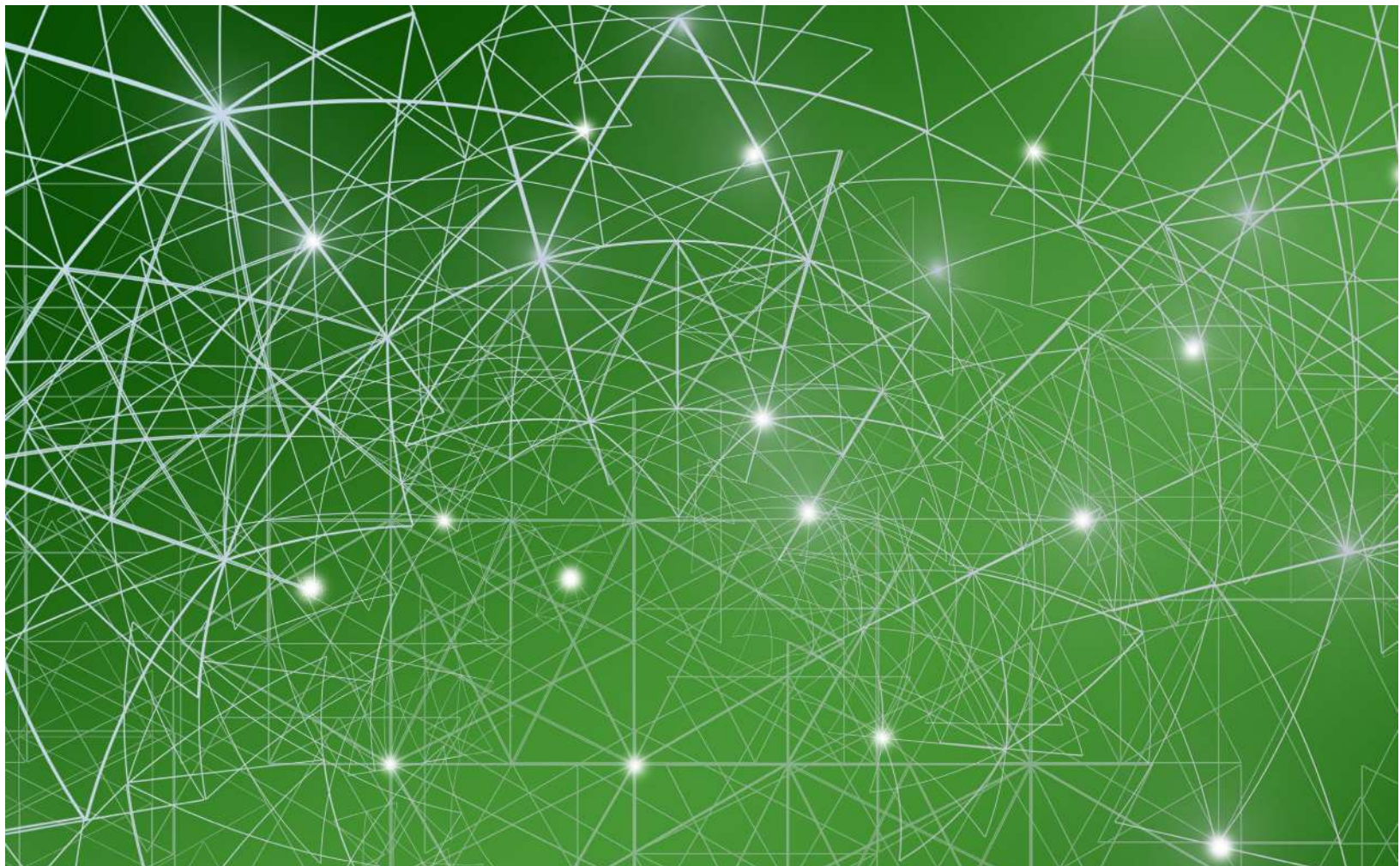




*Strengthening the capacity of African countries and institutions to harness science, technology and innovation for sustainable and inclusive development*



# **Annual Report**

## **2023**

Published by

**ACTS Press**

African Centre for Technology Studies

ICIPE Duduville Campus, Kasarani,

P.O. Box 45917-00100

Nairobi, Kenya.

Tel. +254710607210/+254737916566

Email: [info@acts-net.org](mailto:info@acts-net.org)

© ACTS, 2023

All rights reserved. The moral rights of the author have been asserted. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except as permitted by copyright laws, without the prior permission of the publisher.

# TABLE OF CONTENTS

Abbreviations.....	4
I. Background and Context.....	7
II. Agriculture, Food and Nutrition Security (AFNS).....	8
III. Climate Resilient Economies (CRE) .....	13
IV. Science Technology Innovation Knowledge and Society (STIKS).....	18
V. Digital Economy Programme (DEP) .....	26
VI. Gender, Youth and Inclusive Development (GYID).....	29
VII. Corporate Affairs.....	30
VIII. Summary of Key Outputs, Outcomes and Impact .....	31
IX. Impact Stories .....	32
X Audited Accounts .....	35
XI. Publications.....	36

# ABBREVIATIONS

ACES	Africa Centre of Excellence for Sustainable Cooling and Cold-Chain
ACTS	African Centre for Technology Studies
AFNS	Agriculture, Food and Nutrition Security
AfricaLics	African Network for Economics of Learning, Innovation & Competence Building Systems
AI	Artificial Intelligence
AI4D	Artificial Intelligence for Development in Africa
APA	ACTS Pathways Academy
AU	African Union
BE	Blue Empowerment
BMU	Beach Management Unit
CBE	Circular Bioeconomy
CCH	Community Cooling Hub
CGIAR	Consultative Group on International Agricultural Research
CLARE	Climate Adaptation and Resilience
CRDF	Civilian Research and Development Foundation
CRE	Climate Resilient Economies
CREEC	Centre for Research in Energy and Energy Conservation
CTAs	Collaborative Technical Agencies
CTCN	Climate Technology Centre and Network
CTFR	Consortium for Trans-disciplinary Futures Research
DRR	Disaster Risk Reduction
EABL	East Africa Breweries Limited
ECA	Early Career Academics
EiA	Excellence in Agronomy (EiA)
FAO	Food and Agricultural Organization
FCDO	Foreign, Commonwealth and Development Office
FNS	Food and Nutrition Security
GCCF	Global Cold Chain Foundation
gDIH	Green Digital Innovation Hub
GDP	Gross Domestic Product
GeckoCir	Circular Retrofitting for Sustainable Industrialization
GEI	Gender Equity and Inclusivity
GHG	Green House Gases
GYID	Gender, Youth and Inclusive Development
HCDI	Human Capital Development International (HCDI)
ICT	Information Communication & Technology
IDRC	International Development Research Centre
IFT	Institute of food Technologists

# ABBREVIATIONS

IITA	International Institute of Tropical Agriculture (IITA).
IMeCHE	Institute of Mechanical Engineers
IMTA	Integrated Multi-Trophic Aquaculture
JOOUST	Jaramogi Oginga Odinga University of Science and Technology
KCIC	Kenya Climate Innovation Center
KII	Key Informant Interviews
KIRDI	Kenya Industrial Research and Development Institute (KIRDI)
M&E	Monitoring and Evaluation
MCM	Multi-criteria Mapping
ML	Machine Learning
NARO	National Agricultural Research organization
NEADAP	Netherlands East Africa Dairy Program
NETFUND	National Environment Trust Fund
NGO	Non-Governmental Organizations
NSTIP	National Science, Technology and Innovation Policy
OEAD	Austria's Agency for Education and Internationalization
PEF	Post-harvest Education Foundation
PHL	Post-harvest Losses
QBMPs	Quality Based Milk Payment Systems
RIM	Research and Innovation Management
SAT	Sustainable Agriculture Tanzania
SDGs	Sustainable Development Goals
SGCI	Science Granting Council Initiative
SGCs	Science Granting Councils
SIDA	International Development Cooperation Agency
SME	Small & Medium Enterprises
SPOKES	Specialized Outreach and Knowledge Establishments
SSA	Sub-Saharan Africa
STREM	Strengthening Community Based Research for River Health and Climate Change Mitigation in Eastern Africa
TBYB	Try Before You Buy
ToT	Trainer of Trainers
TransCIIT	Transforming Climate Innovation Ecosystems through Inclusive Transdisciplinarity
UJ	University of Johannesburg
UK	United Kingdom
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization.
VFP	Visiting Fellowship Programme
YLOs	Youth Led Organizations

# KENYA 10-Year INNOVATION MASTHEAD



# I. BACKGROUND AND CONTEXT

The African Centre for Technology Studies (ACTS) is a pioneering development research think founded in 1988 to pursue policy-oriented research towards strengthening the capacity of African countries and institutions to harness science and technology for sustainable development. Article 3 of the Charter that established ACTS in 1988, empowers the Centre to undertake capacity building, conduct research, provide advisory services, and disseminate information on the policy aspects of the application of science and technology to sustainable development in Africa. Consequently, in the last 30 years, ACTS has been instrumental in enlarging the range of policy choices for sustainable development in Africa through high-quality research. The year 2023, was the second year of the Centre's implementation of its Seventh Strategic Plan (SP-2022-2026) and the activities reported in this year were aligned to the Centre's vision, mission, goal and value proposition as outlined in Box 1. The Centre has made significant strides in advancing sustainable development across Africa through its strategic focus areas with notable achievements.

Box 1: VISION, MISSION, GOAL AND VALUE PROPOSITION	
VISION	VALUE PROPOSITION
<p><b>Knowledge for better livelihoods</b></p>	<ul style="list-style-type: none"> <li>a) To conduct high quality research, policy analysis, capacity building and outreach on the application of science, technology and innovation policies for sustainable and inclusive development.</li> <li>b) To facilitate and convene evidence-based policy dialogues and debates.</li> <li>c) To inform, influence and enhance sustainable and inclusive development theory, policy and practice.</li> <li>d) To put critical issues of science, technology and innovation on the development agenda, with special focus on agriculture, food and nutrition security, digitalization, climate change and energy, and gender and youth development.</li> <li>e) To provide independent and objective policy options and business models to African governments and institutions, regional economic communities, private sector, civil society and put issues critical to Africa's development on global, regional and national agenda.</li> <li>f) To broker and leverage STI research, knowledge and expertise for trade and development policy, practice and entrepreneurship in Africa.</li> <li>g) To promote science diplomacy for global development.</li> </ul>
<p><b>MISSION</b></p> <p>To strengthen the capacity of African countries and institutions to harness science, technology and innovation for sustainable and inclusive development (to review and cross check with previous SP)</p>	
<p><b>GOAL</b></p> <p>To position ACTS as a think tank of choice for policy relevant research in the application of STI in strategic thematic areas including climate change, energy, digital innovation, agriculture and food security, gender and youth; inclusive innovation- through quality research, policy analysis, dialogues, capacity building and outreach.</p>	

1. **Policy Research:** ACTS continues to pioneer rigorous and insightful policy research, contributing to informed decision-making processes that underpin sustainable development strategies. The Centre delivered impactful research outcomes, including; 5 Inception workshops and reports, 5 Baseline/Survey reports, and 10 Research/ Technical papers. The Centre's commitment to policy oriented, evidence based research resulted in over 13 Journal papers and 6 book chapters across different thematic areas and programmes.
2. **Capacity Building:** Nurturing a cadre of experts and leaders by investing in targeted capacity-building initiatives, empowering individuals and institutions to navigate the evolving landscape of technology and development. In the pursuit of capacity strengthening and knowledge dissemination among the STI ecosystem stakeholders, the Centre realized impressive results. Over 23 training workshops were conducted, 2 training manuals/curriculum developed; enhanced academic excellence through teaching and learning evidenced by the support provided to over 70 Masters' and PhD students across two major programmes. Furthermore, the organization played a pivotal role in enhancing capacities among young and early career scholars, produced 2 capacity assessment reports, and initiated 4 Concept notes for PhD academies and professional development. With a focus on cutting-edge technologies, 10 Short courses relevant to AI and ML were offered, reinforcing the commitment to targeted and relevant skill development.
3. **Policy Engagement:** In active collaboration with policymakers and stakeholders, ACTS remains at the forefront of advocating for policies that foster sustainable development, contributing to impactful and lasting change. The Centre actively engaged with stakeholders through over 10 national workshops on AI and ML and general 12 policy engagement workshops fostering a collaborative environment for knowledge exchange. Some specific outputs out of these policy activities include 2 policy briefs that are expected to contribute to evidence-based decision-making in the dynamic STI and climate change fields.
4. **Knowledge Brokerage:** Serving as a nexus for the exchange and dissemination of knowledge, ACTS facilitates collaboration, ensuring that valuable insights are shared and harnessed for collective progress.
5. **Dissemination of Knowledge:** In the digital age, effective sharing of relevant and timely information is paramount. The Centre in 2023 embraced various channels, delivering content through 5 media articles, 2 newsletters, 5 brochures/ project briefs, and 7 info-briefs. The organization has also leveraged multimedia platforms with 15 videos, ensuring a dynamic and accessible approach to knowledge dissemination. Additionally, the establishment of 2 knowledge management platforms strengthened ACTS' commitment to organized and accessible information.

Overall, the Centre remains dedicated to fostering sustainable development through research, capacity building, policy engagement, and efficient knowledge and information dissemination. The collaborative efforts across these key areas underscore the organization's vital role in shaping an innovative, resilient and sustainable future for Africa. The report provides a comprehensive overview of the Centre's programmatic outputs and outcomes across its five programmatic areas: Agriculture, Food, and Nutrition Security (AFNS), Climate Resilient Economies (CRE), Science, Technology, Innovation, Knowledge and Society (STIKS), Digital Economy and Gender, Youth and Inclusive Development (GYID). This annual report serves as a testament to ACTS' unwavering commitment to advancing the frontiers of knowledge and addressing critical challenges facing Africa. As we reflect on the accomplishments of 2023, we remain dedicated to our vision of Knowledge for better livelihoods.

## II. AGRICULTURE, FOOD AND NUTRITION SECURITY (AFNS)

The AFNS program's mission is to contribute to the efforts of the African governments and partners and the sustainable development goals to enhance food and nutrition security, improve livelihoods in Africa through harnessing science, technology, and innovation for sustainable and inclusive agri-food systems. The program implemented three major projects and two consultancies and was involved in other two projects led by Climate Resilient Economies (CRE) Program. The program covered three key thematic focus areas in line with the strategic plan as reported below.

### Research

#### 1. Circular Bioeconomy for the Kenyan Dairy Sector (VALORISE) Project- 2022-2025

In Kenya, dairy is a leading sector, processing 634 million liters of milk in 2018 and contributing 14% of agricultural GDP and 4% of national GDP. Per capita per annum consumption of milk and dairy products is over 110 liters and is projected to double by 2030 with increasing shares of processed products such as yoghurt and cheese. The VALORISE project seeks to examine how Circular Bioeconomy (CBE) principles of resource use, i.e., prevention, reuse, recycling, can be leveraged in the growing and modernizing dairy industry in Kenya. In addition to research, there is a complementary project to enhance effective science communication of the project through using non-scientific modalities for communicating the insights from the research and engaging with stakeholders. The VALORISE research focuses on:



*Dr. Catherine Kilelu, the head of Agriculture, Food and Nutrition Security (AFNS) Programme in consultation with a staff member of the Brown's Cheese Factory in Limuru, Kenya. This was during a visit by the Danida Fellowship Centre under the VALORISE project.*

- i. Developing an analytical framework and mapping of actors and institutions in the dairy innovation system.
- ii. Undertake analysis of quality dairy side streams, especially whey and potential of products that can be developed. This has been undertaken by an MSc student.
- iii. Analysis of firm incentives and opportunities to engage in valorization.
- iv. Conduct stakeholder workshops to look into Future scenarios for a circular dairy bioeconomy in Kenya to inform policy and investment considerations.

Research activities undertaken include literature review in developing a conceptual framework, survey of sampled dairy processing firms, with a particular interest of those involved in cheese processing to understand how side streams are handled and extent of utilization, key informant interviews (KIIs), and collection of whey samples to analyze quality and develop products. Consequently, 25 dairy processing firms in Kenya have been analyzed under this project. Further, literature review has been conducted as part of development of a conceptual framework for the research on circularity and dairy sector in a developing country context.

#### 2. Building High Level Support and National Capacities to Enhance Climate and Ozone Protection Through Cooling Efficiency (ACES/ CCH) Project- 2022-2023

This project is part of the Africa Centre of Excellence for Sustainable Cooling and Cold-Chain (ACES) initiative. The goal of ACES is to accelerate deployment of best-fit sustainable (environmentally, economically, and socially) and resilient, temperature-controlled, low-carbon end to end cold-chain connectivity for food and health. This is expected to simultaneously protect the quality and safety, minimize loss, and create and provide equitable value to all stakeholders. The programme is led by the University of Birmingham and the United Nations Environment Programme (UNEP) with more than \$20M of seed investment to date committed by the UK and Rwanda Governments.

ACES operates on a hub model which aims to cascade knowledge through Specialized Outreach and Knowledge Establishments (SPOKES) to be established at country level. The first of these is in Kenya, with ACTS is leading in implementation. At the Kenya SPOKE, the action research is focused on conceptual refinement and operationalization of delivery of sustainable cooling technology and related business models. This year was mainly an inception phase. The research has focused on undertaking needs and market assessment to guide in development of a business plan and model for the CCH across selected counties. There has been extensive engagement with farmers and other stakeholders as part of concretizing the partnership. We have also contributed to seminal reports that are part of ACES thought leadership in the areas of sustainable cooling and cold chain and have been expounding on the applied research agenda for Kenya SPOKE in alignment with the broader ACES research framework. Empirical data from this project will support further implementation of the TBYB model.



### 3. Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya – Opportunities for Inclusive Climate-Action Enterprises (IFT)

Postharvest loss (PHL) presents a threat to food and nutrition security (FNS) and sustainable livelihoods in sub-Saharan Africa (SSA). Reducing losses is a key target in the Sustainable Development Goal (SDG) target 12.3, which aims to halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses. Smallholder farmers have limited access to appropriate and affordable postharvest technologies, where majority use artisanal techniques for PHL management such as open sun-drying causing less optimal quality, acceptability, marketability, and poor nutrient retention of dried foods. Hence, there is need to innovate solutions to reduce these high levels of PHL to contribute to food security as well as agricultural transformation. The project implemented in 2023 was a partnership with Kenya Industrial Research and Development Institute (KIRDI) and UNEP that seeks to scale-up the proof-of-concept of climate-action solutions of low-cost quality hybrid solar drying technology



*A prototype hybrid solar dryer was installed in Kitui County and is currently being used as a demonstration and trainer unit.*

enterprises to reduce PHLs and drive realization of multiple SDGs. The research focused on optimizing and performance assessment of a prototype hybrid solar dryer and supporting the commercialization by understanding the market drivers and challenges for uptake, and related business models to deliver the technology. Additionally, the issue of enhanced delivery of quality solar drying technology was considered through analysis of policy and standards aspects.

### 4. Blue Empowerment Project - 2022-2024

Blue Empowerment project aims to empower women in Kenya's coastal region to optimally and sustainably exploit the lucrative blue economy through adoption of climate-smart integrated multi-trophic aquaculture (IMTA). This research project is undertaking social, technological, and institutional analyses of the barriers, challenges, and opportunities for leveraging IMTA of seaweed and fish as a low-carbon, gender-transformative, environmentally, and economically sustainable innovation for equitable empowerment. The proposed IMTA innovation brings fish and seaweed farming together into an integrated and mutually economically beneficial production cluster. The overall project is led by CRE, with AFNS leading WP3 (Mapping social technical pathways for adoption and upscaling of IMTA) and is also contributing to WP5 (Promoting knowledge translation, dissemination, and learning) through supervision of MSc students' research.

### 5. Capacity Strengthening (CS) Hub of the IDRC-FCDO CLARE Programme

The project is a support initiative for the International Development Research Centre and Foreign and Commonwealth Development Office (IDRC-FCDO) supported Climate Adaptation and Resilience (CLARE) projects aimed at establishing a capacity strengthening hub that supports the project's objective to strengthen capacity from research to action for sustainable climate resilient development. The hub is led by a consortium of ACTS and Plan Adapt (PAACTS). While the focus of the project is to facilitate capacity strengthening support for the CLARE projects, there will be elements of research to understand the effect of the CS hub support in enhancing different types of transformative capacity strengthening. The CS hub has held several engagements that have served as the beginning of the contribution to its objective of enhancing capacity for climate-resilient development by engaging with project teams and their CS focal points other CLARE programme supporting functions. The project concluded its inception phase by end of October and an inception report and detailed work plan was submitted to the funder: International Development Research Centre (IDRC).

### 6. Netherlands East Africa Dairy Program (NEADAP) of Netherlands Development Organization (SNV) as Product lead on Quality Based Milk Payment Systems (October 2022- May 2023)

This consultancy explored the opportunities for scaling Quality Based Milk Payment Systems (QBMPs) among dairy processors and their linked cooperatives. The introduction of a QBMPs is key for systemic and gradual improvement of milk quality towards national and international standards. To guide in assessing opportunities for scaling QBMPs in Kenya, ACTS conducted a mapping and characterization of potential dairy processors and cooperatives that could be targeted for technical support.

## 7. Excellence in Agronomy (EiA)– WUR/IITA

This consultancy project is undertaking a qualitative study on the efficiency and effectiveness of the use case approach (UCA) that is being applied by Excellence in Agronomy (EiA) program of the CGIAR led by International Institute of Tropical Agriculture (IITA). EiA seeks to co-develop demand-driven agronomic solutions through full participation of stakeholders. The implementation is guided by the UCA that outlines a seven-step process that leads to delivery of scalable demand driven solutions. The study will provide in-depth analysis of select (potentially 6) use cases across Africa, Asia, and Latin.

### Capacity Building

All projects integrated aspects of capacity building that is multidimensional. One dimension is providing capacity strengthening opportunities for partners and stakeholders, the other dimension relates to internal (team) capacity building.

#### 1. Building High Level Support and National Capacities to Enhance Climate and Ozone Protection Through Cooling Efficiency- ACES/ CCH Project

- The project co-organized four post-harvest and cold training workshops for farmers' cooperative/group leaders and individual farmers in collaboration with the World Food Logistics Organization (as part of with the Global Cold Chain Foundation (GCCF)) and the Postharvest Education Foundation (PEF). Over 80 farmers from Kiambu County were trained on various aspects of post-harvest management with aspects related to the cold chain, targeting horticultural crops. The training workshops were held in August and October 2023.
- The project contributed to development of a trainer of trainer curriculum for the in-county flagship capacity building program that will be offered initially at ACES headquarters in Rwanda, then rolled out to the Country SPOKES, with Kenya being the first. The training program covers 15 modules related to design, development, and operation of a community cooling hub. The AFNS team is leading in development of four modules and contributing to 5 other modules.
- Early in 2023, two staff participated in a high-level study tour in the UK that covered several institutions working on various aspects of sustainable cooling and cold chain. One of the staff further participated in a training of trainers in sustainable refrigeration that was also held in the UK at the University of Birmingham.

#### 2. FT (Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya – Opportunities for Inclusive Climate-Action Enterprises - 2022-2023

- In recognition of some of the capacity gaps that were found among fabricators in the market, the project in collaboration with KIRDI Kisumu team conducted a 2-day training of solar fabricators. The training benefited 6 fabricators firms on the fundamentals of design and construction of a hybrid solar dryer. The training was geared toward an entry point for identifying potential business partners that would enable the delivery of the prototype dryer to the market and grow the commercialization potential.
- The project co-organized and participated in a training of trainers (ToTs) workshop on 'Addressing Current and Emerging Threats to the Mango Fruit Crop' held in Kitui County on 22<sup>nd</sup> & 23<sup>rd</sup> June, 2023. The training was in collaboration with Jomo Kenyatta University of Science and Technology (JKUAT), Vine Fruits Ltd and Nuru International. The training was offered to 20 selected farmers and extension service providers from different regions of Kitui, who can then go and train others on good agronomic and post-harvest handling of mangoes.



*Participants of the policy dialogue on 'Opportunities and Challenges for Enhancing the Market for Quality, Low-cost Solar Drying Technology'.*

#### 3. Netherlands East Africa Dairy Program (NEADAP) Product Lead Milk Quality- 2022 (October- May 2023)

The project team organized a learning visit from January - February 2023 to Southwest Uganda as a regional knowledge exchange platform between dairy processors and cooperatives from Rwanda, Kenya, and Uganda. One of the Kenyan processors (Abysinia) who expressed interest in implementing a quality-based milk payment system in their supply chain was part of the visiting delegation. Uganda dairy sector has experienced exponential growth in the past years, and this is due to the coordinated effort among all stakeholders including processors, farmer cooperatives, extension service providers, private sector run- dairy training centers the dairy regulatory authority, the National Agricultural organization (NARO) among others.

## Policy Engagement

### 1. Circular Bioeconomy for the Kenyan Dairy Sector (VALORISE) Project- 2022-2025

The project team made a presentation on the preliminary findings of the VALORISE project at the 16<sup>th</sup> Dairy Africa Conference. The presentation focused on trends with milk processing and product innovation in Kenya to demonstrate the potential opportunities with integration of circular bioeconomy principles in the sector's development. The meeting was attended by over 1500 delegates that included policy makers in the region.

### 2. Building High Level Support and National Capacities to Enhance Climate and Ozone Protection Through Cooling Efficiency- ACES/ CCH Project

- The project team presented at the 1st International Conference & Workshop on Climate Adaptation & Resilience organized by the Institute of Mechanical Engineers (IMeCHE) from 6<sup>th</sup> - 8<sup>th</sup> September in the UK. The focus was on effects of drought and heat on the agri-food systems in Africa.
- The team attended the Africa Centre of Excellence for Sustainable Cooling and Cold Chain (ACES) Forum that was held on 17<sup>th</sup> and 18<sup>th</sup> October 2023, at the ACES Institute Rubirizi campus, Kigali, Rwanda. The forum gathered experts from governments, research and academia, non-profit organizations, and private sectors. The team contributed to the discussions and provided perspectives for policy consideration.
- The project team participated in the pre-launch and launch of the national cooling plan meetings to provide input related to sustainable cooling and cold chain especially in relation to the agri-food sector. ACTS interest is to see a more interactions between policy actors in agrifood, energy and environment to see more sectoral integration to advance the sustainable national cooling agenda.

### 3. IFT (Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya – Opportunities for Inclusive Climate-Action Enterprises - 2022-2023

The project organized a policy dialogue in June 2023 on 'Opportunities and Challenges for Enhancing the Market for Quality, Low-cost Solar Drying Technology in Kenya'. The policy dialogue stimulated discussions with stakeholders on issue related to quality of the dryers available in the market and kick-start discussions on the needs for standards, and capacity in this industry.

### 4. Aquaculture of Seaweeds and Fish: Opportunities for Blue Economic Empowerment and COVID-19 Resilience of Fisher Women in Kenya (Blue Empowerment – BE project) 2022-2024

The project organized a stakeholders' workshop in Kwale County on 27<sup>th</sup> February to 1<sup>st</sup> March 2023. The workshop aimed to utilize the MCM as a participatory approach to assess and establish the priorities for technology, policy, and governance options for optimization of gender-transformative approaches in the BE project. Multiple stakeholders were engaged to explore policy, technology, governance, and inclusive business options, based on weighted criteria, to identify pathways that would be best suited in promoting uptake of IMTA. A co-innovation and co-ideation Platform for the IMTA was conducted in Kwale to enhance women access to blue resources.



*A panel discussion during the policy dialogue on the potential of solar dryers to reduce post-harvest losses held in Nairobi, Kenya.*

## Technology Brokerage

### 1. Building High Level Support and National Capacities to Enhance Climate and Ozone Protection Through Cooling Efficiency- ACES/ CCH Project

The project is geared toward brokering the delivery of sustainable cooling and cold chain technology through a proof-of-concept approach, preceding the deployment of a community cooling hub. The hub will include a full-size sustainable pre-cooling and cold storage facility, cold chain transportation and other complementary technologies that may be relevant e.g. farm gate solutions on precooling. Coupled with the deployment of the CCH, is technology brokerage through industry and farmer demonstration and training that will be focus at Konza SPOKE unit and the CCH respectively.

### 2. IFT (Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya – Opportunities for Inclusive Climate-Action Enterprises - 2022-2023

The project installed a prototype hybrid solar dryer in KIRDI Kitui that is being used as a demonstration and trainer unit. This is one approach to promoting the technology in the market. Additionally, ACTS has commenced commercial deployment of the hybrid solar dryer model with the first dryer acquired by Human Capital Development International (HCDI), -a social enterprise in Kitui engaged in mangoes, chillies, tomatoes, and African leafy vegetables drying. The dryer was acquired through a financing approach of the project, where the client paid 10% and a 90% pre-financing through a rotating fund from the project, to be paid back over 3 years. Their pay back period is determined by a business analysis.



*A prototype hybrid solar dryer that was installed in Kitui County. This is part of a project of scaling solar drying to reduce post-harvest losses in Kenya.*

### III. CLIMATE RESILIENT ECONOMIES (CRE)

#### Research

##### 1. Strengthening Community Based Research for River Health and Climate Change Mitigation in Eastern Africa (STREM) project

The STREM project aims to improve existing knowledge on rivers via conceptual modeling on the socio-economic and ecological impact on the rivers to i) enhance the skills and capacity for research and management of rivers through case studies, ii) to contribute to management frameworks and alternatives for rivers via community-based management, and iii) contribute to knowledge development, dissemination and synthesis in Uganda and Kenya through knowledge integration. An online meeting was held on June 15, 2023, with partner organizations including Egerton University, Kyambogo University (Uganda), BOKU University (Austria), and ACTS, with discussions centering around the STREM technical paper. The consensus was to revise the structure of the technical paper and make it accessible online, allowing the entire team to provide comments. Once the comments are addressed, the paper will be published through ACTS Press.

##### 2. Blue Empowerment Project

The Blue Empowerment project aims to empower women in Kenya's coastal region to optimally and sustainably exploit the lucrative blue economy. The initiative is specifically supporting women in Kilifi and Kwale counties through adoption of climate-smart integrated multi-trophic aquaculture (IMTA) of seaweeds and fish for improved livelihoods and resilience. The project will also promote adoption of sustainable and inclusive IMTA business models.

- A Multi-criteria Mapping (MCM) workshop, a component of work package (WP) 3 of the project was held in March 2023. The workshop aimed to utilize the MCM as a participatory approach to assess and establish the priorities for technology, policy, and governance options or optimization of gender-transformative approaches in the project. During the two-and-a-half day's workshop, multiple stakeholders were engaged, while exploring policy, technology, governance and inclusive business options that would be best suited in promoting uptake of IMTA.
- Recruitment of field officers including induction and contracting was done on the 11th May 2023. Four field officers were selected from Lungalunga, Msambweni, Kilifi North and Kilifi South sub counties. Induction was done both in person and Virtual by all project partners.
- In person project meeting was conducted at Kenya School of Monetary Studies to update activities for each work package and preparation of work plan for year two activities and guidance in financial reporting.
- Cage Assembling. The multiple activities included various meetings at community level, followed by the assembling of the cages by the groups, and finally moving the cages to respective localities. These activities were done in July 2023. In September 2023, there was cleaning of the cages and tiring of the floaters to reduce rust from splash water.
- Socio-Economic Survey-Transect analysis of socioeconomic activities, physio-chemical, variable fauna and flora at Kijiweni, Kibuyuni and Mwazaro, Kwale County were held on 3<sup>rd</sup>-5<sup>th</sup> August 2023.
- Co-innovation Platform Activity-Field officers in Kwale County engaged in the mobilization of the women to participate in the co-innovation activities on 21st and 22nd August 2023. On 26<sup>th</sup> -28<sup>th</sup> August 2023, there was an activity to confirm age groups of members who participated in the co-innovation platform activity by the field officers from Lungalunga sub-county. On 29<sup>th</sup>-30<sup>th</sup> August 2023, the field officers engaged the women in getting feedback about the cages.
- Participation and co-ideation of IMTA at Mwazaro SolColDry: This activity held on 23rd and 24<sup>th</sup> August 2023 involved women from various part of Kwale County. The project team also visited Mwazaro fishpond construction and Kijiweni where the IMTA cages are located on the 24<sup>th</sup> August 2023.
- A life history survey for Kilifi County and Kwale County was held on 4th July 2023; field officers were trained on data collection of life history. Field officer conducted life histories of people involved in seaweed and fish value chain.



*Blue Empowerment business model training held in May-June, 2023 in Kilifi County.*

### 3. Agrivoltaics Project

The Project is a unique agricultural concept that focuses on co-utilization of land for agricultural production, solar energy and water harvesting. The concept has already demonstrated its value for multiple stakeholders in energy, agriculture, water, and microclimate creation. It is exciting, for many stakeholders in arid-and-semi-arid areas, who harvest the solar irradiance in often off-grid areas, use the water harvested for irrigation and animals, produce food beneath the panels, and/or create 'cooler' shade for animals. The project aims to change the perception on current vs future cost of Agrivoltaics, as well as influencing public opinion on the practicality and suitability of this technology in the region.

- A funders' webinar was organized on the 16th of February 2023 and included partners from Climate Technology Centre and Network (CTCN), National Environment Trust Fund (NETFUND), United Nations Development Programme (UNDP), the National Treasury, and Food and Agriculture Organization (FAO). Expected output - a webinar report.
- Project team together with the Agrivoltaics partners such as ICRAF, Kenya, ICRAF, Uganda, Sustainable Agriculture Tanzania (SAT), Centre for Research in Energy and Energy Conservation (CREEC), University of Sheffield and University of York organized an Agrivoltaics event for Kenya and Tanzania. The theme of the event was – “The Potential of Agrivoltaics in East Africa.” The partners visited Kenya and Tanzania. The event took place on 26th and 27th July 2023 for the Kenya event at ICRAF, Gigiri and 30th - 3rd August 2023 for Morogoro, Tanzania event.

### 4. UNESCO Disaster Risk Reduction (DRR) Validation Workshop

There was a validation workshop on 9th -10th February 2023 organized by the ACTS and UNESCO. There was representation of participants from Rwanda, Ghana and Nigeria, South Africa and Asia. The ACTS team developed and shared validation workshop report and a policy brief and sent it to the UNESCO team.

### 5. ACTS Pathways Academy (APA)

The ACTS Pathways Academy (APA) platform has been developed to a level that it can now be used to offer trainings internally and externally. The developers trained the ACTS team on how to upload courses and upcoming events. The APA also has a conferencing platform which is now being used to hold most training related activities. The APA was officially launched on July 5th at Safari Park Hotel, inviting various stakeholders, including the press. The Academy officially launched its first module offerings in July, focusing primarily on climate change adaptation. The modules included Climate Finance, Climate Modeling, and Climate Policy and Leadership. These sessions were conducted virtually over a three-week period, with an average daily attendance ranging from 15 to 25 students.

- Recruitment of marketing consultants was done to assist in promoting and selling the modules to the targeted audiences.
- The APA platform development team has successfully addressed issues identified during module offerings through a series of meetings. The final step involved integrating a payment platform into the APA website, enabling potential applicants to make direct payments.
- The team conducted research and surveys in the last quarter to identify potential customers. The goal was to map out the market landscape and gather information on customers who may be interested in ACTS services.



ACTS Climate Resilient Economies (CRE) Programme Lead, Dr Joel Onyango (2nd left) with participants at the launch of the ACTS Pathways Academy.



*A group photo of participants during the launch of the CLARE Capacity Strengthening (CS) Hub in Nairobi, Kenya.*

## **6. CLARE Capacity Strengthening (CS) Hub**

The CLARE initiative (a large-scale FCDO and IDRC-funded research programme across Africa and Asia) supports a range of action-oriented research projects. Embedded within the dynamic CLARE programme, the CS Hub is a new and impact-focused partnership between ACTS and PlanAdapt, each bringing a wealth of strengths and experiences. Underpinned by the principles of knowledge co-creation and equitable partnerships, the CS Hub envisions itself as a collaborative space, that bridges knowledge gaps, encourages self-mobilized capacity strengthening and supports cross-portfolio co-operation within the CLARE portfolio. Building from this foundation of supporting CLARE-internal actors and research grantees, the CS Hub intends to extend methodological advancements and enhanced capacities. The following activities have so far taken place:

- CS Working Group meeting held on 20<sup>th</sup> July 2023.
- CS Hub was successfully launched in Nairobi on September 7th, 2023, with the participation of different CLARE projects, Africa Climate Week attendees, IDRC and FCDO representatives, as well as ACTS and Plan Adapt team members.
- Submission of inception report.
- Bilateral engagement meetings with the CLARE projects to build partnerships.

## **7. Capacity Enhancement of Youth Led Organizations (YLOs)**

ACTS with consortium partners conducted preliminary desktop review of the YLOs followed by an in person visit to each of the YLOs for a preliminary needs assessment. The needs assessment highlighted the importance of understanding the unique challenges and opportunities within each YLO to inform the development of a contextualized curriculum development. Additionally, the capacity assessment reports provided an understanding of the strengths and weaknesses of each YLO, extending beyond governance to encompass operational, financial, and programmatic aspects.

## **8. Transpath Project**

The TransPath project aims to develop science-based tools that support inclusive, pro-active, adaptive transformation pathways towards better management of water resources. It sets out to establish an international network of academics, postgraduate researchers, policy makers, activists, and water stewards for participatory action research on different sites, while also fostering learning across disciplines and locations. It builds the capacity of policymakers to use more inclusive, transparent, participatory and adaptive planning tools; and support water users in different parts of the world to participate meaningfully in policymaking, planning and management of water resources. A visioning workshop was held between 27<sup>th</sup>-29<sup>th</sup> November in Siaya for all stakeholders to collectively come up with suggestions/ideas on how to better manage and conserve the Yala wetland.

# Capacity Building

## 1. STREM Project

An online training on community-based water quality monitoring for river health was held from the 20th to the 23rd of February 2023. The training featured facilitators from partnering organizations, including Egerton University, Kyambogo University in Uganda, BOKU University in Austria, and ACTS. Participants included representatives from Africa, Asia, Europe, and South America. Certificates were issued to all participants. The Decoloniality Summer School, themed 'decolonializing knowledge and learning systems in the global south Summer School 2023' was held in Diani Reef Beach & Spa, Kwale Kenya from the 14th – 21st August 2023. The Summer School was organized by ACTS in partnership with BOKU University, Innsbruck University, BE Project, CTFR, Africa UniNet, OEAD and The Federal Ministry Republic of Austria.

## 2. Blue Empowerment (BE) project

The literature reviews from the various work packages have further been developed into book chapter which will be published under the Book "Opportunities for Blue Empowerment and COVID-19 Resilience of Fisher Women in Kenya: Vol.1 (1st ed.)", ACTS Press. A business model training was organized from the 20th May -3rd June in Lungalunga, Msambweni, and Kilifi. The training involved selected community groups in each sub-county on business models. Mobilization of the community groups was done by field officers for each sub-county. After the training, selection of business units to be supported by BEP was done. MSc. Student from University of Edinburgh was recruited to support work package 5. The student was engaged from May to June, 2023. The project through the ACTS researchers' seminar series organized a webinar on Technology and Business Models on the 17<sup>th</sup> of August.

## 3. Agrivoltaics

A funders' webinar was organized on the 16th of February 2023 and included partners from CTCN, NETFUND, UNDP, The National Treasury, and FAO and a webinar report is being written.

## 4. UNESCO DRR

A training manual on meaningful engagement of the youth in Disaster Risk Reduction and Climate Action was developed. A validation workshop on the training manual was held in the month of February 2023.

## 5. ACTS Pathways Academy

The APA officially gave their first module offerings in the month of July. These modules were mainly on climate change adaptation and they included - Climate Finance, Climate Modeling and Climate Policy and Leadership. These were offered virtually over a period of 3 weeks. The classes averaged a number of 15 – 25 students per day. On 2<sup>nd</sup> November the team organized a webinar focusing on raising awareness on the courses within the academy. The courses showcased include:

- Climate finance
- Climate modeling for decision making
- Climate policy and leadership
- Grant writing and Fundraising
- Science Communication/Communicating Science
- Climate negotiations



*A group photo of participants of the Decoloniality Summer School held on 14th – 21, August 2023 in Kwale County, Kenya.*



## 6. CLARE Capacity Strengthening Hub

The capacity strengthening hub team members participated in the CLARE learning exchange in a three-day event held on November 7th, 9th, and 15th. The agenda for each day was as follows:

- Day One: Networking, exploring cross-cutting research questions for CLARE and GEI Panel.
- Day Two: Day Two: Networking, exploring capacity strengthening in CLARE and revisiting the CLARE Programme theory of Change.
- Day Three: Diving Into Research 4 Impact (R4I) and Explore Project Presentations in Multiple Networking Rounds.

A knowledge management platform has been set up with an aim to promote seamless sharing of information materials between the projects and the CS hub.

## 7. Governing SDG Interactions in East Africa

This project that commenced on December 1st, 2021 has been implemented in three East African countries. Each of these countries is focusing on one specific SDG as listed below:

- Ethiopia- SDG15 (Life on land) – Landscape Restoration
- Kenya - SDG2 (Zero Hunger) – Climate Smart Livestock
- Uganda – SDG6 (Clean Water and Sanitation) – Water-Energy-Food nexus.

The project held a stakeholder engagement workshop on 28th November 2023 where discussions focused on countries alignment with the various SDGs themes.

## 8. Capacity Enhancement of Youth-Led Organizations (YLOs)

Developing contextualized curriculum that does not follow the one shoe fits all approach underscores the need for initiatives to adopt a holistic assessment approach to inform targeted capacity-building interventions. ACTS is currently developing a governance curriculum informed by a baseline report. The curriculum will be contextualized to the needs of the YLOs during its delivery at the Boot Camp scheduled in early 2024.

## 9. Blue Empowerment

MCM workshop conducted in February involved exploring policy pathways for IMTA adoption and women fisherfolk empowerment. The policy pathways that were explored in the workshop were (gendering blue economy policies, integrating new practices into existing policies, and promoting informal business frameworks). In the end, it was determined that gendering blue economy policy emerged as the optimal policy pathway. More policy dialogue sessions were held in the month of November as a pre-launch activity. The aim of these sessions were to:

- Revisit discussion from the MCM workshop that identified policy, governance and technical pathways best suited in promoting uptake of IMTA as a sustainable, resilient, gender transformative pathway.
- Facilitate discussions informed by summary insights from a gender analysis of existing policies and strategies guiding development of fisheries and aquaculture to assess the extent to which the policies are gendered.

## 10. UNESCO DRR

Developed policy brief on meaningful engagement of the youth in disaster risk reduction and climate action.



*Participants of the multi-criteria mapping workshop under the Blue Empowerment project held in Kwale County, Kenya.*

This report summarizes the key achievements for 2023 across the 8 projects, which include the African Network for Economics of Learning, Innovation, and Competence Building Systems (*AfricaLics*); (Evidence for Policy- EviPol), Circular Retrofitting for Sustainable Industrialization (*GeckoCir*); The Trilateral Chair Project; Research Innovation Management (RIM); TransCIIT and Flexible Research Fund: Climate Compatible Growth and the IDRC -Energy Project.

### Research

#### 1. AfricaLics Project

*AfricaLics* brings together scholars, researchers and policy analysts who study development, innovation, learning, and competence building in an African context. *AfricaLics* connects scholars working within the areas of innovation and development with specific focus on these issues for African countries. *AfricaLics* provides networking opportunities and increased access to education to enhance economic and socially sustainable development in Africa. *AfricaLics* provides these opportunities for scholars through various activities including research conferences, PhD academies, Visiting Fellows Programme (VFP) for PhD students and post-doctoral researchers. The program carried out various research activities during the period. Some of the key highlights include:

- Development of the *AfricaLics* annual report which was shared with the Swedish International Development Cooperation Agency (Sida).
- The project team submitted funding proposal to International Development Research Centre (IDRC).
- Three (3) concept notes for PhD academies, research conferences and VFP programme were developed and shared with various development partners.
- Two (2) research papers were accepted and presented during the *Globelics* Conference in India on the month of October 2023.



*Participants who attended the 5th AfricaLics conference held in Yaounde, Cameroun. AfricaLics brings together scholars, researchers and policy analysts who study development, innovation, learning, and competence building in an African context.*



IDRC · CRDI

International Development Research Centre  
Centre de Recherches Internationales en Développement International

Canada



BE

BLUE ECONOMY

# Blue Empowerment Project

*aquaculture of seaweed  
opportunities for blue  
employment and coastal  
fisher women*



## 2. Trilateral Chair Project

The Trilateral Research Chair in Transformative Innovation, the 4IR and Sustainable Development (UJ-TRCTI) is a partnership between the University of Johannesburg (UJ), South Africa, the University of Sussex, UK and ACTS. The research programme has the ambition to develop and test a new theoretical framework to understand transformation, in the context of 4IR and from an African perspective. The project carried out various research activities including data collection (both secondary and primary), data synthesis, reporting, and seminars where the team presented at various events. ACTS is supporting students for fieldwork since the deadline for using British Council funds elapsed in March 2023. The beneficiary PhD students completed the first drafts of their thesis by the end of 2023 and prepared 2 research articles for publishing in early 2024.

## 3. Transforming Climate Innovation Ecosystems through Inclusive Transdisciplinarity (TransCIIT) project

TransCIIT project takes cognizance of the fact that climate change threatens ecosystem services and endangers jobs, often those of the most vulnerable, perpetuating exclusion and inequality. The project is a beneficiary of the Innovation for African Universities (IAU) programme. Other members of the consortium include the University of Sussex, Kenya Climate Innovation Center (KCIC), Jaramogi Oginga Odinga University of Science and Technology (JOOUST) and University of Johannesburg (UJ). During the year under reference, critical lessons for academics and entrepreneurs matching making were documented and shared.

## 4. Research and Innovation Management (RIM) Project

The Research and Innovation Management (RIM) project is a Science Granting Councils Initiative (SGCI) project that aims to support science granting councils (SGCs) to fund and manage research and innovation projects. The goal of the programme is to strengthen the capacities of SGCs to fund and manage research and innovation projects in areas aligned with their national development plans and priorities. The RIM project team carried out various research activities that included data collection (both secondary and primary), data synthesis, reporting, and seminars where the team presented at various events. Some of the key highlights included a three-day face-to-face inception meeting with consortium partners was held on 8 – 10 February in Mombasa, Kenya to jumpstart the implementation of the project. Review of various aspects and cross-cutting themes of the project (e.g., ownership of the project activities by councils, GEI, and Research Excellence) was done and strategies to attain the SGCI objectives discussed and agreed upon. Research related components under this project include:

- A draft research and innovation framework was developed in anticipation of the regional workshops to train and support councils in co-developing their own individualized research and innovation frameworks.
- A baseline survey was conducted to understand the manuals and/ or frameworks that councils employed in managing and funding research and innovation projects.
- Increased attention to Gender and inclusivity: at least six (6) of the councils launched specific calls targeting only women (Tanzania, Cote d'Ivoire, Ghana, Zambia, Senegal, and Kenya). Most of the councils attained the "at least 30%" rule on gender inclusion in their calls and selected projects.
- Research funds disbursements made to beneficiaries of 10 councils who have finalized the selection of projects to be funded.



Research and Innovation project manager at IDRC, Dr Ellie Osir, talking to SGCS from East Africa during a workshop in Mombasa, Kenya.

## 5. Evi-Pol 2 Project

The project aims to strengthen the capacity of Science Granting Councils (SGCs) to use data and evidence in policy and decision-making and to enhance their roles as policy champions. The implementation of the Evi-Pol 2 project started in May 2023. Individualized work plans were agreed on and signed July 2023. The project team supported councils to review/ develop and operationalize STI policy document and STI policy implementation plans. Some of the councils targeted include Kenya, Malawi, Tanzania, Mozambique, Burkina Faso, Uganda, Ghana, Rwanda, and Zimbabwe. The project team completed the development of the online STI policy helpdesk facility. The helpdesk was set for launch in August 2023.

## 6. Circular Retrofitting for Sustainable Industrialization (GeckoCIR)

The overall objective in GeckoCIR is to develop and test an efficient science-based methodology for circular retrofitting in Nairobi, Kenya, i.e., the creation of circular hubs in existing industrial areas. It seeks to demonstrate that it is possible to develop circular hubs in an efficient, fast, and competitive way in developing countries focusing on both internal and symbiotic upcycling of industrial side streams. The project brings in food researchers, biochemical & biorefinery researchers, materials researchers, business/policy researchers and the Rodee technology for upcycling food side streams. The Project carried out various research activities, including data collection (both secondary and primary), data synthesis, reporting, and seminars where the team presented at various events. Some of the key highlights include:

- Mobilization of nine (9) companies into the business case in Export Processing Zone, Ruaraka and Kiambu.
- Completed two (2) business surveys for the already confirmed firms (Farmers choice and Kenafric industries).
- Reviewed case studies for different value chains (Coffee, Macadamia, Breweries) on Circular economy.
- Analysis of company cases EABL, Macadamia, and Coffee firms finalized, and presentations made.
- Compilation of literature study documents on circular economy finalized.
- Drafted a conference paper.



*Science Granting Council (SGC) members, IMT and CTAs during Evi-Pol Learning and Consolidation Workshop held in Accra, Ghana, February 2023.*

## 7. Flexible Research Fund: Climate Compatible Growth

This project seeks to analyze the institutional, political, economic, and sociotechnical trends and dynamics that promote (enablers) and jeopardize (barriers) the implementation of renewable electricity policies in Kenya; provide a comprehensive assessment of the successes and failures of Kenya's renewable electricity deployment policies to further deepen our understanding of the political economy of Kenya's renewable energy subsector and generate practical evidence through case studies of renewable electricity auctioning, building evidence for policy recommendations for Kenya's renewable auction policy. It also expects to propose key recommendations for effective development and implementation of renewable energy policies for maximum benefits with a focus on renewable electricity auctioning and engage stakeholders, through a transdisciplinary approach, co-develop future scenarios for transition to sustainable energy, and disseminate findings through participatory workshops and stakeholder networks. The project carried out various research activities, including data collection (both secondary and primary), data synthesis, and reporting. Some of the key highlights included:

- Project inception report completed and shared with the funders.
- Data collection through administration of online survey completed and the preliminary data analysis and survey report finalized.
- Key Informant Interviews (KII) targeting various county governments, policy makers, financial institutions and development partners, energy experts, and Universities finalized.
- Two (2) Focused group discussions (at the Ministry of Energy and at Tribe hotel) held.
- Benchmarking interviews in two countries (Uganda and Ghana) carried out.

## Capacity Building

### 1. AfricaLics Project

The **project** carried out several capacity building activities under its various projects as outlined below:

- Visiting Fellowship Programme (VFP) - Selection of the 2023 Cohort was a success and the six chosen applicants implemented the proposed activities.
- PhD Academy was held online in September, the call was advertised in February, 48 applications were received, 21 papers accepted.
- The 1st NigeriaLics PhD Academy was held at the University of Lagos from the 3rd to the 8th of February 2023, and it included 19 PhD students, 17 facilitators and about 10 observers. The event was hybrid because some facilitators agreed to hold their sessions online to save money on logistics.
- Mentorship continued throughout the year and 7 mentors identified who worked with the 6 VFP Scholars in 2023. The mentorship programme kicked off in February 2023.



*Visiting Fellowship Programme (VFP) scholars. The programme offer opportunities for PhD and post-doctoral students from low income and low-middle income African countries.*

## 2. Trilateral Chair Project

Two (2) PhD entered the AfricaLics VFP 2023 cohort and joined other students under the programme where they held a series of meetings with their mentors and supervisors. During this time, the Fellows received training and mentorship on specific innovation and development studies issues relating to their PhDs. They interacted with each other and with peers and staff linked to TRCTI Chair, University of Johannesburg (UJ). From 18th – 22nd September 2023, a week of physical activities were organized involving the students, their home supervisors and AfricaLics mentors as well as some students and staff from UJ and the AfricaLics Secretariat. All events took place at UJ. A poster session took place that involved all students from the AfricaLics VFP and some of the UJ PhD students.

## 3. RIM Project

In the reporting period, the project team engaged in several capacity building activities, through virtual and offline meetings and workshops targeting the councils. During the inception meeting, the team supported councils in co-designing and revision of concept notes for the RIM project. The team also held three (2-day face-to-face) regional workshops to support SGCs to understand the research and innovation frameworks. The regional workshops (East, Southern, and West Africa) were held in-person. Follow-up virtual meetings were held to support six select councils (Ethiopia, Tanzania, Mozambique, Malawi, Sierra Leone, and Burkina Faso) to further refine their research and innovation frameworks. During the three regional workshops, the RIM project team also held capacity building sessions with councils to discuss the synthesis of research results. The RIM project team also attended and supported the trainings of beneficiaries in 5 councils (Kenya, Uganda, Mozambique, Botswana, and Cote d'Ivoire). Trainings were on monitoring, evaluation & learning, technical and financial reporting, and synthesis of research results.



*Participants follow proceedings during the Research and Innovation Management (RIM) project workshop in Livingstone, Zambia. The project aims to support Science Granting Councils (SGCs) to fund and manage research and innovation projects by strengthening the capacities of SGCs to fund and manage research and innovation projects in areas aligned with their national development plans and priorities.*

# Science Granting Councils Initiative in Sub-Saharan Africa



## Learning Consolidation Workshop

Learning and Reflecting on SGCI-2 (2018 - 2023)



A panel discussion during the inception workshop for the Research and Innovation Management (RIM) project held in Ghana, February, 2023.

## Policy Engagement

### 1. AfricaLICs Project

The project engaged in a number of webinars as shown below:

- Industrializing through Global Value Chains: What Africa can learn from East Asia and Latin America, February 2023.
- Developing new innovation indicators suitable for informing new policy mixes in African countries, March 2023.
- Technological Innovation and Economic Inequality, April 2023.
- Financing Innovation and Industry Development challenges in the African Pharmaceutical Sector, May 2023.
- Building Research and Policy Capacities on Learning, Innovation, and Competence Building Systems in Burkina Faso, July 2023.
- Multi-layer challenges to building local innovation capabilities in Africa: a quest for our roles, August 2023.
- Construction of transformative innovation capabilities in peripheral regions of the Global South, October 2023.
- Alumni meet-up session on publishing with special journal issues, October 2023.
- Emerging Technologies and Innovations for Agriculture and Food Systems Security in Africa, November 2023.

### 2. Trilateral Chair Project

Under the **Trilateral Chair** project, a transformative Innovation Policy (TIP) workshop was held in September 2023 at the Kenya School of Monetary Studies (KSMS). The workshop was attended by stakeholders from different backgrounds including policymakers, researchers, academia and industry players.

### 3. TransCIIT Project

A showcase event targeting policymakers and stakeholders which was held at the Kenya School of Monetary Studies (KSMS) in September 2023. The event shared how Universities can help to bridge the gap between industry and education thereby enabling the enduring learning, internships, professional and technical education necessary for starting, managing, and growing small businesses. Activities included: sharing results of the matchmaking project, sharing reflections and lessons learnt, showcase the improved match making web-based application, and share the benefits of the matchmaking service that shows the need to draw from academic and practice-based knowledge systems in the co-production of knowledge with key stakeholders.

### 4. RIM Project

The project team held a series of meetings and engagements with councils to discuss among other things needs assessments and other cross-cutting themes of the SGCI (including Research Excellence, and Gender, Equality, and Inclusivity). During the reporting period, the RIM project team had some commendable achievements including:

- Inception meetings with SGCs successfully organized and held.
- All 17 participating Science Granting Councils have submitted their concept notes and launched calls. SGCs aim to fund 83 research and innovation projects.
- Increased attention to Gender and inclusivity: at least six (6) of the councils launched specific calls targeting only women (Tanzania, Cote d'Ivoire, Ghana, Zambia, Senegal, and Kenya). Most of the councils attained the "at least 30%" rule on gender inclusion in their calls and selected projects.



## 1. Evi-Pol 2 Project

Under Evi-Pol 2 project, discussions with 14 of the 17 Councils were held to discuss work plans and 10 work plans finalized. Discussions with three further Councils in the final stages. The Evi-Pol2 team also held discussions with 14 of the 17 councils to discuss their workplans. Ten workplans were finalized, out of which the Evi-Pol2 team has engaged with six councils (Kenya, Malawi, Ghana, Zambia, Mozambique, and Zimbabwe) virtually to discuss the councils' individualized work plans and how to operationalize support and engagement between ACTS and the councils. Discussions touched on development of concept notes, budget, and work plans. Two councils (Kenya and Malawi) have already begun implementation of activities including:

- Kenya – Monitoring and evaluation of socio-economic impacts of former funded projects.
- Malawi – (i) Validation of the draft STI Policy through stakeholder validation meetings, and (ii) Submission of the Draft National STI Policy (NSTIP) 2023 to Principal Secretaries Committee.

These engagements are expected to yield concept notes which will kick-start the implementation of the activities agreed with the other four councils beginning of 2024. During the year 2023, the Evi-Pol2 team had some commendable achievements including:

- Completion of the online STI policy helpdesk facility that was launched in August 2023.
- Two collaborative agreements already drafted and signed (Kenya, Malawi). The two are already in the implementation stage having shared concept notes, drawn disbursement requests and received financial support.



*Science Granting Council (SGC) members and the Evi-Pol team during one of the Science Technology and Innovation (STI) policy workshops.*

## V. DIGITAL ECONOMY (DE)

The Digital Economy Programme aims to enhance the development, deployment and adoption of responsible digital technologies for sustainable and inclusive development in Africa through capacity building, policy research and technology brokerage. This will help unlock the potential of state-of-the-art digital technologies, such as the 4th industrial revolution technologies, for driving the economies of African countries.

### Research

#### 1. AI4D Africa Scholarship Project

This project, funded by IDRC, Canada and SIDA, Sweden, has been supporting PhD, Masters and Early Career Academics (ECAs-post-docs) to apply AI and machine learning in various SDG areas within their countries. The research initiatives by the scholars that continued in 2023 focus on 6 key thematic areas: Agriculture, telecommunication and process automation, health, climate change, energy and education.

#### 2. Monitoring, Management and Mitigation of Environmental Challenges with Collaborative Data Analytics and Machine Learning for Sustainable Development

This project, funded by Africa UniNet of Europe, deploys low-budget sensor networks to collect data that is used to model the environment by way of AI, for sustainable development. Collection of data continued in 2023.

#### 3. Benchmarking the Control of Kenya's Research in Dual-Use Technologies, Against Global Standards

This project employed a methodology that involved a combination of desktop research, surveys, personal interviews, and workshops. The study surveyed government ministries, state-based regulators, universities and research institutions in an attempt to establish the existence of policies, guidelines or practices that secure and document such research.

#### 4. Strengthening the Capacity of AI4D Africa Scholarship Beneficiaries to integrate Gender Equality and Inclusion Considerations in their Artificial and Machine Learning Studies

Through collaborative efforts within the AI4D Africa Scholarship Network, this project encompasses 15 study initiatives, comprising 10 PhD projects involving student-supervisor pairs and 5 ECA projects. This initiative attempts to enable the beneficiaries and their mentors to revisit their study processes, isolating areas at which gender equality and inclusion (GEI) was never considered. The study uses the <AI & Equality> A Human Rights toolbox. It is anticipated that each participant shall internalize how to apply a standard tool such as the <AI & Equality> A Human Rights toolbox in all their future studies, and also publish the results. Key research outputs include:

### Capacity Building

#### 1. AI4D Africa Scholarship Project

- This project, funded by IDRC, Canada and SIDA, Sweden, has been supporting PhD, Masters and Early Career Academics (post-docs) to apply AI and machine learning in various SDG areas within their countries. The beneficiaries are drawn from 18 countries and 22 public universities. The AI4D Africa scholarship project is supporting 20 PhD scholars, 10 Early Career Academics (ECAs) and 19 Master's students in 22 universities in 18 African countries uniformly distributed across Anglophone, Francophone and Lusophone sub-Saharan Africa, and evenly across genders.
- **Short Courses:** The project design incorporated complementary activities to build the capacity of beneficiaries (PhD and MSc students, ECA, and supervisors). These included short courses, a PhD Academy, quarterly seminars, annual workshops, regional conferences and online training workshops. The short courses were delivered online and targeted PhD scholars, ECAs and supervisors.



Head of ACTS Digital Economy (DE) Programme, Dr Winston Ojenge, and Dr Mesfin Fikre, University of Addis Ababa at the AI4D Africa Scientific Conference.



*Participants keenly follow proceedings during the AI4D Africa Scientific Conference held in Addis Ababa, Ethiopia in December 2023.*

### **Scientific Conference on AI and ML**

ACTS in collaboration with the universities of Addis Ababa and Bahir Dar planned for a scientific Conference held from 10th - 14th December, 2023 at Golden Tulip Hotel in Addis Ababa, Ethiopia. The conference strived to enhance knowledge and level of exposure of the PhD students to new paradigms and models through a practice- oriented training focusing on artificial intelligence and machine learning. In addition, the conference aimed to nurture and strengthen a network of artificial intelligence and machine learning scholars and researchers driven by AI4D Africa beneficiaries and supervisors. This conference brought together AI4D Africa scholars, PhD and MSc) their supervisors, project staff and partners, researchers and policymakers to deliberate on the pressing need for research and development in responsible Artificial Intelligence (AI) and Machine Learning (ML) across the African continent. It provided a platform for in-depth discussions and knowledge-sharing in alignment with the project's mission to nurture talent and expertise in AI and ML in Africa. The objectives of the AI4D Scientific Conference were:

- Facilitate the exchange of ideas and expertise among scholars, researchers, and students to enhance the understanding of cutting-edge research in the field of artificial intelligence and machine learning.
- Provide a platform for participants to network and establish collaborations with experts and peers, fostering international partnerships and collaborations.
- Enable researchers to present their findings and receive valuable feedback from their peers, leading to the refinement and advancement of their research projects.
- To jointly agree on strategies for sustaining AI4D Africa Scholarship project activities.



*Prof. Tom Ogada (left) ACTS Executive Director, Prof. Berhanu Abegaz (middle), Emeritus Professor, Department of Chemistry, Addis Ababa University (AAU) and Dr. Firew Tegegne, President Bahir Dar University during the AI4D Africa Scientific Conference.*

## Joint MSC in AI and ML

A curriculum for Joint MSc Programme in AI and ML has been developed to broaden the pool of PhD candidates addressing Africa's development challenges. The curriculum was endorsed during a Scientific Conference held in Addis Ababa in December 2023. Traditionally centered on ICT backgrounds, the program acknowledges that scholars often innovate in agriculture, health, education, and energy. The inclusive curriculum, developed with input from representatives of 7 universities across Anglophone, Lusophone, and Francophone regions, caters to students from diverse academic backgrounds. Five universities, identified by the committee, have committed to early adoption and will forge collaborative agreements with ACTS.

## Scholarship for ACTS Staff

Two PhD scholars from ACTS, Patrick Obunga and Samuel Wanjau, are being supported under the AI4D Africa Scholarship Programme.

## Policy Engagement

### 1. National Workshops

- Each of the universities affiliated to the AI4D Africa Scholarship Project organized annual workshops bringing together participants from academia, policy makers and private sector who mainly focus on research and deployment of AI and ML technologies. The one-day workshops in each university, which attracted at least 60 participants, were designed to be a platform for cross-sharing and learning for different institutions and program beneficiaries. Most workshops adopted a hybrid approach which enabled the AI4D network members in other countries to attend and learn from their colleagues. There have been 10 workshops at the following universities: i) Jomo Kenyatta University of Agriculture and Technology ; ii) Makerere University; iii) Nelson Mandela African Institute of Science and Technology (NM-AIST) ; iv) University of Dar es Salaam; v) University of Zambia; vi) University of Abomey-Calavi (UAC); vii) University of Nairobi; viii) Université Cheikh Anta Diop de Dakar; ix) Bahir Dar University; x) University of Yaounde I.
  - AI4D Africa Scholarship Conference was held in Addis Ababa, Ethiopia, in Dec 2023 following extensive meetings and discussions with the beneficiaries.
2. CRDF Global Research project: Under this project experts from diverse stakeholders, including universities, regulatory bodies, and government ministries, actively participated in workshops alongside other engagement formats.
  3. 4<sup>th</sup> Calestous Juma Series: Benchmarking the Control of Kenya's Research in Dual-Use Technologies, Against Global Standards.



One of the AI4D Africa Scholarship Project national workshops held at the University of Bahir Dar in Ethiopia. The workshops bring together participants from academia, policy makers and private sector who mainly focus on research and deployment of AI and ML technologies.

## 5. GENDER, YOUTH AND INCLUSIVE DEVELOPMENT (GYID)

Under the 7<sup>th</sup> Strategic Plan, ACTS mandated the establishment of a fully-fledged program focusing on Gender and Inclusivity. This was further realized with the recruitment of a Research Fellow to lead the program. The GYID program is in its first year of implementation and most of the current activities are done collaboratively with other program at ACTS. The GYID team developed a Strategic Plan (2023-2026) to map out intended activities that will drive the program to achieve its vision of “empowering women, youth and vulnerable groups to harness science, technology and innovation for economic, social and environmental sustainability in Africa”. The Strategic Plan also details how gender will be mainstreamed across all the policies and programs at ACTS; this will be guided by a gender mainstreaming policy to be launched early 2024.

### Research

The programme is implementing its first research project, commissioned by the German Federal Ministry for Economic Development (GIZ). The project on **the Analysis of Leather and Textile Sectors Value Chains and Enterprise Development in Kenya**, is being executed through collaboration with key experts in Leather and Textiles from KIRDI, and with a team of high level consultants from the ECOTECH Consulting Group. The research will encompass multiple approaches, including literature reviews, primary data collection, key stakeholder interviews and focus group discussions.

### Capacity Building

#### Green Digital Innovation Hub (gDIH)

The Green and Digital Innovation Hub was unveiled on November 28, 2023 during Kenya Innovation Week 2023 and will provide MSMEs and start-ups in the countryside with access to technology and innovation resources. The hub will help foster a culture of digital innovation and entrepreneurship and equip MSMEs with the tools, skills, and networks necessary to thrive in the digital economy. Additionally, the hub will serve as a platform for collaboration, learning, and growth while promoting environmentally sustainable business practices. The program lead participated in capacity building activities namely:

- Mainstreaming gender Ethics in research.
- Marketing and Communication workshops under the Green and Digital innovation Hub (gDIH).

### Policy Engagement

The GYID programme carried out one policy engagement in collaboration with the DE and the AFNS programmes. The webinar titled “*Gender and community inclusion knowledge synthesis in agriculture*”, was organized by **Women at the Table**, an organization that focuses on helping women gain influence in sectors such as technology, economy and sustainability.

### Technology Brokerage

Upon the launch of the Green and Digital Innovation Hub at the close of 2023, the GYID program will support implementation of the hub, especially on the second pillar which aims to up-skill and re-skill youth and women in technology.



ACTS Executive Director, Prof. Tom Ogada, GIZ Programme Director, Sustainable Economic Development, Employment and Digitalisation, Mr. Bernd Lakemeier and the Principal Secretary in the Ministry of Information, Communications and the Digital Economy, Eng. John Tanui, during the launch of the Green Digital Innovation Hub (gDIH) in Nairobi, Kenya.

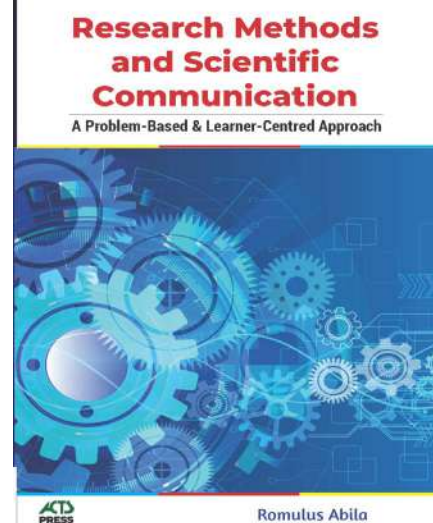
## VI. CORPORATE AFFAIRS

### ACTS Press publishes book on research methods

The ACTS Press has published a book on research methods: **Research Methods and Scientific Communication: A Problem-Based Learner-Centred Approach**

Although a number of textbooks exist in this area of Research Methods, this book departs from conventional textbooks because it draws its content entirely from the author's practical experience in teaching Research Methods to a new generation of undergraduates. The book takes a practical, learner-centred and problem-based approach to impart in students key learning skills. Application, analysis and synthesis skills are covered, besides comprehension and recalling of facts. This approach is consistent with the paradigm shift in education that advocates for competency-based approach and knowledge discovery by the student, hence the learner-centred approach to learning.

Through case studies, student activities, scenarios and end of chapter questions and assignments, this book is an interactive tool and a primer in learning how to conceive a research idea, formulate research questions, develop a viable research proposal, collect and analyze data and present research findings through various dissemination outlets. In addition, it covers research approaches used in major disciplines such as natural sciences, humanities, education and economics. It is therefore appropriate to students across all research disciplines.



### ACTS Office in Konza Technopolis now ready

ACTS has partially moved to the new offices in Konza Tehnopolis. The offices were ready for occupation by December 2023 and the Digital Economy Programme is the first cohort of staff to occupy the new offices. The technology city will also host ACTS Artificial Intelligence Institute and the first Specialized Outreach, Knowledge Establishment (SPOKE) on cooling and cold-chain solutions in Africa. It will also host the Green Digital innovation Hub (gDIH).



Lilian Wainaina (left) from Konza Technopolis poses for a photo with ACTS staff after she presented a key to symbolize the Centre's physical presence at the technology hub; it will host ACTS Artificial Intelligence Institute and the first Specialized Outreach and Knowledge Establishment (SPOKE) on cooling and cold-chain solutions in Africa.

## VII. A SUMMARY OF KEY OUTPUTS AND OUTCOMES

Focus Area	Outputs	Expected Outcomes
Research	<ul style="list-style-type: none"> <li>• 2 Inception reports</li> <li>• 5 Inception workshops</li> <li>• 5 Baseline/survey reports</li> <li>• 15 Research/technical papers</li> <li>• 70 Masters' and PhD students supported</li> <li>• 13 Journal papers+</li> <li>• 6 book chapters</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge advancement</li> <li>• Innovation and Technology development</li> <li>• A better understanding of environmental issues and sustainable practices</li> <li>• Research uptake</li> </ul>
Capacity Building	<ul style="list-style-type: none"> <li>• 23 Training workshops</li> <li>• 2 Training manuals/Curriculum</li> <li>• 2 Capacity assessment reports</li> <li>• 4 Concept notes for PhD Academies</li> <li>• 10 Short courses relevant to AI and ML</li> </ul>	<ul style="list-style-type: none"> <li>• Skills development</li> <li>• Institutional strengthening</li> <li>• Technology adoption</li> <li>• Networking opportunities</li> </ul>
Policy Engagement	<ul style="list-style-type: none"> <li>• 10 National workshops on AI and ML</li> <li>• 12 Policy Engagement Workshops</li> <li>• 2 policy briefs</li> </ul>	<ul style="list-style-type: none"> <li>• Policy awareness and influence</li> <li>• New guidelines and standards to ensure consistency and quality in various sectors</li> </ul>
Dissemination	<ul style="list-style-type: none"> <li>• 40 Blog posts</li> <li>• 5 Media articles</li> <li>• 2 Newsletters</li> <li>• 5 Brochures/Project briefs</li> <li>• 7 Info-briefs</li> <li>• 15 Videos</li> <li>• 2 Knowledge Management Platforms</li> </ul>	<ul style="list-style-type: none"> <li>• Increased public awareness and understanding of key ACTS interventions</li> <li>• Improved decision-making</li> <li>• Enhanced community engagement</li> <li>• Improved Networking and collaboration</li> <li>• Increased funding and support</li> </ul>

### How AI4D Africa Scholar is using AI to change reporting of mortality statistics in Tanzania

***A beneficiary of the AI4D Africa scholarship project has developed a unique AI model that can easily determine causes of deaths for patients who die out of hospital. Consequently, the government of Tanzania is now changing how it collects, compiles and reports mortality statistics in the country.***



*Dr. Mahadia Tunga being conferred with a PhD degree in Data Science at Nelson Mandela African Institution of Science and Technology in Tanzania. Her studies were partly funded by the AI4D Africa Scholarship project.*

Dr Mahadia Tunga, who was funded by the AI4D Africa Scholarship project, recently graduated with a PhD in Data Science from the University of Dar-es-Salaam. The Project, implemented by ACTS is funded by the International Development Research Centre (IDRC) and the Swedish International Development Cooperation Agency (SIDA).

The model is based on a list of about 500 questions developed by WHO, which is administered by community health volunteers in Tanzania to collect data on the symptoms leading to death for those who die out of hospital. This process is known as verbal autopsy. This data could then be used by physicians to determine the causes of death.

She then developed the model using existing data to determine cause of death for those who die out of hospital. To validate the accuracy of the model, the Ministry of health compared results of the verbal autopsy generated by the model with those verified by the physicians. The model registered 97% accuracy.

Previously, the Ministry of Health in Tanzania compiled verbal autopsy and medically certified reports separately.

“Previously, to compile mortality statistics, physicians had to go through the questions to determine the cause of death, which was tedious and could be also be biased. It also comes with the risk of double counting,” she explained.

---

According to Dr Tunga, this model would not have been developed as quickly as it was without support from the AI4D Africa Scholarship project.

---

This methodology has now changed: this year’s report will integrate both sets of data – medically certificated reports and verbal autopsy generated by the model - into one national mortality statistics report. She is now working with the Ministry to use the verbal autopsy based on the model to generate causes of death in real time rather than wait for the physician to go through the data and determine the causes of death.

“Conducting this kind of study is expensive. It required the researcher to go to the field and understand how the data is being collected, validation, getting permits, engaging Ministry officials. It helped me a lot with regard to financial and also credibility of the work. This support also made me complete my PhD studies in record 3 years or less,” she said.



## Five Universities to start offering courses in Artificial Intelligence and Machine Learning

Five universities are ready to start offering a new Masters Course in Artificial Intelligence and Machine Learning. The proposed joint MSc in AI and ML offers a unique opportunity to expand the pipeline of PhD students capable of developing AI solutions for Africa's pressing development challenges.

Whereas the focus has traditionally been on people with ICT backgrounds pursuing undergraduate degrees in ICT fields, it has since emerged that scholars often develop solutions in areas like agriculture, health, education and energy. It is therefore important to develop a curriculum that accommodates students from academic backgrounds other than ICT.

The curriculum has been developed by representatives from 7 universities under the ambit of AI4D Africa Scholarship project drawn from Anglophone, Lusophone and Francophone regions in Africa. The committee has identified 5 universities that are willing to be early adopters and will enter into collaborative agreements with ACTS.



*Members of the steering committee charged with designing and implementing the new programme on AI and ML.*

The AI4D Africa Scholarship project is supporting 20 PhD scholars, 10 early career academics (ECAs) and 19 Master's students in 22 universities in 18 African countries. The research initiatives by the scholars under the ambit of AI4D Africa scholarship project focus on 6 key thematic areas: Agriculture, telecommunication and process automation, health, climate change, energy and education.

## Installation of a prototype hybrid solar dryer in Kitui, Kenya

A prototype hybrid solar dryer was installed in Kitui County and is currently being used as a demonstration and trainer unit. This is one approach to promoting the technology in the market. Commercial deployment of hybrid solar dryers has also commenced with the first dryer acquired by Human Capital Development International (HCDI), a social enterprise in Kitui engaged in mangoes, chillies, tomatoes, and African leafy vegetables drying. This is part of a project of scaling-up solar drying to reduce post-harvest losses in Kenya – Opportunities for Inclusive Climate-Action Enterprises. The project was a partnership with Kenya Industrial Research and Development Institute (KIRDI) and United Nations Environment Programme (UNEP) that seeks to scale-up the proof-of-concept of climate-action solutions of low-cost quality hybrid solar drying technology enterprises to reduce PHLs and drive realization of multiple Sustainable Development Goals (SDGs). The research focused on optimizing and performance assessment of a prototype hybrid solar dryer and supporting the commercialization by understanding the market drivers and challenges for uptake, and related business models to deliver the technology. Additionally, the issue of enhanced delivery of quality solar drying technology was considered through analysis of policy and standards aspects.



*A prototype hybrid solar dryer was installed in Kitui County; it is currently being used as a demonstration and trainer unit.*

## How aquaculture is shifting gender and socio-economic dynamics in coastal communities in Kenya

The Blue Empowerment project is slowly changing the socio-economic status of women in Kenya's coastal region by supporting them tap into the enormous economic value of fish and seaweed. The initiative, funded by and funded by the International Development Research Centre (IDRC), *aims to empower* fisher women in Kenya's coastal region through adoption of climate-smart integrated multi-trophic aquaculture (IMTA) of seaweeds and fish for improved livelihoods and resilience.

The project has provided women in Kibokoni, who depended on men to get fish supplies from the sea, a new form of economic activity – fish farming. Under the umbrella of Umoja self-help group, have now come together and started fish farming. And now, the economic tide is slowly shifting in favour of women; interestingly, men and the youth are also benefiting.

“We used to suffer so much because we had to go to the forest, cut trees for firewood and sell in Kilifi and also make coconut leaves. But when this project came, it started to help us. We were supported to dig the ponds and later we got prawn fingerlings from the creek,” said Christine Tsori, the chair-lady of Umoja Self-Help group in Kibokoni.

The ponds enable women to get fish throughout the season unlike the Ocean where there are times when the fish is scarce.

“We get fingerlings from the creek and farm them in the ponds. Because if you farm prawns in the ponds, it takes three months to mature then harvesting is done. Prawns only take 3 months to mature. So in one year, we harvest three times” she revealed.

The group makes about Ksh 22, 000 (US\$ 220) a month through sale of the fish.

To enhance fish production in the ponds, the group would like to have a machine which would help them make feed for the fish and also a hatchery where they can get prawn fingerlings.



*Christine Tsori, the chair-lady of Umoja Self-Help group in Kibokoni, Kilifi County in Kenya displaying fish caught from the ponds.*

# IX. AUDITED ACCOUNTS

**African Centre for Technology Studies (ACTS)  
Statement of Comprehensive Income  
For the year ended 31 December 2022**

	Note	2022 US\$	2021 US\$
<b>Income</b>			
Long term grants	4	2,851,198	1,670,367
Short term grants	5	1,217,927	967,408
Sundry income	6	13,947	42,083
Other income	7	66,324	62,340
		<u>4,149,396</u>	<u>2,742,198</u>
<b>Expenditure</b>			
<b>Program costs</b>			
Staff costs	8	816,849	775,804
Sub - grantees	9	467,705	746,570
Consultancy	10	744,024	380,008
Travel costs	11	1,088,783	117,131
Other operating costs	12	410,369	323,949
Workshops and conferences	13	211,178	37,744
Sub - total program costs		<u>3,738,908</u>	<u>2,381,206</u>
<b>Institutional costs</b>			
Staff costs	8	181,909	155,452
Consultancy	10	6,878	4,536
Travel costs	11	5,025	1,026
Other operating costs	12	124,271	120,636
Workshops and conferences	13	5,537	981
Sub - total institutional costs		<u>323,620</u>	<u>282,631</u>
<b>Total expenditure</b>		<u><b>4,062,528</b></u>	<u><b>2,663,837</b></u>
<b>Surplus for the year</b>		<u><b>86,868</b></u>	<u><b>78,361</b></u>

# X. PUBLICATIONS

## Agriculture, Food and Nutrition Security (AFNS)

1. Circular Bioeconomy for the Kenyan Dairy Sector (VALORISE) Project- 2022-2025  
Technical reports

## Blog Posts

- C. Kilelu- Dairy more than milk- Accelerating the transforming of the African Dairy Sector for People, Planet and Profit.
- 2. Building High Level Support and National Capacities to Enhance Climate and Ozone Protection Through Cooling Efficiency- ACES/ CCH Project.
- 3. 'RoadMap' to sustainable cooling and cold chain systems in Africa and Beyond
- 4. IFT (Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya – Opportunities for Inclusive Climate-Action Enterprises - 2022-2023

## Technical Reports/ Briefs

- a. Yosr Allouche, Judith Evans, Leyla Sayin, Natalia Falagán, Bas Hetterscheid, Toby Peters  
Support authors Shane Brennan, Szabolcs Varga, Monique Baha, Kristina N. Widell, Catherine Kilelu, Joshua Ombaka, Hameed Al-Muhammedawi, Denis Leduq, Graciela Alvarez (2023)  
Three degrees of change? Frozen Food in a Resilient and Sustainable Food System. Technical Report. International Institute of Refrigeration and Centre for Sustainable Cooling.  
[https://www.sustainablecooling.org/wp-content/uploads/2023/11/The-Three-Degrees-of-Change\\_Summary-Report\\_November-2023.pdf](https://www.sustainablecooling.org/wp-content/uploads/2023/11/The-Three-Degrees-of-Change_Summary-Report_November-2023.pdf)
- b. Tim Fox, Leyla, Sahin and Toby Peters (Editors) “The Hot Reality: Living in a +50°C World” (2023)- A CoP28 Briefing Report  
<https://www.sustainablecooling.org/wp-content/uploads/2023/11/Hot-Reality-Living-in-a-50C-World.pdf>

## Technical Reports/Working paper

- a. Kilelu, C.W, and Fatuma, L. (2023). Trends In Solar Dryers' Uptake and Dried Food Markets Development in Kenya – A Market Analysis. IFT Working paper 001. Nairobi, Kenya:
- b. Ogutu, F; Aukah, J; Asugo, W (2023) Design, installation, and optimization of the Hybrid solar dryer prototype - Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya – Opportunities for Inclusive Climate-Action Enterprises. A technical report

## Policy/Research project briefs

- a) Kalele, D; Kilelu, C and Ogutu, F (2023) Assessing Capabilities and Skills for Delivery of Quality Solar Drying Technologies in the Kenyan Market- [https://ift.acts-net.org/images/Publications/policybriefs/afns-ift\\_pb001.pdf](https://ift.acts-net.org/images/Publications/policybriefs/afns-ift_pb001.pdf)
- b) Kilelu,C.W; Omolo IO, and Okemwa, J (2023) Opportunities and Challenges for Enhancing the Quality of Solar Drying Technology and Agri-enterprise in Kenya Accessible at [https://ift.acts-net.org/images/Publications/policybriefs/afns-ift\\_pb002.pdf](https://ift.acts-net.org/images/Publications/policybriefs/afns-ift_pb002.pdf)

## Newsletter Feature

- a) Training solar dryer fabricators to reduce post-harvest losses ([ACTS Newsletter](#))

### Workshop Proceedings

- a) Catherine W. Kilelu, Josephat M. Okemwa, Dorcas Kalele and Isaiah Omolo -Opportunities and Challenges for Enhancing the Market for Quality, Low-cost Solar Drying Technology in Kenya- A Policy Dialogue on Standards, and Capacity Needs. - Policy Workshop Proceedings

## Newspaper Article

- a) Farmers bank on solar dryers to reduce post-harvest losses published on Standard News Paper on 12th June 2023 accessible at <https://www.standardmedia.co.ke/business/amp/national/article/2001474973/farmers-bank-on-solar-dryers-to-reduce-post-harvest-losseson>
- Aquaculture of Seaweeds and Fish: Opportunities for Blue Economic Empowerment and COVID-19 Resilience of Fisher Women in Kenya (Blue Empowerment) 2022-2024  
See link: <https://blueeconomy.acts-net.org>

## Book Chapters

- a. Appraising technology, policy, and governance options to optimize women empowerment using Multicriteria Mapping (MCM) approach.
- b. Women Agency in blue empowerment; the case of Kibuyuni in Kwale county.  
Book Chapters (Under Review)
- a. Chapter 1: Introduction - Kalele D., Onyango J., & Kilelu C. Opportunities for Blue Economy Empowerment and Covid-19 Resilience of Fisher Women in Kenya.
- b. Chapter 2: Odary K., Komba E., Kalele D., & Masinde, G., Profiling and documenting gender responsive challenges, potentials, and opportunities in the fisheries and aquaculture sector.
- c. Chapter 3: Kalele D., Otieno, E., & Kilelu C. Mapping socio-technical pathways: Opportunities and barriers in promoting the uptake and up-scaling of gender transformative and sustainable aquaculture technologies.

## Journal articles

Opola, F. O., Klerkx, L., Leeuwis, C., & Kilelu, C. W. (2023). Examining the legitimacy of inclusive innovation processes: perspectives from smallholder farmers in Uasin Gishu, Kenya. *Journal of Responsible Innovation*, 10(1), 2258631

## Climate Resilient Economies (CRE)

### Infobriefs

1. Kilelu, C. W., Atieno, E., Juma, S., & Wanjiku, E. (2023). Socio-Technical Perspectives for Enabling Adoption and Scaling of Sustainable and Gender-Transformative Mariculture Development: The Case of IMTA in Coastal Kenya.
2. Maundu, A., Obondo, J., Nazi, B., Mohamed, O., Kondo, M., Mohamed, M., Oduor, A., Makayoto, F., & Onyango, J. (2023). Business Canvas Model: Inclusive Business Training Models for Coastal Fisher Women in Kwale and Kilifi County.
3. K'osambo, L., Obondo, J., & Kopa, A. (2023). Setting Up of the IMTA Cage at Kijiweni: Cage Assembly at Changai and Setting at Kijiweni in Kwale County.
4. Muli, K. K., Nyambura, E., & Onyango, J. (2023). Preservation of Knowledge Systems through Integration of Indigenous Knowledge System: A Case Study of Ogiek Community in Mau Forest, Kenya. [Link-Preservation of Knowledge Systems through Integration of Indigenous Knowledge System: A Case Study of Ogiek Community in Mau Forest, Kenya.](#)

## Book Chapters

The literature reviews from the various work packages have further been developed into book chapter which will be published under the Book "Opportunities for Blue Empowerment and Covid-19 Resilience of Fisher Women in Kenya: Vol.1 (1st ed.). Africa Centre for Technology Studies ACTS) Press."

- Luseka et al. Women's economic empowerment in low carbon transitions. (draft)
- Atieno et al. Socio-technical barriers and opportunities in promoting the uptake and scaling of gender transformative and sustainable aquaculture technology. (draft)
- Atieno et al. Policy and legal frameworks supporting and governing aquaculture development. (draft)
- Wang'endo et al. A Synthesis of Integrated Multi-Trophic Aquaculture Designs and Business models for the Empowerment of Fisher Women in the Kenyan coast. (draft)
- Wanjohi E., Kalele D., Onyango J., (2022). Promoting knowledge translation, dissemination and learning. (draft)
- Kalele D., Onyango J., & Kilelu C., (2022). Introduction - Opportunities for Blue Economy Empowerment and Covid-19 Resilience of Fisher Women in Kenya.

## Blogs

1. Atieno, E., Fatuma, L., & Murphy, D. (2023). The Potential of Innovative Financial Instruments for Climate Change Adaptation. Foresight Africa Blog. Retrieved from [[The Potential of Innovative Financial Instruments for Climate Change Adaptation - African Centre for Technology Studies \(ACTS\) \(acts-net.org\)](#)]
2. [ACTS Pathways Academy: a new model of professional and executive training in Africa](#)
3. Wang'endo, M., & Mayuba, M. (2023). Climate Change and Mental Health - Role of the Youth. Foresight Africa Blog. Retrieved from [Climate Change and Mental Health - Role of the Youth](#)
4. Joel Onyango, Challenging the Narrative: Shifting Perspectives and Embracing Openness, CTN0012023. <http://acts-net.org/blogs/challenging-the-narrative/challenging-the-narrative-shifting-perspectives-and-embracing-openness>
5. Joel Onyango, Adapting to Climate Change Together: A Collective Responsibility. CTN0032023. <http://acts-net.org/blogs/challenging-the-narrative/adapting-to-climate-change-together-a-collective-responsibility>
6. Joel Onyango, Empowering Coastal Women Communities in Kenya through Inclusive Business Models. <https://blueeconomy.acts-net.org/blog/empowering-coastal-women-communities-in-kenya-through-inclusive-business-models>

## Journal Papers

- Stirling, A., Cairns, R., Johnstone, P., & Onyango, J. (2023). Transforming imaginations? Multiple dimensionalities and temporalities as vital complexities in transformations to sustainability. *Global Environmental Change*, 82. <https://doi.org/10.1016/j.gloenvcha.2023.102741>
- Wang'endo et al. Lamu Paper: Multi-governmental Approach to Energy adoption and Resource exploitation. (draft)

## Science Technology Innovation Knowledge and Society (STIKS)

### Blogs

- Navigating the Art of Publishing Special Journal Issues: Insights from online AfricaLics Alumni event, October 2023: <https://africalics.org/navigating-the-art-of-publishing-special-journal-issues/>
- Rethinking biotechnology deployment pathway: Insights for emerging applications like Gene editing: <https://africalics.org/rethinking-biotechnology-deployment-pathway-insights-for-emerging-applications-like-gene-editing/>
- Breaking the Glass Ceiling... Is Academic Writing a Competence for Everyone??? Highlights from AfricaLics course on academic writing skills: <https://africalics.org/breaking-the-glass-ceiling/>
- Multi-layer challenges to building local innovation capabilities in Africa: a quest for our roles: <https://africalics.org/multi-layer-challenges-to-building-local-innovation-capabilities-in-africa-a-quest-for-our-roles/>
- Building Research and Policy Capacities on Learning, Innovation, and Competence Building Systems in Burkina Faso: <https://africalics.org/building-research-and-policy-capacities-on-learning-innovation-and-competence-building-systems-in-burkina-faso/>
- Financing Innovation and Industry Development challenges in the African Pharmaceutical Sector: <https://africalics.org/financing-innovation-and-industry-development-challenges-in-the-african-pharmaceutical-sector/>
- Developing innovation indicators to inform new policy mixes in African countries: <https://africalics.org/developing-innovation-indicators-to-inform-new-policy-mixes-in-african-countries/>
- Intellectual Property, Innovation and Entrepreneurship as drivers for Economic Development in Africa: <https://africalics.org/intellectual-property-innovation-and-entrepreneurship-as-drivers-for-economic-development-in-africa/>
- Industrializing through Global Value Chains: What Africa can learn from East Asia and Latin America: <https://africalics.org/industrializing-through-global-value-chains-what-africa-can-learn-from-east-asia-and-latin-america/>
- Using mobile money to increase enterprises' sectorial turnover: <https://africalics.org/using-mobile-money-to-increase-enterprises-sectorial-turnover/>
- Overview of TransCIIT Phase 3: <https://www.acts-net.org/blogs/foresight-africa-blog/transciit-on-the-move-scaling-out-and-up-of-a-student-entrepreneur-matchmaking-service>
- Reflections on Focus - Group Discussion on the Matchmaking Experience: Transforming Climate Innovation Ecosystems through Inclusive Transdisciplinarity (TransCIIT, Phase 3) project: <https://www.acts-net.org/blogs/foresight-africa-blog/reflections-on-focus-group-discussion-on-the-matchmaking-experience-transforming-climate-innovation-ecosystems-through-inclusive-transdisciplinarity-transciit-phase-3-project>

### Videos

1. VFP Supervisors Opinion on the VFP Program: <https://youtu.be/VLgCo3M4pFc>
2. Meet Geci, AfricaLics ASB member, as she speaks on Africa Innovation Summit and links to AfricaLics: <https://youtu.be/19TSQdvyeTk>
3. Unveiling EthiopiaLics - Igniting Innovation, Learning, and Development: <https://youtu.be/m4UmJTkvnfM>
4. Daniel Kitaw, one of the members of AfricaLics Scientific Board: <https://youtu.be/bDJ0QRxgHaA>
5. Mammo Muchie, one of the Board Members of AfricaLics since its inception: [https://youtu.be/3\\_Gk0bmvzb8](https://youtu.be/3_Gk0bmvzb8)
6. The Journey Begins NigeriaLics - Pioneering Innovation in Nigeria: <https://youtu.be/Hfzqlb5EBZs>
7. The AfricaLics ASB Members: Meet the Minds Behind the Network: <https://youtu.be/0KM52E6Rfn8>
8. Unveiling AfricaLics: Journey Through History, Remarkable Activities, and Inspiring Achievements: <https://youtu.be/qKOHo961-Uw>
9. AfricaLics PhD supervision and mentoring course (A VPF training course): <https://youtu.be/mf-nIOY-a-c>
10. The Impact of AfricaLics Ph.D. Academy on My Career: <https://youtu.be/VjYUZbMtT10>
11. My Journey With AfricaLics P.h.D Academy: <https://youtu.be/QITJPig2BYI>

## Digital Economy

- State of Technology Transfer in Public Universities Across Sub-Saharan Africa.
- A compendium of the AI4D Africa Scholarship research projects: Research and Application of AI and ML in Africa
- Transforming Africa's Agriculture through artificial intelligence and machine learning.
- Nurturing We-being: How African researchers are using artificial intelligence and machine learning to address health challenges.





**Published by**  
**African Centre for Technology Studies**  
**ICIFE Duduville Campus, Kasarani,**  
**P.O. Box 45917-00100**  
**Nairobi, Kenya.**  
**Tel. +254710607210/+254737916566**  
**Email: [info@acts-net.org](mailto:info@acts-net.org)**