10.1038/s41598-024-81313-1>
 81. Khogali, R., Getange, D., Bastos, A., Masiga, D., & Villinger, J. (2025). Extraction of saliva, haemolymph, salivary glands, and midgut from individual ticks (Acari: Ixodidae). *Journal of Visualized Experiments (JoVE)*, (224), e68952. <https://doi.org/10.3791/68952>
 82. Kiboi, M., Bautze, D., Matheri, F., Riar, A., & Fliessbach, A. (2025). Maize yield stability under organic and conventional farming systems in sub-humid agro-ecozones of Central Kenya. *European Journal of Agronomy*, 170 <https://doi.org/10.1016/j.eja.2025.127746>
 83. Kimuli, P., Beesigamukama, D., Wambua, J., Sokame, B., Tanga, C., Chidawanyika, F., Subramanian, S., & Mutiyambai, D. (2025). Do rates matter? Validation of insect frass fertilizer rates in a vegetable intensified push-pull technology for optimal sustainable production. *Frontiers in Agronomy*, 7 <https://doi.org/10.3389/fagro.2025.1716663>
 84. Kirui, E. C., Kidoido, M. M., Akutse, K. S., Wanyama, R., Boni, S. B., Dubois, T., Dinssa, F. F., & Mutiyambai, D. M. (2025). Factors influencing the adoption of agroecological vegetable cropping systems by smallholder farmers in Tanzania. *Sustainability* 17(3), 1148. <https://doi.org/10.3390/SU17031148>
 85. Koka, H., Langat, S., Mulwa, F., Mutisia, J., Owaka, S., Sifuna, M., Ongus, J. R., Lutomiah, J., & Sang, R. (2025). Combining morphological and molecular tools can enhance tick species identification for improved tick-borne disease surveillance among pastoral communities in Kenya. *Vector-Borne and Zoonotic Diseases*. <https://doi.org/10.1089/vbz.2024.0034>
 86. Konan, Y., Dieudonné Ta, B., Berté, D., Coulibaly, B., Coulibaly, K., Egnankon, N., Diarrassouba, F., Djabo, K., Watier-Grillot, S., Demoncheaux, J., De Marie Kouadio, K., N'Dri, L., Solano, P., Ravel, S., Adingra, G., Barreaux, A., Ségard, A., Kaba, D., Jamonneau, V., De Meeûs, T., & Djohan, V. (2025). Challenges and lessons from a vector control campaign targeting *Glossina palpalis palpalis* in an isolated protected forest area in Abidjan, Côte d'Ivoire. *Parasite*, 32. <https://doi.org/10.1051/parasite/2025017>
 87. Kulohoma, B., & Ng'eno, I. (2025). NOMAD: metagenomic characterisation of the viral pathogen composition in outbreaks of non-malaria acute febrile illness cases. *Open Research Africa*, 5 <https://openresearchafrica.org/articles/5-24>
 88. Kyalo, H., Tonnang, H., Egonyu, J., Olukuru, J., Tanga, C., & Senagi, K. (2025). Automatic synthesis of insects bioacoustics using machine learning: A systematic review. *International Journal of Tropical Insect Science* 1–20. <https://doi.org/10.1007/S42690-024-01406-2>
 89. Lambin, E. F., Anugwom, E., Prist, P. R., Agha, S., White, S., Randolph, D. G., Khan, S. A., Fèvre, E. M., Gottdenker, N., & Murray, K. (2025). Disturbance and disease. *One Earth*, 8(4). <https://doi.org/10.1016/j.oneear.2025.101280>
 90. Leyton, M. S., Lattorff, H. M. G., Kiatoko, N., & Requier, F. (2025). Climate effects on honey bees can be mitigated by beekeeping management in Kenya. *Journal of Environmental Management*, 374, 123879. <https://doi.org/10.1016/j.jenvman.2024.123879>
 91. Liepa, A., Thiel, M., Taubenböck, H., Klein, D., Steffan-Dewenter, I., Peters, M. K., Schönbrodt-Stitt, S., Otte, I., Landmann, T., Khan, Z. R., Obondo, M. O., Chidawanyika, F., Martin, E. A., & Ullmann, T. (2025). Earth observations reveal impacts of climate variability on maize cropping systems in sub-Saharan Africa. *GIScience & Remote Sensing*. <https://www.tandfonline.com/doi/abs/10.1080/15481603.2025.2476248>
 92. Luan, X., Zhang, X., Wei, Z., Guo, J., Obiero, G., Getahun, M., Yan, Q., Zhang, J., & Dong, S. (2025). Odorant receptor 75 is essential for attractive response to plant volatile p-anisaldehyde in Western flower thrips. *Pesticide Biochemistry and Physiology*, 211. <https://doi.org/10.1016/j.pestbp.2025.106421>
 93. Ma, X., Yan, J., Su, G., Khamis, F., Hategekiman, A., & Gao, Y. (2025). 4-Ethylacetophenone from potato plants repels *Phthorimaea operculella* and inhibits Oviposition: A Sustainable Management Strategy. *Insects*, 16 (4). <https://doi.org/10.3390/insects16040403>
 94. Magondu, E., Njogu, L., Ouko, K., Mboya, J., Muthoka, M., Yossa, R., Munguti, J., Opiyo, M., Meenakshisundaram, M., Tanga, C., & Obiero, K. (2025). A PESTEL-SWOT matrix analysis of sustainable



- aquafeed sector: A case of Kenya's fish feed Sector. *Reviews in Aquaculture*, 17 (4). <https://doi.org/10.1111/raq.70081>
95. Maina, A., Osuga, I., Munga, L., Munguti, J., Sevan, S., Barwani, D., Meenakshisundaram, M., Mboya, J., Bourou, S., Zachariadi, A., Zachariadis, V., Yossa, R., Beesigamukama, D., Ochieng, B., Yusuf, A., Chia, S., Liti, D., & Tanga, C. (2025). Emerging insect-based aquafeed for sustainable African catfish production. *Plos One*, 20 (11 November) <https://doi.org/10.1371/journal.pone.0335422>
 96. Maina, T., Shisia, A., Gichubi, J., Bargul, J., Herren, J., & Bukhari, T. (2025). Maximizing horizontal transmission through mating: increased mating frequency and mating competitiveness associated with *Microsporidia* MB-infected *Anopheles arabiensis* males. *Malaria Journal*, 24 (1). <https://doi.org/10.1186/s12936-025-05354-1>
 97. Maiyo, N., Okoth, M., Abong, G., Ochieng, B., Khamis, F., Kababu, M., & Tanga, C. (2025). Processed Amaranth and Finger Millet enriched with cricket flour influence the functionality, microbial quality, shelf life, and consumer preference of the porridge products. *Journal of Food Processing and Preservation*, 2025 (1) <https://doi.org/10.1155/jfpp/8877620>
 98. Malou, T., Parisey, N., Adamczyk-Chauvat, K., Vergu, E., Laroche, B., Calatayud, P. A., Lucas, P., & Labarthe, S. (2025). Biology-informed inverse problems for insect pests detection using pheromone sensors. *Peer Community Journal*, 5. <https://doi.org/10.24072/pcjournal.520>
 99. Mangole, C. D., Maina, C. M., Mulungu, K., Tschopp, M., Harari, N., Suresh, R., & Kassie, M. (2025). Adoption of sustainable land and water management practices and their impact on crop productivity among smallholder farmers in sub-Saharan Africa. *Land Use Policy*, 153, 107533. <https://doi.org/10.1016/j.landusepol.2025.107533>
 100. Mangole, C., Mulungu, K., Kaghoma, C., & Kassie, M. (2025). The direct and indirect effects of mobile phone ownership on maize yields in Tanzania. *Journal of Agricultural and Applied Economics*. <https://doi.org/10.1017/aae.2025.10010>
 101. Mangole, C., Nguetzet, P., Feleke, S., Manyong, V., Christian, K., Bamba, Z., & Abdoulaye, T. (2025). Is youth's engagement in agribusiness an opportunity or a necessity? A closer look at the situation in South Kivu, Eastern Democratic Republic of the Congo. *Agribusiness* <https://doi.org/10.1002/agr.22065>
 102. Mbuta, D., Sokame, B., Khamis, F., & Akutse, K. (2025). Know where you go: Infestation dynamics and potential distribution of two bed bug species (Hemiptera: Cimicidae) in Africa. *Insects*, 16 (4). <https://doi.org/10.3390/insects16040395>
 103. Meenakshisundaram, M., Mboya, J. B., Sugantham, F., Panigrahi, A., Gamba, J. L., Subramanian, S., Chia, S. Y., Beesigamukama, D., Munguti, J., Ogello, E., Yossa, R., & Tanga, C. M. (2025). Synergistic microbial interactions between algae and bacteria augment growth and immune performance in Red Tilapia (*Oreochromis* sp.). *Aquaculture Journal* 2025, Vol. 5, Page 12, 5(3), 12. <https://doi.org/10.3390/AQUACJ5030012>
 104. Meenakshisundaram, M., Shanmugam, S., Mboya, J., Sugantham, F., Obiero, K., Munguti, J., Ekesi, S., Subramanian, S., Chia, S., Beesigamukama, D., Yossa, R., & Tanga, C. (2025). Mapping global research on mycotoxins in aquafeed from scientometric and critical perspectives. *Frontiers in Sustainable Food Systems*, 9. <https://doi.org/10.3389/fsufs.2025.1609489>
 105. Mfangnia, C., Tonnang, H., Tsanou, B., & Herren, J. (2025). An eco-epidemiological model for malaria with *Microsporidia* MB as bio-control agent. *Modeling Earth Systems and Environment*, 11 (3) <https://doi.org/10.1007/s40808-025-02322-1>
 106. Misango, V., Nzuma, J., Irungu, P., & Kassie, M. (2025). Impact of adoption of fall armyworm and stemborer pest control practices on maize yields in Rwanda: A multinomial endogenous switching regression approach. *Journal of Agriculture and Food Research*, 22. <https://doi.org/10.1016/j.jafr.2025.102008>
 107. Mongare, R., Gachoki, S., Adam, E., Kimathi, E., Barreaux, A., Cecchi, G., Onyango, S., Ngari, N., Masiga, D., & Abdel-Rahman, E. (2025). Species distribution modeling to predict tsetse fly (*Glossina* spp.) habitat suitability in Kenya. *Parasites Vectors*, 18 (1), 378. <https://doi.org/10.1186/s13071-025-06938-1>
 108. Morales, X. C., Sobhy, I. S., Cheruiyot, D., Midega, C. A. O., Bruce, T. J. A., Khan, Z. R., & Tamiru, A. (2025). Acceptability and suitability of some Poaceae plants for fall armyworm feeding and oviposition. *CABI Agriculture and Bioscience*, 6 (1) <https://doi.org/10.1079/ab.2025.0082>
 109. Motisi, N., Heuclin, B., Kimani, E. G., Bieysse, D., Dubois, T., Sokame, B. M., & Avelino, J. (2025). Temperature and CO₂ Interactions Reshape *Hemileia vastatrix* Urediniospore Germination *in vitro*. *Plant Disease*, PDIS-04-25-0845-RE. <https://doi.org/10.1094/PDIS-04-25-0845-RE>
 110. Moustapha, L., Mukhtar, M., Sanda, A., Adamu, S., Aliyu, Y., Einoi, H., Maigari, M., Okeke, P., Nwele, D., Obembe, A., Nwangwu, U., Herren, J., & Ibrahim, S. (2025). Spatial Distribution of *Microsporidia* MB Along



- Clinal Gradient and the Impact of Its Infection on Pyrethroid Resistance in *Anopheles gambiae* s.l. Mosquitoes from Nigeria and Niger Republic. *Parasitologia*, 5 (3). <https://doi.org/10.3390/parasitologia5030031>
111. Mubayiwa, M., Machekano, H., Mvumi, B. M., Opio, W. A., Segaiso, B., Chidawanyika, F., & Nyamukondiwa, C. (2025). Thermal performance drifts between the egg parasitoid *Telenomus remus* and the fall armyworm may threaten the efficacy of biological control under climate change. *Entomologia Experimentalis et Applicata*, 173(5), 338–350. <https://doi.org/10.1111/eea.13557>
 112. Muchina, P., Kinyua, J., Khamis, F., Tanga, C., Gebreyesus, G., Cai, Z., & Sahana, G. (2025). The genomic landscape of *Hermetia illucens*: Exploring the potential of the black soldier fly through molecular insights. *Journal of Insects as Food and Feed*. <https://doi.org/10.1163/23524588-bja10200>
 113. Muborakeye, M. C., Namikoye, E. S., Khamis, F. M., Wanjohi, W., & Akutse, K. S. (2025). Effective homemade V8 juice formulation as alternative suitable medium for culturing *Phytophthora infestans*. *Discover Applied Sciences*, 7(10), 1–10. <https://doi.org/10.1007/s42452-025-07495-z>
 114. Muhorakeye, M., Khamis, F., Namikoye, E., & Akutse, K. (2025). *Fusarium equiseti* pathogen of potato in Kenya and its potential in vitro biocontrol using fungal endophytes. *Pathogens*, 14 <https://doi.org/10.3390/pathogens14121239>
 115. Muta, J., Bargul, J., Makwatta, J., Ngatia, E., Tawich, S., Masiga, D., & Getahun, M. (2025). Stomoxys flies (Diptera, Muscidae) are competent vectors of *Trypanosoma evansi*, *Trypanosoma vivax*, and other livestock hemopathogens. *PLoS Pathogens*, 21 (5). <https://doi.org/10.1371/journal.ppat.1012570>
 116. Mukwevho, L., Ndlovu, M., & Chidawanyika, F. (2025). Fire and mammal herbivory on arthropods in the protected savannas: A systematic review. *Koedoe*, 67 (1). <https://doi.org/10.4102/koedoe.v67i1.1835>
 117. Mulungu, K. (2025). Gender perspectives on mobile phone ownership and use: a case study of smallholder farmers in Uganda. *Gender Technology and Development*, 29 (3), 384–397. <https://doi.org/10.1080/09718524.2025.2557649>
 118. Mulungu, K., Kassie, M., & Tschopp, M. (2025). The role of information and communication technologies-based extension in agriculture: application, opportunities and challenges. *Information Technology for Development*, 1–30. <https://doi.org/10.1080/02681102.2025.2456232>
 119. Munene, A., Bebor, L., Mwangi, P., Mbindyo, C., Ndeto, K., Gathenya, C., Ndimbu, G., & Maingi, J. (2025). Prevalence of *Escherichia coli* and *Enterococcus* in poultry farms in Kiambu county, Kenya: A One Health approach. *Pan African Medical Journal One Health*, 18 <https://doi.org/10.11604/pamj-oh.2025.18.14.46978>
 120. Munguti, J., Muthoka, M., Mboya, J. B., Kyule, D., Meenakshisundaram, M., & Tanga, C. M. (2025). Unraveling the potential of black soldier fly larvae as a sustainable protein source for Nile tilapia production in diverse aquaculture systems. *Aquaculture Nutrition*, 2025(1), 3598843. <https://doi.org/10.1155/ANU/3598843>
 121. Mutai, J., Medvecky, B., Vanek, S., Ojiem, J., Bolo, P., Kihara, J., & Fonte, S. (2025). Long-term cropping system and manure effects on soil health parameters and associated soil-borne pathogens. *Soil Science Society of America Journal*, 89 (3) <https://doi.org/10.1002/saj2.70076>
 122. Mutyambai, D., Mutua, J., Jalloh, A., Beesigamukama, D., Kessler, A., Subramanian, S., Dubois, T., Ekesi, S., & Tanga, C. (2025). Insect frass fertilizer upregulates maize defence genes and resistance against an invasive herbivore pest. *Scientific Reports*, 15 (1). <https://doi.org/10.1038/s41598-025-14883-3>
 123. Mwanza, S., Mudalungu, C., Kimani, N., Mokaya, H., Ochieng, B., Juma, S., & Tanga, C. (2025). Nutritional and antioxidant properties of two species of edible scarab beetles (*Cetonia aurata* and *Oryctes rhinoceros*). *Journal of Insects as Food and Feed*, 11 (2), 353–372. <https://doi.org/10.1163/23524588-00001009>
 124. Mwanza, S., Mudalungu, C., Makwatta, J., Kabii, J., Kimani, N., & Tanga, C. (2025). Elucidating the functions of gut microbiota from two edible dung beetle species: Implications for waste management and food industry. *Plos One*, 20 (6 June). <https://doi.org/10.1371/journal.pone.0325756>
 125. Nakakaawa, L., Gbala, I. D., Bargul, J. L., Cheseto, X., & Wesonga, J. M. (2025). Therapeutic potential of *Brassica carinata* microgreens extract in alleviating symptoms of type 2 diabetes in Wistar rats. *Food Science & Nutrition*, 13(1), e4635. <https://doi.org/10.1002/FSN3.4635>
 126. Nang'oni, M., Kasina, M., Karanja, R., Guantai, M., Kinyanjui, R., Omuse, E., Lattorff, M., Abdel-Rahman, E., Adam, M., Mohamed, S., & Dubois, T. (2025). Annual diversity of honey bee pollen sources in two pumpkin growing landscapes, Machakos County, Kenya. *Journal of Pollination Ecology*, 38, 97–109. [https://doi.org/10.26786/1920-7603\(2025\)809](https://doi.org/10.26786/1920-7603(2025)809)
 127. Nazziwa, W., Neema, S., Elliot, A., Kaboko, S., Ecuru, J., & Mwaka, E. (2025). How community members in Uganda perceive controlled human infection studies. *Research Ethics*. <https://doi.org/10.1177/17470161251355985>



128. Nembu, R. T., Soh Wenda, B. D., Mube, H. K., Napi, H. W., Chia, S. Y., Ndindeng, S. A., Kamga, R. B., & Fon, D. E. (2025). Do behavioral attitudes of livestock farmers in Cameroon influence the adoption of insect-based feed? An application of the theory of planned behavior. *Food and Humanity*, 4, 100558. <https://doi.org/10.1016/j.foohum.2025.100558>
129. Nganso, B., Agboka, K., Atagong, S., Topé, S., Massing, T., Landmann, T., Sergan, S., Mwiza, W., Odera, F., Piiru, E., Otieno-Ayayo, Z., Soroker, V., & Guimapi, R. (2025). A Geospatial atlas of honey bee forage plants and their distribution patterns in Africa and beyond. *Scientific Reports*, 15 <https://doi.org/10.1038/s41598-025-17240-6>
130. Nganso, B., Ayalew, W., Wubie, A., Assefa, F., Belayhun, L., Ndungu, N., Toroitich, D., Otieno-Ayayo, Z., Wambua, M., Oyieyo, Y., Elie, N., Sikirou, R., Idrissou, S., Mwiza, W., Turner, S., Bobadoye, B., Fameni, S., Gaboe, S., Agbodzavu, M., Mafwila, P., Tasse Taboue, G., Kimathi, E., Henri, T., Niassy, S., Fonkou, S., Pirk, C., Gray, A., Soroker, V., Brodschneider, R. & Subramanian, S. (2025). Honey bee colony losses and causes during the active beekeeping season 2022/2023 in nine Sub-Saharan African countries. *PLoS ONE*, 20. <https://doi.org/10.1371/journal.pone.0322489>
131. Ninsin, K., Billah, M., Boateng, B., Osei-Owusu, J., Ablormeti, F., Opuni-Basoa, S., Dofuor, A., Edusei, G., Baleba, S., & Aidoo, O. (2025). Morphometric characterization of invasive *Diaphorina citri* infesting citrus and orange jasmine in Ghana. *Cogent Food and Agriculture*, 11 (1) <https://doi.org/10.1080/23311932.2025.2522985>
132. Njowe, K., Duodu, K., & Emmambux, M. (2025). Techno-functional properties of protein-rich flours from different species of edible insects as affected by drying methods. *Food Research International*, 221. <https://doi.org/10.1016/j.foodres.2025.117224>
133. Noiset, P., Héger, M., Salmon, C., Kwapong, P., Combey, R., Thevan, K., Warrit, N., Rojas-Oropeza, M., Cabirol, N., Zaragoza-Trello, C., Rasmussen, C., Nkoba, K., & Vereecken, N. J. (2025). Ecological and evolutionary drivers of stingless bee honey variation at the global scale. *Science of The Total Environment*, 969, 178945. <https://doi.org/10.1016/j.scitotenv.2025.178945>
134. Ntirenghanya, E., Gofitshu, M., Sokame, B., Assefa, Y., & Nsengimana, V. (2025). Pest status and dynamic of sugarcane stemborer (*Eldana saccharina*) in sugarcane plantations of Nyabugogo tropical Wetland, Rwanda. *International Journal of Tropical Insect Science* <https://doi.org/10.1007/s42690-025-01690-6>
135. Nuambote-Yobila, O., Bruce, A., Makumbi, D., Ogola, G., Marangu, C., Beyene, Y., Mahungu, N., Prasanna, B., Marion-Poll, F., & Calatayud, P. (2025). Combining ability for resistance to fall armyworm, *Spodoptera frugiperda* in tropical maize inbred lines. *Phytoparasitica*, 53 (3). <https://doi.org/10.1007/s12600-025-01259-6>
136. Nyamamba, D., Karanja, J., & Akutse, K. (2025). Friends or betrayers? Beneficial effects of endophytic colonization of *Amaranthus dubius* on the reproductive traits of *Spoladea recurvalis* (Lepidoptera: Crambidae). *Arthropod Plant Interactions*, 19 (6) <https://doi.org/10.1007/s11829-025-10212-7>
137. Odermatt, D. M., Chidawanyika, F., Mutiyambai, D. M., Schmid, B., Domeignoz Horta, L. A., Onjura, C. O., Tamiru, A., & Schuman, M. C. (2025). *Desmodium* volatiles in 'push-pull' cropping systems and protection against the fall armyworm, *Spodoptera frugiperda*. *ELife*, 13. <https://doi.org/10.7554/ELIFE.100981>
138. Odermatt, D. M., Chidawanyika, F., Mutiyambai, D. M., Schmid, B., Domeignoz Horta, L. A., Onjura, C. O., Tamiru, A., & Schuman, M. C. (2025). *Desmodium* volatiles in 'push-pull' cropping systems and protection against the fall armyworm, *Spodoptera frugiperda*. *eLife*, 13 <https://doi.org/10.7554/eLife.100981>
139. Ogol, B., Omondi, E., Olukuru, J., Muriithi, B., & Senagi, K. (2025). Predicting food prices in Kenya using machine learning: a hybrid model approach with XGBoost and gradient boosting. *Frontiers in Artificial Intelligence*, 8 <https://doi.org/10.3389/frai.2025.1661989>
140. Ogola, E., Ochwoto, M., Chiuya, T., Bloom, M., & Tchouassi, D. (2025). Evaluating the zoonotic spectrum of sandfly-borne phleboviruses, Africa. *Current Opinion in Virology*, 73 <https://doi.org/10.1016/j.coviro.2025.101494>
141. Okal, M., Akinyi, S., & Santer, R. (2025). Developing targets to control multiple pest fly species: violet polyester targets effectively attract tsetse (Diptera: Glossinidae), stable flies (Diptera: Muscidae), and house flies (Diptera: Muscidae). *Journal of Economic Entomology*, 118 (4), 1993-2000. <https://doi.org/10.1093/jee/toaf113>
142. Oke, A., Dako, O., N'Goran, M., Samita, N., Sanon, A., Abdelgader, H., Kimathi, E., Omuse, E., Dadji, G., Moise, A., Sokame, B., Pitan, F., Ajayi, F., Otieno-Ayayo, Z., Kioko, E., Munyua, L., & Niassy, S. (2025). Nexus of climate change, insects, and human livelihood: Proceedings of the 25th AAIS meeting and scientific conference in Lusaka, Zambia. *International Journal of Tropical Insect Science*, 45 (6), 2449-2453. <https://doi.org/10.1007/s42690-025-01689-z>



143. Okello, C., Wambiji, N., Kihia, S., Ongeso, N., Mwamburi, S., Wandera, A., Demory, M., & Owuor, M. (2025). Harnessing eDNA metabarcoding to monitor species diversity in restoration sites: Insights from Laikipia, Kenya. *Environmental DNA*, 7 (3). <https://doi.org/10.1002/edn3.70110>
144. Okoma, R., Omuse, E., Mutiyambai, D., Beesigamukama, D., Murongo, M., Subramanian, S., & Chidawanyika, F. (2025). An assessment of vegetable production constraints, trait preferences and willingness to adopt sustainable intensification options in Kenya and Uganda. *Frontiers in Sustainable Food Systems*, 9 <https://doi.org/10.3389/fsufs.2025.1471333>
145. Ombura, F., Malele, I., Abd-Alla, A., Akutse, K., Ajene, I., & Khamis, F. (2025). Potential of entomopathogenic fungi for *Glossina austeni* control: insights into microbiome alterations and implications on sustainable management of the pest. *Insect Science*. <https://doi.org/10.1111/1744-7917.70052>
146. Omuse, E. R., Machekano, H., Sokame, B. M., Mutiyambai, D. M., Dubois, T., Subramanian, S., & Chidawanyika, F. (2025). One health interventions and challenges under rural African smallholder farmer settings: A scoping review. *One Health*, 20, 100959. <https://doi.org/10.1016/j.ONEHLT.2024.100959>
147. Onjura, C. O., Peter, E., Asudi, G. O., Gicheru, M. M., Mohamed, S. A., Bruce, T. J. A., & Tamiru, A. (2025). Differential responses of the egg-larval parasitoid *Chelonus Bifoveolatus* to fall armyworm-induced and constitutive volatiles of diverse maize genotypes. *Journal of Chemical Ecology*, 51(2), 34. <https://doi.org/10.1007/s10886-025-01585-3>
148. Onyango, L., Beesigamukama, D., Muthomi, J., Kimenju, J., Subramanian, S., Kelemu, S., & Tanga, C. (2025). Trends in invasive root maggots (Diptera: Anthomyiidae) and prospects of frass fertilizer as a biorational control strategy. *Crop Protection*, 197. <https://doi.org/10.1016/j.cropro.2025.107330>
149. Opio, B., Mutiyambai, D. M., Cheseto, X., Omuse, E. R., Jalloh, A. A., Mumo, N. N., Schuman, M. C., & Chidawanyika, F. (2025). Push-pull cropping system soil legacies enhance glucosinolate production and subsequent defense against Diamondback moth (*Plutella xylostella*) larvae in Kale (*Brassica oleracea*). *Discover Plants*, 2(1), 346. <https://doi.org/10.1007/s44372-025-00420-z>
150. Orubuloye, O. Y., Tchouassi, D. P., Yusuf, A. A., Pirk, C. W. W., Masiga, D. K., Kariuki, E., & Torto, B. (2025). Machine learning predicts non-preferred and preferred vertebrate hosts of tsetse flies (*Glossina* spp.) based on skin volatile emission profiles. *Journal of Chemical Ecology*, 51(2), 30. <https://doi.org/10.1007/s10886-025-01582-6>
151. Osalla, J., Gouagna, L., Rotich, G., Nzilani, M., Safari, P., Senagi, K., Mutuku, F., Torto, B., & Tchouassi, D. (2025). Longitudinal surveillance of *Aedes aegypti* (Diptera: Culicidae) in urban coastal Kenya: population dynamics, blood feeding frequency and dengue virus infection rates. *Scientific Reports*, 15 (1). <https://doi.org/10.1038/s41598-025-05408-z>
152. Osman, M. A. A., Abdel-Rahman, E. M., Onono, J. O., Elhag, M. M., Olaka, L. A., & Tonnang, H. E. Z. (2025). Integrating satellite remote sensing data and small-scale farmers' perceptions to determine land use/land cover changes and their driving factors in Gedaref state, Sudan. *Environment, Development and Sustainability* 2024, 1–27. <https://doi.org/10.1007/S10668-024-05689-W>
153. Otieno, F., Barreaux, P., Belvinos, A., Makbulu, E., Onchuru, T., Wairimu, A., Omboye, S., King'ori, C., Sokame, B., Nyamache, A., & Herren, J. (2025). The dissemination potential of *Microsporidia* MB in *Anopheles arabiensis* mosquitoes is modulated by temperature. *Scientific Reports*, 15 (1). <https://doi.org/10.1038/s41598-025-07414-7>
154. Otieno, S., M. Nzuma, J., N. Ritho, C., & Muriithi, B. (2025). Impact of adoption of Integrated Pest Management practices on the control of fruit fly infestation among smallholder mango farmers in Kenya. *International Journal of Pest Management* <https://doi.org/10.1080/09670874.2025.2516474>
155. Ouaba, J., Meutchieye, F., Agboka, K., Villinger, J., Souaibou, A., Ondifu Ochieng, D., Tonle, F., Djieto-Lordon, C., Tchuinkam, T., Tonnang, H., & Niassy, S. (2025). Diversity and bio-ecology of edible caterpillars in the bimodal rainforest of Cameroon. *Journal of Insects as Food and Feed*. <https://doi.org/10.1163/23524588-bja10231>
156. Oumer, A. M., Burton, M., & Kassie, M. (2025). Dynamics of multiple sustainable agricultural intensification practices adoption: Application of the intertemporal multivariate probit model. *PLOS ONE*, 20(2), e0314172. <https://doi.org/10.1371/journal.pone.0314172>
157. Oundo, J. W., Hartemink, N., de Jong, M. C. M., Koenraad, C. J. M., Kalayou, S., Masiga, D., & ten Bosch, Q. (2025). Biological control of ticks in domestic environments: Modeling the potential impact of entomopathogenic fungi on the transmission of East Coast fever in cattle. *Ticks and Tick-Borne Diseases*, 16(1), 102435. <https://doi.org/10.1016/j.ttbdis.2024.102435>



158. Ozor, N., Nwakaire, J., Salifu, D., Sagoe, R., Nwobodo, C., Waller, M., & Sutton, S. (2025). An integrated approach to gender equality, diversity, and inclusion in the development of artificial intelligence tools in agriculture and food system in Africa. *AI and Society* <https://doi.org/10.1007/s00146-025-02722-y>
159. Palonen, A., Papach, A., Muturi, M., Weinstein Teixeira, É., Williams, G., Jacobsen, R., Evans, J., Posada-Florez, F., Pirk, C., Lattorff, H., Lawrence, A., Oluseyi, M., Spooner-Hart, R., House, C., Federico, G., Formato, G., & Neumann, P. (2025). Spatiotemporal variation of small hive beetle infestation levels in honeybee host colonies. *Apidologie*, 56 (5) <https://doi.org/10.1007/s13592-025-01206-8>
160. Paweer, M. M. Z., Namikoye, E. S., Nchore, S. B., & Akutse, K. S. (2025). Can fungal endophytes suppress *Trialeurodes vaporariorum* and the transmission of tomato infectious chlorosis and chlorosis viruses in field conditions? *Frontiers in Cellular and Infection Microbiology*, 15, 1470821. <https://doi.org/10.3389/FCIMB.2025.1470821>
161. Pérez-Hedo, M., Hoddle, M., Alferez, F., Batista, L., Beattie, G., Chakravarty, S., Holford, P., Khamis, F., Ajene, I., Manrakhan, A., Fourie, P., Luis, M., Osorio-Hernández, E., Sétamou, M., Tena, A., Yamamoto, P., Wade, T., Zhou, C., Wang, N., Stelinski, L., & Urbaneja, A. (2025). Global strategies to manage huanglongbing (HLB) and its vectors: insights and implications for the Mediterranean region. *Entomologia Generalis*, 45 (1), 1-16. <https://doi.org/10.1127/entomologia/2024/2877>
162. Razakamiamanana, A., Ihsane, O., Héger, M., Aganze Mweze, M., Karanja, R., Randriamalala, J., Rakotondrasoa, O., Russell-Smith, A., Nkoba, K., Warrit, N., & Vereecken, N. (2025). Meliponophagy: New Records Involving Native and Exotic Jumping Spiders (Araneae, Salticidae) Preying Upon Stingless Bees (Apidae, Meliponini) in the Afrotropical Realm. *African Journal of Ecology*, 63 (7) <https://doi.org/10.1111/aje.70110>
163. Rebaudo, F., Legrand, J., & Calatayud, P. A. (2025). Kenyan maize lepidopteran pests and microclimate monitoring dataset from 2021 to 2024. *Data in Brief*, 62, 112006. <https://doi.org/10.1016/J.DIB.2025.112006>
164. Ren, Y., Wu, F., Munawar, A., Li, G., Liu, X., Liu, X., Ding, N., Ju, Z., Akutse, K., Zhou, W., & Zheng, Y. (2025). *Metarhizium anisopliae* as a potential biocontrol agent to suppress the tomato leafminer *Phthorimaea absoluta* in China. *Pest Management Science*. <https://doi.org/10.1002/ps.70155>
165. Salifu, D., Chepkemai, L., Ibrahim, E. A., Nkoba, K., & Tonnang, H. E. Z. (2025). Data augmentation and machine learning algorithms for multi-class imbalanced morphometrics data of stingless bees. *Heliyon*, 11(3), e42214. <https://doi.org/10.1016/j.heliyon.2025.e42214>
166. Senagi, K., Nzilani, M., Omondi, E., Tchouassi, D. P., Landmann, T., Matoke-Muhia, D., Okunga, E., Gesimba, B., Abdel-Rahman, E. M., Maranga, D., Ndungu, J. M., & Masiga, D. (2025). Spatial analytics to elucidate the incubation period and drivers of visceral leishmaniasis: Case of Turkana County in Kenya. *Frontiers in Digital Health*, 7, 1643314. <https://doi.org/10.3389/fdgth.2025.1643314>
167. Shara, S., Garo, G., Khamis, F., Kearsley, E., Ocimati, W., Tefera, T., & Blomme, G. (2025). Experimental confirmation of the leafhopper *Cicadella cosmopolita* as a potential vector of *Xanthomonas vasicola* pv. *musacearum* of enset in Ethiopia. *European Journal of Plant Pathology* <https://doi.org/10.1007/s10658-025-03174-2>
168. Sherrard-Smith, E., Fillinger, U., Tia, J., Winskill, P., Koudou, B., Tchicaya, E., Sanou, A., Okumu, F., Opiyo, M., Majambere, S., Hamlet, A., Charles, G., Lambert, B., & Churcher, T. (2025). Heterogeneous impacts for malaria control from larviciding across villages and considerations for monitoring and evaluation. *Plos Pathogens*, 21 (7 July). <https://doi.org/10.1371/journal.ppat.1013287>
169. Sibhatu, K. T., Tabe-Ojong, M. P. Jr., & Siregar, H. (2025). Nature-based land management practices and yield dynamics in oil palm production: Insights from Indonesian smallholder growers. *Agricultural Economics*. <https://doi.org/10.1111/agec.70018>
170. Sileshi, G., Kuyah, S., Schuman, M., Chidawanyika, F., Muriithi, B., Midega, C., Olagoke, A., Otim, M., Mafongoya, P., & Martin, E. (2025). Opportunities for expansion of push-pull technology as an agroecological and sustainable intensification approach in Africa. *Npj Sustainable Agriculture*, 3 (1) <https://doi.org/10.1038/s44264-025-00069-x>
171. Sisay, B., Nakamura, A., Mihretie, A., Tamiru, A., Weldon, C., & Ashton, L. (2025). Semiochemical-based strategies for sustainable management of the fall armyworm, *Spodoptera frugiperda* (J.E Smith) (Lepidoptera: Noctuidae). *Arthropod Plant Interactions*, 19 <https://doi.org/10.1007/s11829-025-10196-4>
172. Sokame, B. M., Kipkorir, B., Agboka, K. M., Niassy, S., Belayneh, Y., Elkahky, M., & Tonnang, H. E. Z. (2025). A system dynamics model for predicting African armyworm occurrence and population dynamics. *Agriculture, Ecosystems & Environment*, 380, 109378. <https://doi.org/10.1016/J.AGEE.2024.109378>



173. Sokame, B., Tonnang, H., Abdel-Rahman, E., & Villena, O. (2025). System dynamics modelling of temperature effects on stemborer phenology in Kenyan maize ecosystems. *International Journal of Tropical Insect Science* <https://doi.org/10.1007/s42690-025-01666-6>
174. Tanga, C. M., Nzomo, A. M., Ndegwa, P. N., Ekesi, S., Khamis, F. M., Akutse, K. S., Ong'amo, G., Ochieng, B. O., Kababu, M., Beesigamukama, D., Chia, S. Y., Changeh, J., Subramanian, S., Dubois, T., & Kelemu, S. (2025). Desert locust (*Schistocerca gregaria*) flour as an emerging functional ingredient for baking flavorful and nutritious whole wheat bread. *Applied Food Research*, 5(1), 100802. <https://doi.org/10.1016/j.afres.2025.100802>
175. Tantrawatpan, C., Vaisusuk, K., Tanga, C. M., Pilap, W., Bunchom, N., Andrews, R. H., Thanchomnang, T., Maleewong, W., & Saijuntha, W. (2025). Nuclear intron sequence variation of the *Bulinus globosus* Complex (Mollusca: Planorbidae): Implications for molecular systematic analyses. *Biology*, 14(1), 53. <https://doi.org/10.3390/biology14010053>
176. Tonle, F., Tonnang, H., Ndadji, M., Tchendji, M., Nzeukou, A., & Niassy, S. (2025). A novel integrated computational approach for agroecological similarity. *Environmental Modelling and Software*, 191 <https://doi.org/10.1016/j.envsoft.2025.106494>
177. Tonle, F., Tonnang, H., Ndadji, M., Tchendji, M., Nzeukou, A., Senagi, K., & Niassy, S. (2025). Advancing Multivariate Time Series Similarity Assessment: An Integrated Computational Approach. *IEEE Access*. <https://doi.org/10.1109/ACCESS.2025.3584712>
178. Tonnang, H., Tepa-Yotto, G., Sokame, B., Winsou, J., Tamò, M., & Djouaka, R. (2025). Roadmap for mainstreaming integrated pest management (IPM) into a climate smart one-health (CS-OH) framework. *One Health*, 20 <https://doi.org/10.1016/j.onehlt.2025.101084>
179. Trzebny, A., Taylor, A., Herren, J., Björkroth, J., Jedut, S., & Dabert, M. (2025). Microsporidian infection of mosquito larvae changes the host-associated microbiome towards the synthesis of antimicrobial factors. *Parasites and Vectors*, 18. <https://doi.org/10.1186/s13071-025-06813-z>
180. Tulu, D., Aleme, M., Temteme, S., Bogale, A., Shifa, K., Terefe, M., Dechassa, N., Tefera, T., & Mendesil, E. (2025). Cassava, *Manihot esculenta* Crantz Dual Use for Food and Eri-Silkworm (*Samia cynthia ricini* Boisduval) (Lepidoptera: Saturniidae) Rearing. *Psyche Journal of Entomology*, 2025 (1) <https://doi.org/10.1155/psyc/9988976>
181. Ulrich, A., Moua, N., Mack, A., Imai-Eaton, N., Erin Staples, J., Mehr, A., Ostrowsky, J., Leighton, T., Cehovin, A., Fay, P., Golding, J., Maynard, E., Alphey, L., Rojas Alvarez, D., Coffey, L., Faria, N., Maciel-De-Freitas, R., Maringer, K., Murray, K., Salje, H., Sang, R., Vasconcelos, P., Leo, Y., Sinkins, S., De Vasconcelos, J., Dadzie, S., Harris, E., Dos Santos, T., & Velayudhan, R. (2025). Meeting Report on an Integrated Research Agenda for Mosquito-Borne Arboviruses. *Open Forum Infectious Diseases*, 12 (7) <https://doi.org/10.1093/ofid/ofaf395>
182. Vereecken, N., Héger, M., Mweze, M. A., Razakamiamanana, A., Karanja, R., Nkoba, K., & Noiset, P. (2025). Afrotropical stingless bees illustrate a persistent cultural blind spot in research, policy and conservation. *Diversity*, 17 <https://doi.org/10.3390/d17120826>
183. Wachira, B., Echodu, R., Ouma, J., Malele, I., Gamba, D., Okal, M., Ogolla, K., Mangwiro, C., Opiro, R., Malulu, D., Ochieng, B., Mdachi, R., & Mireji, P. (2025). Field responses of *Glossina pallidipes* and *Glossina fuscipes fuscipes* tsetse flies to novel repellent blend and waterbuck repellent compounds in Kenya. *Plos Neglected Tropical Diseases*, 2025-July. <https://doi.org/10.1371/journal.pntd.0013367>
184. Waiswa, D., Muriithi, B. W., Murage, A. W., Ireri, D. M., Maina, F., Chidawanyika, F., & Yavuz, F. (2025). The role of social-psychological factors in the adoption of push-pull technology by small-scale farmers in East Africa: Application of the theory of planned behavior. *Heliyon*, 11(1), e41449. <https://doi.org/10.1016/j.heliyon.2024.e41449>
185. Wambua, M., Fombong, A., Nkoba, K., Onyambu, G., Kutima, H., Subramanian, S., & Nganso, B. (2025). Influence of colony and hive attributes, landscape, and seasonality on occurrence of large hive beetles (Coleoptera: Scarabaeidae) in Taita Taveta County, Kenya. *Journal of Insect Science*, 25 (3). <https://doi.org/10.1093/jisesa/ieaf065>
186. Wandera, H., Nattoh, G., Kiboi, D., Aloo, M., Kitur, S., Nyagaka, S., Atieno Otieno, M., Ochomo, E., Matoke-Muhia, D., Herren, J., & Kamau, L. (2025). Investigation of prevalence and phylogenetic classification of *Microsporidia* MB and insecticide target site insensitivity resistance mutations in *Anopheles gambiae* s.l. and *Anopheles funestus* mosquitoes from Busia, Kenya. *BMC Microbiology*, 25 <https://doi.org/10.1186/s12866-025-04324-6>



187. Wanore, W., Pirk, C., Yusuf, A., Ayalew, W., & Nganso, B. (2025). Fending for thyself: honey bees from Ethiopia inflict physical damage on *Varroa destructor*. *Ecology and Evolution*, 15 (12) <https://doi.org/10.1002/ece3.72660>
188. Wanore, W., Pirk, C., Yusuf, A., Baleba, S., Chege, M., Ndingu, N., Wubie, A., Ayalew, W., & Nganso, B. (2025). Honey bees of Ethiopia: Their lineages and subspecies based on morphometrics, mitochondrial DNA, and mandibular gland pheromone analyses. *Plos One*, 20 <https://doi.org/10.1371/journal.pone.0335551>
189. Whittle, M., Barreaux, A. M. G., Haines, L. R., Bonsall, M. B., English, S., & Ponton, F. (2025). How do host age and nutrition affect density regulation of obligate versus facultative bacterial symbionts? Insights from the tsetse fly. *ISME Communications*, 5(1), 108. <https://doi.org/10.1093/ISMECO/YCAF108>
190. Wyckhuys, K., Zou, Y., Crowder, D., Adriani, E., Albaytar, A., Beltran, M., Ben Fekih, I., Camargo-Gil, C., Filomena, F., Cicero, L., Colmenarez, Y., Cuellar-Palacios, C., Dubois, T., Eigenbrode, S., Francis, F., Fereres, A., Haddi, K., Khamis, F., Le Lann, C., Le Ralec, A., Lopez, L., Lyu, B., Montoya-Lerma, J., Muñoz-Cardenas, K., Nurkomar, I., Palmeros-Suarez, P., Perier, J., & Ramirez-Romero, R. (2025). Biological control mitigates spread of vector-borne plant pathogens. *Agriculture, Ecosystems and Environment*, 388. <https://doi.org/10.1016/j.agee.2025.109683>
191. Yang, T., Ma, Y., Dai, Z., Li, Y., Wang, J., Bai, T., Getahun, M., Obiero, G., Dong, S., & Zhang, J. (2025). Molecular mechanisms based on peripheral level of vanillin recognition in *Orthaga achatina* (Lepidoptera: Pyralidae). *Insect Biochemistry and Molecular Biology*, 180. <https://doi.org/10.1016/j.ibmb.2025.104317>
192. Zhang, Y., Liu, J., Xiao, Y., Yang, H., Zhang, Y., Tanga, C., Huang, D., & Xiao, J. (2025). Integrating metabolomics and physicochemical analysis in black soldier fly bioconversion of *Schizochytrium* residue: A pathway to high-value ω -3 products. *Future Foods*, 12. <https://doi.org/10.1016/j.fufo.2025.100759>
193. Zhao, Y., Nzisa, N., Cheseto, X., Osano, A., & Peng, J. (2025). Metabolomic study of tea tree oil and *Melaleuca* spp. Using HPTLC, LC-MS and GC-MS. *Phytochemistry Letters*, 69, 103801. <https://doi.org/10.1016/j.phytol.2025.103801>
194. Zoh, M. G., Barreaux, A., Dangbenon, E., Koffi, A. A., Ahoua Alou, L. P., Camara, S., Brou, N., Koffi, S. Y., Thomas, M. B., & N'Guessan, R. (2025). Insecticide-treated screening of windows for household protection against insecticide-resistant *Anopheles gambiae* sensu lato in Côte d'Ivoire: A semi-field trial. *Parasites & Vectors*, 19(1), 60. <https://doi.org/10.1186/s13071-025-07194-z>

Annex 4 – Rsif Scholars and Grantees Publications List

(Note: Author names shown in italics are Rsif scholars and grantees)

PUBLISHED JOURNAL ARTICLES (86)

Rsif Scholars publications (53)

1. *Adane, B. T.*, Egyir, I. S., Onumah, E. E., Ahene-Codjoe, A. A., & Kim, T. (2025). Effect of malt barley cluster farming on food security in Amhara Region, Ethiopia. *Scientific African*, 29, e02925. <https://doi.org/10.1016/j.sciaf.2025.e02925>
2. *Adjei, G.*, Joel, O. F., Ikiensikimama, S. S., & Aimikhe, V. J. (2025). Biogenic calcium waste as CaO adsorbents for CO₂ capture: Progress and future outlook. *Journal of Environmental Management*, 394, 127576. <https://doi.org/10.1016/j.jenvman.2025.127576>
3. *Agbedanu, P. R.*, Yang, S. (Jay), Musabe, R., Gatara, I., & Rwigema, J. (2025). ALMANET: A hybrid online learning IDS for real-time IoT security. *Egyptian Informatics Journal*, 31, 100764. <https://doi.org/10.1016/j.EIJ.2025.100764>
4. *Agbedanu, P. R.*, Yang, S. J., Musabe, R., Gatara, I., Rwigema, J., Agbedanu, P. R., Yang, S. J., Musabe, R., Gatara, I., & Rwigema, J. (2025). A scalable approach to internet of things and industrial internet of things security: Evaluating adaptive self-adjusting memory K-Nearest neighbor for zero-day attack detection. *Sensors* 2025, Vol. 25, 25(1). <https://doi.org/10.3390/S25010216>
5. *Agoundedemba, M.*, Kim, C. K., Kim, H. G., Nyenge, R., & Musila, N. (2025). Modelling and optimization of microgrid with combined genetic algorithm and model predictive control of PV/Wind/FC/battery energy systems. *Energy Reports*, 13, 238-255. <https://doi.org/10.1016/j.egy.2024.12.008>
6. *Agoundedemba, M.*, Kim, C. K., Kim, H. G., Nyenge, R., & Musila, N. (2025, June). Technical and economic optimization of a 348 kWp PV/Wind/Battery in Cinkassé, Togo: Comparative analysis of genetic algorithm and homer pro configurations. In *2025 IEEE 53rd Photovoltaic Specialists Conference (PVSC)*, 1072-1078). IEEE. <https://doi.org/10.1109/PVSC59419.2025.11132768>



7. Armando, E. J., Hanyurwimfura, D., Gatera, O., & Nduwumuremyi, A. (2025). Enhancing agricultural internet of things data accuracy: Evaluating kalman filter-based sensor denoising techniques. *Journal of Biosystems Engineering* 2025, 1–12. <https://doi.org/10.1007/S42853-025-00252-5>
8. Armando, E. J., Hanyurwimfura, D., Gatera, O., Kim, K. S., & Nduwumuremyi, A. (2025). Evaluation of advanced Kalman filter on real-time agricultural soil parameters through an IoT resources-constrained device. *Scientific Reports*, 15(1), 20829. <https://doi.org/10.1038/s41598-025-05427-w>
9. Azenge, J. P., & N'Dja, J. K. (2025). Impact of Anthropogenic Activities and Urban Proximity on the Conservation of Trees Outside Forests on Agricultural Lands in the Mongala Province, Democratic Republic of Congo. *East African Journal of Forestry and Agroforestry*, 8(1), 306–323. <https://doi.org/10.37284/EAJFA.8.1.3329>
10. Azenge, J. P., Zon, A.-O., Diesse, H., Meniko, J. P. P., Ebuy, J., Kassi, J. N., & Chirwa, P. W. (2025). Conserving carbon stocks under climate change: Importance of trees outside forests in agricultural landscapes of Mongala province, Democratic Republic of Congo. *Earth*, 6, 6(2). <https://doi.org/10.3390/earth6020019>
11. Comia, H. R., Kenee, F. B., Nelson, F. C., & Mucova, S. A. R. (2025). Smallholder farmers' livelihood vulnerability to climate change in Metuge district, Northern Mozambique. *Environmental Research Communications*, 7(6), 065014. <https://doi.org/10.1088/2515-7620/ade123>
12. Comia, H. R., Kenee, F.B., Nelson, F.C. *et al.* Trend analysis of rainfall and temperature in Metuge district, northern Mozambique. *Discov Atmos* 3, 8 (2025). <https://doi-org.uplib.idm.oclc.org/10.1007/s44292-025-00034-w>
13. Compaore, A., Toure, J. Y. N. Z. K., Klenam, D. E. P., Merenga, A. S., Asumadu, T. K., Obayemi, J. D., Rahbar, N., Migwi, C., & Soboyejo, W. O. (2025). Foam concrete with mineral additives: from microstructure to mechanical/physical properties, workability and durability. *Open Ceramics*, 23, 100812. <https://doi.org/10.1016/j.oceram.2025.100812>
14. Compaore, A., Toure, K. J.-Y. N., Klenam, D. E. P., Asumadu, T. K., Obayemi, J. D., Rahbar, N., Migwi, C., Merenga, A. S., & Soboyejo, W. O. (2025). Performance of foam concrete containing low-temperature calcined clay as a partial replacement of Portland cement. *Journal of Materials Research and Technology*, 38, 1761–1781. <https://doi.org/10.1016/j.jmrt.2025.07.137>
15. Fode, T. A., Jande, Y. A. C., Kim, Y. D., Ham, M. G., Lee, J., Kivevele, T., & Rahbar, N. (2025). Effects of different lengths and doses of raw and treated sisal fibers in the cement composite material. *Scientific Reports* 2025 15:1, 15(1), 1–20. <https://doi.org/10.1038/s41598-025-86046-3>
16. Fundikira, S., Kimanya, M., Suleiman, R., De Boevre, M., Tesfamariam, K., & De Saeger, S. (2025). Effect of Aflasafe TZ01® on aflatoxin reduction and emerging challenges with fusarium mycotoxins in maize from rural Tanzania. *Toxins*, 17(8), 419. <https://doi.org/10.3390/toxins17080419>
17. Gadallah, N. A. H., Gone, B. Z. B., Hakam, O., Siddig, A. A. H., & Ongoma, V. (2025). Modeling the impacts of climate change on the current and future distribution of baobab (*Adansonia digitata* L.) in Sudan. *Modeling Earth Systems and Environment*, 11(6), 404–. <https://doi.org/10.1007/s40808-025-02574-x>
18. Habimana, V., Mrode, R., Chenyambuga, S. W., Ekine-Dzivenu, C. C., & Houaga, I. (2025). The Role of genetics in understanding and improving heat tolerance in tropical African livestock. *Animal Science Cases*. <https://doi.org/10.1079/animalsciencescases.2025.0017>
19. Habimana, V., Nguluma, A. S., Nziku, Z. C., Ekine-Dzivenu, C. C., Morota, G., Mrode, R., & Chenyambuga, S. W. (2025). An HPLC-MS/MS method for the quantification of heat stress-related milk metabolites in milk from Holstein-Friesian cross-bred cows in Tanzania - SASAS. 55(3), 154–172. <https://www.sasas.co.za/journals/an-hplc-ms-ms-method-for-the-quantification-of-heat-stress-related-milk-metabolites-in-milk-from-holstein-friesian-cross-bred-cows-in-tanzania/>
20. Kabor, R., Sanou, Y., Tiendreb, R., ogo, Compaor, A., Konat, A., Par, S., Kabor, R., Sanou, Y., Tiendreb, R., ogo, Compaor, A., Konat, A., & Par, S. (2025). Preparation and characterization of clay soils for applications in cyanide removal from mining wastewater. *Journal of Minerals and Materials Characterization and Engineering*, 13(1), 1–17. <https://doi.org/10.4236/JMMCE.2025.131001>
21. Kiribou, I. A. R., Dimobe, K., & Dejene, S. W. (2025). Strengthening ecosystem sustainability and climate resilience through integrative nature-based solutions in Bontioli natural reserve, West African drylands. *Earth*, 6(3), 111. <https://doi.org/10.3390/earth6030111>



22. Kiribou, I. A. R., Dimobe, K., Sanou, C. L., & Dejene, S. W. (2025). Spatiotemporal land use changes dynamics impacts on natural reserves in West African dryland: Drivers, carbon emissions and climate change implications. *Environmental and Sustainability Indicators*, 28, 101004. <https://doi.org/10.1016/j.indic.2025.101004>
23. Komadja, G. C., Rana, A., Singh, A., Kaushik, A. P., Sawmliana, C. (2025). Case Study: Assessing blast-induced air overpressure in tunnel excavation: a finite element analysis based approach. *Noise Control Engineering Journal*, 73(2), 214–225. <https://doi.org/10.3397/1/377314>
24. Komadja, G. C., Westman, E., Rana, A., & Vitalis, A. (2025). A machine learning approach to lithology classification in mining using measurement while drilling and exploration data. *Mining, Metallurgy & Exploration* 2025 42:4, 42(4), 1955–1973. <https://doi.org/10.1007/S42461-025-01286-1>
25. Komadja, G. C., Westman, E., Rana, A., & Vitalis, A. (2025). Predicting rock mass strength from drilling data using synergistic unsupervised and supervised machine learning approaches. *Earth Science Informatics* 2025 18:3, 18(3), 325-. <https://doi.org/10.1007/S12145-025-01837-6>
26. Lita, E. P., Mkupasi, E. M., Ochi, E. B., Misinzo, G., van Heerden, H., Katani, R., Godfroid, J., & Mathew, C. (2025). Molecular evidence of *Brucella abortus* circulating in cattle, goats, and humans in Central Equatoria State, South Sudan. *Scientific Reports* 2025 15:1, 15(1), 12378-. <https://doi.org/10.1038/s41598-025-87368-y>
27. Magu, T. O., Jolayemi, O. R., Emmanuel, E., Musa, R., & Ikiensikimama, S. S. (2025). Implication of group 13 elements for the tailoring of Fe₃H hydride perovskites for optoelectronic and hydrogen storage applications: An intuition from theoretical study. *Journal of Physics and Chemistry of Solids*, 199, 112544. <https://doi.org/10.1016/j.jpcs.2024.112544>
28. Mavhemwa, P. M., Zennaro, M., Nsengiyumva, P., & Nzanywayingoma, F. (2025). Naïve bayes based android adaptive user authentication prototype for young internet of medical Things users. *IET Communications*, 19(1), e70082. <https://doi.org/10.1049/cmu2.70082>
29. Musa, A. A., Bello, A., Adams, S. M., Onwualu, A. P., Anye, V. C., Bello, K. A., Obianyo, I. I., Musa, A. A., Bello, A., Adams, S. M., Onwualu, A. P., Anye, V. C., Bello, K. A., & Obianyo, I. I. (2025). Nano-enhanced polymer composite materials: a review of current advancements and challenges. *Polymers* 2025, Vol. 17, 17(7). <https://doi.org/10.3390/polym17070893>
30. Musa, A. A., Park, J., Hong, G., Yoon, S. H., Onwualu, A. P., & Kim, M. (2025). Development of high-performance basalt fiber-reinforced polymer composite using a nanocellulose-based surface modification strategy. *Composites Part A: Applied Science and Manufacturing*, 199, 109191. <https://doi.org/10.1016/j.compositesa.2025.109191>
31. Mutadza, I., Ikiensikimama, S. S., & Joel, O. F. (2025). Petrophysical and petrographic characterisation of the reservoirs in Niger delta for carbon capture and storage. *Scientific African*, 29, e02774. <https://doi.org/10.1016/j.sciaf.2025.e02774>
32. Mutadza, I., Ikiensikimama, S. S., & Joel, O. F. (2025). Preliminary assessment of the reservoir rock in the niger delta for carbon capture and storage in depleted reservoirs. *Journal of GeoEnergy*, 2025(1), 4230897. <https://doi.org/10.1155/JGE5/4230897>
33. Mutua, H. N., Tarimo, D. J., Rutavi, G., Maphiri, V., Mwabora, J., Musembi, R., & Manyala, N. (2025). A novel study on chronoamperometry electrodeposition of hexagonal boron nitride with Eucalyptus grandis-derived activated carbon for supercapacitor applications. *Journal of Energy Storage*, 107, 114968. <https://doi.org/10.1016/j.jest.2024.114968>
34. Nebie, B. A. O., Lawane, A., Hema, C., Siroux, M., Nebie, B. A. O., Lawane, A., Hema, C., & Siroux, M. (2025). Energy Efficiency in the Building Sector in Burkina Faso: Literature Review, SWOT Analysis, and Recommendations. *Energies* 2025, Vol. 18, 18(11). <https://doi.org/10.3390/EN18112689>
35. Ngwira, A., Manda, S. O. M., Karimuribo, E. D., & Kimera, S. I. (2025). JSTMap: A web-based joint spatiotemporal modelling and mapping application for epidemiologists. *PLOS One*, 20(12), e0332607. <https://doi.org/10.1371/journal.pone.0332607>
36. Ngwira, A., Manda, S., Karimuribo, E. D., & Kimera, S. I. (2025). Meta-analysis of the prevalence of tuberculosis in cattle and zoonotic tuberculosis in humans in sub-Saharan Africa. *One Health Outlook*, 7(1), 14. <https://doi.org/10.1186/s42522-024-00130-8>
37. Nsengimana, I., Hakizimana, E., Mupfasoni, J., Hakizimana, J. N., Chengula, A. A., Kasanga, C. J., & Eastwood, G. (2025). Identification of potential vectors and detection of rift valley fever virus in mosquitoes collected



- before and during the 2022 outbreak in Rwanda. *Pathogens*, 14(1), 47. <https://doi.org/10.3390/pathogens14010047>
38. Offia-Kalu, N. E., Abraham, B. N., Ogbazode, J. E., Anye, V., Nwanonenyi, S. C., & Bello, A. (2025). Electromechanical behavior of dual network polyethylene oxide/polyvinyl alcohol composite hydrogel electrolyte for metal-air battery: A DFT and molecular dynamics approach. *Computational and Theoretical Chemistry*, 1248, 115232. <https://doi.org/10.1016/j.comptc.2025.115232>
 39. Ogbazode, J. E., Anye, V. C., Ajide, O. O., Bello, A., Ofi, O., Oluwale, O. O., & Onwualu, A. P. (2025). Investigation of the reduction mechanism and comparative reaction kinetics of milled scale goethite–hematite pellets in the carbothermic atmosphere from non-coking coal for application in sponge iron synthesis. *Journal of Sustainable Metallurgy*, 11(4), 4167–4194. <https://doi.org/10.1007/s40831-025-01237-6>
 40. Okwako, J. A., Song, S.-H., Park, S., Waita, S., Aduda, B., Hong, Y.-S., & Han, C.-H. (2025). Enhanced photoelectrochromic performance of WO₃ Through MoS₂ and GO–MoS₂ quantum dot doping for self-powered smart window application. *Energies* 2025, Vol. 18, 18(10). <https://doi.org/10.3390/EN18102411>
 41. Ouedraogo, H., Sidibe, S. dit S., Richardson, Y., & Zoungrana, L. (2025). Optimizing gasification in downdraft fixed-bed gasifier through experimental and kinetic modeling. *Case Studies in Thermal Engineering*, 68, 105910. <https://doi.org/10.1016/j.csite.2025.105910>
 42. Oyetade, J. A., Oluwafemi, K., Hammond, V. N. K., Boateng, A., Machunda, R. L., & Hilonga, A. (2025). Photocatalytic remediation of selected emerging organic pollutants in industrial effluent using conducting polymeric-based nanocomposites photocatalysts -A review. *Materials Science in Semiconductor Processing*, 199, 109832. <https://doi.org/10.1016/j.mssp.2025.109832>
 43. Oyetade, J. A., van Hulle, S. W., Machunda, R. L., Hilonga, A., & de Buysser, K. (2025). Development of ternary PANI/GO-Fe₃O₄@AgNps nanocomposites for photocatalytic remediation of toxic dye effluent under energy-efficient system. *Journal of Molecular Structure*, 1324, 140818. <https://doi.org/10.1016/j.molstruc.2024.140818>
 44. Palange, N. J., Obua, T., Sserumaga, J. P., Wembabazi, E., Ochwo-Ssemakula, M., Nuwamanya, E., Dramadri, I. O., Matovu, M., Edema, R., & Tukamuhabwa, P. (2025). Artificial intelligence-driven near-infrared spectrophotometry model for rapid quantification of anti-nutritional factors in soybean (*Glycine max.*). *Discover Applied Sciences*, 7(6), 1–13. <https://doi-org.uplib.idm.oclc.org/10.1007/s42452-025-07235-3>
 45. Sasia, A., Ochoo, L., Bem, D., Lyczko, N., Sauceau, M., Nzihou, A., & Onyuka, A. (2025). Synthesis and characterization of gelatin-hydroxyapatite nanohybrid composites. *Surfaces and Interfaces*, 73, 107533. <https://doi.org/10.1016/j.surfin.2025.107533>
 46. Savadogo, A., Nyangonda, T. N., Aduda, B. O., Lemmer, U., & Hussein, M. (2025). Characteristics of a V-shaped rectenna for 28.3 THz energy harvesting. *Journal of Computational Electronics*, 24(2), 1–15. <https://doi.org/10.1007/S10825-025-02295-5>
 47. Savadogo, I., Bayen, P., Balima, L. H., Sanou, C. L., Kouassi, F. A., & Worou, O. N. (2025). Climate-driven shifts in the geographic distribution of fodder trees in West Africa's Grazing landscapes. *Trees, Forests and People*, 22, 100995. <https://doi.org/10.1016/j.tfp.2025.100995>
 48. Somda, S. J. L., & N'Tsoukpoe, K. E. (2025). Improving optical efficiency of linear Fresnel collectors in the Sahel via position and length adjustment. *Solar Compass*, 13, 100105. <https://doi.org/10.1016/j.solcom.2024.100105>
 49. Soro, A. N., Armitage, A. D., Ogunsanya, O., Soro, S., Yéo, S. Y., & Koné, D. (2025). First report of *Colletotrichum orchidearum* species causing anthracnose on cashew leaves in Côte d'Ivoire. *New Disease Reports*, 52(1), e70054. <https://doi.org/10.1002/NDR2.70054>
 50. Soro, A. N., Sibirina, S., Oumarou, D. Z., Aboulaye, T., Issa, W., Kouabenan, A., & Daoud, K. (2025). Molecular and morphological characterization of *Colletotrichum gloeosporioides* Isolates Causing Anthracnose of Cashew (*Anacardium occidentale* L.) in Côte d'Ivoire. *International Journal of Phytopathology*, 14(1), 29–40. <https://doi.org/10.33687/phytopath.014.01.5517>
 51. Tokannou, I. E. T., Sanogo, S., Salako, K. V., Hounkpèvi, A., Dogbo, S. F., & Fandohan, A. B. (2025). Cultural and socio-economic drivers of conservation and cultivation of the cola nut tree. *Agroforestry Systems*, 99(8). <https://doi.org/10.1007/s10457-025-01363-w>



52. Umechukwu, J. N., Sarpong, D. B., Mensah-Bonsu, A., Ahene-Codjoe, A., & Kim, T. (2025). Effects of flooding-induced migration on farm technical efficiency in Rivers State, Nigeria. *Journal of Agriculture and Food Research*, 23, 102189. <https://doi.org/10.1016/J.JAFR.2025.102189>
53. Vincent, H., Chinyere, C. E.-D., Athumani, S. N., Zabron, C. N., Gota, M., Sebastian, W. C., & Raphael, M. (2025). Estimation of genetic parameters for physiological and milk production traits of Holstein Friesian crossbreds reared in Tanzania. *International Journal of Livestock Production*, 16(2), 9–18. <https://doi.org/10.5897/IJLP2025.0874>

Rsif scholars and grantees publications - co-authored (11)

54. Allan, L., Mwabora, J. M., Mulwa, W. M., Mapasha, R. E., Robinson & Musembi, J. (2025). First-principles investigation of structural, mechanical, electronic, and thermal properties of half-Heusler ZrPtSn. *MRS Advances* 2025, 1–8. <https://doi.org/10.1557/S43580-025-01314-8>
55. Gadallah, N. A. H., Gone Bi, Z. B., Ongoma, V., Omer, A., Ahmed, A. E. M., Hasoba, A. M. M., & Siddig, A. A. H. (2025). Investigating tree diversity and structure across varying land cover classes and altitudes in the savanna woodlands of Sudan. *Frontiers in Forests and Global Change*, 8, 1581188. <https://doi.org/10.3389/ffgc.2025.1581188>
56. Karssa, T. H., Kussaga, J. B., Semedo-Lemsaddek, T., & Mugula, J. K. (2025). Fermentation, handling and claimed therapeutic effects of *dhanaam*: An Ethiopian fermented camel milk. *Food Science & Nutrition*, 13(5), e70295. <https://doi.org/10.1002/fsn3.70295>
57. Kiribou, I. A. R., Nikiema, T., Dimobe, K., Zoungrana, B. J. B., Ouedraogo, V., Yang, H., Santika, T., & Dejene, S. W. (2025). Climate change and variability as drivers of vegetation dynamics in Bontoli Natural Reserve, West African drylands. *Environmental Challenges*, 20, 101175. <https://doi.org/10.1016/J.ENVC.2025.101175>
58. Latchiba, W. E., Waita, S. M., Krueger, R., & Mwabora, J. M. (2025). a feasibility study on barriers to access to solar photovoltaic energy: A survey study of Moundou, Chad. *African Journal of Environmental Sciences and Renewable Energy*, 19(1), 1–41. <https://doi.org/10.62154/ajesre.2025.019.01011>
59. Manzwera, J., Kwabena, A. A., Mensah-Bonsu, A., & Barimah, A. (2025). Preferences for enhanced seasonal weather and climate services among maize farmers in Zimbabwe: A choice experiment analysis. *Meteorological Applications*, 32(2), e70040. <https://doi.org/10.1002/met.70040>
60. Mugabe, N. A., Kussaga, J., & Issa-Zacharia, A. (2025). Assessment of bio-security knowledge, attitude and hygienic practices among smallholder chicken farmers in Southern Mozambique. *African Journal of Food Science*, 19(8), 113–133. <https://doi.org/10.5897/AJFS2025.2356>
61. Nizyimana, E., Hanyurwimfura, D., Uwanyirigira, G., Karikumutima, B., Nsenga, J., & Mihigo, I. N. (2025). Cleancity IoT: A vehicle-mounted platform for real-time urban air-quality monitoring and forecasting in resource-constrained african cities. *International Journal of Advanced Computer Science and Applications (Ijacs)*, 16(12). <https://doi.org/10.14569/IJACSA.2025.01612100>
62. Ntawurubunga, D., Ngowi, E. E., Mangi, H. O., Salanga, R. J., & Leonard, K. L. (2025). Farmers' knowledge, attitude, and motivation for adoption of climate-smart agroforestry in two contrasting agroecosystems of Rwanda. *Trees, Forests and People*, 19, 100766. <https://doi.org/10.1016/J.TFP.2024.100766>
63. Ntirenganya, E., Goftishu, M., Sokame, B. M., Assefa, Y., & Nsengimana, V. (2025). Pest status and dynamic of sugarcane stemborer (*Eldana saccharina*) in sugarcane plantations of Nyabugogo tropical Wetland, Rwanda. *International Journal of Tropical Insect Science*. <https://doi.org/10.1007/s42690-025-01690-6>
64. Sande, T. J., Msanya, B. M., Tindwa, H. J., Alovizi, A. M. T., Semoka, J. M., & Shitindi, M. (2025). Advancing Sustainable Practices: Integrated Pedological Characterization and suitability assessment for enhanced irish potato production in Tsangano and Angónia districts of Tete Province, Mozambique. *Soil Systems*, 9(2), 53. <https://doi.org/10.3390/soilsystems9020053>

Rsif Grantees publications (22)

65. Abdilah, R. H., Kifaro, E. G., Chengula, A. A., & Kasanga, C. J. (2025). Assessment of knowledge, attitude, and practice of poultry farmers against Avian influenza (Bird Flu), in Morogoro municipality. *Tanzania Journal of Health Research*, 26(4), 2164. <https://doi.org/10.4314/THRB.V26I4.6>
66. Abrha, H., Birhane, E., Nigusse, R., Ongoma, V., Dodiomon, S., Mamadou, C., Hagos, H., & Gebresamuel, G. (2025). Climate mitigation and adaptation potential of an endangered tree across land-use types under climate change. *Trees, Forests and People*, 21, 100971. <https://doi.org/10.1016/J.TFP.2025.100971>



67. *Abrba, H., Dodiomon, S., Ongoma, V., Hagos, H., & Birhane, E. (2025). Hydrological and soil loss dynamics under climate and land cover change in a dry Afromontane Forest, Tigray, Ethiopia. Environment, Development and Sustainability 2025, 1–24. <https://doi.org/10.1007/S10668-025-06802-3>*
68. Allan, L., Mulwa, W. M., Mapasha, R., Mwabora, J. M., & Musembi, R. J. (2025). The effect of Y element on the properties of cobalt-based full-Heusler ZrCo₂Y (Y=Sb, Bi, As) as a potential thermoelectric contact electrode. *Materials Science in Semiconductor Processing*, 200, 109898. <https://doi.org/10.1016/j.mssp.2025.109898>
69. Ansong, M., Huang, G., Nyang'onda, T. N., Musembi, R. J., & Richards, B. S. (2025). Very short-term solar irradiance forecasting based on open-source low-cost sky imager and hybrid deep-learning techniques. *Solar Energy*, 294, 113516. <https://doi.org/10.1016/j.solener.2025.113516>
70. Caser M., Mozzanini, E., Mainetti, A., Victorino I., Lumini, E., Demasi, S., Bianciotto, V., Po,gio, L. & Scariot, V. (2025). Germination capacity of *Artemisia umbelliformis* Lam. wild populations and agro-techniques to enhance seedling production. *International Journal of Horticultural Science and Technology*. 12, 2, 159-170. <https://doi.org/10.22059/ijhst.2024.366123.702>
71. Folorunso, O., Ojo, O., Busari, M., Adebayo, M., Adejumbi, J., Folorunso, D., Ayo, F., Alabi, O., & Olabanjo, O. (2025). GeaGrow: a mobile tool for soil nutrient prediction and fertilizer optimization using artificial neural networks. *Frontiers in Sustainable Food Systems*, 9, 1533423. <https://doi.org/10.3389/fsufs.2025.1533423>
72. Gahamanyi, N., Habimana, A. M., Harerimana, J. P., Iranzi, F., Ntwali, S., Kamaliza, G., Mukayisenga, J., Bosco, S. J., Komba, E. V., Rujeni, N., & Amachawadi, R. G. (2025). High prevalence of antibiotic resistant *Campylobacter* among patients attending clinical settings in Kigali, Rwanda. *BMC Infectious Diseases*, 25(1), 225-. <https://doi.org/10.1186/s12879-025-10626-x>
73. Gahamanyi, N., Habimana, A. M., Harerimana, J. P., Mukayisenga, J., Ntwali, S., Umuhoza, A., Nsengiyumva, E., Irmaso, E., Bosco Shimirwa, J., Pan, C. H., Komba, E. V., Muvunyi, C. M., Rujeni, N., & Amachawadi, R. G. (2025). Antimicrobial susceptibility profiles of thermophilic *Campylobacter* species from human, pig, and chicken feces in Rwanda. *Frontiers in Microbiology*, 16, 1570290. <https://doi.org/10.3389/fmicb.2025.1570290>
74. Hakizimana, J. N., Yona, C., Makange, M. R., Adamson, E. K., Ntampaka, P., Uwibambe, E., Gasana, M. N., Ndayisenga, F., Nauwynck, H., & Misinzo, G. (2025). Complete genome analysis of the African swine fever virus genotypes II and IX responsible for the 2021 and 2023 outbreaks in Rwanda. *Frontiers in Veterinary Science*, 12, 1532683. <https://doi.org/10.3389/fvets.2025.1532683>
75. Kachira, J. P., Musembi, R., Nyongesa, F., Mbilo, M., Nyamuga, M., & Musanyi, I. (2025). First-principles study of the structural, electronic, mechanical, and optical properties of Zintl-phase K₂AgBi ternary compound for optoelectronic applications. *AIP Advances*, 15(4). <https://doi.org/10.1063/5.0267495>
76. Kachira, J. P., Musembi, R., Nyongesa, F., Mbilo, M., Nyamunga, M., & Musanyi, I. (2025). Ab-Initio investigation of the structural, electronic, mechanical, thermophysical, and optical properties of the Zintl-phase K₂AgSb ternary compound for optoelectronic applications. *Next Materials*, 8, 100713. <https://doi.org/10.1016/j.nxmate.2025.100713>
77. Kazeneza, M., Bosman, A. S., Amenyedzi, D. K., Hanyurwimfura, D., Ndashimye, E., & Vodacek, A. (2025). Balancing complexity and performance of machine learning models for avian pests sound detection in agricultural environments. *IEEE Access*, 13, 105813–105827. <https://doi.org/10.1109/access.2025.3580620>
78. Kyei, S. K., Eke, W. I., Frimpong, A. J., Nagre, R. D., & Akaranta, O. (2025). Sustainable valorization of onion (*Allium cepa* L.) skin as a resource for value-added products: A comprehensive review. *Sustainable Chemistry and Pharmacy*, 44, 101942. <https://doi.org/10.1016/j.scp.2025.101942>
79. Kyei, S. K., Frimpong, A. J., Agorku, E. S., Eke, W. I., & Akaranta, O. (2025). Onion (*Allium cepa* L.) skin waste for industrial applications: A sustainable strategy for value addition and circular economy. *Bioresource Technology Reports*, 29, 102094. <https://doi.org/10.1016/j.biteb.2025.102094>
80. Mbilo, M., Musembi, R., Kachira, J. P., Nyamunga, M., Musanyi, I., Wafula, S., & Yusuf, M. (2025). First principles Study of the properties of CS₂GAAGF₆ double halide perovskite compound for optoelectronic and thermoelectric applications. *Journal of Inorganic and Organometallic Polymers and Materials*. <https://doi.org/10.1007/s10904-025-03838-w>



81. Mbilo, M., *Musembi, R., Kachira, J. P., Onsate, W. N., Keheze, F. M., & Mapasha, R. E.* (2025). Insights into the optoelectronic and thermoelectric properties of lead-free Rb₂NaIrF₆ double perovskite compound: A first-principles study. *Results in Physics*, 75, 108349. <https://doi.org/10.1016/j.rinp.2025.108349>
82. Mondlhane, C., Munjonji, L., *Victorino, I., Huenchuleo, C., Pimentel, P., & Cornejo, P.* (2025). Sustainable agricultural alternatives to cope with drought effects in semi-arid areas of southern Mozambique: Review and strategies proposal. *World*, 6(1), 23. <https://doi.org/10.3390/world6010023>
83. Musanyi, I., Mbilo, M., *Musembi, R., Kachira, J., Nyongesa, F., Nyamunga, M., & Wafula, S.* (2025). Optoelectronic and thermoelectric properties of the K₂SbAu zintl phase ternary compound using first principles methods. *Computational Condensed Matter*, 44, e01073. <https://doi.org/10.1016/j.cocom.2025.e01073>
84. *Mutua, H. N., Tarimo, D. J., Rutavi, G., Maphiri, V., Mwabora, J., Musembi, R., & Manyala, N.* (2025). A novel study on chronoamperometry electrodeposition of hexagonal boron nitride with eucalyptus grandis-derived activated carbon for supercapacitor applications. *Journal of Energy Storage*, 107, 114968. <https://doi.org/10.1016/j.EST.2024.114968>
85. *Nizeyimana, E., Hwang, J., Zirikana, J., Karikumutima, B., Mihigo, I. N., Nizeyimana, P., Hanyurwimfura, D., & Nsenga, J.* (2025). Revolutionizing air pollution spikes analysis with a Blockchain-Driven machine learning framework. *Transactions on Emerging Telecommunications Technologies*, 36(5). <https://doi.org/10.1002/ett.70143>
86. Victor-Oji, C. O., Emechebe, S. C., God'sdelight, I. C., Opusunju, A., & *Akaranta, O.* (2025). Biobased emulsion breakers: Investigating red onion skin and orange mesocarp extracts for oilfield application. *Asian Journal of Chemical Sciences*, 15(2), 42–60. <https://doi.org/10.9734/ajocs/2025/v15i2359>

Annex 5 – List of Books/Book Chapters/Other Publications

(Note: Author names shown in italics are *icipe* staff or Graduate Students)

BOOK CHAPTERS, BOOKS, AND OTHER PUBLICATIONS

1. Baehr, T., *Sibhatu, K. T.* (2025). The impact of production diversification on livelihood outcomes among smallholder farmers. DLL Knowledge Review. 10:01, 1-14. <https://www.devlearnlab.no/wp-content/uploads/2025/10/Issue-1-Production-diversification.pdf>
2. Cécillon, L., Scott, B., *Dubois, T., Kunyanga, C., Kwen, K., Nigussie, Y., Hundessa, N., Nabanoga, G. N. K., Kigozi, A., Kashaigili, J., Saida, P., Calatayud, P.-A., Szurek, B., Médard, C., Savy, M., Grimaud, P., Barreaux, A., Brevault, T., Pinard, F., ... Odhiambo, T.* (2025). Report from the 1st workshop of the dP Trace consortium: Transforming agriculture for animal, crop and ecosystem health. 27-29 January 2025, *icipe campus, ICRAF campus, Nairobi, Kenya*. <https://agritrop.cirad.fr/612157>
3. Coyne, D., Kisaakye, J., & *Haukeland, S.* (2025). Nematology knowledge transfer: Creating awareness and understanding. In R. H. Manzanilla-López, D. Hunt, N. Marbán-Mendoza, & S. Infante-Gil (Eds.), *Practical Plant Nematology* (2nd ed., pp. 614–627). CABI. <https://doi.org/10.1079/9781836990413.0022>
4. Dinesh, G. K., Venkatramanan, V., Jayaraman, S., Bolan, N., *Rao, C. S., Meena, R. S., Prasad, J., Ramasamy, V., Bhatt, R., Dubey, R., Sinduja, M., Raveena, R., Harper, R., Karthika, S., Smith, P., Prasad, S., Sabarivasan, R., Dalal, R. C., Lal, R., ... Velmurugan, A.* (2026). Carbon farming: Ecosystem services and its potential in achieving UN sustainable development goals. In *Advances in Agronomy* (Vol. 196, pp. 201–378). Elsevier. <https://doi.org/10.1016/bs.agron.2025.10.002>
5. *Herren, J.* (2025). Discovery of sporogeny in the malaria transmission-blocking symbiont of *Anopheles* mosquitoes. *Mosphere*, 10, e0032525. <https://doi.org/10.1128/msphere.00325-25>
6. Joshua, B., Carpentero, E., & *Nyaboke, J.* (2025). Biocontrol of plant-parasitic nematodes on some medicinal and ornamental plants. *Plant Nematode Interactions and their Management Strategies*, 47-63. <https://doi.org/10.1201/9781779643285-3>
7. Nguedia Momo, M., Zekeng Ndadi, M., Tchoupé Tchendi, M., & Tonle Noumbo, F. (2025). Expressiveness of the LSAwF Workflow Language Compared to BPMN. *Communications in Computer and Information Science*, 2462 CCIS, 172-186. https://doi.org/10.1007/978-3-031-88226-5_12
8. *Tanga, C. M., Kababu, M., Xavier, C., Menaga, M., della Penna, A. A., Subramanian, S., Beesigamukama, D., & Chia, S. Y.* (2025). Chapter 5: Production of edible insects for enhanced food security and rural livelihoods. *Insect Oil*



9. Tanga, C. M., Xavier, C., Kababu, M., Subramanian, S., Beesigamukama, D., & Chia, S. Y. (2025). Chapter 14: Insect oils and food safety regulations. *Insect Oil as a Source of Nutraceuticals*, 227-248. <https://doi.org/10.1016/B978-0-443-23934-2.00014-7>

Rsif Grantees publications (1)

(Note: Author names shown in italics are Rsif scholars and grantees)

1. *Abirha, H.*, Birhane, E., Gufi, Y., Solomon, N., Kidu, G., Abdu, M. S., Tesfamariam, B., Ongoma, V., Gebresamuel, G., Dodiomon, S., Mamadou, C., Hagos, H., Gidey, T., & Manjur, B. (2025). Influence of anthropogenic activities and climate change on ecosystem services of forests in Northern Ethiopia. *Proceedings of the 5th International Conference on Drylands*. <https://tinyurl.com/242js4p3>

Annex 6 – List of Non-refereed Publications

icipe List of non-refereed publications and other outputs of scientific value

1. Annual Reports (2024)

- Technical Annual Report - [TAR 2024](#)
- Non-Technical Annual Report - [Spotlight magazine](#)

2. *icipe* Newsletters (Monthly Digests)

- *icipe* Monthly Digest – [Volume 1, Issue 1, January 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 2, February 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 3, March 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 4, April 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 5, May 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 6, June 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 7, July 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 8, August 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 9, September 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 10, October 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 11, November 2025](#)
- *icipe* Monthly Digest – [Volume 1, Issue 12, December 2025](#)

3. Conferences/workshops attended by Scientists and Post Doctoral Fellows (18)

1. Dr Tobias Landmann (Senior Scientist) and Dr Bonoukpoè Mawuko Sokame (Postdoctoral Fellow) attended the AfroGrow project kick-off meeting; and conducted workshops to create a realistic activity plan, based on the grant agreement, with valuable insights from Policy and Research Officers. Held at ICRAF Campus, 10-12 March 2025.
2. Dr Frank Chidawanyika (Senior Scientist) participated in the One Health Horizon Scanning Workshop. The meeting, organized by the International Livestock Research Institute (ILRI) involved plenary sessions and discussions to identify key research/priorities on One Health. Held at ILRI, Nairobi, 11 March 2025.
3. Dr Thomas Dubois (Director, Impact Delivery), Dr Takemore Chagomoka (Head, Technology Transfer Unit), and Dr Frank Chidawanyika attended the 2nd Eastern Africa Agroecology Conference themed ‘Strengthening Agri-Food System Transformation for Resilience, Sustainability and Socioeconomic Development.’ Held at Argyle Hotel, Nairobi, Kenya, 25-28 March 2025.



4. Dr Sunday Ekesi, (Deputy Director General, Research for Development (DDG-R4D)), Dr Samira Mohamed, (Head, Plant Health Theme) attended the kick-off workshop on Red Palm Weevil Management as well as the Khalifa International Award for Date Palm and Agricultural Innovation. This prize catalyses international collaboration in date palm production and agricultural innovation. Held at United Arabs Emirates, 14-22 April 2025.
5. Dr Tobias Landmann (Senior Scientist) attended the World Bank Land and Poverty Conference, where he discussed his work on the 'Challenges and possibilities of implementing carbon accreditation schemes in agro-silvopastoral systems in Africa.' Held at Washington DC, USA, 4-9 May 2025.
6. Dr Jeremy Herren, (Senior Scientist, spoke at the Malaria Gordon Research Conference (GRC). The Malaria GRC is a premier, international scientific conference focused on advancing the frontiers of science through the presentation of cutting-edge and unpublished research, prioritizing time for discussion after each talk, and fostering informal interactions among scientists of all career stages. Held at Barcelona, Spain, 25-30 May 2025.
7. Dr Merid Getahun, (Interim Head, *icipe* Behavioral Chemical Ecology Unit (BCEU)) attended a workshop titled 'Insect Chemical Ecology: Insect, plant/ animal interactions' at Nanjing Agricultural University, China. He also gave a lecture on insect chemical ecology to graduate students and participated in a joint project proposal development and manuscript revision. Held at Nanjing, China, 15-25 August 2025.
8. Dr Syeda Tullu Bukhari, (Scientist, Human Health Theme), conducted a week-long training on the risk factors associated with Tungiasis among individuals aged 50 years, in Vihiga County, western Kenya. Representatives from the Ministry of Health and County Officers were in attendance. Vihiga, Western Kenya, 18–23 August 2025.
9. Dr Dan Masiga (Head, Human Health Theme) and Dr Kennedy Senagi (Postdoctoral Fellow) participated in the Data for Health in Africa Meeting and the 5th Data Science for Health Discovery and Innovation in Africa (DS-I Africa) Consortium Meeting. The core objective of the DS-I Africa Consortium is to advance data science and related innovations in Africa. This approach will create an ecosystem that provides local solutions to countries' most urgent public health challenges in the target countries. Held at Accra, Ghana, 22-29 August 2025.
10. Dr Daniel Masiga, (Head, Human Health Theme), Dr Tobias Landmann, (Senior Scientist), participated in the National Institute of Allergy and Infectious Diseases (NIAID), and an interview for the Wellcome Trust 2025 Discovery Award application titled: 'Establishing the Main Drivers of Visceral Leishmaniasis Transmission and Disease Risk in a Changing Climate in Kenya.' London, United Kingdom, 11 September 2025.
11. Dr Antoine Barreaux attended the 37th International Scientific Council for Trypanosomiasis Research and Control (ISCTRC) Conference and made a presentation titled: 'Modelling Framework to Declare Elimination of a Tsetse Population: Example of Tsetse Control in Chad' and a poster presentation titled: 'IMPACTING: Integrated Multi-vector-borne Diseases Platform to Assess How Global Change impacts Transmission Using Innovative Systems Modeling, Novel Monitoring Tools, and Transmission Blocking Micro-organisms' in Nairobi, Kenya, 15-19 September 2025
12. Dr Amanuel Tamiru (Senior Scientist and Leader of the Push-Pull Integrated Pest Management Programme) participated in the International Conference on Ecological Management in Crop Health and gave a talk entitled 'Push-Pull Technology in Africa for Crop Health.' Held in Jinhua, China, 25-26 September 2025.
13. Dr Sunday Ekesi, (Deputy Director General, Research for Development (DDG-R4D)), and Dr Samira Mohamed, (Head, Plant Health Theme), met with representatives of the Brazilian Agricultural Research Corporation (EMBRAPA), to explore potential collaboration on the proposed project, 'Consortium for red palm weevil control (C4RPWC), a global programme to protect palms, livelihoods, and ecosystems' at Aracaju, Brazil, 1-9 October 2025.



14. The Integrated Data and Analytics Platform (IDAP) team, including Dr Elfatih Abdel-Rahman, (Senior Scientist and Interim Head, Data Management, Modelling and Geo-Information Unit (DMMG)), Dr Daisy Salifu (Senior Research Officer), and Dr Bonoukpoè Sokame (Postdoctoral Fellow), hosted 30 University of Nairobi students from the Geospatial Engineering Students Association (GESA) on a learning experience of how geospatial technologies are applied in insect physiology and ecological research. *icipe* Duduville Campus, 2 October 2025.
15. Dr Merid Getahun (Senior Research Scientist and Interim Head, Behavioral Chemical Ecology Unit), attended the 9th International Greenhouse Gas and Animal Agriculture Conference, where he gave a presentation titled: 'Diets enriched with black soldier fly larvae reduced potent greenhouse gas emission in poultry production' at Sarit Expo Centre, Nairobi Kenya, 5-9 October 2025.
16. Dr Frank Chidawanyika (Senior Scientist and Coordinator of the Regional Multi-actor Research Network for Agroecology in East Africa), attended the 2025 International Forum on Agroecosystem Living Labs. The event brings together a diverse international community of Living Labs in agroecology with the aim of showcasing research, actions and lessons learned in the use of the new approach around the world, at Bordeaux, France, 15-17 October 2025.
17. Dr Elfatih Mohamed Abdel-Rahman Ahmed (Senior Scientist and Interim Head, DMMG Unit), presented an abstract titled: 'Digital defenses: ecological modelling for fall armyworm early warning in Malawi' at the International Society for Ecological Modelling Global Conference 2025, at Kashiwa, Japan, 19-23 October 2025.
18. Dr Amanuel Tamiru (Senior Scientist and Head, Push-Pull Integrated Pest Management Programme) showcased the *icipe* Push-Pull innovation at the AU-EU-UfM Innovation Fair 2025. The event was jointly organised by the African Union (AU), the European Union (EU), and the Union for the Mediterranean (UfM), to bring together policymakers, innovators, investors and researchers to showcase innovation-driven solutions with strong societal and market impact, at Maison de la Poste, Brussels, Belgium, 23 October 2025.

4. Conferences/workshops attended by *icipe* scholars (15)

icipe scholars attended and/or made research presentations at national, regional, and international various conferences and workshops.

1. Peter Muchina (Kenya, DRIP PhD) oral presentation on 'Building a reference imputation panel and optimizing imputation strategies for low-pass sequencing of Black Soldier Fly' at the 1st EAAP Workshop on Insect Genetic Improvement, Implementation, Impact (Insect-IMP) held in Athens (Greece), 29-31 January 2025.
2. Agnes Kiriga (Kenya, ARPPIS PhD) oral presentation on 'Impacts of vegetable-integrated push-pull and insect frass fertilizer on pest incidence and kale productivity' at the 2nd East Africa Agroecology Conference (EACC): Harnessing the Potential of Agroecology in Transforming and Sustaining Resilient Agri-Food Systems. Held in Nairobi, Kenya, 25-28 March 2025.
3. Evanson Omuse (Kenya, ARPPIS PhD) oral presentation on 'Effects of intensified push-pull technology and frass-based soil amendment on pest damage, striga weed, farm productivity and carbon sequestration' at the 2nd Eastern Africa Agroecology Conference held at Argyle Grand Hotel, Nairobi, Kenya, 25-28 March 2025.
4. Margaret Wahome (Kenya, DRIP PhD) oral presentation on 'Ngari Virus in humans and livestock in Arid and Semi-Arid ecologies in Kenya' at the Kenya Veterinary Annual Conference held in Kisumu, 23-26 April 2025.
5. Evanson Omuse (Kenya, ARPPIS PhD) oral presentation on 'Quantifying ground- and soil-dwelling arthropod assemblages and soil health in response to vegetable integrated push-pull with black soldier fly frass soil amendments' at the 24th Congress of the Entomological Society of Southern Africa held at the University of the Free State, Bloemfontein, South Africa. 8-11 July 2025.
6. Agnes Kiriga (Kenya, ARPPIS PhD) oral presentation on 'Impacts of vegetable integrated push-pull and insect frass fertilizer on the incidence of pests and performance of maize and kale crops in Kenya' at 24th



congress of the Entomological Society of Southern Africa (ESSA). Held at the University of the Free State, Bloemfontein campus, South Africa, 8–11 July 2025.

7. Denis Waiswa (Uganda, ARPPIS PhD); Poster presentation (online) titled ‘Adopt or dis-adopt Push-Pull technology? insights from discrete-time proportional hazard models and machine learning-based survival analysis in East Africa’ at the TROPENTAG 2025 hybrid conference held in Bonn, Germany, 10-12 September 2025.
8. Teresia Wamwondwe (Kenya, ARPPIS PhD) poster presentation on ‘Stakeholder perceptions for adoption and profitability of black soldier fly farming for organic waste management in Kenya’ at the Tropentag 2025 hybrid conference held at University of Bonn, Germany, 10-12 September 2025.
9. Agnes Chepkorir (Kenya, DRIP MSc) - Oral presentation on ‘Insect frass fertilizer as a novel input for improving soil fertility and bean productivity: Catalysing knowledge transformations to promote ecosystem resilience in tropical environments.’ at the joint 6th MWECAU & 30th Soil Science Society of East Africa (SSSEA) International Conference 2025 held in Moshi, Kilimanjaro – Tanzania, 28 September – 3 October 2025.
10. Richard Malingumu (Uganda, ARPPIS PhD) virtual oral presentation on ‘Optimizing nutrient balance in insect frass fertilizer for improved agroecosystem productivity’ on 24 September 2025 (16:24-16:36) at the Agriculture for Development Conference (Agri4D) held in Uppsala, Sweden, 23-25 September 2025.
11. Catherine Wanjiru Irungu (Kenya: DRIP MSc) attended a workshop (Oral presentation) on ‘Insect-driven recycling of agro-industrial waste into regenerative organic fertilizer inputs’ at the 25th annual workshop of the Horticultural Association of Kenya (HAK) held at Kabianga University, 24-27 November 2025.
12. Emmanuel Anedo (Nigeria, ARPPIS PhD) oral presentation on “Enhancing soil biochemical properties using chitin-fortified insect frass fertilizer” at the joint 6th MWECAU & 30th Soil Science Society of East Africa (SSSEA) International Conference 2025 held in Moshi, Kilimanjaro, Tanzania, 28 September – 3 October 2025.
13. John Muthoni Kamau (Kenya; DRIP MSc) presented a poster at the 25th annual workshop of the Horticultural Association of Kenya (HAK) held at the University of Kabianga. Poster title: Insect frass and inorganic fertilizer recommendations for improved productivity of maize–bean intercrop systems, 24-27 November 2025.
14. Jane Gathoni Njagi (Kenya; DRIP MSc) presented a poster at the 25th annual workshop of the Horticultural Association of Kenya (HAK) held at the University of Kabianga. Poster title: Comparative efficiency of low-cost composting techniques for optimised insect frass fertilizer quality, 24-27 November 2025.
15. Teresia Wamwondwe (Kenya, ARPPIS PhD) gave an oral presentation on ‘Perceptions of economic viability as a driver for the adoption of black soldier fly farming in climate-smart organic waste management’ at the TropAg conference held at University of Queensland, Brisbane, Australia. 11-13 November 2025.

5. Internal Awards - *icipe* Governing Council (GC) Student Awards (7)

Best Published Science Papers

1. Kokou Rodrigue Fiaboe (Togo; ARPPIS PhD) won first prize for his paper: *Fiaboe, K. R., Khamis, F. M., Cheseto, X., Yusuf, A. A., & Torto, B. (2025). Nanosilica supplementation in tomato increases oviposition on stems and caterpillar mortality in the tomato pinworm. Proceedings of the National Academy of Sciences, 122(13), e2427314122. <https://doi.org/10.1073/pnas.2427314122> IF 9.1*
2. Emmanuel Peter (Nigeria, ARPPIS PhD) won second prize for his paper: *Peter, E., Yusuf, A., Subramanian, S., Krüger, K., Karlsson Green, K., Anderson, P., Torto, B., & Tamiru, A. (2024). Crop mixtures influence fall armyworm infestation and natural enemy abundance in maize-based intercropping systems. Journal of Crop Health, 76(6), 1491–1505. <https://doi.org/10.1007/s10343-024-01061-0> IF 3.1*
3. Lilian Mbaisi Ang’ang’o (Kenya; ARPPIS PhD) was awarded the third prize for her paper on: *Ang’ang’o, L. M., Herren, J. K., & Tastan Bishop, Ö. (2024). Bioinformatics analysis of the *Microsporidia* sp. MB genome: A malaria transmission-blocking symbiont of the *Anopheles arabiensis* mosquito. BMC Genomics, 25(1), 1132. <https://doi.org/10.1186/s12864-024-11046-y> IF 3.7*



Best Science Posters

1. Khadija Juma Nyendes (Kenya, DRIP MSc) won the first prize for her poster on “*Microsporidia* MB infection amplifies the sublethal impact of permethrin in *Anopheles arabiensis*.” Supervisors: Dr Jeremy Herren and Dr Priscille Barreaux.
2. Aclaine Shisia Kitiavi (Kenya, DRIP MSc) won second prize for her poster on “Vertical and horizontal transmission dynamics of *Microsporidia* MB in *Anopheles* and *Culex* mosquitoes.” Supervisors: Dr Tullu Bukhari, Dr Thomas Onchuru and Dr Jeremy Herren.
3. Margaret Wambui Wahome (Kenya, DRIP PhD) took the third prize for her poster on “Arbovirus circulation, diversity and potential human, livestock and rodent exposures in Kenya: A One-Health approach.” Supervisors: Prof Rosemary Sang and Dr David Tchouassi.
4. Marc Marin Agbodjan (Togo, ARPPIS PhD) took the third prize for his poster on “A novel soil fertility index for guiding decision making on soil management and sustainable agriculture in Eastern Africa.” Supervisors: Dr Sokame Bonoukpoe Mawuko, Dr Frank Chidawanyika, and Dr Daniel Mutyambai.

6. *icipe* YouTube videos (28)

1. Launch of *icipe* Vision and Strategy 2026–2030: <https://youtu.be/pws63vAeGUA?si=hlyBus-kdEuNOF8A>
2. NORAD Visit to *icipe*: <https://youtu.be/xCnH-xAdCU?si=AQ5lkQZpysllVFD>
3. Participation in Africa Food Systems Summit 2025: <https://youtu.be/P6OftQXwuGk?si=nUWEf0k3d0FLQbey>
4. *icipe* Cultural Day 2025: <https://youtu.be/vBfgKezl3eY?si=dGpkjUHDfRutQdC1>
5. Courtesy visit to *icipe* by Amb Josphat K Maikara, EBS: <https://youtu.be/Js9Qui9rkLU?si=aPnRnkt1C2vTyY2B>
6. Insect farming and value chain development training of Pacific Champions closing ceremony: https://youtu.be/M49z1GO536A?si=zb9_S6d6gUL77pKj
7. World bee day 2025: <https://youtu.be/3IvMdoWbv4o?si=JjzEmF2153SBCW2L>
8. The Joy of Insect Farming: <https://youtu.be/aocinET3rS0?si=H0lDMGJHdEC9p-K>
9. Visit to *icipe* by The End Fund: <https://youtu.be/SmQwfgY2v-w?si=nc5XSHoOyRKsVnTz>
10. The Role of Bees in Agriculture and Nutrition: https://youtu.be/J2jnHkCZ6_A?si=9m_Pta-32xu2NPn
11. Biodiversity Bites - Soil Health: <https://youtu.be/G4t1whDFZf4?si=oczfEprM2oxaQ9Jp>
12. Biodiversity Bites - Insects for Feed: <https://youtu.be/0FVfDI5bESA?si=yBmacdiMDpXspdAH>
13. Biodiversity Bites - Insects for Food: <https://youtu.be/K-KdeTL94os?si=Wph9uGHwDzuJ04Wt>
14. Youth Learning Summit: <https://youtu.be/gZVFA1MSr6Q?si=GhVhliP5E6x8e6I2>
15. Transforming Lives Through Beekeeping - Young People Journey with *icipe* and Mastercard Foundation: <https://youtu.be/XaZurVzY1NY?si=hXdMIqPk5Q39B2EP>
16. Transforming Lives Through Beekeeping - Young People Journey with *icipe* and Mastercard Foundation: <https://youtu.be/VmyzJ79saZA?si=ml3WdsIpeWexonNg>
17. International Day of Women & Girls in Science: Dr Freweini Assefa, Technical Working Group Lead: https://youtu.be/8_oCAVloKzQ?si=ESDlxAFyfm7oZsVQ
18. Regional Multi actor Research Network on Agroecology in East Africa: <https://youtu.be/Pl8x1IRp5tE?si=MDDzIe8J5KakllQd>
19. International Day of Women & Girls in Science: Julia Muita, *icipe* Msc student, biting flies: <https://youtu.be/h3NprVH88ww?si=osFT0KXpt5fp0mOd>
20. International Day of Women & Girls in Science: Beatrice Muriithi, *icipe* Scientist, Gender, Impact: https://youtu.be/U9-KTureKBI?si=apQySR_nIAANJJa1R



21. International Day of Women & Girls in Science: Beritah Mutune, *icipe* Tecnology Transfer Officer: https://youtu.be/B6ATryL2x8k?si=rq_xMmkBCOMiBwfm
22. International Day of Women & Girls in Science: Faith Nyamu, *icipe* Research Officer, INSEFF: <https://youtu.be/GqVfZme0HvI?si=u2uaiAsgUrDjbphL>
23. International Day of Women & Girls in Science: Dr Menaga, *icipe* Scientist, insects & aquaculture: <https://youtu.be/hXAe5OaJq08?si=fE7NXL1kIFrueS4>
24. International Day of Women & Girls in Science: Rua Khogali, *icipe* Phd Scholar, tick research: https://youtu.be/zKMD7x_Kr3U?si=nZr0qFzrxo84GqCf
25. International Day of Women & Girls in Science: Rehemah Gwokyalaya, *icipe* Scientist, insect symbionts: https://youtu.be/aXfdxjaeC_g?si=8bukRwaCEdBp-OWs
26. International Day of Women & Girls in Science: Tullu Bukhari, *icipe* Scientist, vector-borne diseases: https://youtu.be/A5D-0yUIzZQ?si=2Gg7nW6Qb_leMEPd
27. International Day of Women & Girls in Science: Beatrice Nganso, *icipe* Scientist, bees & pollinators: <https://youtu.be/w-7tUDNjDbQ?si=sLXBKK5YbYvVwfy4>
28. Participation in Africa Food Systems Summit 2025: <https://youtu.be/P6OfQXwuGk?si=BAa3L4xTujxX-qC->

Rsif videos (2)

1. More than a scholarship: A path to leadership: <https://youtu.be/9hf-ljj8kI4?si=D9QggaXS43xao5Lr>
2. Building Climate Action in Africa: <https://youtu.be/gpb23iqHUmo?si=e0J1Vl0lIGxyBZqg>

BioInnovate Africa videos (16)

1. Making Ideas Investable – Biobased Innovation and Entrepreneurship Bootcamp: <https://youtu.be/1YZkp0QvNiU?si=Hb8CPbfjE4qjclL2>
2. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Winnie Okeyo: <https://youtu.be/YrNfuAesAr8?si=30GXcMf-FwJm6siu>
3. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Abdel-razakh Hissein: <https://youtu.be/2xI8IpUVSgM?si=1QIJxSXpgrdYYsHF>
4. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Baker Kansime: <https://youtu.be/d9EDjoTNj9w?si=eeDL0wqwwH9Em5Jb>
5. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Rehema Matendo Esther: <https://youtu.be/4ZpfqkEtFgY?si=zWF7IyIEtYb7y3eT>
6. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp –Judith Temu: https://youtu.be/rWh3Li_bBaU?si=1oeAyd_rJlarz7l8
7. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Elizabeth Siago Kusia: <https://youtu.be/drur7knp52g?si=U4M6DqoiOo8yHbrS>
8. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Mercy Mmari: <https://youtu.be/iEQZpJANw9A?si=Qwcvxj0Nf6ehjR6k>
9. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Bhahat Zimba: <https://youtu.be/w-XApWkh9-4?si=9JN7iwNVRNIG97iD>
10. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Shallot Tumuhairwe: <https://youtu.be/ig9YIHHEELf8?si=Z4E6qDA3tG0hocxq>
11. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Marthe Niyibigira: <https://youtu.be/-K36sNWwxiU?si=9vUPVE6MjyjfWY8f>
12. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Solange-Ange Bacinoni: <https://youtu.be/rl622yXFcpo?si=3QXJ4AEftQy8ykgp>
13. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Tsion Amsalu: <https://youtu.be/11vaFgY5Bzo?si=OQs9HeqjVOR3p1E>



14. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Jonas Bayuo:
<https://youtu.be/PTQzJHBX2WA?si=4kd2vA06Tvqr9ZzC>
15. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Abraham Erodi:
<https://youtu.be/7PW-j-yVaJg?si=mi-dmLuyxkAY93Th>
16. Making Ideas Investable: Biobased Innovation and Entrepreneurship Bootcamp – Margareth Lupembe:
https://youtu.be/dXmoCp_aGgg?si=DtQaoVJ5jTycP2Ve

