



Annual Report, 2022

Introduction

This is the first annual report under implementation of the 7th Strategic Plan which focuses on three key objectives:

- Strengthen and sustain the recognition of ACTS as a centre of excellence in policy-relevant research and development in STI, climate change, energy, agriculture and new technologies including digital technology and gender, youth and inclusive development;
- Enhance ACTS' influence and impact through policy advocacy, improved communication, capacity building, knowledge and technology transfer and partnerships;
- Build a strong funding base for ACTS by developing and implementing an effective resource mobilisation strategy.

ACTS is currently implementing five programmes: Agriculture, Food and Nutrition Security (AFNS), Climate Resilient Economies (CRE), STI, Knowledge and Society (STIKS), Digital Innovation and Knowledge Economy (DIKE) and Gender, Youth and Inclusive Development (GYID).

Agriculture, Food and Nutrition Security (AFNS)

AFNS is currently implementing six projects. Two of the projects, AFNS is implementing in collaboration with Climate Resilient Economy (CRE) program. AFNS is steadily building momentum as part of the new ACTS strategic plan. The total project portfolio is currently equivalent to about US\$486,000 (not inclusive of the Aquaculture of Seaweed project led by CRE and whose budget allocation for AFNS needs to be clarified). Some of the key projects implemented under AFNS in 2022 include: Community Cooling Hub (CCH), Circular Bioeconomy for the Kenyan Dairy Sector (VALORISE) Project, Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya– Opportunities for Inclusive Climate-Action Enterprises, Scaling Up Agricultural Digital Innovations within Fairtrade Producer Organizations (FTA) and Building High-Level Support and National Capacities to enhance Climate and Ozone Protection through Cooling Efficiency – ACES/SPOKE

Climate Resilient Economies (CRE)

The CRE programme carried out various research activities within the programme projects, including data collection (both secondary and primary), data synthesis, reporting and seminars where the team presented at various events. Policy engagement activities carried out includes team organized meetings, seminars, workshops, conferences, and dialogues in delivering the planned target project outputs. The programme also conducted numerous capacity building activities under its specific project. In addition, the team was involved in drafting various publications, both published, and drafts including policy briefs, working papers, book chapters, journal papers, working briefs and training modules.

STI, Knowledge and Society (STIKS)

The programme continues to implement the AfricaLics project focussing on research, policy engagement and capacity building. Under research, the project carried out various research activities. Some of the key highlights

VISION	Knowledge for better livelihoods
MISSION	To strengthen the capacity of African countries and institutions to harness science, technology and innovation for sustainable and inclusive development.
GOAL	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, youth and inclusive innovation— through quality research, policy analysis, dialogues, capacity building and outreach.
VALUE PROPOSITION	<ul style="list-style-type: none"> 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. b) To facilitate and convene evidence-based policy dialogues and debates. c) To inform, influence and enhance sustainable and inclusive development theories, policy and practice. d) To put critical issues of science, technology and innovation on the development agenda, with special focus on agriculture, food and nutrition security; digitalisation; climate change and energy; new technologies, and gender and youth development. 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. f) To broker and leverage STI research, knowledge and expertise for trade and development policy, practice and entrepreneurship in Africa. g) To promote science diplomacy for global development.

included mentorship paper, research conference concept notes. There were also several policy engagement activities mainly through webinars, side events. In capacity building the project held several activities key of which included the 8th PhD Academy held from 13th to 24th June 2022 at the Kenya School of Monetary Studies (KSMS), Nairobi, Kenya. Under Evi-POL, the SGCs regional workshop was held virtually in June (29-30). It was co-organized by the African Centre for Technology Studies (ACTS) with support from the Science Granting Councils Initiative. There have been key capacity building activities held in support of the councils: Development of a roadmap to digitization frameworks and template on progress MEL consultants have also been hired to support the councils. Development of generic data management toolkit tailored to individual SGCs. The CB4ICDT project has been finalized and seven policy briefs has been submitted to IDRC for review and publishing

Digital Innovation and Knowledge Economy (DIKE)

Under the Digital Economy programme, several research, capacity building and policy engagement activities have been undertaken. They include: 3rd Calestous Juma Seminar Series (Webinar); AI4D Africa Scholarship Programme; PhD Supervisors and ECA Workshop / conference. 10 -12 October 2022 –EKA Hotel, Nairobi, Kenya and the AI4D Africa Academy / Summer School. Partners, PhD Supervisors, ECAs, PhD Students and MSc Students Conference. 12th – 16th December, 2022. Travelers Beach Resort, Mombasa, Kenya. the programme also conducted a high profile mapping of Mapping Innovation Eco-System in Kenya jointly with UNDP and Konza Technopolis.

Message from Chair of the Governing Council

On behalf of the members of the Governing Council of the African Centre for Technology Studies (ACTS) and its staff, I am delighted to present to all our stakeholders this Annual Report for the year ending December 2022.



Prof. Alfred Oteng-Yeboah

As usual, this report, briefly provides you the stakeholders with critical information related to the performance of the organization – the programs it has pursued, the projects it has implemented and how the work of ACTS has impacted to the targeted beneficiaries.

It is important to mention that 2022 was the first year of the implementation of ACTS' seventh strategic plan (2022-2026). I am pleased to note that the performance of the organisation has continued in the growth path and the momentum created by the sixth strategic plan (2019-2021), despite the impact of covid-19 pandemic.

In 2022, ACTS resumed 100% normal operation following the lifting of the previous restrictions of the covid-19 pandemic in many African countries, where ACTS is active. As a result, the organization has improved in all results areas – policy research, policy engagement, training and capacity building, outreach as well as dissemination of knowledge products.

The Governing Council is keen to continue steering the organization, building on the success of 2022, to achieve even a better performance in 2023. On this, the Governing Council counts on the continued support of our partners.

We therefore look forward to a more brighter 2023.

Prof. Alfred Oteng-Yeboah

Chair, ACTS Governing Council

Message from the Executive Director

Coming from the difficult years of 2020 and 2021, occasioned by the impact of covid-19 pandemic on our activities, the year 2022 was definitely a very rewarding year for the African Centre for Technology Studies (ACTS).



Prof. Tom Peter Migun Ogada

Out of the five programs that we are pursuing, four programs performed very well in their activities. The four programmes – agriculture food and nutrition security, climate resilient economy, Science, Technology and Innovation, and the Digital Economy, implemented several projects, most of them being multi-year and multi-countries in scope and coverage. In total, ACTS implemented 36 projects, with activities being implemented in 21 African countries.

These activities resulted into several outputs including policy briefs, journal publications, technical and synthesis reports, blogs, workshops and conferences, as well as new solutions and innovations. These achievements have made significant contribution not only to the generation of knowledge but also enhancing uptake and deployment of knowledge for sustainable development. Building on these, we look forward to a more rewarding 2023.

On behalf of the staff of the African Centre for Technology Studies, I am delighted to take this opportunity to thank all our stakeholders and development partners for the support given to ACTS that enabled us to post these good results in 2022.

We remain optimistic that working together with you our stakeholders, we will continue to promote the deployment of STI for sustainable development of our continent and thereby positively impact of the lives of the people of Africa.

Prof. Tom Peter Migun Ogada

Executive Director, ACTS

Agriculture, Food Security and Nutrition (AFNS) TM

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Research Outputs

Most of the activities started in 2022. Thus, not many outputs have been realized, except for workshop proceedings. We expect more substantive research and policy outputs to be delivered.

Technical Reports/ Working Papers

- Baseline cooling assessment – Agriculture cold chains and space cooling in Kenya
- Cooling and cold-chain baseline assessment – agriculture sector in Malawi
- Community cooling hub- Mapping of the cold-chain/cooling needs in Kiambu County Sites Report
- Community cooling hub- Mapping of the cold-chain/cooling needs in Kitui County Sites Report
- Community cooling hub- Mapping of the cold-chain/cooling needs in Homa Bay County Sites Report
- Community cooling hub- A framework for purpose driven business models
- IFT: Report on Trends in Solar Dryers' Uptake and Dried Food Markets Development in Kenya: Market Analysis
- Working Paper: Trends in Solar Dryers' Uptake and Dried Food Markets Development in Kenya: Market Analysis (Work in Progress)
- Working Paper: Community Cooling needs assessment: Case of Kiambu, Kitui and Homa Bay (Draft)
- CCH Closure case studies
- Draft papers on socio-technical pathways for women empowerment in marine aquaculture

Programme Vision, Mission and Goal of AFSN Programme	
Programme Vision	To contribute towards realising a sustainably food and nutrition-secure Africa
Programme Mission	To develop a world-class programme that contributes to the efforts of the African Union (AU) partners and the Sustainable Development Goals (SDGs) to enhance food and nutrition security and improve livelihoods in Africa through harnessing STI for sustainable and inclusive agri-food systems.
Programme Goal/ Strategic Objective	To support African countries through cutting-edge STI focused policy-relevant research and knowledge brokerage that guides policy choices, targeted investments, and interventions at different levels to accelerate sustainable, inclusive agri-food systems transformation for food and nutrition security.
Programme Focus (Key areas)	<ol style="list-style-type: none"> 1. Resilient small-holder focused agri-food system transformation; 2. Digitally-led sustainable agri-food systems transition and transformation; 3. Leveraging regional trade for sustainable and inclusive agri-food systems; 4. Innovation-driven, market-led healthy and sustainable agri-food systems; 5. Cross-cutting issues on inclusive, gender-transformative agri-food sector transformation through strategic partnerships.

Workshop Reports

- Community Cooling Hub (CCH) Project- Kitui County Needs Assessment Validation Workshop Proceedings
- Community Cooling Hub (CCH) Project- Homa Bay County Needs Assessment Validation Workshop Proceedings
- Community Cooling Hub (CCH) Project- Kiambu County Needs Assessment Validation Workshop Proceedings
- Scaling-up solar drying Community Cooling Hub (CCH) Project- Kitui County Design, Business model & Training Workshop Proceedings
- Community Cooling Hub (CCH) Project- Homa Bay County Design, Business model & Training Workshop Proceedings
- Community Cooling Hub (CCH) Project- Kiambu County Design, Business model & Training Proceedings
- Stakeholder workshop on Sustainable cooling solutions for Kenya's Agrifood sector transformation: Multisectoral Policy Alignment for Mitigating Post-harvest Loss.
- Presentation at USAID's Regional Economic Growth Conference (September) – Focus on the work on CCH and Solar Drying innovations.

#	PROJECTS	Number of Planned and Achieved Activities	
		Planned	Achieved
1	Community Cooling Hub Project	11	11
2	Circular Bioeconomy for the Kenyan Dairy Sector (VALORISE) Project	7	7
3	Aquaculture of Seaweeds and Fish: Opportunities for Blue Economic Empowerment and COVID-19 Resilience of Fisher Women in Kenya	11	11
4	Scaling-Up Solar Drying to Reduce Post-Harvest Losses in Kenya- Opportunities for Inclusive Climate-Action Enterprises	10	10
5	Scaling Up Agricultural Digital Innovations within Fairtrade Producer Organizations (FTA)	4	4
6	Building High-Level Support and National Capacities to enhance Climate and Ozone Protection through Cooling Efficiency – ACES/SPOKE	3	3
7	Measuring adaptation progress in agricultural sector	-	-
	Total	46	46

Programme Activities - AFNS

Journal Publications

Assessing community cooling and cold chain needs through an integrated approach (Drafting)

Policy Briefs

- Policy Brief CCH: Sustainable cooling solutions for Kenya's Agrifood sector transformation: Multisectoral Policy Alignment for Mitigating Post-harvest Loss.
- Briefing note IFT: Scaling-Up Commercialization of Low-Cost Solar Dryers
- Scaling-Up Commercialization of Low-Cost Solar Dryers
- Scaling up Agricultural Digital Innovations within Fairtrade Producer Organizations

Staffing

The AFNS has a team of three entry level research fellows (MSc level) and two interns. A PhD level research fellow (Dorcas Kalele) who will be supporting both AFNS and CRE program. In Q3, Isaiah Ouma joined the team. Isaiah will be involved in technology brokering and related knowledge generation and dissemination efforts of AFNS. He brings on board requisite expertise in BSc mechanical engineering and MSc in renewable energy and entrepreneurship and innovation. He will spend 75% of his to oversee implementation of African Centre of Excellence (ACES) /SPOKE project a second phase of the CCH project where ACTS in partnership with ACES will install the first CCH in Kenya. Additionally, 15% of his effort is to contribute to the scaling of solar drying technology project and 10% in resource mobilization. The program needs to attract high calibre researchers that can support resource mobilization and delivery of quality outputs and outcomes.



Participants of the Circular Bioeconomy for the Dairy sector in Kenya (VALO-RISE) project during a meeting at ICIPE, Kenya.



The head of Agriculture, Food Security and Nutrition programme, Dr Catherine Kilelu, addressing a policy engagement meeting in Nairobi.

Climate Resilient Economies (CRE)

The programme carried out various research activities within the programme projects, including data collection (both secondary and primary), data synthesis, reporting and seminars where the team presented at various events. Some of the key Research highlights included:

- Meetings with stakeholders in Kwale and Kilifi counties in preparation for the Blue empowerment kick-off meeting. The aim of the meeting was to deliver signed and stamped invitation letters to the kick-off meeting. The stakeholders visited were the community in the Beach Management Units, youth groups county governments and parastatals in the marine and aquaculture sector
- Elizabeth attended the decoloniality webinar, where different speakers from different countries gave their views on decolonization of learning systems. Assisted in as rapporteur and writing report on the webinar
- Elizabeth is working on the literature review on Work Package 5(Promoting knowledge translation, dissemination and learning-to capture the Engagement Framework used)
- Elizabeth and Maureen participated in online stakeholders' interviews, transcribing the responses of the questions asked by Maureen and other colleagues from Uganda, transcribing the responses from the interviewee. Writing a report of the interview.
- Emily has been supporting in primary data collection from the people who have already embraced e-cooking at the household and business level.
- Haron is pursuing data synthesis (RVA and Fire modelling) in supporting the ongoing Project Implementation
- Maureen Kabasa has been holding virtual Stakeholders interviews on River Mayanja for information on DPSIR of the river thus contributing to policy recommendations - the interviews involved stakeholders from the academia (mainly Makerere University), Wetland department and NEMA.

#	PROJECTS	Number of Planned and Achieved Activities	
		Planned	Achieved
1	Strengthening community-based research for river health and climate change mitigation in Eastern Africa (STREM)	16	13
2	Decoloniality book project	14	14
3	Air Quality Projects	10	10
4	Multi-hazard	9	9
5	Rapid Transition Alliance	4	4
6	A Circular Bioeconomy for the Kenyan Dairy Sector – VALORISE	12	12
7	Mobilizing Development Finance for Strategic and Scaled-up Investment in Climate Adaptation	3	3
8	AgriVoltaic	2	2
9	Capacity Building of Technical Institutions – CapCET – COMESA	15	15
10	Blue Economic Empowerment	5	5
11	SDG	5	5
12	CRIBS	2	2
13	MECS	12	12
14	Sustainable networks for using next generation quantitative genetics to modernize breeding programs in Kenya - GentWork	0	0
15	Adaptation Metrics support in Kenya	0	0
16	Water Transformation Pathways Planning (TransPath)	0	0
17	Realities	0	0
18	Multihazard Phase 3	0	0
19	African Group of Climate Change Negotiators	-	-
	Subtotal	109	106

Programme vision	Inclusive, pro-poor and thriving climate change resilient economies for economic, social and environmental sustainability in Africa.
Programme mission	To provide policy choices that support the generation, uptake and harnessing of climate change-related STI for sustainable and diversified livelihoods, socio-economic development and biodiversity conservation in Africa.
Programme goal/ Strategic objective	To support the development of enabling capacities, policies, organisations and institutions for harnessing applications of climate change-related sciences, technologies and innovations for energy access and security, water quality and security, biodiversity and natural resource management in Africa by: <ol style="list-style-type: none"> Mobilising resources and funds for building climate-resilient economies; Strengthening the research quality and messaging within international discourses through the climate change policy laboratory; Strengthening knowledge and learning systems on climate change through the virtual academy; Leveraging strategic partnerships for influence and outreach on policy, research and training.
Programme focus (Key areas)	Building on the achievements of ACTS over the last 10 years under the Climate Resilient Economy programme and, considering the projects that are transitioning to the 2022-2026 period, this programme focuses on supporting African countries and institutions to tap into global and regional opportunities in climate discourse. Specifically, during the 2022-2026 period, the programme will build the capacity of African countries and institutions in the following areas: <ol style="list-style-type: none"> Climate change mitigation, adaptation and negotiation; Access to climate finance and technology; Green recovery; Clean and affordable energy; Disaster risks and response; Cascading climate change effects on sustainable development; Climate change innovation and development; Climate change action training; Gender inclusive climate action; The blue economy.

- In interactive community engagements in Uganda, Maureen and Joel continue to gather information on DPSIR with people who live adjacent to River Mayanja, Uganda and benefit directly and the academia community within Kyambogo University.
- There was a reconnaissance of the sampling sites along River Mayanja for collection of abiotic and biotic variables.
- Maureen is scoping on issues on DRR and climate change involvement of the youth and young people in the selected countries
- Maureen, Martin and Elizabeth participated in virtual interview sessions for the STREM project by transcribing and report writing in a template provided in the months of July and August 2022. Maureen and Dr. Onyango attended the stakeholders' engagement on 9th -15th July 2022 in Uganda and Maureen worked on the STREM technical paper that was based on mainly the findings that they found from the community engagement and some of the key messages.
- The Blue Empowerment Project team attended a write shop for the different work packages from 23rd -25th August 2022 at Kasarani Sportsview hotel. Dr. Kalele is reviewing the literature reviews of the work packages.
- A field activity for the Blue Empowerment project was conducted from 26th to 30th September in Kwale. Activities included development of baseline survey data collection tools, recruitment and training of 4 field

officers and 24 enumerators on data collection using Kobo toolbox. The household survey questionnaire was completed and pre-tested before deployment.

- Luseka on-boarded the new Blue Empowerment Project manager called Asma who joined the project on 31st August 2022. She assisted Asma in developing a work plan so that the work on Work Package 2 and 3 can start rolling quickly.
- The BE project conducted interviews for MSc. Students on 24th September and successfully identified two candidates who will support in the implementation of WP 2 & 3.
- Under the business models and financing for electric cooking study, Emily and Haron managed to complete the data collection process and submitted the results to the consultant on the 22nd August 2022.

Policy Engagement

- Policy engagement activities carried out includes team organized meetings, seminars, workshops, conferences, and dialogues in delivering the planned target project outputs. The highlights included:
 - a. Decoloniality Project- Attended the decoloniality webinar on 30th June from 2-3:30pm where different speakers from different countries tackled the topic of decolonizing Learning Systems in the Global South- Organised by the CRE team headed by Dr. Onyango. Assisted in rapporteuring and report writing of the webinar. Output- The Webinar report that will inform the development of a policy brief.
 - Part of the committee organizing the Summer School on 21st-29th Oct 2022. Assisted Maureen with drafting the Summer School brief and the schedule.
 - STREM Project-Supported stakeholders online interviews organized by Maureen Kabasa by, transcribing the responses of the questions asked by Maureen and other colleagues from Uganda, transcribing the responses from the interviewee, writing a report that will inform the development of the policy brief."
 - The team organized for the launch of the e-cooking community of practice (CoP) and subsequent monthly dialogues that are meant to create awareness and stir conversations on e-cooking as well as get outputs from different stakeholders that are meant to inform the National E-cooking strategy that is to be developed. The CoP was launched on the 13th of April 2022 and the next monthly dialogue is scheduled for the 27th of July 2022. A draft report on the same has been developed and is being reviewed and will be shared once done.
 - Engagements with different county government officials in the energy sector in the counties of Nakuru, Kisumu, Kitui, and Makueni before and during the regional e-cooking hub launches given the key role they play of influencing policy. The Nakuru hub was launched on the 26th of April 2022 at SCODE, Makueni on the 11th of May 2022 at CARITAS, Makueni on the 16th of June 2022 at Wote Technical and Training Institute (WTTI), and Kisumu on the 29th of June 2022 at Ramogi Institute of Applied Technology (RIAT).



Enumerators training for the Blue Empowerment projects baseline study in Kilifi and Kwale counties.

- There are continuous community engagements to build a Community of practice dialogue on MECS project as an avenue of upscaling our research, and supported in e-hub launch and meeting with government county official in Kitui, Makueni, Nakuru and Kisumu
- STREM project stakeholders' engagements were conducted by Maureen and the team, they were both virtual and in person (done in Uganda). The report will inform the development of a policy brief.
- The CJ4 Seminar held on the 20th -22nd September 2022 –The seminar report will inform the development of a policy brief.
- Emily and Paul with support from the MECS team held the 2nd Community of Practice (COP) on e-cooking on minigrids that was in the month of July 2022. The ACTS team, Tom, Paul & Haron, moderated the session and from the meeting. The outputs were: a video documentary and a report.
- The multihazard project had a workshop that hosted the Ministry of Housing aimed at demonstrating the impact of Building Climate Resilience for the Urban Poor (BCRUP) at the National level by showcasing what they have done on 29th July 2022.
- Haron participated in a Summer School on Resilient Spatial Science virtually that focused on how spatial science can be used to support Africa through the global cities to be resilient on the 25th -29th July 2022. A certificate was awarded.
- Salome and Charles have been working together with other partners on the tomorrow Cities project. They have been trying to map out the engagements they have had since the project started in 2019 and see how they can build on the decision support environment phase coming on after the end of September.

Capacity Building

The CRE team, was part of various capacity building initiatives within the quarter, including:

- World Oceans day facilitated by KMFRI on 8th June, 2022. This was a hybrid event held on 28th June, 2022. The main event was in Portugal.
- Gender and Fisheries in the face of Covid 19 pandemic. The event was held on 21st June, 2022 by The University of Nairobi and KMFRI.
- Convening weekly awareness creation on e-cooking at the Pika na Power demonstration center at KPLC, and public sensitization on e-cooking during the launch of the four regional hubs. The use of different social media platforms to convey information on e-cooking generated during the practical demonstration sessions.
- Training clean cooking champions at WTTI and RIAT who had no prior knowledge on the e-cooking technology for them to be better positioned to run the hubs. The team supported training of the E-Cooking champions in Makeni, Kitui, Kisumu and Makeni which was organized the MECS. The output include a report, impact case stories, photo story
- Development and implementation of decoloniality webinar series 1: Knowledge production, hegemony in publication practices & non-differentiated funding systems in the global south and the development of the summer school package in preparation for the even in October 21st - 29th.
- The CRE team attended researchers meeting at the Kenya School of Monetary Studies in July 2022.
- Elizabeth, Martin, Maureen, and Nora rapporteured and moderated on the Decoloniality Webinar Series of the months of June, August and September 2022. Outputs include: webinar recordings, webinar report, webinar info briefs, and webinar blogs. The call for book chapter is out and the submissions are ongoing. Nora is heading the process of reviewing the submitted chapters. The summer school will be on October 21st -27th.
- Maureen and team, are doing a landscape analysis of a UNESCO project, a training project on DRR and climate Change. It started on the month of July and this will help feed on the Needs Assessment across Africa. On 13th August they organized a successful webinar training on the DRR and Climate Action for the youth.
- Maureen and team members did a virtual academy module development from 16th -20th September 2022 at Jacaranda Elementaita Lodge. They did three modules that is climate modelling, climate finance and DRR and Climate Action Module.
- Emily supports with awareness creation on e-cooking technology at the Pika na Power Demonstration Center at the KPLC every Thursday.
- Emily attended a capacity building workshop that was organized by Kenya Climate Change Working Group at Sheraton hotel on 26th September 2022, where she did a presentation on the role of climate finance and just energy transition and also managed to capture the aspect of MECS project.



Participants of the Decoloniality Pathways Summer School.

- Charles did an application of the side events of the Conference of the Parties (COP) in the month of August. The COP side events are already in planning stages, happening on 11th Nov 2022. The presentation is on Climate Financing- co-lead by ACTS, EAC, and conservation international, among other partners.
- The multihazard project team attended a training on what we call 'Tomorrow Cities Decision Support Environment' on how to operationalize it in our cities throughout the month of September 2022.
- Tom attended the Climate Change AI Summer School 2022 from August 15th -26th, 2022. Climate Change AI Summer School 2022 | Climate Change AI

Publications

The team spent substantial time in documenting publications. The team was involved in drafting various publications, both published, and drafts.

Blogs

- Kabasa et al. Developing draft blog on the stakeholder engagement in Uganda key findings
- Onyango et al. Managing Action Research in the Global South <https://blueeconomy.acts-net.org/blog/managing-action-research-in-the-global-south>
- Bolo et al. Exploiting the eCooking Opportunities in Kenya is good for Populace Health <https://www.acts-net.org/foresight-africa-blog/exploiting-e-cooking-opportunities-in-kenya-is-good-for-populace-health> or <https://mecs.org.uk/blog/exploiting-the-ecooking-opportunities-in-kenya-is-good-for-populace-health/>
- Bolo et al. E-Cooking Hub Launch in Kitui County <https://mecs.org.uk/blog/e-cooking-hub-launch-in-kitui-county/>
- Bolo et al. Nakuru hosts the first County eCooking Hub Launch in Kenya <https://mecs.org.uk/blog/nakuru-hosts-the-first-county-ecooking-hub-launch-in-kenya/>
- Bolo et al. Why adopt e-cooking. (draft blog)

- Bolo et al. Debunking the myths about e-cooking. (draft blog)
- Bolo et al. Makueni e-cooking hub launch. (draft blog)
- Bolo et al. The Kisumu's E-cooking hub launch. (draft blog)
- Wang'endo et al. Knowledge Production, Hegemony in Publication Practices, and Non-Differentiated Funding Systems. (submitted for review)
- Wanjohi et al. Dichotomy of Knowledge System Contexts: Privilege, Elitisms, Inequalities and Power. (submitted for review)

Technical Briefs / Reports

- Joel Onyango, Maureen Kabasa. 2022. Enhancing the Capacity Of Technical institutions Involved In The Provision of Climate Change Education, Training and Scientific Research Services In Thecomesa Region (CaPCET) Project. pp 1-19. ACTS Press.
- Akala et al. Comprehensive Assessment of Dynamic Risk and Vulnerability and Impact of Road Infrastructure on Risk in Mukuru Kwa Reuben Slum, Mukuru Slum, Nairobi City, Kenya. (status- submitted for review)
- Akala et al. Technical Report: Spatial Fire Spread Risk Modelling (SFSRM) approach developed within Tomorrow's Cities. (Submitted for review)
- Randa T. et al. Review of Air Quality Monitoring Studies: A case of Nairobi City, Kenya. To be submitted before year ends.
- Randa T. et al. Techno-policy spaces Analysis for e-cooking in Kenya submitted on Energies Journal (submitted for review).
- Randa T. et al. Flood analysis in informal settlements using HEC-RAS model: a case study of Mukuru slums in Nairobi, Kenya. (Almost done for submission).
- Randa et al. Nairobi Flood Hazard Modeling Report under the Tomorrow's Cities. (Finalized and ready for submission).
- Emily et al. MECS final technical report (submitted)
- Bolo et al. E-cooking hub launch report (draft)
- Bolo et al. E-cooking in Mini-grids report (draft)

Policy Briefs

- Erica Atieno, Maureen Kabasa, Joel Onyango, Shem Wandiga, Joanes Atela, Bethwel Mutai and Tom Migun Ogada. June 2022. Building the capacity towards climate financing in Africa. pp1- 5. ACTS Press. <https://www.acts-net.org/images/Publications/Policy-Briefs/CRE/Climate-Finance-June22.pdf>
- Maureen Kabasa, Joel Onyango, Erica Atieno, Tom Randa, Bethwel Mutai, Shem Wandiga and Tom Migun Ogada. June 2022. Contextualizing Climate Change Training, Education and Scientific Research for Action in Africa. pp1- 6. ACTS Press. <https://www.acts-net.org/images/Publications/Policy-Briefs/CRE/Climate-Finance-June22.pdf>
- Randa et al. Seven priorities for an inclusive Global Goal on Adaptation. 21096iied.pdf

Journal Papers

- Tonui et al. The future of small farms and small food businesses as actors in regional food security: A participatory scenario analysis from Europe and Africa. The future of small farms and small food businesses as actors in regional food security: A participatory scenario analysis from Europe and Africa - ScienceDirect
- Randa et al. Urban diagnostics and a systems approach to air quality management: Pathways towards sustainable economic development and a healthy Nairobi, Kenya.
- Randa et al. Review of flood modelling and models in developing cities and informal settlements: A case of Nairobi city. Review of flood modelling and models in developing cities and informal settlements: A case of Nairobi city - ScienceDirect
- Joel et al. Imagining urban transformation in Kenya. Imagining urban transformation in Kenya - ScienceDirect
- Journal paper: Review of the fire risk in Nairobi and methodological application for informal settlement; Case of Mukuru (submitted for review).
- Wang'endo et al. Lamu Paper: Multi-governmental Approach to Energy adoption and Resource exploitation. (draft)

Book Chapters

- Akala et al. Risk modelling and Multi-hazard system Approach for Resilient cities (Draft)
- MECS E-cooking impact story booklet. (draft)
- Tonui et al. Disaster Risk Policy Interplay: Case of Nairobi (submitted for review)
- Tonui et al. Disaster Risk Governance in Nairobi. (draft)

Working Papers

- Kabasa et al. Developing draft paper on socioeconomics and governance issues on river ecosystems
- 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 et al. Promoting knowledge translation, dissemination and learning. (draft)
- Maureen Kabasa, Martin Wang'endo & Elizabeth Wanjohi. Riverine Health. (draft)
- Randa et al. The Clean Cooking Landscape in Kitui County in Kenya. (draft)
- Bolo et al. The clean cooking landscape in Kitui. (draft)

Info Briefs

- Fiona Makayoto, Martin Wang'endo, Elizabeth Wanjohi, Joel Onyango, Nora Ndege & Maureen Kabasa. Knowledge Production, Hegemony in Publication Practices, and Non-Differentiated Funding Systems (Submitted info brief)
- Fiona Makayoto, Martin Wang'endo, Elizabeth Wanjohi, Joel Onyango, Nora Ndege & Maureen Kabasa. Dichotomy of Knowledge System Contexts: Privilege, Elitisms, Inequalities and Power. (Submitted Info brief)
- Emily et al. Grid electric cooking (draft info brief)

Books

- Bolo et al. E-cooking Impact Story Booklet (Draft)

Modules

- Maureen Kabasa, Erica Atieno & Dr. Kalele. Development of draft modules including lessons summary for Climate Finance and DRR & Climate Action modules to be part of the virtual academy.

Programme Achievements

The team had some commendable achievements, including:

- Luseka successfully coordinated the stakeholders' meetings for the week of 11th to 15th April and Prepared inception report for BE project, including the coordination of EIA activities
- The team contributed to various proposals as provided in the proposal listing.
- The team, as reported by Emily also successfully launched the 4 regional e-cooking hubs, and witnessing 20% of the participants at WTTI request for the purchase of air fryers doubled up as pressure cookers, and successfully convincing 3 of the ACTS team to purchase air fryers doubled up as pressure cookers.
- The team also successfully launched the e-cooking CoP, and follow-up blogs published.
- Haron managed to submit paper for titled Mapping informal settlements using UAS in support of local climate models for upcoming symposium in Berlin.
- The team successfully held the 4th Calestous Juma Seminar on the 20th -22nd September 2022 where each member played a role in the success of the seminar.
- The team successfully hosted two decoloniality webinar series in the months of June and August, 2022.
- The team has started implementing the strategic plan for the programme. The Enterprise hub is headed by Dr. Onyango, the Policy Lab is headed by Dr. Kalele, the Training lab is headed by Maureen and the Partnership lab is headed by Nora.
- The third e-cooking community of practice meeting that was held on 6th September 2022, titled "Grid Electric Cooking" was a success. The event attracted almost 100 participants, both virtual and onsite. Participants embraced the technology and bought the EPCs at a discounted price.

- Being able to convince the policy makers and partners like the Practical Action on how energy saving the e-cooking technology works, and them embracing the technology is a big achievement to the MECS team. Practical Action is planning to do a similar project in Narok and the Kakamega county government is also embarking on the e-cooking technology because of the awareness and sensitization of the e-cooking technology by the MECS team.
- Dr. Kalele developed a draft strategy on implementing the Policy Lab that is part of the CRE Strategy and will be subjected to reviews for improvement in the month of August.
- On 13th August, 2022 Maureen organized a successful training of the DRR and Climate Action for the youth. Martin and Elizabeth assisted in rapporteuring and report writing.
- Luseka successfully coordinated the BE baseline survey activity held in Kwale county on 26th to 30th September. Key outputs included development of a semi-structured questionnaire for collecting household data, recruitment and training of 4 field officers and 24 enumerators on data collection using Kobo toolbox. The team contributed to various proposals as provided in the proposal listing.
- Tom was a speaker in the Africa Climate week - UNFCCC Session 7: Exploiting indigenous and frontier technologies for transformative adaptation and long-term resilience in Africa on 31st August 2022.
- Tom presented a poster: Towards an Improved Air Quality in Nairobi City: Insights from the A system Approach to Air pollution studies at the iCACGP-IGAC Joint Conference 2022. It was tweeted by ANGA: https://twitter.com/ANGA_AtmosSci/status/1569350454022119424

Staffing

CRE programme welcomed four new staff members: Mr. Martin Wangendo – Intern; Ms. Elizabeth Nyambura – Intern; and Dr. Dorcas Kalele – Research Fellow II and Asma Kopa - Blue Empowerment Project Manager



Head of CRE programme, Dr Joel Onyango and Finance Director Phelès Ngovo during a due diligence for the BE project.

STI, Knowledge and Society (STIKS)

AfricaLics

AfricaLics is the acronym for the African Network for Economics of Learning, Innovation, and Competence Building Systems. 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 increase 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.

Research

The project carried out various research activities. Some of the key highlights includes:

- The secretariat developed alternative funding report which is under review.
- Mentorship paper submitted to a Journal which is under review.
- 2022 research conference concept note developed and dates set (8th – 11th November 2022).
- Mentorship paper written and submitted for journal review.
- Conducted paper review process for the 5th AfricaLics research conference and provided review feedback to the authors.

Policy Engagement

Policy engagement activities carried out during this period includes.

- 3 webinar series held.
- Discussion initiated for formation of KenyaLics with JOOUST.
- Support for development of national and regional hubs is ongoing (NigeriaLics and Burkina FasoLics).
- 2 webinar series held (A holistic view of Inclusive Innovation co-organised with NigeriaLics on 28th April 2022 and Reconfiguring science systems for societal challenges: lessons from Covid-19 for STI policies in Sub-Saharan Africa by Prof. Joanna Chataway, keynote speaker and Julius Mugwagwa as a discussant on 12th May 2022)

#	PROJECTS	Number of Planned and Achieved Activities	
		Planned	Achieved
1	SGCI-2: Use of Evidence in Policy and Decision Making	47	47
2	Trilateral Chair on Transformative Innovation	10	10
3	AfricaLics	48	48
4	Transforming Climate Innovation Ecosystems through Inclusive Transdisciplinarity (TransCIIT) project	07	07
5	STI for SDGs	06	06
6	Green & Circular Innovation in Kenyan Companies (GeckoCit)	0	0
7	Institutional Commercialisation Support – Phase II	0	0
8	Support to SGC's to Fund and Manage Research and Innovation	0	0
9	Strengthening Use of Data an Evidence in Policy and Decision Making	0	0
	Subtotal	118	118

Programme vision	An African continent that effectively creates and utilises research findings on the interplay between STI, knowledge and society to formulate development strategies, policies and practice.
Programme mission	To advance key research and analysis of the interplay between STI, knowledge and African society to formulate development strategies, policies and practice.
Programme goal/ Strategic objective	To undertake key STI research and support the development of a cadre of researchers, analysts, policy makers, entrepreneurs, businesses and communities in Africa on the interplay of STI, knowledge and society, specifically related to the African context.
Programme focus (Key areas)	<ol style="list-style-type: none"> 1. Research: Strengthen undertaking of action, policy-oriented and transdisciplinary research to generate evidence for policy and practice; 2. Capacity building: Strengthen the capacity of Africa's Science Granting Councils and support capacity building in the field of innovation and development; 3. Policy; 4. Knowledge and technology transfer—promote knowledge and technology transfer for sustainable development; 5. Impact and communication: Strengthen evaluation of impact of STI and communication.

- 1 blogs on Reflections on the webinar “Re-configuring science systems for societal challenges: lessons from Covid-19 for STI policies in Sub-Saharan Africa” published.
- 2 webinars series held (Intellectual property, Innovation, Entrepreneurship and Economic Development by Dr. Mclean Sibanda, Keynote speaker on 7th July 2022 and co-organised a joint webinar with Bio-innovate on innovation in practice and official release of the Bio Innovate Africa Video Documentary on ‘Innovation in the Development Context of Eastern Africa’ – Speakers for this event included Dr. Ann Kingiri, Dr. Julius Ecuru, Prof. Dhanjay Jhurry, Prof. Christine Lang and Dr. Flora Tibazarwa on 15th September 2022). Draft blog submitted for review.
- Sida seminar on the role of research for innovation eco-systems for Africa which took place in Stockholm, Sweden. Dr. Ann Kingiri, Prof. Rebecca Hanlin and Dr. Margrethe Holm Andersen attended the seminar on 20th September 2022.

Capacity Building

- The various capacity building initiatives within the quarter, includes:
- 8th PhD Academy call published where we received 57 applications and currently under review.
- ACTS/JOOUST MOU signed to host VFP programme in 2022.
- Informal VFP introduction seminar for 2022 cohort was held successfully.
- VFP individual meetings held with the PhD students to discuss their workplans.
- 2 VFP trainings - Writing course workshop, Journal article writing were held and writing sessions are still ongoing.
- First online paper presentation was held involving the PhD students, mentors and home supervisors.

- The 8th PhD Academy call published, 54 applications received, and submitted for review process. The academy was held from 13th to 24th June 2022 at the Kenya School of Monetary Studies (KSMS), Nairobi, Kenya. It was hosted by Jaramogi Odinga Oginga University of Science and Technology (JOOUST) and ACTS (AfricaLics Secretariat). The event was attended by 22 PhD students (full participants), 2 PhD students as observers and 8 students (PhD and Masters) from JOOUST. The students were selected by the members of the AfricaLics Scientific Board and Secretariat through an open call for applications and a review of applications. The academy provided an opportunity for PhD students enrolled at African universities who work in the field of innovation and development studies to gain more knowledge of this burgeoning field, meet leading academics in this field and receive feedback on their PhD studies. Draft report submitted for review
- 5th AfricaLics research conference call published, webpage and conference management system implemented, 2 papers received and submitted for review.
- Finalised the new PhD Visiting Fellowship (VFP) African based model.
- MOU between ACTS and JOOUST signed. For hosting VFP 2022 cohort.
- Held the 5th VFP paper presentation seminar at Jaramogi Odinga Oginga University of Science and Technology JOOUST on 26th September 2022.
- Held PhD Visiting Fellowship Programme (VFP) seminar week and PhD supervision workshop in Kenya from 21st – 26th August 2022. This provided PhD students in 2022 cohort and three PhD students from the 2020-21 cohort to meet with their home supervisors and mentors to coordinate views, attend to critical issues and agree on a way forward and provided an opportunity for PhD students, home supervisors, mentors, and the secretariat to meet for substantial discussions on research papers and collaboration as well as on PhD supervision and mentoring. Draft report submitted for review.
- Published PhD Visiting Fellowships Programme (VFP) 2023 Cohort call.

Publications: Published Outputs

- 2 blog articles published and 2 under review.
- Mentorship paper submitted to a Journal and currently under review.
- Science Granting Council Initiative-2: Evi-Pol
- Several activities have been implemented successfully. The year had several key highlights as discussed herein. The SGCs Regional workshop was held virtually in June (29-30). It was co-organized by the African Centre for Technology Studies (ACTS) with support from the Science Granting Councils Initiative-Monitoring, Evaluation and Learning (SGCI-MEL) Lead and focused on the overall SGCI's monitoring, evaluation and learning (MEL) system which documents the changes in the Councils' operations and performances that can be associated with the Initiative's activities.



Participants of the SGCI Annual Forum held on Dec 4th - 9th.

There have been key capacity building activities held in support of the councils: Development of a roadmap to digitization frameworks and template on progress MEL consultants have also been hired to support the councils. Development of generic data management toolkit tailored to individual SGCs. Knowledge acquired by Botswana, Namibia, Ghana, Malawi, Uganda and Zambia through dedicated workshops focusing on challenges towards a digitization roadmap.

Research

- The project conducted several research activities. Some of the key highlights includes:
- Completed a review of best practice in STI impact measurement: Design and evaluation of research funding
- A protocol on research funding finalized
- 2022 Regional Meeting Report developed.
- MEL methodologies and frameworks completed
- The 'research-to-policy' report on selected case studies to review research impact has been finalized
- A policy dialogue event report being drafted
- A review of best practice in STI impact measurement: Design and evaluation of research funding – a review
- A protocol on research funding drafted
- A workshop report on SGCs as boundary managers drafted.
- MEL methodologies and frameworks drafted
- The development of the generic data management document is well underway.
- At least 6 national policy dialogue events supported STI policy review targets are in progress and individual country support ongoing with six (6) councils
- The update of the STI policy- The update of the STI policy for Senegal completed was completed; while an implementation plan for the second National Research,

Science, Technology and Innovation programme for Namibia was developed.

- Generic frameworks and methodology templates for inclusive development review of STI policy
- Policy dialogue events related to STI policy discussions are being supported for Mozambique, Senegal and Malawi.
- Case studies on research to policy impact are nearing completion with two events having been completed in Burkina Faso and Uganda.
- Review of MEL templates and methodologies has been completed and draft MEL guide is ready for distribution for feedback from MEL officers
- Development and review of frameworks and plans completed

Policy Engagement

Policy engagement activities carried out during Q2 include:

- 2022 Regional Meeting held
- STI policy engagement activities held with the following Councils: Senegal, Malawi, Uganda and Mozambique.
- The other policy dialogue event linked to selected case studies held in four councils: Uganda, Burkina Faso and Malawi.
- STI policy consultants hired to support councils in relation to STI policy review and implementation plans. At least 3 councils already have the consultants' support.
- STI policy help consultants were contracted to support the councils on matters of STI policy and policy processes. 6 councils supported by the contracted STI policy helpdesk consultants.
- MEL consultants hired to support the councils in the development of MEL plans and frameworks; and MEL dashboards. At least 7 councils supported by the contracted MEL consultants.
- The 2022 Regional Meeting of the Science Granting Councils Initiative (SGCI) was held virtually in June (29-30) and a report has been finalized

Capacity Building

- The various capacity building initiatives include:
- More STI policy consultants hired to support councils in relation to STI policy review and implementation plans.
- Development of a roadmap to digitization frameworks and template on progress
- MEL frameworks and planned target has been achieved.
- Nine (9) consultants have already been hired to support councils in updating the MEL frameworks and plans as well as providing backstopping support.
- Development of generic data management toolkit tailored to individual SGCs
- Knowledge acquired by Botswana, Namibia, Ghana, Malawi, Uganda and Zambia through dedicated workshops focusing on challenges towards a digitization roadmap



AfricaLics PhD Academy meeting held in Nairobi.

Publications: Published Outputs

- Workshop report: 2022 Regional Meeting Report
- The 'research-to-policy' report on selected case studies
- Workshop report: SGCs as boundary managers
- NOTE: STIKS Outputs and Proposals
- Agnes Lutomiah [corresponding author] co-authored an article in *Science, Technology and Society* (2022: 1-16) on: In Between Centre and Periphery: Kenya as a Key Scientific Nation in East Africa? Access: <https://journals.sagepub.com/doi/abs/10.1177/09717218221078229> DOI: 10.1177/09717218221078229

CB4ICTD

The CB4ICTD project has been finalized and seven policy briefs has been submitted to IDRC for review and publishing. They are as follows:

- Almaz.Y, Mibey, S., & Numi, A. (2021). Communicating Climate Information for Local Adaptations (CB4ICTD) [Policy Brief]. ACTS
- Gichuru. J, Mibey, S. & Numi, A. (2021). Addressing information needs of smallholder farmers using ICTs: a Policy narrative [Policy Brief]. ACTS.
- Otieno.E, Mibey, S., & Numi, A. (2021). Understanding the Cybersecurity Governance Frameworks in Kenya towards a Robust Information Security Mitigation Strategy (CB4ICTD) [Policy Brief]. ACTS
- Otieno.E, Mibey, S., & Numi, A. (2021). Understanding the Cybersecurity Governance Frameworks in Kenya towards a Robust Information Security Mitigation Strategy (CB4ICTD) [Policy Brief]. ACTS
- Gichuru. J, Mibey, S. & Numi, A. (2021). Addressing information needs of smallholder farmers using ICTs: a Policy narrative [Policy Brief]. ACTS
- Kingiri, A., Mibey, S., & Numi, A. (2021). The Voice of the Industry in Capacity Building for Information and Communication Technology Development (CB4ICTD) [Policy Brief]. ACTS
- Hanlin, R. Mibey, S., & Numi, A. (2021). The Relevance of Science, Technology, and Innovation Studies: Linking Academia and Industry (CB4ICTD) [Policy Brief]. ACTS

Digital Innovation and Knowledge Economy (DIKE)

Research Outputs

The following high level summary of statistics have been realized during the reporting period:

- 2 progress reports, one for each of the following projects; AI4D Africa and Mapping Innovation Eco-System in Kenya Project
- 15 research progress reports from 15 PhD beneficiaries; the 6 post-Doc beneficiaries are yet to submit progress reports due to delayed disbursement of our support
- 10 journal papers from the AI4D Africa PhD and post-Doc researchers
- 15 research progress reports from 15 PhD beneficiaries for the second time; 5 ECA (post-Doc) progress reports.
- 3 progress reports for AI4D Africa Scholarship project submitted to IDRC
- Final report on Mapping Innovation Eco-System in Kenya Project (UNDP Accelerator Lab) complete and submitted.

Publications and Papers

- Mushagalusa C.A., Fandohan A.B., and Glèlè Kakaï R.L. (2022). Random Forests in Count Data Modelling: An Analysis of the Influence of Data Features and Overdispersion on Regression Performance
- Opio, R.; Mugume, I.; Nakatumba-Nabende, J. (2022). Understanding the Trend of NO₂, SO₂ and CO over East Africa from 2005 to 2020. <https://doi.org/10.3390/atmos12101283>
- Nanvou Tsopgny Nel, Messi Nguélé Thomas and Kouokam Etienne. (2022). DSL for parallelizing Machine Learning Algorithms on multi-core Architectures. <https://hal.archives-ouvertes.fr/hal-03727658/document>
- Claudia Abineza. (2022). Interpretable machine learning for COPD prediction.
- Halubanza, B., Phiri, J., Nyirenda, M., Nkunika, P. O. Y., & Kunda, D. (2022). Detection of *Locusta Migratoria* and *Nomadacris septemfasciata*. https://doi.org/10.1007/978-3-031-09073-8_43
- Halubanza, B., Phiri, J., Nyirenda, M., Nkunika, P. O. Y., & Kunda, D. (2022). Toward Locust Management: Challenges and technological opportunities
- D. Dione, I. Diop, I. Gueye, B. Ngom and S. M. Farssi. (2022). Proposal for an IoT-based e-health model in developing countries: case of Senegal. doi: 10.1109/ICE-CET52533.2021.9698664

Programme vision	Application of responsible digital innovation & knowledge economy for sustainable and inclusive development in Africa.
Programme mission	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.
Programme goal/ Strategic objective	To unlock the potential of state-of-the-art digital technologies, such as 4th industrial revolution technologies, for driving the economies of African countries. The strategic objectives of the digital innovation and knowledge economy programme are to: <ol style="list-style-type: none"> 1. Conduct policy research in enhancing effective application of digital solutions in Africa; 2. Strengthen post-graduate training and research in responsible digital technologies in Africa for sustainable development; 3. Promote uptake, deployment and adoption of digital technologies for sustainable development; 4. Enhance the growth and financial sustainability of the digital innovation and knowledge economy programme; 5. Build the required human resource capacity for the digital innovation and knowledge economy programme.

- Dione Doudou. (2022). Survey on Internet of Things security and medical data protection: challenges and perspectives. (under review).
- Dione Doudou. (2022). IoT and health systems in developing countries. (under review).
- Stewart Mchuchuti. (2022). Retinal Disease Detection using Deep Learning Techniques: A Comprehensive Review. (under review).
- Neema Mduma. (2022). Mask R-CNN model for banana disease segmentation
- Neema Mduma. (2022). Convolutional Neural Network deep learning model for early detection of streak virus and lethal necrosis in maize
- Ogada, T.M., Obunga, P.O., & Owade J.O. (UNESCO, 2022). Climate Change Vulnerability Hotspots in the East African Indian Ocean Islands.
- Ogada, T.M., Obunga, P.O., & Owade J.O. (UNESCO, 2022). Catalysing Sustainable Water Security in Africa through Science Technology and Innovation.
- Ogada, T.M. Obunga, P.O., & Owade J.O. (UNESCO, 2022). Enabling Institutions, Policies, and Financial Mechanisms for Science Technology and Innovation in Eastern Africa.



AI4D Africa supervisors meeting held at Eka Hotel in Nairobi.

#	PROJECTS	Number of Planned and Achieved Activities	
		Planned	Achieved
1	Artificial Intelligence for Development Africa Scholarship	21	20
2	Mapping Innovation Eco-System in Kenya Project	6	6
3	SGCI Database Development Project – Additional Component	3	3
4	Explainable and Auditable AI in the Nexus of Climate Change and Food Security – Tech Ethics Lab	3	3
	Subtotal	33	32

Policy and Public Engagement

- 3rd Calestous Juma Seminar Series (Webinar). Accelerating the Realization of Sustainable Goals for Development (SDGs) through Deployment of Artificial Intelligence. <https://www.acts-net.org/events/3rd-cj-seminar-series>
- Media Coverage. Highlight of artificial intelligence and machine learning at the CJ seminar series. <https://www.standardmedia.co.ke/sports/education/2001449854/scholars-at-calestous-juma-seminar-explore-place-of-innovation-in-sdgs>.
- AI4D Africa Scholarship Programme; PhD Supervisors and ECA Workshop / conference. 10 -12 October 2022 –EKA Hotel, Nairobi, Kenya.
- AI4D Africa Academy / Summer School. Partners, PhD Supervisors, ECAs, PhD Students and MSc Students Conference. 12th – 16th December, 2022. Travelers Beach Resort, Mombasa, Kenya.



The Head of Digital Economy Programme Dr. Winston Ojenge addressing AI4D Africa supervisors meeting in Nairobi.

Outreach Tools and Processes

- Why Artificial Intelligence is key to Africa’s development - African Centre for Technology Studies (ACTS) (acts-net.org)
- Expanding the boundaries of Artificial Intelligence in Africa - African Centre for Technology Studies (ACTS) (acts-net.org)
- News letter: [ACTS-Newsletter-Aug22.pdf](https://acts-net.org/acts-newsletter-aug22.pdf) (acts-net.org) and [ACTS-Newsletter-May22.pdf](https://acts-net.org/acts-newsletter-may22.pdf) (acts-net.org)
- Video: Proceedings of CJ Seminar featuring AI4D scholar. Presentations on Artificial Intelligence and machine learning by AI4D Africa scholars. 3rd Calestous Juma Seminar, June 14 -16 2022 - YouTube

Media Coverage and Citations in Public Events

- The Standard Media Group. Highlight of artificial intelligence and machine learning at the CJ seminar series. <https://www.standardmedia.co.ke/sports/education/2001449854/scholars-at-calestous-juma-seminar-explore-place-of-innovation-in-sdgs>
- University World News. Lack of data compromises research on climate change. Lack of data compromises research on climate change ([universityworldnews.com](https://www.universityworldnews.com))
- University World News. 5,000 PhD scholars to meet Africa’s growing AI needs. <https://www.universityworldnews.com/post.php?story=20220130114337493#:~:text=If%20Africa%20wants%20to%20tap,to%20Professor%20Tom%20Ogada%2C%20executive>

Other Quantitative Outputs

Indicator	Female	Male	Total
Number of PhD students supported through the project	10; details provided in annexes	14 (including 4 under ECAs); details provided in annexes	24
Number of MSc students supported through the project	8 under ECAs; details provided in annexes	11 under ECAs; details provided in annexes	19
Number of graduated PhDs supported through the project	1	0	1
Number of graduated MSc supported through the project	0	0	0
Number of researchers who are receiving grants through the project	5; details provided in annexes	5; details provided in annexes	10
Number of Public Universities in Africa brought onboard	22		

Staffing

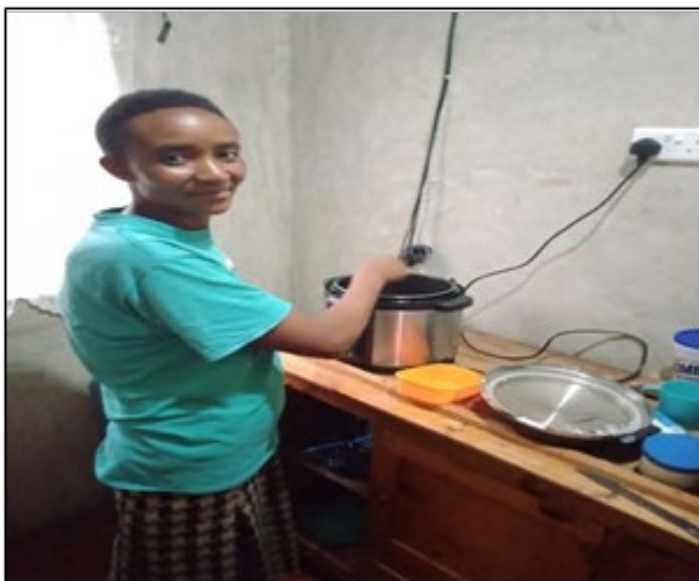
- Local Agronomy Intern with a BSc in Horticulture – Mr. Dennis Mwangi; contract period: March – June, 2022 for data collection within the Project: Explainable and Auditable AI in the Nexus of Climate Change and Food Security – Funded by Tech Ethics Lab of Notre Dame University-IBM
- Local Agronomy and Climate Consultant with MSc in Climate studies - Mr. Paul Murage; contract period: March – June, 2022, for providing interface with farmers within the Project: Explainable and Auditable AI in the Nexus of Climate Change and Food Security – Funded by Tech Ethics Lab of Notre Dame University-IBM).
- Mercy Kirui – consultant for study on Non-Revenue Water in 9 counties in Kenya was also brought on-board for six months

Climate Resilient Economies (CRE)

Phoebe Wairimu is a young woman living in Heshima, Kiama Center in Nakuru County. She resides with her husband and children. She is a participant of the pilot project championed by Sustainable Community Development Services (SCODE) in partnership with the UK government.

“I do appreciate the technology and I cannot compare it to the cooking methods that I had been using before,” she states. “For a start, it is easy to use, convenient, and safe. The foods I prepare are tastier and what excites me most is the fact that I can cook from the comfort of my home even at night,” she adds. Until recently, she still fuels stack (firewood, charcoal, and LPG) for her cooking needs.

She mainly used firewood and charcoal with the LPG being occasionally used. She mentions that when she was still using the traditional cooking methods, her family members often complained of headaches, coughs, and flu, which have reduced in frequency ever since she started using the EPC. The smoke emitted from the use of firewood meant that she had to prepare her meals outside the house, even at night. She dreaded this most, “given that I live in a secluded environment, I was always afraid when cooking out at night. Phoebe thus considers the EPC life-changing for her and does not see herself going back to the use of biomass fuel. To her, getting to know how the appliance is used was not difficult for her, as she had witnessed severally through cooking demonstrations organised by SCODE. With the EPC, she can do dissimilar chores at the same time such that by the time she goes to bed, her kitchen is clean with no dirty dishes. She prides on the fact that her house is free from cockroaches and rats initially attracted to dirt.



*Phoebe preparing supper for her family using an EPC.
Photo credit Emily Bolo*

Gibson Kamau is a middle-aged man residing in Mbaruk, Nakuru County. To Gibson and his family, their favourite dish is Githeri, a mixture of beans and maize. Githeri is a staple food for many community members. It is a food item that averagely takes 3 hours for it to be ready. To prepare it, they normally rely on the use of firewood as the main fuel source. Firewood is also the fuel source that they use to cook most of their dishes with the LPG being rarely used.

“Though we may want to feed on Githeri regularly, sometimes time becomes a constraining factor,” says Gibson. For lighting their home and other amenities such as radios and television, they previously depended on the battery system, which they had to recharge now and again. With time, he states, “the cost of recharging the battery began taking a toll on me financially that we would some days go without light whenever I did not have the money to recharge the battery.”

In 2017, a team from SCODE, visited the Mbaruk area to promote the use of EPCs. Gibson was around then and decided to take advantage of the opportunity to know more about the EPC and received an EPC at no cost after some training sessions on its use. No longer did they have to wake up early to prepare breakfast as with the EPC, all they needed was less than 10 minutes to make everything ready. Besides, the EPC made their milking work easier as they could now boil water for washing their cows’ udder before milking, which helped stimulate the flow of milk and consequently guaranteed them more milk. Most importantly, they could now cook their favourite meal, Githeri, as often as they wished in less than an hour.

“Though we do not have electricity, I am at ease since we get the same services that we would if we were connected to the grid. Though the battery-powered EPC helps prepare foods that require long boil time, it is not as versatile as the electronically powered EPC and its effectiveness may be limited during cold and rainy seasons,” says Gibson.



Gibson and his wife - Photo credit Emily Bolo.

CapCET Project

To enhance the capacity of technical institutions involved in climate change education, training, and research services (CapCET) in the COMESA region the African Centre for technology studies (ACTS), Institute of Climate Change and Adaptation (ICCA), and Tetralink Taylors & associates East African limited (T&T) commissioned by COMESA seek to do market research as a prerequisite to needs assessment, curriculum development, delivery, and dissemination. The CapCET project prioritised the identification of gaps in skills and competencies required to develop and deliver the climate agenda. The probable demand for climate services for the future were estimated based on the analysis of the existing desired skills and competencies required by the specific country's technical institutions.

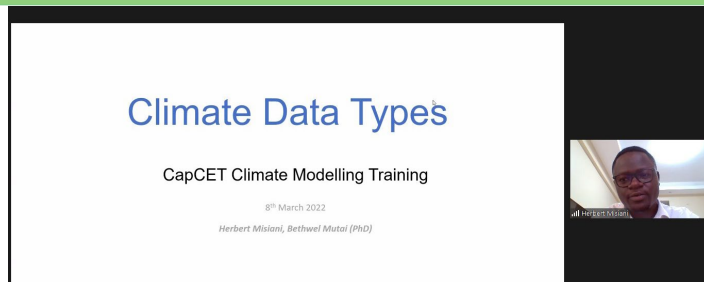
The CapCET project selected two institutions in the COMESA region to build capacity in. Through a competitive bid the Ethiopian Environment and Forest Research Institute (EFFRI) in Ethiopia and Environment, Climate and Sustainable Development Institute (ECSDI) at the University of Zimbabwe were selected for capacity building.

Following the selection of the two institutions a needs assessment was done as a prerequisite for the development and delivery of modules. The assessments that were done included a demand assessment, managerial assessment and individual assessments. The demand assessment covered the whole continent while the needs (managerial and individual) assessments were institutional. Thereafter the demand and the needs were linked to select the training needs that will not only impact the institution but also their country and Africa.

Reflections of Participants on CapCET Training

CapCET Workshops were Inspirational

"MCCFS class would like to thank the training organisers for the inspirational experience throughout the sessions. We were capacitated with a great deal of knowledge, understanding that will go a long way in our career development. We are indeed grateful to all the facilitators. Thank you so much for the dedication, organization, enthusiasm and hard work. There are two types of lecturers, one who teach their students what the syllabus dictates and the other, who goes beyond the coursework to teach their students things that life dictates. Thank you for being the latter. It was an interactive session in which we were granted an opportunity to question without being judged. It was so clear that you wanted us to learn and apply the knowledge gained in training. Throughout the training, you allowed us to freely express our experiences, thoughts and opinions, which helped us to gain insights into many of the concepts we learned. Thank you and stay blessed." - **Isaiah Mabaso, Zimbabwe.**



CapCet online training on Climate modeling

I learned Invaluable Lessons

"My experience as a trainee: During the course of the training, I learnt a lot of invaluable lessons. I learnt that as Zimbabwe, a developing country, we already are at a disadvantage when it comes to the talks on climate change. I also learnt that this should not hinder us in any way and those imbalances may always exist in spite of our efforts to ensure that there is equal representativeness. However, this should not hinder us from contributing and ensuring that in our countries we use the different platforms and become champions in climate change. The content was diverse and covered most of the main issues related to climate change and we were even taught about the different processes that happen at the COP and the different platforms of discussion and how we as youth and scientist can contribute to these discussions". - **Esther Simango, Zimbabwe.**

"The training was very interesting and valuable. I have learned a lot of skill as well as knowledge particularly from the climate modeling part both in the virtual and face to face sessions. The Climate Finance part is new for me and I want to learn more in both climate modeling and climate finance and leadership" - **Marta Gebreyesus, Ethiopia.**

I promise to work With ACTS and the CapCET Team

"Both the virtual and the face to face training were very valuable. I promise to work together with ACTS and the entire CapCET team. This kind of collaboration is also in the interest of the EFFRI as well as the Environment, Forest, and Climate Change Commission. As a seat for African Union (AU), the government of Ethiopia (FDRE) is highly motivated and very enthusiastic to strengthen collaboration with all African countries. In particular, the government of Ethiopia is working strongly with neighboring African countries such as Eritrea, Kenya, Sudan, South Sudan, Somalia, Djibouti, etc. in peace and security of the region as well as in trade, education, technology transfer, and in various disciplines such as energy, environment, and climate resilient green development. A resource mobilization department is valuable and should be considered in the future." - **Dr. Zenebe Mekonnen.**

I learned Climate Modeling and Finance

"I have learned a lot from the climate modeling and climate finance and leadership training and hope the training to be continued and to have sustainability. The training can be considered and included in the annual plan of our directorate (Climate Change Science Research Directorate)."- **Antensay Mekoya, Ethiopia.**

STI, Knowledge and Society (STIKS)

5th AfricaLics Conference

This 3-day event was hosted by The University of Yaoundé II in collaboration with the Pan-African University, Institute for Governance, Humanities, and Social Sciences (PAUGHSS). The Conference received over 200 full paper submissions from which 85 were selected for presentation. The selection of papers was based on a double-blind peer review process focusing on relevance, academic quality and originality. During this conference AfricaLics provided additional support to an early career researcher with her 5-month-old child as a special participant. This is in line with its goal in recognizing gender and enabling women to participate even in demanding responsibilities.

2018 AfricaLics VFP Alumni Selected for US Department of State Programme

AfricaLics VFP alumni keep excelling in their respective fields of endeavors. Dr. Justina Onumah, 2018 VFP alumna who was recently conferred her Ph.D. recorded another milestone in her career. Justina was selected for the prestigious U.S. Department of State's Mandela Washington Fellowship Programme for Young African Leaders. It is a flagship program of the Young African Leaders Initiative (YALI) which seeks to invest in the next generation of African leaders to spur growth and prosperity, strengthen democratic governance, and enhance peace and security across Sub-Saharan Africa. She was part of 32 young Ghanaians selected from a pool of nearly 4,000 applicants only from Ghana through a rigorous, competitive process. The 32 Ghanaian Fellows were part of 700 young African leaders selected for the 2022 program. They comprised leaders from businesses, the public sector, and non-governmental organizations. Justina was placed in the Civic Engagement track at the University of Delaware, for 6 weeks, where she honed her leadership skills with further support for professional development after the fellowship.

Upon completion of the Mandela Washington Fellowship, Justina hopes to use the skills gained to expand and launch her mentoring support program, especially for girls in Science, Technology, Engineering & Mathematics (STEM), and contribute to strengthening research-policy engagements.



Participants of the AfricaLics PhD Academy meeting.



Post-docs Visiting Fellowship Programme (VFP).



Participants of the AfricaLics PhD Academy meeting.

Post-docs Visiting Fellowship Programme (VFP)

In 2021, the AfricaLics post-docs Dr. Abdi Yuya, Dr. Charity Osei-Amponsah and Dr. Kassahun Yimer (with support from their Aalborg University collaborating partners) finalized the joint guest-editing of a Special Issue of the journal Innovation and Development (I&D) with the title: "Building innovation capabilities for sustainable industrialization in Africa: Status and prospects". All articles and the introductory note prepared by the guest editors are online, while a physical version of the special issue was published in late 2022. Three parts of the special issue are open access and can be accessed here: <https://www.tandfonline.com/doi/full/10.1080/02157930X.2021.1928988>

Dr. Abdi Yuya Ahmad also gave an online presentation of his AfricaLics post-doc work during a conference organized by the Danish United Nations Association Northern Jutland (UNA) and Aalborg University. His presentation focused on the topic "The Economic, Social and Political challenges in implementing SDGs in Africa: with focus on youth employment, democracy, Human rights, & Migration".

In the same event, Prof. Banji Oyelaran-Oyeyinka – also a long-term member of the Globelics and the AfricaLics fraternity – gave a presentation on "SDGs in Africa: The role of the Private sector in COVID-19 recovery". He underlined the significance of the private sector in combating COVID-19 in Africa and other diseases. He also mentioned that African Development Bank (AfDB) is working towards establishing an African Pharmaceutical Foundation.

Evi-Pol: Use of Data and Evidence for Policy

During the 2022 Regional Meeting held online in June and during the SGCI Annual Forum held in Cape Town, 4-9 December 2022, the Councils shared several stories of change on use of data and evidence for policy. These stories of change are detailed below according to the different work packages and activities of the Evi-Pol project. Following SGCs' experiences, it was acknowledged that the support of the Evi-pol project had enabled the development for some and the finalization for others of STI policy documents (Senegal and Namibia).

- Senegal: The work focused on revising and finalizing Senegal's first National Research and Innovation policy document which was validated by stakeholders after workshops,
- Namibia: Members of the Evi-Pol team presented the work done to review the Namibian STI policy in Windhoek at a national STI stakeholder event, at the invitation of the National Commission on Research Science and Technology (NCRST). In addition, an STI policy implementation plan of Namibia's second National Programme on Research, Science and Technology (NPRST II) was developed and finalized
- National Science and Technology Council (NSTC)-Zambia reviewed their STI policy in 2020 without SGCI related support. However, the Evi-Pol team agreed on TORs for an STI policy consultant to monitor/ assess status of its implementation.
- Ministry of Environment Science Technology and Innovation (MESTI)- Ghana is reviewing STI policy whereby research funding issues is being reflected in the document.

STI Policy Processes

National Commission for Science and Technology (NCST)-Malawi reported that:

- The Evi-Pol (ACTS) project has provided technical assistance and financial assistance on the development of national guidelines on technology transfer and commercialization as a form of STI policy support.
- In addition, NCST received support to host a policy dialogue event on research to policy and share notes on how to ensure research information is steered through to policy makers [Acquired knowledge].

Monitoring Evaluation and Learning

Monitoring Evaluation and Learning (MEL) consultants were hired to support seven (7) councils (Tanzania, Uganda, Burkina Faso, Mozambique, Senegal, Kenya and Uganda) to develop or modify MEL systems, provide backstopping support and design online dashboards. In Tanzania this resulted in the revision of their MEL framework and the development of online dashboards in Burkina Faso and Uganda.

- The Commission of Science and Technology (COSTECH) -Tanzania indicated that review of the MEL plans was realised; the consultant supported the review and design of the MEL plans. COSTECH has been able to use MEL report to inform their decisions.

- National Research Fund (FNI)-Mozambique reported that a new MEL framework and strategy is being designed.
- For National Science and Technology Council (NSTC)-Zambia, reported that NSTC staff had been empowered with skills to conduct studies for generation of evidence for policy advice; the NSTC was one of the five Councils that participated in a pilot study on mapping research and innovation infrastructure, with support from the Scinnovent Centre. It was reported that the staff had successfully conducted the study and are in the process of validating the policy brief based on the findings of the study. Overall, it is evident that staff have been empowered to carry out studies for generation of evidence for policy advise.
- National Commission for Science and Technology (NCST)- Malawi reported that the recruited MEL consultant reviewed a MEL framework developed 8 years ago. This has made significant progress and is aligning to National Development Plan and the revisions are feeding into discussions ongoing to develop a National Research Agenda.



Participants in one of the EVi-Pol regional meetings.



Participants in one of the EVi-Pol regional meetings.

Digital Innovation and Knowledge Economy (DIKE)

AI4D Africa Made Me Who I Am Today

Dr Jennifer Batamuliza is the first AI4D Africa beneficiary to graduate; she graduated in 2022 with PhD in Data science from the University of Rwanda. Dr Batamuliza was among 20 Phd students and 19 MSC students being supported by the AI4D Africa project in 22 universities across 18 African countries.



Dr Jennifer Batamuliza

“I have just graduated with a Phd in data Science from the University of Rwanda. The AI4D Africa Scholarship programme has really supported me in research and I am proud to said that AI4D Africa made me what I am today and now I am a Phd holder because of the scholarship that I received. I could not fund my research project and I am grateful that I was sponsored by ACTS through the AI4D Africa scholarship project. ACTS is really doing

a good job because any Africans

students, both men and women, want to pursue their studies especially in emerging technologies but some of them cannot fund their studies. I would really urge them to do more to support as many students as they can especially women in Africa because they are very few in this area of artificial intelligence due to biases and stereotypes around women and science. But now more women are pursuing courses in AI and I hope that we shall have many women in this field” said Jennifer.

I Appreciate the Support Given to Me by ACTS

“Africa has clearly limited expertise on Artificial intelligence especially women, less than 30% of the workforce in Data and AI-related jobs are women. To solve this challenge in Africa, we need to work on mindset change. Cultural settings are the root cause, most STEM books at lower levels of education portray engineers and related science professionals as women. We need to intervene by inclusive educational programs and a conducive working environment for women in technology. I sincerely appreciate the support provided to me by IDRC/SIDA through ACTS. The grant from IDRC is helping me to focus on my research agenda, expose to AI professional programs, and grow my research network. Allow me to access tools and technology to facilitate my research. The capacity development programs will help me to enhance my research skills in AI. Without this program, I would not be able to access professional programs from abroad which are not available in my country.” - **Ms Mahadia Tunga, University of Dar es Salaam.**

ACTS' AI4D Initiative is Critical in Capacity Building

“It is important that as Africans we be involved in building our own AI and ML systems and technologies and most importantly using the technologies on the data that is collected on our continent. We are now in the 4th industrial revolution where AI is one of the very many technologies that are coming up and as Africa, we need to embrace the revolution to be able to solve the problems that are going on here we have seen that there is a lot of data that is being collected and used. There is lack of capacity in using the technologies that are being developed and brought on the African context and that is why the work being spearheaded by ACTS, through AI4D Africa initiative, is critical.”

However, the problem that we have is that many of the technologies that are developed outside of Africa and then brought to be used here in Africa face a very big challenge, that they will not solve the problems that we have because they have probably not been trained on the data that was collected on our context. - **Dr. Joyce Nakatumba-Nabende, Makerere University, Uganda**

AI4D Africa Network Formed

A network has been formed consisting of the scholarship beneficiaries (PhD students and MSc) ECA and the PhD supervisors. The network envisions continuous partnerships and collaborations beyond the scholarship programme.

President William Ruto Endorses ACTS' Report on Innovation

This mapping exercise of the Kenya Innovation Ecosystem (2022) was initiated by the UNDP Accelerator Lab in Kenya in partnership with Konza Technopolis Development Authority (KoTDA), the Digital Innovation and Knowledge Exchange Programme under the African Centre for Technology Studies (ACTS) and the Association of Countrywide Innovation Hubs. It builds on and appreciates diverse research conducted on the innovation ecosystem by other stakeholders and in particular a research conducted by the UNDP Accelerator Lab and graduate students from Thunderbird School of Global Management in 2021. The final report has been published and adopted by the Government of Kenya for further action.

H.E. Hon. Dr. William Samoei Ruto President of the Republic of Kenya said of the report: “Kenya’s Innovation Ecosystem ranks among the top three in Africa. Pioneering technologies continue to be realized across all sectors of development driven by the country’s innovative startup community. Kenya prides itself as regional innovation leader and a hub for tech startups. Kenya is committed to engage development partners in enhancing capacity for innovation and the contribution of ICT sector to the overall economy of the country. We commit to consider the recommendations in this report to influence policy direction, even as we strengthen the partnership between the government, private sector and non-state actors.”