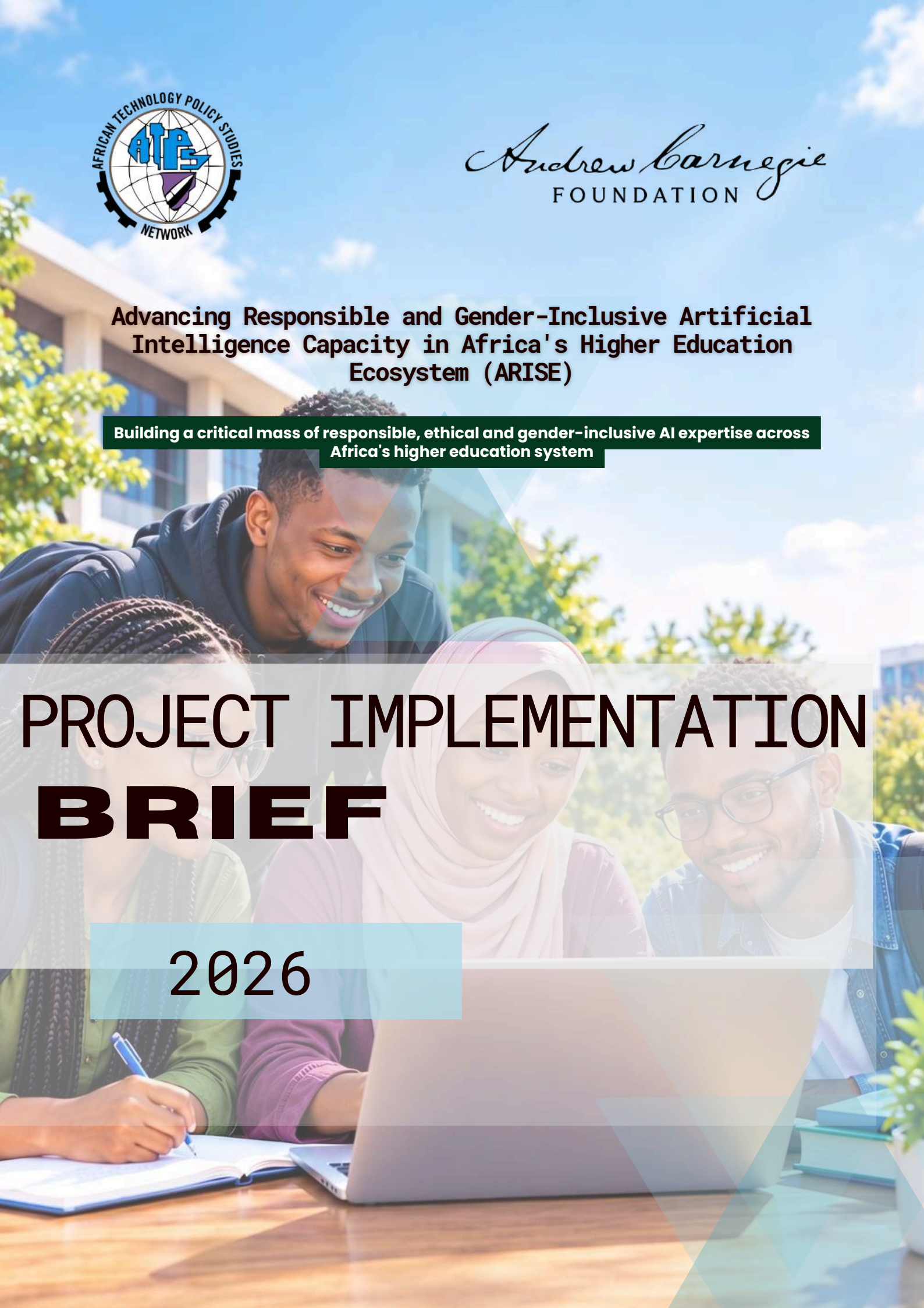


Advancing Responsible and Gender-Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem (ARISE)

Building a critical mass of responsible, ethical and gender-inclusive AI expertise across Africa's higher education system

PROJECT IMPLEMENTATION BRIEF

2026

Advancing Responsible and Gender-Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem (ARISE)

Building a critical mass of responsible, ethical and gender-inclusive AI expertise across Africa's higher education system

Funder

The Andrew Carnegie Foundation

Implemented by

African Technology Policy Studies Network (ATPS)

Principal Investigator

Prof. Nicholas Ozor, Executive Director

African Technology Policy Studies Network (ATPS)

P.O. Box 10081-00100, Nairobi, Kenya

Email: executivedirector@atpsnet.org | Telephone: +254 202714092

Website: African Technology Policy Studies Network (ATPS)

ISBN 978-9966-124-01-2

Editor:
Azubuike Aniedu

Design and layout:
Susan Aquila Mburu

TABLE OF CONTENTS

CONTENTS

MESSAGES FROM KEY PLAYERS ii

Message from the Principal Investigator ii
Message from the Donor iv

ABOUT THE DONOR 1

The Andrew Carnegie Foundation (Formerly Carnegie Corporation of New York

ABOUT ATPS — THE MANAGING ORGANIZATION 2

African Technology Policy Studies Network (ATPS)

PART A: ARISE PROJECT OVERVIEW AND SELECTION PROCESS 3

1. Overview of the ARISE Project 3
2. Awards on Offer 5
3. Overview of the Selection Process 8
4. PhD Scholarship Screening and Shortlisting 9
5. Postdoctoral Fellowship Screening and Shortlisting 11
6. Gender Composition Across Both 11
7. Final Review 12
8. Key Achievements of the ARISE Hub So Far 16

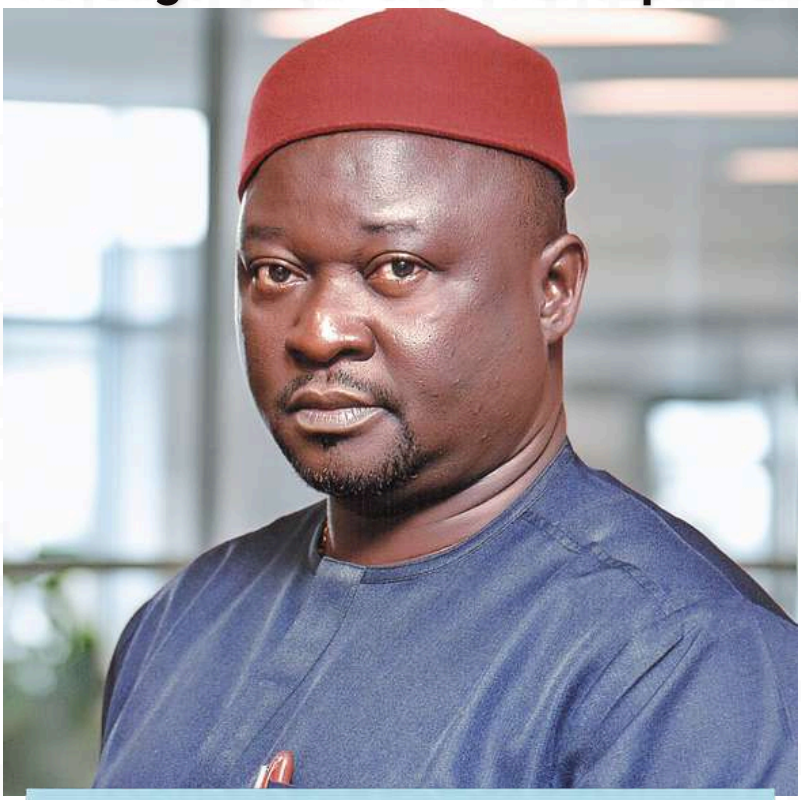
PART B: PRESENTATION OF THE ARISE FELLOWS 18

PhD Scholars 18

Postdoctoral Fellows 40

MESSAGES FROM KEY PLAYERS

Message from the Principal Investigator



Prof. Nicholas Ozor

Executive Director,ATPS

It is with great pride that I welcome you to this Project Implementation Document (PID) on ARISE: Advancing Responsible and Gender-Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem. Africa has the youngest population in the world, with more than 400 million people aged between 15 and 35. Yet the continent still lacks the doctoral-level AI expertise it needs, and project estimates put the requirement at over 5,000 such scholars every five years. ARISE is ATPS's contribution to closing that gap. Its purpose is plain: to build capacity at PhD and postdoctoral level, and to strengthen the human and material capacity on which responsible AI developmen, deployment and scaling depend. Behind it lies a conviction that Africa should be recognised as an innovator and thought leader in AI, not merely a consumer of technology built elsewhere.

ARISE did not start from a blank page. Through the AI4AFS Innovation Research Network, ATPS and its partners, ICIPE and Kumasi Hive, supported ten homegrown AI research projects in agriculture and food systems across eight African countries.

That experience shaped how we approached this project: a transparent and competitive selection process, gender and inclusion built into the design from the outset, and a deliberate effort to grow a community of practice among researchers.

The response to our call was encouraging. We received 143 applications from 23 countries, shortlisted 46, and had 17 independent expert reviewers assess them under strict conflict-of-interest rules. The result is our inaugural cohort of 16 fellows, ten PhD scholars and six postdoctoral fellows, whose work spans health, agriculture and food security, climate and environment, energy, and the digital economy, among other areas. Our webinar series, now in its third edition, supports them with sessions that respond to needs we identify along the way. I urge the fellows to dedicate their time, energy, and best effort to their projects, report on time, and surpass expectations. Make us proud. ATPS supports you every step of the way.

I thank the **Andrew Carnegie Foundation**, formerly the Carnegie Corporation of New York, for seeing the importance of this novel project and for the funding and trust that made it possible. I also thank our host universities, supervisors, mentors, reviewers and national chapter coordinators, whose commitment is turning this investment into lasting capacity.

Message from the Donor



Omotade (Tade) Akin Aina
Senior Program Director of the Higher Education and Research in Africa



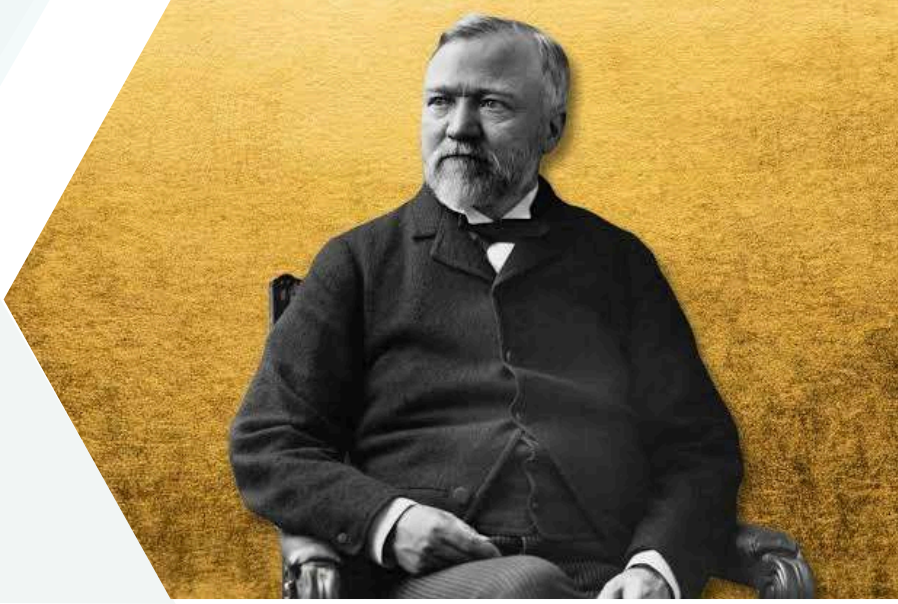
Hiba Said
Interim Program Officer, International Program, & ARISE Program Officer

The Andrew Carnegie Foundation, formerly Carnegie Corporation of New York, is pleased to support the African Technology Policy Studies Network (ATPS) in implementing ARISE. The Foundation's Board of Trustees approved this 36-month, USD 900,000 grant in September 2025 to advance artificial intelligence capacity in African higher education.

Through ARISE, the ATPS provides doctoral and postdoctoral fellowships in AI studies, organises training, works with universities to develop and revise AI curricula, and convenes policy dialogues on adopting and regulating AI innovations. The Foundation has long supported higher education in Africa, and ARISE extends that commitment into a field that is reshaping universities and economies alike.

We congratulate the inaugural cohort of 16 fellows and thank ATPS and its partners for the care taken in selecting them. We look forward to following their progress.

Andrew Carnegie Foundation



ABOUT THE DONOR

The Andrew Carnegie Foundation *(Formerly Carnegie Corporation of New York)*

The Andrew Carnegie Foundation — known until 9 June 2026 as Carnegie Corporation of New York — is a private grantmaking foundation established by the Scottish-American industrialist and philanthropist Andrew Carnegie on 9 June 1911, "to promote the advancement and diffusion of knowledge and understanding." Headquartered in New York City, it is one of the oldest and most influential grantmaking foundations in the United States, with an endowment of approximately USD 4.9 billion and an annual grantmaking budget of around USD 220 million. President Dame Louise Richardson leads the Foundation, with Janet L. Robinson chairing its Board of Trustees.

The Foundation's grant-making is organized around three enduring priorities that reflect Andrew Carnegie's own philanthropic interests: strengthening democracy, advancing education, and promoting international peace and security. Its involvement in Africa dates back to the 1920s and 1930s, and for more than two decades the Foundation has been a leading philanthropic supporter of the continent's higher education sector through its Higher Education and Research in Africa (HERA) programme. Building on the Partnership for Higher Education in Africa (2000–2010), HERA has invested well over USD 130 million in strengthening the training, retention, and research productivity of academics at universities across sub-Saharan Africa, including long-standing partnerships with institutions in Ghana, South Africa, and Uganda.

ARISE sits squarely within this tradition. By funding doctoral and postdoctoral fellowships in artificial intelligence, alongside institutional mapping, curriculum development, and policy engagement, the Foundation's support responds directly to the continent's shortage of advanced AI research capacity and to its ambition to see African universities lead — not merely adopt — AI research relevant to African contexts. The award also reflects the Foundation's confidence in African-led, African-designed interventions, informed by ATPS's track record in managing the AI4AFS Innovation Research Network, as the most effective route to sustainable impact. Website: www.carnegie.org



ABOUT THE ATPS

African Technology Policy Studies Network (ATPS) - Managing Organisaton

The African Technology Policy Studies Network (ATPS) is a transdisciplinary network of researchers, policymakers, private sector actors, and civil society actors that promotes science, technology, and innovation (STI) for African development, environmental sustainability, and global inclusion. It is the largest STI network in Africa and is ranked as the 1st Top Science and Technology Think Tank in Africa (10th globally) according to the 2021 Global Report. Headquartered in Nairobi, Kenya, ATPS implements its activities through National Chapter Offices in 32 countries (28 in Africa and 4 in the Diaspora—Australia, Swaziland, the UK, and the USA), with over 5,000 network members and 3,000 stakeholders across 51 countries on 5 continents.

ATPS operates through five-year strategic plans developed with its stakeholders. The current ATPS Phase IX Strategic Plan (2023–2028) aligns its strategic priorities and programmes with the African Union's Agenda 2063 — which identifies STI as a critical driver of the continent's development goals — and with the 17 Sustainable Development Goals of the United Nations.

ATPS Thematic Priority Areas

The strategic plan is anchored along seven thematic priority areas, including:

- Agriculture, Food and Nutrition Security
- Climate Change and Environment
- Energy
- Health
- Digital Economy and ICT
- Creative Industries and Entrepreneurship
- Education and Technology

Website: www.atpsnet.org



PART A: ARISE PROJECT OVERVIEW AND SELECTION PROCESS

1. Overview of the ARISE Project

The project, titled Advancing Responsible and Gender-Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem (ARISE), is funded by the Andrew Carnegie Foundation for 36 months, from 1 October 2025 to September 2028. Its overall goal is to advance responsible and gender-inclusive AI capacity in Africa's higher education ecosystem, with special emphasis on supporting doctoral and postdoctoral programmes, in order to build a critical mass of AI capacity that will enable Africa's transformation across all sectors of the economy.

Table 1: Details of the ARISE project

Attribute	Detail
Project name	ARISE — Advancing Responsible and Gender-Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem
Funder	Andrew Carnegie Foundation, USA
Implementing organization	African Technology Policy Studies Network (ATPS), Nairobi, Kenya
Principal Investigator	Prof. Nicholas Ozor
Grant value	USD 900,000
Duration	36 months (1 October 2025 – September 2028)
Geographic scope	Sub-Saharan Africa (49 countries)
Awards funded	16 fellowships — 10 PhD scholarships and 6 postdoctoral fellowships

1.1 Goal of the ARISE Project

The main goal of ARISE is to advance responsible and gender-inclusive AI capacity in Africa's higher education system, with a focus on doctoral and postdoctoral programmes, to build a critical mass of AI expertise for Africa's development.

1.2 Specific Objectives

The specific objectives of the ARISE project, as set out in the call for applications, are to:

1. Enable informed, targeted interventions by conducting situational analyses and mapping AI resources and institutions within Africa's higher education ecosystem to identify status, surface gains, identify gaps, and establish capacity needs.
2. Build a strong Community of Practice (CoP) and skilled workforce in AI by supporting 16 fellowships — ten PhD fellowships and six postdoctoral fellowships — over three years.
3. Advance knowledge sharing, exchange, and dissemination of research findings and innovations by organizing a series of sensitization, customized hands-on training, and mentorship programmes on AI for development in Africa.
4. Mainstream AI into academic programmes by supporting the development and revision of contextualized AI curricula that meet the needs of Africa in selected higher education institutions.
5. Sustain AI adoption across sectors by contributing to the development of AI policies and strategies at Africa's national, regional, and continental levels.

1.3 Strategic and Thematic Alignment

ARISE sits within the Education and Technology Thematic Priority Area of the ATPS Phase IX Strategic Plan and spans all five of the network's Programmatic Priority Areas. Applicants' research had to fall within one or more of the seven ATPS Thematic Priority Areas, and this alignment was one of the screening criteria applied at shortlisting.

Table 2: Thematic and Programmatic Priority Areas of ATPS Phase IX Strategic Plan

ATPS Thematic Priority Areas	ATPS Programmatic Priority Areas
Agriculture, Food and Nutrition Security	STI policy research, policymaking, and advocacy
Climate Change and Environment	Training, sensitisation, and capacity building
Energy	Youth and gender empowerment
Health	Knowledge brokerage, management, and com
Creative Industries & Entrepreneurship	Intra-Africa and global collaboration and parti
Education and Technology (ARISE sits here)	—
Digital Economy and ICT	—

Because the programme area sits within the Phase IX Strategic Plan, it is designed to continue beyond the Carnegie-funded project period. Other donors, including the IDRC and Afreximbank, have committed to supporting ATPS's AI projects, and ATPS has already built a Community of Practice of AI researchers, policymakers, and practitioners across the continent — over 100 experts in the AI field across 10 countries currently work with ATPS within Africa's higher education ecosystem.

1.4 Rationale and Scope

Africa's higher education ecosystem holds substantial potential as the engine for generating the capacity and infrastructure needed for knowledge-driven, innovation-led, sustainable development. With a young population of over 400 million people aged 15 to 35, Africa has the youngest population in the world (UNESCO, 2024) — an opportunity for economic growth and innovation, provided that people are well educated and equipped with the right skills.

The project concentrates on the 49 countries of sub-Saharan Africa. Inequality in access to new technologies is significant in the region, and the limited policy and regulatory environment has meant that AI implementation has largely followed a laissez-faire approach. African countries continue to struggle to expand capacity relative to the size of the technology sector, the business environment, and the development of a skilled AI workforce (Yeboah, 2021). ARISE addresses this gap by funding advanced research training and by strengthening the institutions that host it.

Project background: https://atpsnet.org/arise-gender-inclusive-ai-africa-higher-ed/

2. Awards on Offer

ARISE builds its critical mass of AI expertise through two complementary fellowship tracks, both requiring alignment with ATPS's thematic priority areas and a demonstrated commitment to responsible, ethical, and gender-inclusive AI.

2.1 PhD Scholarships (10 Awards)

ARISE offers two fellowship tracks. The first is a set of 10 PhD scholarships, open to candidates already enrolled in or accepted into a PhD programme at an accredited African university. Each award provides partial support for tuition, research expenses, a living stipend, and conference or workshop travel, along with mentorship from global and African AI experts, access to the ATPS Community of Practice and its Interactive Collaborative Environment (ICE), and opportunities for policy engagement.

2.2 Postdoctoral Fellowships (6 Awards)

The second track comprises 6 postdoctoral fellowships, one of which is reserved for a fellow based at ATPS headquarters in Nairobi, with the remaining five hosted at accredited African institutions. Eligible candidates must hold a PhD in an AI-related field completed within the last five years and must already have host-institution acceptance at the time of application. Fellows receive an indicative stipend for up to two years, plus additional research and travel support, with priority given to those undertaking the fellowship at an institution different from where they currently study or work.

2.3 Application Process and Eligibility

ATPS opened separate online application portals for the PhD scholarships and postdoctoral fellowships, and held a public information webinar on 18 February 2026 to brief prospective applicants on eligibility, thematic priorities, and the application process. PhD applications closed on 15 March 2026, while the Postdoctoral applications closed on 31 March 2026. To be eligible, applicants had to be African citizens or permanent residents currently residing in Africa, with PhD applicants formally enrolled in or accepted into an accredited African PhD programme, and postdoctoral applicants holding a PhD completed within the last five years along with a formal letter of acceptance from an accredited African host institution. Beyond these baseline requirements, due diligence also assessed if the research proposal aligned with one or more ATPS thematic priority areas — with strong preference given to proposals emphasizing responsible/ethical AI and gender responsiveness — and whether the application documentation (transcripts, recommendation letters, host-institution letters, and the like) was complete. Table 3 summarises the award structure.

Table 3: Summary of the ARISE Award Structure

Feature	PhD Scholarship	Postdoctoral Fellowship
Awards available	10	6
Duration	Up to 3 years, aligned to the project implementation period	2 years within the project timeframe
Funding	Partial: tuition, research expenses, living stipends, and travel for conferences and workshops	Research expenses, stipend, and travel to conferences and workshops
Indicative value	USD 10,000–15,000 over the award period	USD 1,200–1,500 per month
Additional benefits	Mentorship from global AI experts; linkage with ATPS AI networks; ICE knowledge-exchange platform	ATPS networks for collaboration; global AI mentors; ICE platform; opportunities for policy influence and industry partnerships
Host institution	Accredited African higher education institution where the candidate is already registered	Recognized African institution actively involved in AI research and development
Application deadline	Mar 15, 2026	Mar 31, 2026

2.4 Overview of the Applicant Pool

The call garnered 143 applications from 23 countries spanning all six regions of Africa, including 96 males and 47 females. This highlights the African focus of the ARISE project and underscores gender diversity among applicants. Figures 1-6 show the gender and country distributions by region.

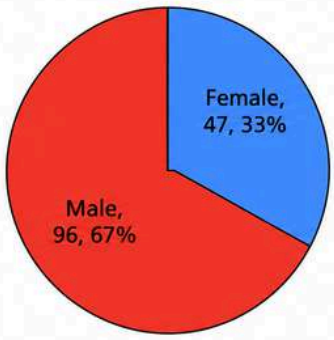


Figure 1. Distribution of applications by gender.

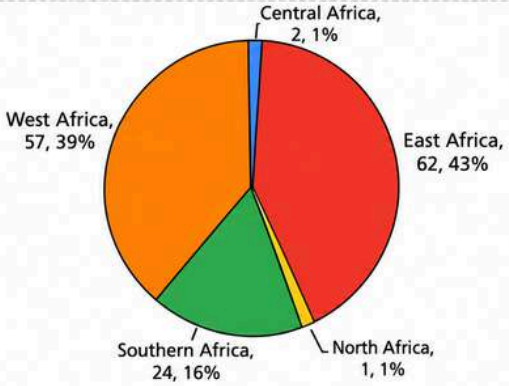


Figure 2. Regional distribution of applications received.

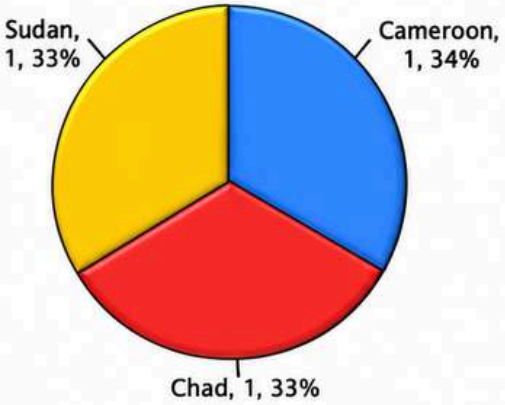


Figure 3. Distribution of applications from countries in North and Central Africa.

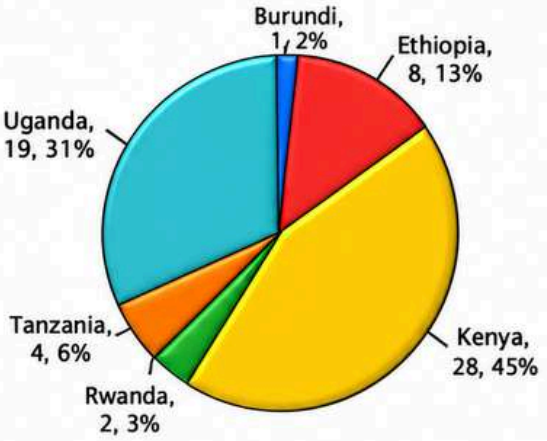


Figure 4. Distribution of applications from countries in East Africa.

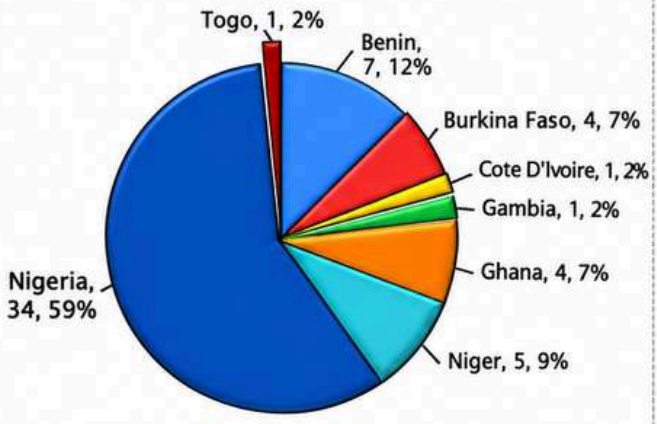


Figure 5. Distribution of applications from countries in West Africa.

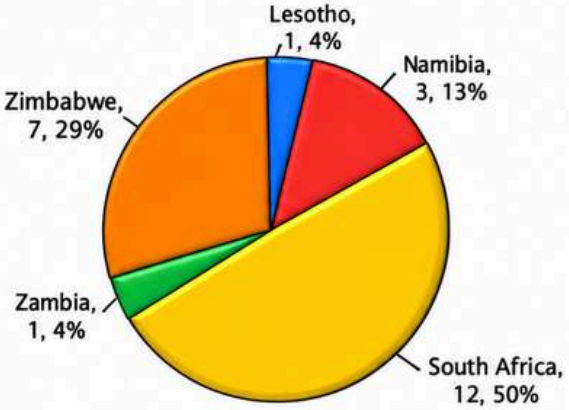


Figure 6. Distribution of applications from countries in Southern Africa.

3. Overview of the Selection Process

The selection process was structured in four sequential stages.

Table 4: Selection process of the ARISE awards

Stage	Activity	Status
1	Receipt of applications through the ATPS online portal and verification that supporting documents are complete	Complete
2	Screening of each application against the published eligibility criteria; shortlisting of qualifying candidates	Complete
3	External review of shortlisted applications by expert reviewers in responsible AI	Complete
4	Final selection, diversity and gender-inclusion review of the emerging cohort, and notification of awardees	Complete

The screening at Stages 1 and 2 was applied uniformly to every application received. No application was advanced that failed any element of the eligibility criteria, and no application was excluded on grounds outside the published criteria.

3.1 Screening Results at a Glance

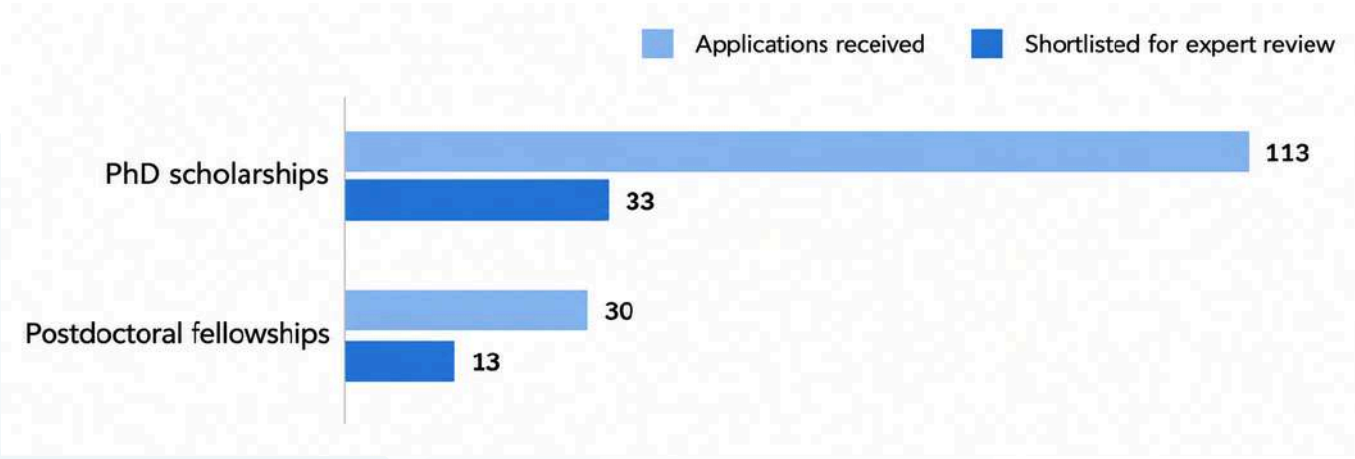


Figure 7. Applications received and shortlisted for external expert review, by award track.

Table 5: Progression rate of the received applications

Award track	Received	Shortlisted	Progression rate
PhD scholarships	113	33	29.20%
Postdoctoral fellowships	30	13	43.30%
Total	143	46	32.20%

4. PhD Scholarship Screening and Shortlisting

A total of 113 applications were received for the PhD scholarship track. Each application was examined individually against the criteria below, applied in sequence.

4.1 Screening Criteria Applied

1.Verification of the Master's degree certificate submitted.

2.Availability of a letter of admission to a PhD programme.

3.Presence of a research proposal in the application.

4.Whether the candidate's PhD admission is held at the institution where the Master's degree was obtained, or at another African host institution.

5.Alignment of the project proposal with the ATPS thematic priority areas.

6.Whether the PhD programme has already commenced or is ongoing.

4.2 Shortlisting Outcome

Following the review and scanning of all 113 applications, 33 were selected to proceed to the next stage of external review by experts in responsible AI. All 33 shortlisted applicants met the eligibility requirements in full.

4.3 Country Representation

The PhD shortlist draws from 14 African countries. Nigeria accounts for the largest single share at 8 shortlisted candidates, followed by Kenya and Uganda with 4 each and South Africa with 3. The remaining ten countries contribute one or two candidates each, giving the shortlist broad continental spread alongside its concentration in the larger research systems.

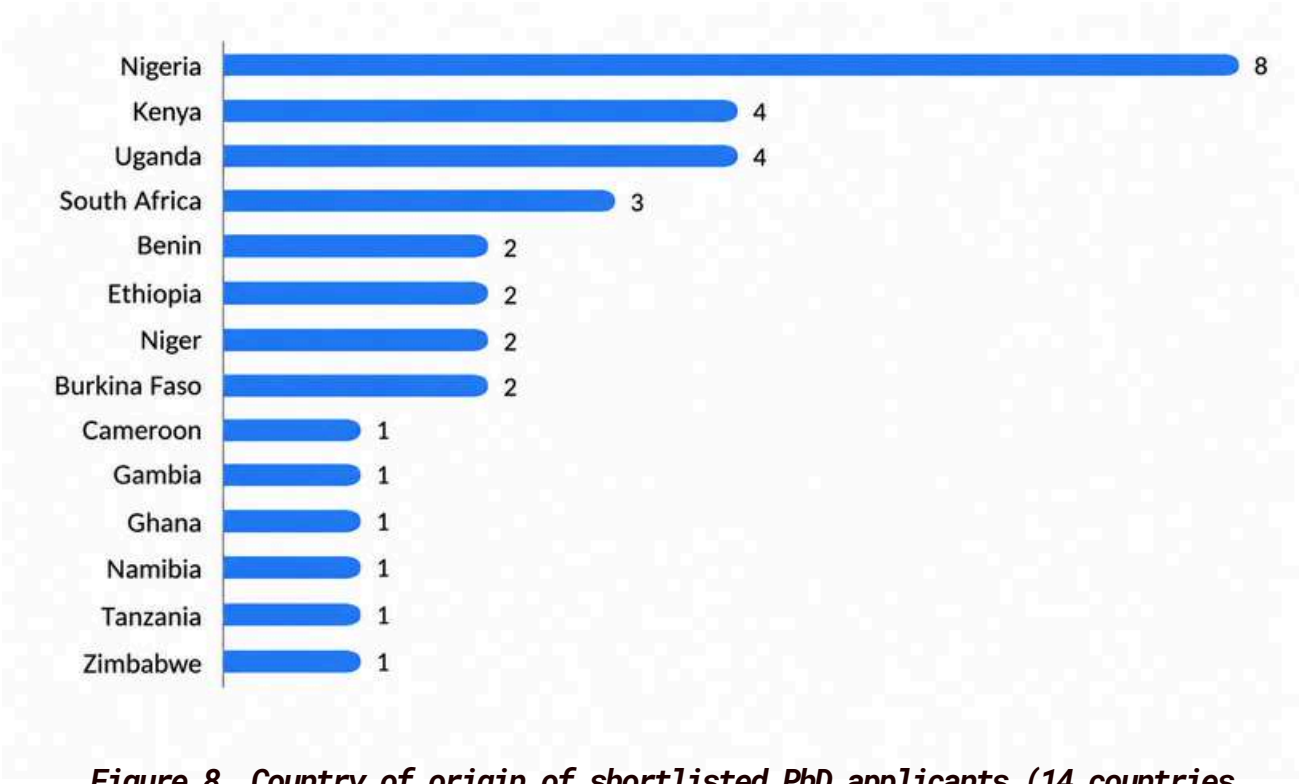


Figure 8. Country of origin of shortlisted PhD applicants (14 countries represented)

4.4 Gender Composition

The PhD shortlist is close to gender parity, with 15 women (45.5 per cent) and 18 men (54.5 per cent). This is a strong result against the project's gender-inclusion objective and requires no corrective adjustment at the final selection stage.

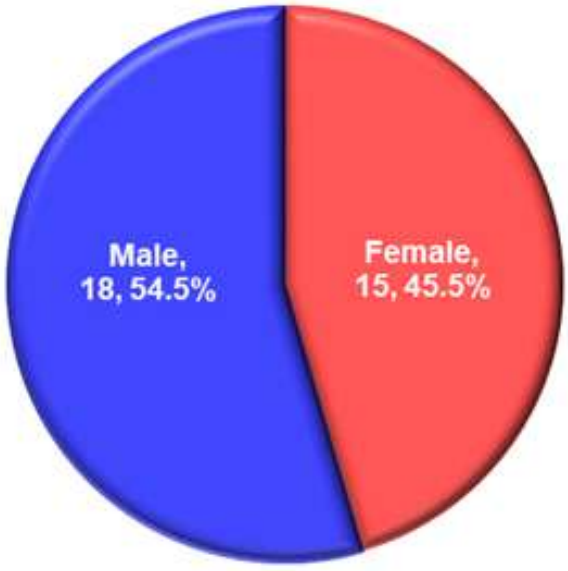


Figure 9. Showing gender parity of the PhD Shortlist

5. Postdoctoral Fellowship Screening and Shortlisting

A total of 30 applications were received for the postdoctoral fellowship track. Each was screened against the criteria below.

5.1 Screening Criteria Applied

1. A letter of acceptance from the proposed host institution.
2. Confirmation that the postdoctoral host is an institution other than the PhD-awarding institution.
3. Alignment of the proposal with the ATPS thematic priority areas.

5.2 Shortlisting Outcome

Thirteen applications were shortlisted for external expert review, comprising 4 women (30.8 per cent) and 9 men (69.2 per cent). This distribution reflects the gender composition of the applications received at intake rather than any differential applied during screening; the screening criteria were applied identically to all applicants.

The postdoctoral track recorded a higher progression rate than the PhD track — 43.3 per cent against 29.2 per cent — consistent with a smaller, more self-selecting applicant pool at a more advanced career stage.

6. Gender Composition Across Both Tracks

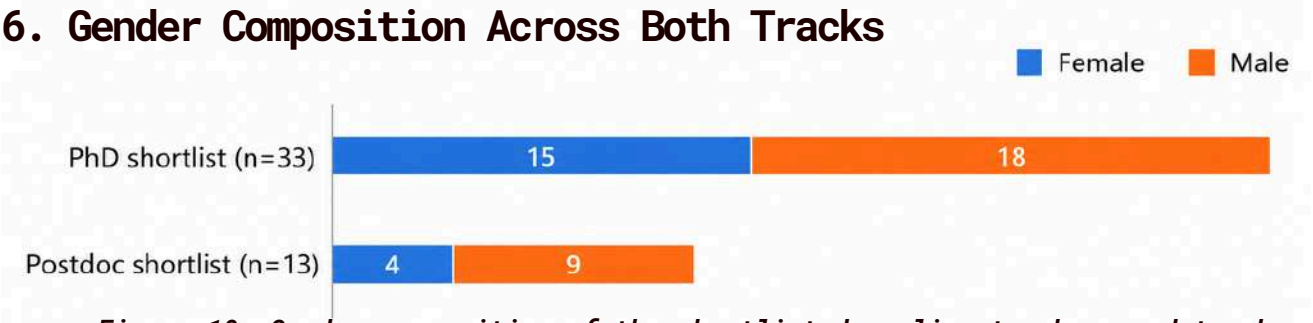


Figure 10. Gender composition of the shortlisted applicants, by award track

Table 6: Gender composition of both PhD and Postdoctoral tracks showing the total female share

Award track	Female	Male	Total	Female share
PhD scholarships	15	18	33	45.50%
Postdoctoral fellowships	4	9	13	30.80%
Combined	19	27	46	41.30%

Taken together, women comprise 41.3 per cent of all shortlisted applicants. The gap between the two tracks is concentrated entirely in the postdoctoral cohort and originates upstream of screening, in the composition of the applicant pool.

7. Final Review

Proposals that survived Stage 2 screening advanced to a full external review. This review was led by a panel of independent experts drawn from the ATPS network, who applied standardized, transparent scoring criteria to every shortlisted proposal and whose assessments directly determined the composition of the final ARISE cohort.

7.1 Review Methodology and Scoring Criteria

Each shortlisted proposal was assessed against five weighted criteria: the applicant's academic and research record; the technical quality and feasibility of the proposed research; the proposal's alignment with ATPS's thematic priority areas; the extent to which it addressed responsible-AI and gender-responsiveness considerations; and the fit between the proposal and its proposed institutional or host arrangement. Reviewer scores were aggregated into a single composite score for each application, and a composite score of 70 per cent was set as the pass mark for advancement to final selection. As at the earlier screening and shortlisting stages, ATPS prioritized gender balance and equitable representation across sub-Saharan Africa's regions and language groups throughout the review.

7.2 Review Panel and Reviewer Assignment

For the full proposal review stage, ATPS selected seventeen (17) reviewers from its pool of experts and professional networks. Reviewers were selected and assigned to proposals based on the following criteria:

- **Independent review:** Each proposal was assigned to three (3) independent experts, including at least one reviewer from the region in which the proposal was to be implemented.
- **Country of origin:** Reviewers were not assigned to proposals submitted by applicants from their own country.
- **Regional diversity:** Proposals from one African region were assigned to reviewers from other regions, ensuring cross-regional assessment. For example, proposals from West Africa were reviewed by experts from Southern, Eastern, or Central Africa, and vice versa.
- **No prior research collaboration:** Reviewers must not have previously published with or conducted joint research with any of the applicants whose proposals they were assigned to review.
- **No conflict of interest:** Reviewers must not be applicants, collaborators, or otherwise involved in any of the applications under review.
- **Confidentiality:** All reviewers were required to sign the ARISE Non-Disclosure Agreement (NDA) prior to participating in the review process.

The full proposal review process commenced on 1 July 2026 and was successfully concluded on 15 July 2026.

7.3 Expert Reviewers for the ARISE Grantee Selection

Table 7 lists the seventeen experts who served as external reviewers for the ARISE full-proposal review stage, together with their institutional affiliations.

Table 7: List and affiliations of ARISE Grantee reviewers

Reviewer Details	Gender
Emaediong Ofonime Akpan, Independent Consultant on Gender Equality and Inclusion, Canada	F
Engr Prof. Chinenye C. Anyadike, Professor of Soil, Water Resources and Aquacultural Engineering, University of Nigeria Nsukka, Nigeria	F
Prof. Christopher Kanali, Department of Agricultural and Biosystems Engineering, Jumo Kenyatta University of Agriculture and Technology, Kenya	M
Dr. Elizabeth Oseku, Infectious Diseases Institute, Kampala, Uganda	F
Prof. Idy Diop, Professor of Signal Processing, Image Processing, and Digital Communication, Cheikh Anta Diop university, Dakar, Senegal	M
Prof Agaji Iorshase, Professor of Computer Science, Joseph Sarwuan Tarka University Makurdi, Nigeria	M
Dr. Eng. Joseph Sang, Senior Lecturer, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya	M
Dr. Hilda Kalekye Manzi, Remote Sensing and GIS Expert, Geo-Spatial Research International, Kenya	F
Dr. Ivone Muocha, Deputy Director of the Center for Research and Technology Transference for Community Development (CITT), Eduardo Mondlane University, Mozambique	F
Dr. Omoregbee Henry Ogbemudia, Lecturer, University of Lagos, Nigeria	M
Prof. Ozoemena Ani, Professor of Power Systems, Machinery, and Mechatronics, University of Nigeria Nsukka, Nigeria	M
Prof. Patrick Kwabena Mensah, University of Energy and Natural Resources, Ghana	M
Yassen Eltayeb, Founder and CEO of Conefia, a technology/AI company.	M
Prof. Ibra Dioum, Professor of Telecommunication and Electronic Engineering, Cheikh Anta Diop University of Dakar, Senegal	M
Prof Jean Louis Fendji, Associate Professor University of Ngaoundéré, Cameroon	M
Patrick Sama-Lang (PhD), Senior Researcher at IRAD Cameroon	M
Prof. Eric Tutu Tchao, Associate Professor, Department of Computer Engineering, Kwame Nkrumah University of Science and Technology (KNUST), Ghana	M

7.4 First-Stage Review Results

At the conclusion of scoring, 22 of the 33 shortlisted PhD applications (66.7 per cent) and 12 of the 13 shortlisted postdoctoral applications (92.3 per cent) achieved a composite score above the 70 per cent pass mark and advanced to final selection. The stronger pass rate on the postdoctoral track is consistent with its smaller, more experienced, and more self-selecting applicant pool.

7.5 Final Selection and Cohort Profile

From this pool, ATPS selected the final ARISE cohort of ten PhD scholars and six postdoctoral fellows. The cohort is drawn from six sub-Saharan African countries — Nigeria, Kenya, South Africa, Uganda, Burkina Faso, and Zimbabwe — spanning three African regions: West Africa, East Africa, and Southern Africa, as summarized in Table 8.

Table 8: Country and regional representation of the final ARISE cohort

Country	African Region
Nigeria	West Africa
Burkina Faso	West Africa
Kenya	East Africa
Uganda	East Africa
South Africa	Southern Africa
Zimbabwe	Southern Africa

Figure 11 traces the progression of applications through each stage of the selection pipeline for both award tracks, from initial receipt through to final selection.

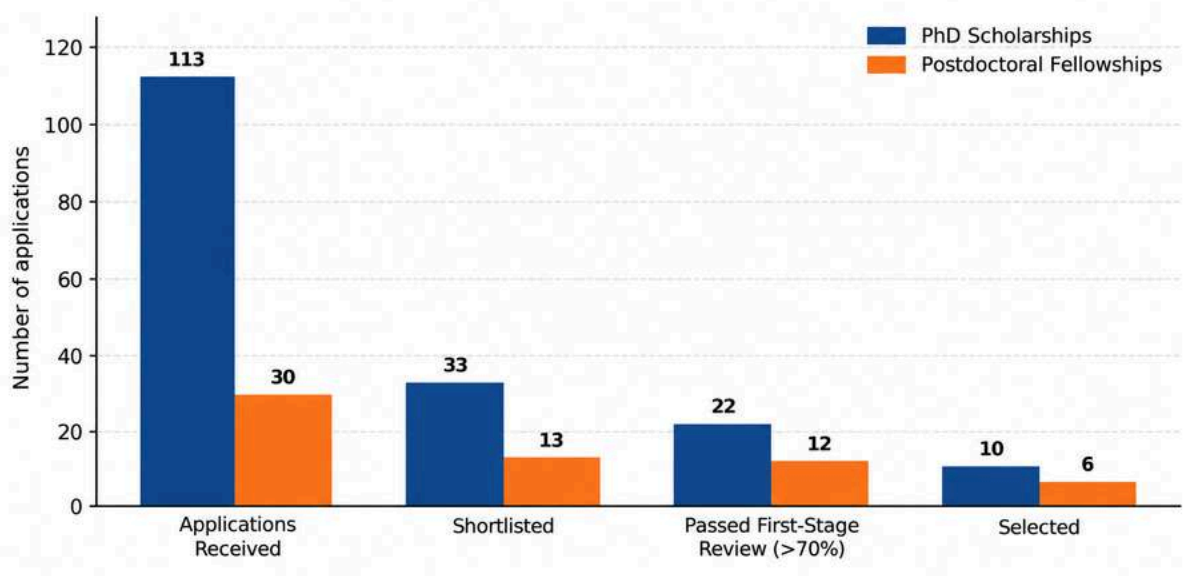


Figure 11. Progression of PhD and postdoctoral applications through the ARISE selection pipeline, by stage.

In gender terms, the final cohort comprises ten men and six women overall: six men and four women on the PhD scholarship track, and four men and two women on the postdoctoral fellowship track (Figure 12).

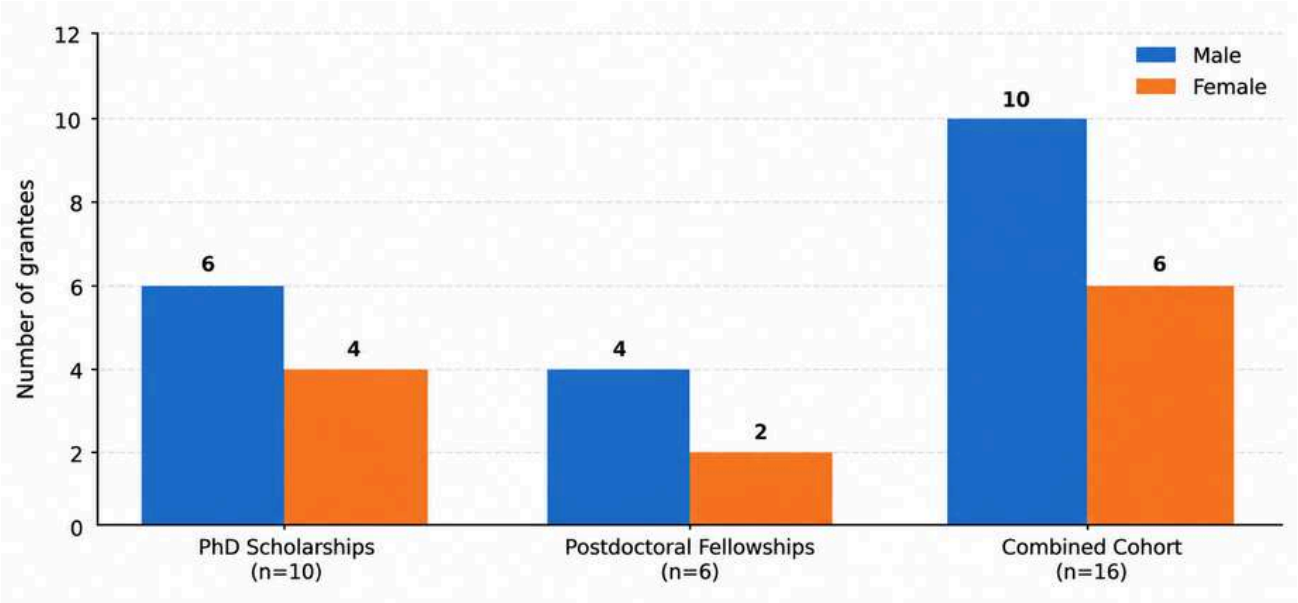


Figure 12. Gender composition of the final ARISE cohort, by award track.

Figure 13 summarises the full ARISE selection process end to end, from the receipt of expressions of interest through to the notification of the final cohort of awardees.

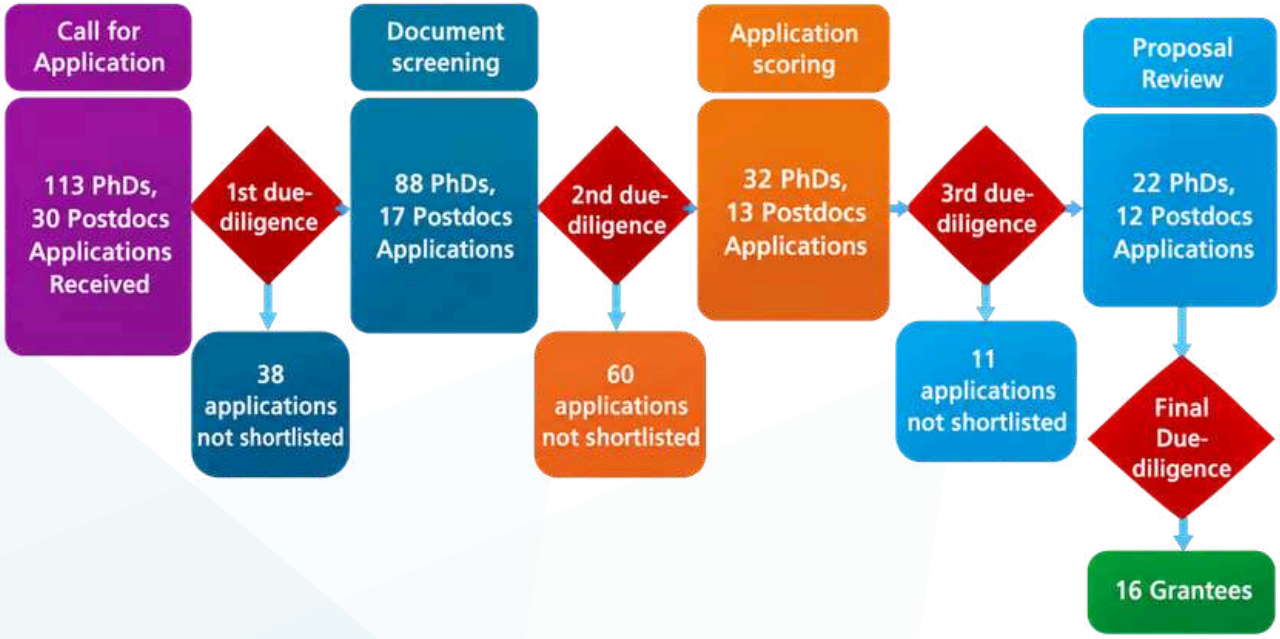


Figure 13. The ARISE grantee selection process at a glance.

8. Key Achievements of the ARISE Hub So Far

Since its inception, the ARISE Project has made significant progress toward establishing a strong foundation for responsible and gender-inclusive AI capacity development in Africa's higher education ecosystem. Key achievements to date include:

- **Successful Launch of the Project (October 2025):** ARISE was formally launched in October 2025, bringing together ATPS, its national chapters, and key stakeholders to set the strategic direction for the project. The launch marked the start of a coordinated three-year effort to build responsible and gender-inclusive AI capacity across Africa's higher education system and set in motion the subsequent workstreams on mapping, fellowships, curriculum support, and policy engagement.
- **Extensive Outreach and Dissemination Across Africa:** The Hub carried out a wide-reaching sensitization campaign across the continent to build awareness of the fellowship opportunities and the broader goals of ARISE. This included the use of ATPS's National Chapter network, digital and social media channels, university partnerships, and a public information webinar (18 February 2026) to reach prospective PhD and postdoctoral applicants across all 49 eligible Sub-Saharan African countries, ensuring broad and equitable visibility of the programme. A second webinar designed to formally onboard the selected grantees, introduce them to the project's goals and expectations, and foster a shared understanding of responsible and gender-inclusive AI as a core principle of the ARISE programme held on August 26 2026.
- **Development of Application and Selection Frameworks for PhD/Postdoc Grantees:** ATPS designed and rolled out standardized, transparent application and review frameworks for both fellowship tracks, including separate online application portals, clearly defined eligibility and due-diligence criteria, structured proposal templates, and a scoring rubric for reviewers. These frameworks were built to ensure merit-based, gender-responsive, and regionally equitable selection, drawing on lessons learned from ATPS's earlier management of the AI4AFS grantee selection process.
- **Successful Mapping of AI-Focused Higher Education Institutions in Africa:** Through a comprehensive desk study, the Hub mapped Higher Education Institutions (HEIs) across Africa engaged in AI-related teaching, research, and development. The exercise identified institutional strengths, weaknesses, and gaps in AI curricula, infrastructure, research output, and staffing capacity, generating an evidence base that is now informing ARISE's curriculum-support and capacity-building activities and helping to target future interventions where they are most needed.

- **Development of comprehensive survey questionnaires** and research instruments to support the systematic assessment of AI capacities, strengths, gaps, and capacity needs within African higher education institutions and validate the outcome of the desk study and mapping previously carried out.

- **Establishment of Mentorship and Gender Support Structures:** The project established dedicated mentorship structures pairing PhD scholars and postdoctoral fellows with experienced African and global AI experts, alongside gender support mechanisms designed to ensure equitable participation and a supportive research environment for women and other underrepresented groups in AI. These structures will underpin fellows' academic and professional development throughout the life of their awards.

- **Successful Selection of 6 Postdoctoral Fellows and 10 PhD Scholars:** Following a rigorous and competitive review process, the Hub selected 6 postdoctoral fellows and 10 PhD scholars, equitably distributed across 6 sub-Saharan African countries — Kenya, Nigeria, Uganda, South Africa, Burkina Faso, and Zimbabwe. The selection reflects ARISE's commitment to regional diversity and gender inclusion, with a balanced representation of male and female fellows across the cohort.

- **Development of Draft Standardized AI Curricula:** Drawing on the findings of the institutional mapping study, the Hub developed draft standardized AI curricula intended to guide and support partner institutions in developing or updating their own AI programmes. These draft curricula provide a common reference framework covering core AI competencies, ethics and responsible AI principles, and gender-inclusive pedagogy, which institutions can adapt to their local context and academic structures.



PART B: PRESENTATION OF THE ARISE FELLOWS

The following pages introduce the scholars and fellows supported under the ARISE fellowship programme — ten PhD scholars and six postdoctoral fellows drawn from across Sub-Saharan Africa, each pursuing research that advances responsible and gender-inclusive AI within ATPS's thematic priority areas.

PhD Scholar 1



PhD Scholar
KABORE Moumini

Award Ref: ARISE2563173-PhD-01

Approved Research Title: Transfer Learning for Responsible and Inclusive AI in Extremely Low-Resource African Languages: Building Foundational Language Technologies for Digital Sovereignty

Total Award Amount: $15,000

Host Institution / University: Interdisciplinary centre of excellence in AI for development (CITADEL) & University Nazi Boni (Burkina Faso)

Area of Study: PhD in Computer Science – Natural Language Processing (NLP), Transfer Learning and Artificial Intelligence

Programme: PhD Scholarship

Thematic Area: Digital Economy and ICT (Primary); Education and Technology (Secondary)

Supervisor / Mentor: Dr. Tegawendé F. BISSYANDE (Co-Supervisor & Mentor)

Research Focus

My research investigates how transfer learning can be optimized to develop responsible, inclusive, and high-performing AI language technologies for extremely low-resource in Burkina Faso, particularly Moore, Fulfulde, Gulmancema, and Dioula. The project combines multimodal corpus development, ethical data collection, and AI model adaptation to reduce linguistic exclusion and strengthen digital sovereignty while ensuring fairness across gender and speaker communities.

Goal

To develop a reproducible transfer learning framework that enables the development, evaluation, and deployment of responsible AI language technologies (ASR, MT, and TTS) for extremely low-resource African languages.

Objectives

- Characterize the linguistic properties of the four main target languages of Burkina Faso and build ethically sourced multimodal datasets.
- Develop and compare transfer learning strategies for ASR, MT, and TTS across the four languages.
- Establish reproducible adaptation pipelines and evaluation benchmarks for responsible AI in African languages.

Key Activities

- Conducted a PRISMA-based systematic literature review on transfer learning for low-resource languages and designed the research framework.
- Designed a unified multimodal corpus architecture and developed a linguistically controlled evaluation framework for machine translation.
- Initiated multimodal data collection by acquiring speech and textual resources from the Radiodiffusion Télévision du Burkina (RTB), the Ministry of National Education, Literacy and Promotion of National Languages (MENAPLN), language experts, and the linguistic laboratory of Université Joseph KI-ZERBO.

Key Achievements

- Completed a systematic literature review covering 160 selected studies; manuscript finalised and scheduled for submission to an Elsevier journal in the coming weeks.
- Developed a linguistically controlled MT evaluation framework, with the corresponding paper accepted at CARI 2026.

Next Steps

- Prepare and submit a research paper on a linguistically informed taxonomy of machine translation errors for low-resource African languages, building on the evaluation framework developed in the accepted CARI 2026 paper.
- Complete the collection, annotation, and quality control of the multimodal corpus.
- Develop and evaluate transfer learning models for ASR, MT, and TTS across the four target languages.
- Conduct fairness and performance evaluations and release open datasets and benchmarks.
- Disseminate research outcomes through peer-reviewed journal publications and international conferences.

PhD Scholar 2



PhD Scholar
Richard G. Wairagu

Award Ref: ARISE2563173-PhD-02

Approved Research Title: A Retrieval-Augmented Large Language Model Framework for Explainable Oncology Clinical Decision Support in Kenya's Public Healthcare System (ONCARE)

Total Award Amount: $15,000

Host Institution / University: Technical University of Kenya

Area of Study: A Retrieval-Augmented Large Language Model Framework for enhancing oncology clinical decision support within resource-constrained healthcare environments: case study of Kenya's public healthcare system.

Programme: PhD in Information Systems and Technology / Department of Computing and Information Technologies

Thematic Area: Health

Supervisor / Mentor: Prof. Salessio M. Kiura

Research Focus

My research investigates how an Explainable Retrieval-Augmented Large Language Model (RAG-LLM) framework can enhance oncology clinical decision support within Kenya's public healthcare system by providing transparent, evidence-grounded, and context-aware recommendations. The study contributes to responsible and gender-inclusive AI by integrating explainability, human oversight, fairness, and trusted clinical guidelines into AI-assisted decision-making, while addressing healthcare inequities and improving access to high-quality cancer care for diverse and underserved populations in resource-constrained settings.

Goal

To develop and evaluate an Explainable Retrieval-Augmented Large Language Model (RAG-LLM) framework for enhancing oncology clinical decision support within resource-constrained healthcare environments: case study of Kenya's public healthcare system.

Objectives

- To analyse the clinical, technological, and organisational challenges affecting oncology clinical decision support within Kenya's public healthcare system.
- To design an Explainable Retrieval-Augmented Large Language Model (RAG-LLM) framework that integrates heterogeneous oncology knowledge sources, hybrid retrieval mechanisms, explainable reasoning, and clinician-centred decision support.
- To develop and implement a prototype of the proposed Explainable RAG-LLM framework using trusted oncology knowledge repositories, hybrid retrieval techniques, Large Language Models, and explainability mechanisms.
- To evaluate the proposed framework with respect to technical performance, evidence grounding, explainability, usability, clinician acceptance, and suitability for deployment within resource-constrained healthcare environments.

Key Activities

The research focuses on developing an Explainable Retrieval-Augmented Large Language Model (RAG-LLM) framework to support oncology clinical decision-making within Kenya's resource-constrained public healthcare system. It has progressively evolved from problem identification and literature analysis to the development and evaluation of a clearly defined conceptual, methodological and technical framework.

Research framework: Explainable RAG-LLM Framework
Prototype:ONCARE (Oncology Clinical Assistance and Recommendation Engine)
Clinical focus: Initially breast cancer
Core technology: Hybrid RAG + LLM + XAI
Role: Clinician-centered clinical decision support
Principle: Assist and augment clinicians, not replace clinical judgement.

Key activities include:

- Refinement and Definition of the Research Problem
- Development of the ONCARE Concept
- Development of the Conceptual Framework
- Development of the Proposed Technical Architecture
- Development of the Research Methodology
- Literature Review and Identification of Research Gaps
- Development of the Evaluation Framework
- Integration of Responsible AI Principles
- Alignment with Kenya's Healthcare and AI Policy Environment

The research has reached an important stage of maturity, with the core research problem, objectives, conceptual framework, methodology, technical architecture and evaluation strategy substantially developed.

Key Achievements

A significant milestone has been achieved in the development and academic progression of the research proposal. The proposal was successfully presented and defended before the Departmental Academic Board, following which the recommended corrections and improvements were incorporated. The revised proposal has subsequently been forwarded to the Faculty for consideration and the next stage of academic review.

Next Steps

Following the departmental presentation of the research proposal, the study will proceed through a series of academic, ethical, technical, clinical and empirical activities culminating in the successful completion and defense of the PhD thesis. The next steps can be summarized using Figure 14 below:

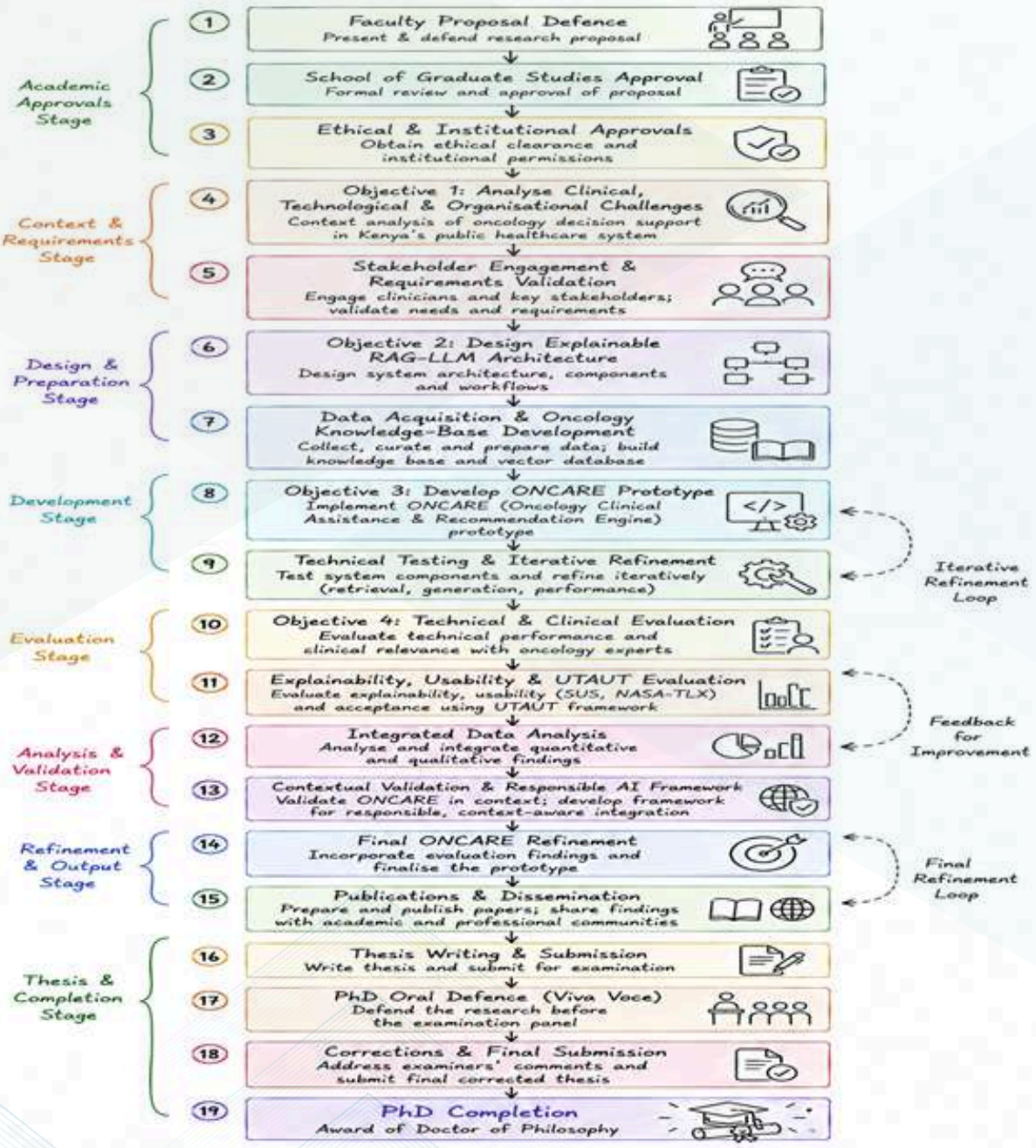


Figure 14: Next steps to completion of PhD work

PhD Scholar 3



PhD Scholar
Lebogang Tisane

Award Ref: ARISE2563173-PhD-03

Approved Research Title: Rawlsian Framework to Promote Fairness for Female-Led Small and Medium sized Enterprises in Gauteng's E-Commerce Platforms

Total Award Amount: $15,000

Host Institution / University: University of Johannesburg, South Africa

Area of Study: Doctor of Philosophy (DPhil) with specialisation in Digital Transformation.

Programme: PhD Scholarship

Thematic Area: Creative Industries & Entrepreneurship; Digital Economy and ICT

Supervisor / Mentor: Prof Lungile Ntsalaze

Research Focus

This research investigates how a Rawlsian Ethical AI Framework can be developed and validated to promote fairness and reduce algorithmic bias affecting female-led SMEs operating on e-commerce platforms in Gauteng. The study is particularly relevant to responsible and gender-inclusive AI because it examines how AI-driven systems influence product visibility, promotional opportunities, and market access for women entrepreneurs, while proposing ethical governance mechanisms that advance fairness, transparency, and equality of opportunity.

Goal

To develop, operationalize, and empirically validate a Rawlsian Ethical AI Framework that promotes fairness, mitigates algorithmic bias, and enhances equitable opportunities for female-led SMEs on e-commerce platforms in Gauteng.

Objectives

- Examine how female-led SMEs perceive the integrity, fairness, and transparency of algorithms used by e-commerce platforms.
- Investigate the relationship between perceptions of algorithmic fairness and the adoption of e-commerce platforms by female-led SMEs.
- Design and validate a Rawlsian Ethical AI Framework to promote fairness, equality of opportunity, and ethical AI governance for female-led SMEs in South Africa's digital economy.

Key Activities

- Conducted an extensive literature review on AI ethics, algorithmic fairness, Rawlsian justice, gender equity, female entrepreneurship, and e-commerce platform
- Developed the conceptual and methodological framework, including mixed-methods research design, variable operationalization, sampling strategy, and data collection instruments.

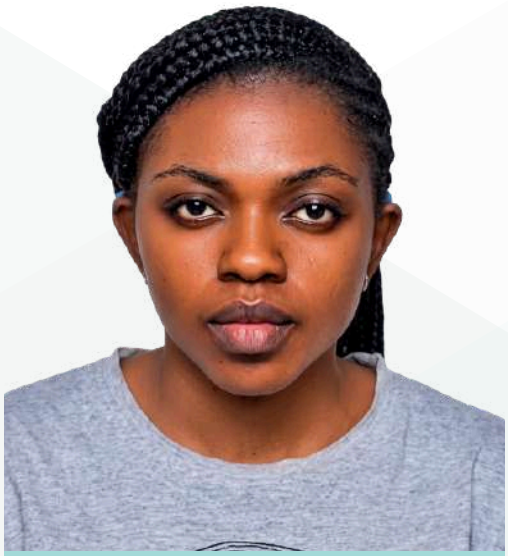
Key Achievements

- Successfully obtained approval of the DPhil research proposal, subject to non-substantive corrections
- Established industry partnerships and stakeholder access channels to support participant recruitment and data collection for the study.

Next Steps

The next phase of the fellowship will focus on obtaining ethical clearance, conducting quantitative surveys and qualitative interviews with female-led SMEs in Gauteng, analyzing evidence on algorithmic fairness and platform outcomes, and validating the proposed Rawlsian Ethical AI Framework through stakeholder and expert review. The findings will be used to generate practical recommendations for policymakers, platform operators, and development agencies to support gender-inclusive and responsible AI governance in South Africa's digital economy.

PhD Scholar 4



PhD Scholar
ORBAN, Iwuese Judith

Award Ref: ARISE2563173-PhD-04

Approved Research Title: Investigation of Gender Representation in Electronic Health Record Data and Its Impact on AI-Driven Clinical Predictions

Total Award Amount: $15,000

Host Institution / University: Joseph Sarwuan Tarka University, Makurdi, Nigeria

Area of Study: Artificial Intelligence/PhD in Computer Science/Department of Computer Science

Programme: PhD Scholarship

Thematic Area: Health, Digital Economy and ICT

Supervisor / Mentor: Prof. I. Agaji

Research Focus

This research investigates gender representation in Electronic Health Record (EHR) datasets and examines how gender imbalance influences the fairness and predictive performance of AI-driven clinical prediction models. By identifying sources of gender bias and evaluating fairness across machine learning models, the study seeks to contribute to the development of responsible, ethical, and gender-inclusive AI systems that promote equitable healthcare outcomes.

Goal

The goal of the study is to investigate gender representations in Electronic Health Record datasets and assess their impact on the accuracy and fairness of AI-driven clinical prediction models.

Objectives

- Examine the distribution of gender representation in Electronic Health Record datasets used for AI-based clinical prediction.
- Identify potential sources of gender bias within Electronic Health Record data and evaluate the performance and fairness of AI-driven clinical prediction models across gender groups.
- Develop strategies and recommendations for improving gender inclusivity, fairness, and responsible AI in healthcare systems.

Key Activities

- Conducted an extensive literature review on gender bias, Electronic Health Records, fairness in AI, and responsible AI in healthcare.
- ·Designed the research methodology, identified appropriate public EHR datasets (such as MIMIC-IV and eICU), and developed a machine learning evaluation framework for assessing gender fairness in AI models.

Key Achievements

- Successfully developed a comprehensive PhD research proposal addressing an important challenge in responsible and gender-inclusive AI for healthcare.
- Established a methodological framework for evaluating gender representation and fairness in AI-driven clinical prediction models using publicly available Electronic Health Record datasets.
- Successfully completed the First Semester of my First Year with two publications in line with this Study.

Next Steps

The next phase of the fellowship will involve obtaining access to selected Electronic Health Record datasets, preprocessing and analysing the data, developing and evaluating machine learning models, assessing fairness metrics across gender groups, disseminating findings through peer-reviewed publications and conference presentations, and completing the PhD thesis.

PhD Scholar 5



PhD Scholar
Carlin Foka Takamgno

Award Ref: ARISE2563173-PhD-05

Approved Research Title: Toward a Foundation Model for Disease-Based Ecological Niche Modelling

Total Award Amount: $7,500

Host Institution / University: CERI, Stellenbosch University, South Africa

Area of Study: Applied Mathematics

Programme: PhD Scholarship Fellowship

Thematic Area: Health

Supervisor / Mentor: Prof Houriiyah Tegally

Research Focus

This research investigates how deep learning can be used to model infectious disease dynamics across ecological and evolutionary scales, with a focus on arbovirus including dengue or zika. It combines joint pathogen-vector suitability modelling with simulations of spatial pathogen dispersal, while supporting responsible and gender-inclusive AI through bias mitigation, interpretability, uncertainty quantification, and compatibility with gender-disaggregated health data.

Goal

To develop an equitable and transparent AI framework for understanding where arboviruses can establish and how they disperse across geographic regions.

Objectives

- Conduct a literature review of how AI has been applied in the spatial epidemiology of infectious diseases.
- Develop joint pathogen-vector models of ecological suitability for arboviruses including dengue, Zika, and chikungunya
- Develop a temporal graph neural network that learns from historical phylogeographic reconstructions to simulate plausible arboviral dispersal trajectories.

Key Activities

- Literature review, data collection
- Manuscript preparation for the different objectives
- Training

Key Achievements

- Paper submitted and under review. Title: Deep learning with multiscale spatial context improves global dengue suitability mapping.

Next Steps

- Manuscript preparation and submission for objective
- Development of a temporal graph neural network that learns from historical phylogeographic reconstructions to simulate plausible arboviral dispersal trajectories

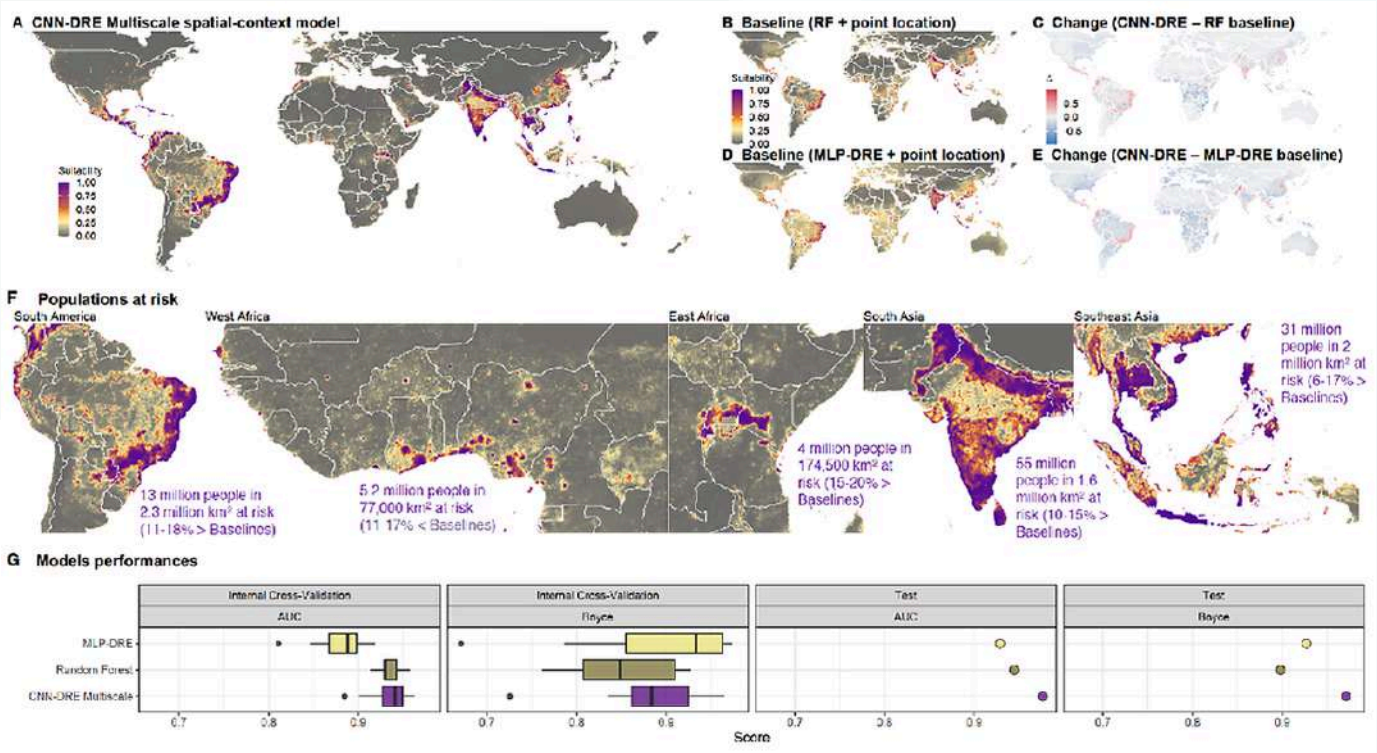


Figure 15. Multiscale spatial context increases predicted suitability and estimated populations at risk.

(A) Global suitability predicted by the multiscale CNN-DRE model. (B, D) Baseline suitability predictions from a Random Forest model and an MLP-DRE model using point-location information. (C, E) Difference maps showing the change in suitability between the multiscale CNN-DRE model and each baseline. Positive values indicate higher suitability under the multiscale CNN-DRE. (F) Regional zooms showing populations and land area classified as at risk in South America, West Africa, East Africa, South Asia, and Southeast Asia. The multiscale CNN-DRE identifies additional at-risk populations and areas relative to the baselines, with the largest exposed population in South Asia. (G) Internal cross-validation and held-out test.

PhD Scholar 6



PhD Scholar
Zziwa Simon

Award Ref: ARISE2563173-PhD-06

Approved Research Title: Predictive Breeding of Stable Resistance to Striga hermonthica in Maize through Explainable Machine Learning

Total Award Amount: $15,000

Host Institution / University: Mountains of the Moon University, Fort Portal City, Uganda

Area of Study: Doctor of Philosophy in Agro-ecological Sciences (Crop Improvement and Biotechnology), Faculty of Agriculture and Environmental Sciences

Programme: Agriculture, Food and Nutrition Security; Digital Economy and ICT

Thematic Area: Health

Supervisor / Mentor: Dr. Obala Jimmy (Mountains of the Moon University), Dr. Lwanga Charles (National Crop Resources Research Institute)

Research Focus

The research focuses on predicting host-parasite dynamics using artificial intelligence for durable resistance to Striga hermonthica in maize. The study integrates genomic, phenotypic, and environmental data to develop explainable machine learning models that can predict Striga virulence, identify durable maize resistance, and support equitable deployment of resistant varieties among smallholder farmers in Uganda.

Goal

To develop and apply machine learning models that integrate genomic, phenotypic, and environmental data to predict Striga hermonthica virulence and enable durable maize resistance deployment in Uganda.

Objectives

- To characterize the genetic diversity and population structure of Striga hermonthica across selected agro-ecological zones.
- To develop supervised machine learning models that predict phenotypic virulence of Striga hermonthica biotypes.
- To construct an integrated AI-based predictive framework that estimates the risk of maize resistance breakdown.
- To identify maize genotypes with stable resistance across multiple Striga hermonthica biotypes and environments.

Key Activities

- Completed an extensive literature review on resistance to Striga, plant genomics, and AI applications in crop improvement.
- Successfully completed all required PhD coursework units (25 credit units) under the joint Mountains of the Moon University–UGent university framework with 100% attendance and active participation.
- Developed and refined a doctoral research proposal currently estimated at approximately 57.4% completion.
- Conducted regular consultations with supervisors and mentors to strengthen the research design, conceptual framework, and methodological approach.
- Prepared for subsequent phases involving ethical clearance, development of research instruments, and field sampling of Striga populations.

Key Achievements

- Awarded the ATPS ARISE PhD Scholarship under the project "ARISE".
- Successfully completed five cross-cutting doctoral course units: (Epistemology, Research Methodology, Introduction to Institutional Pedagogy, Scholarly Writing and Publication Skills, and Computer Applications in Research).
- Maintained 100% attendance across online lectures, physical lectures, workshops, tutorials, and university library sessions.
- Developed a draft doctoral proposal titled "Predicting Host-Parasite Dynamics Using Artificial Intelligence for Durable Striga hermonthica Resistance in Maize.

Next Steps

- Complete the full doctoral proposal and submit it to the Department and Graduate School.
- Defend the proposal before the university panel.
- Apply for ethical and institutional research clearance.
- Develop and pre-test research instruments for field and greenhouse studies.
- Initiate geo-referenced sampling of Striga hermonthica populations across selected agro-ecological zones of Uganda.
- Begin molecular characterization and preparation of datasets for supervised machine learning model development.
- Participate in ATPS ARISE mentorship, AI training, and knowledge-sharing activities.

PhD Scholar 7



PhD Scholar
Mary Ofuru Kama

Award Ref: ARISE2563173-PhD-07

Approved Research Title: Development of a Predictive Computational Framework for Climate Variability on Sickle Cell Disease Crisis

Total Award Amount: $7,500

Host Institution / University: Ebonyi State University, Abakaliki, Nigeria

Area of Study: Data Science/ Ph.D/ Computer Science

Programme: PhD Scholarship Fellowship

Thematic Area: AI/ Health/ Environmental

Supervisor / Mentor: Prof. I. A. Ajah

Research Focus

The research investigates how climate variability and environmental stressors influence sickle cell anemia disease crisis outcomes by integrating heterogenous spatiotemporal climate data with SCA crisis records using responsible AI and machine learning. The work develops and evaluates robust predictive models to generate accurate, reliable, and equitable risk prediction across diverse climate conditions and demographic groups, supporting gender-inclusive and data-driven public health interventions for vulnerable populations in Africa.

Goal

This work aim to development of a Predictive Computational Framework for Sickle Cell Crisis Based on Climate Variability in Sub-Saharan Africa.

Objectives

- Design a multi-modal integration pipeline that fuses heterogenous spatiotemporal climate data (temperature, humidity, and air quality) from sources like African Data Hub with localized SCA mortality records from Institute for Health Metrics and Evaluation (IHME) to address challenges of data sparsity and label noise.
- Implement a robust predictive computational framework using ML architecture such as random forest, XGBoost, logic regression, Bayesian and decision tree, LSTM and GRU capable of modeling the non-linear and sequential relationships between climatic variabilities, environmental stressors and SCA crises outcome.
- Evaluate the framework's predictive accuracy and generalizability using rigorous computational metrics (MSE, RMSE, MAPE, and R^2) and validation techniques to ensure the model remains reliable across different climatic scenarios and demographic groups.

Key Activities

- Systematic literature review, Planning, and Literature Review
- Data and Stakeholder Mapping, Collection.
- Data Cleaning, EDA, and Feature Engineering
- Modeling and Deployment
- Testing and Documentation
- Project Close-Out and Dissemination of Findings.

Key Achievements

- Published a manuscript titled: "Machine learning-based prediction of climate-driven sickle cell anemia crises across Nigerian regions using synthetic multimodal data" in the Proceedings of the Nigerian Society of Physical Sciences (PNSPS).
- Systematic literature review, submitted to Journal of Biomedical Informatics and Decision Making (BMC). Title: "Systematic Review of Machine Learning Approaches for Predicting Sickle Cell Crisis and Mortality Risk at the Climate-Health Nexus"
- Currently, I am about to submit "A Machine Learning-Driven Analysis of Climate Impacts on Mortality in Sickle Cell Anemia Patients", for publication.
- Data collection from African Data Hub and Institute for Health Metrics and Evaluation (IHME)

Next Steps

- Engage into data collection that is gender based.
- Perform an exploratory.
- Model development and training: Select machine learning models and perform initial training.
- Development and testing: Carry out system integration and user interface development.
- Documentation and report writing: Compile and submit a comprehensive research report of results and findings.
- Provide ongoing support, share lessons learned, and finalise any gaps.



Figure 16. Images from several sickle cell disease advocacy programmes carried out as part of the research.

PhD Scholar 8



PhD Scholar
Noah Herbert Paul

Award Ref: ARISE2563173-PhD-08

Approved Research Title: Design and Development of a Digital Twin-Driven Automated Modular GMP Pilot Plant for Trivalent FMD Vaccine Manufacturing in Zimbabwe

Total Award Amount: $15,000

Host Institution / University: Chinhoyi University of Technology, Zimbabwe

Area of Study: Mechanical and Mechatronic Engineering – Digital Biomanufacturing, Artificial Intelligence and Vaccine Manufacturing

Programme: PhD Scholarship/Postdoctoral Fellowship

Thematic Area: Responsible Artificial Intelligence for Health Systems, Advanced Manufacturing and Sustainable Development

Supervisor / Mentor: Professor Tawanda Mushiri

Research Focus

This PhD develops a Digital Twin and AI-assisted GMP manufacturing model for automated upstream production of trivalent Foot-and-Mouth Disease vaccines. It integrates mechanistic modelling, AI, automation and techno-economic analysis to optimise manufacturing and strengthen Africa's vaccine preparedness through responsible, explainable AI.

Goal

To develop and validate a Digital Twin and AI-assisted GMP-compliant manufacturing model for automated upstream production of a trivalent Foot-and-Mouth Disease vaccine.

Objectives

- Develop a GMP transferability framework for veterinary FMD vaccine production.
- Design an AI-enabled Digital Twin for upstream process simulation and optimisation.
- Develop an AI-assisted techno-economic model for facility planning and investment decisions.

Key Activities

- Completed literature, patent and regulatory reviews and developed the conceptual Digital Twin framework.
- Prepared the PhD proposal, residency presentation and review manuscript; initiated computational model development.

Key Achievements

- Developed the proposal and presented to a postgraduate team and faculty at the Residency week at the Department, School of Mechanical and Mechatronic Engineering.
- Prepared a review manuscript on computational modelling for trivalent vaccine upstream production- ready for submission.

Next Steps

- Review the Manufacturing Landscape in Africa post Covid-19

PhD Scholar 9



PhD Scholar
Chisom Ezinne Ogbuanya

Award Ref: ARISE2563173-PhD-09

Approved Research Title: An AI-Enabled Multi-Objective Smart Home Optimization Framework for Sustainable Energy and Water Resource Management in the Era of Climate Change

Total Award Amount: $11,250

Host Institution / University: University of Nigeria, Nsukka, Nigeria

Area of Study: PhD in Control & Instrumentation Engineering/Africa Center for Excellence and Sustainable Energy and Power Development

Programme: PhD Scholarship

Thematic Area: Climate Change and Environment; Energy

Supervisor / Mentor: Dr. Joy Nnenna Eneh

Research Focus

My research centers on the design of AI enabled solutions for sustainable energy and water management in the residential domain via intelligent monitoring, prediction and decision support. It fosters equitable access to resource-efficient technologies and an understanding of the heterogeneity of household users' needs, and supports transparent, human-centred AI systems that contribute to sustainable development and quality of life, thus contributing to responsible and gender-inclusive AI.

Goal

The aim of this study is to design, develop, and validate an AI-enabled smart home optimization for sustainable energy and water resource management.

Objectives

The specific objectives associated with the above aim include but are not limited to:

- Build an AI-powered contextual smart home sensing framework and associated data acquisition system for Nigerian households that support real time monitoring of domestic energy and water use, subject to infrastructure limitations, affordability and ease of deployment.
- Train and validate AI algorithms/models for learning household behavioral patterns and predicting domestic energy and water use and uncover potential resource use efficiency.
- Create and assess an AI-powered control and optimization engine to enable intelligent decision-making for coordinated energy and water management across varying household operating conditions.
- Build, implement and validate (via simulation and experimental measurements) a prototype AI-powered smart home platform and outline design and policy considerations for promoting intelligence smart home technologies for efficient energy and water management in Nigeria.

Key Activities

- Proposal of project topic presented and accepted by key institutional professors
- Thorough systematic, comparative, narrative reviews carried out.

Key Achievements

- Systematic review published (doi: 10.3389/fcteg.2026.1793880)
- Conference paper (Comparative review) accepted for ICEPT 2026 (https://nieee.org.ng/Conference/)

Next Steps

- Present conference paper in October, 2026
- Implement the custom-5-in-one LoRaWAN kit
- Go to various selected residential homes and collect energy and water usage datasets
- Use LSTM to predict energy and water usage
- Use DRL for control policies
- Finish up thesis

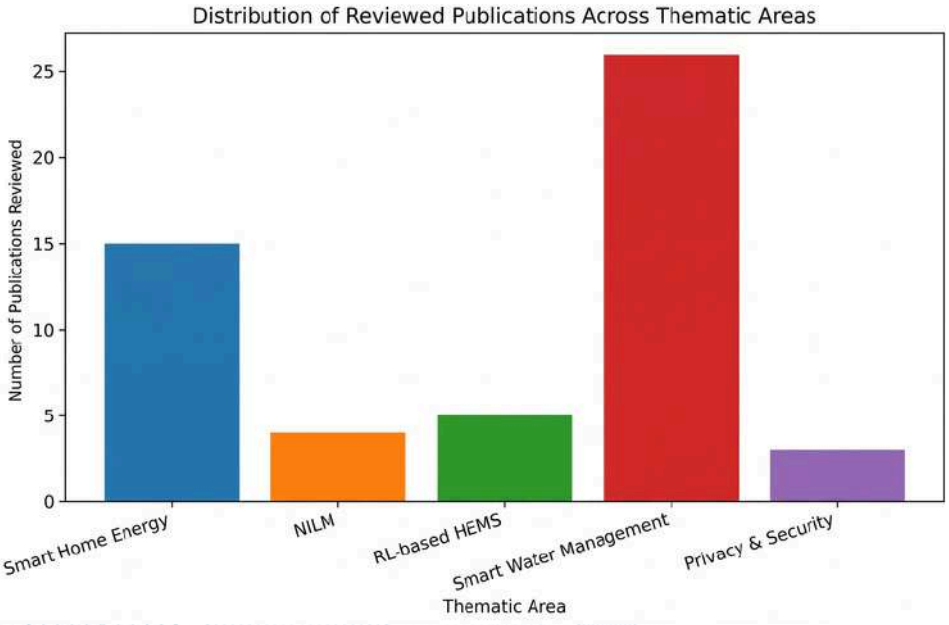


Figure 17. Distribution of reviewed publications across thematic areas.

PhD Scholar 10



PhD Scholar
Mugoya Shariff

Award Ref: ARISE2563173-PhD-10

Approved Research Title: An Interpretable Hybrid Deep Learning Cyberattack Detection Framework for Grid-Connected Solar Photovoltaic Systems: A Uganda Case Study

Total Award Amount: $7,500

Host Institution / University: Busitema University, Uganda

Area of Study: Doctor of Philosophy of Cyber Physical Systems Engineering / Department of Computer Engineering and Informatics, Faculty of Engineering and Technology

Programme: PhD Scholarship

Thematic Area: Energy; Education and Technology

Supervisor / Mentor: Dr. Irene Nandutu (PhD)

Research Focus

This study investigates how a mathematically grounded, interpretable, scalable, and edge-deployable DL framework can detect anomalies in Uganda's grid-connected solar PV Smart Grids. It will achieve this by combining mathematical modelling, hybrid DL, operator-friendly explainability, and edge deployment. The research will also build local AI capacity by prioritising mentorship of early-career women in energy cybersecurity, aligning with ATPS' ARISE objectives of responsible, gender-inclusive, and context-sensitive AI for Africa's development.

Goal

To develop and validate a mathematically grounded, interpretable, scalable and real-time deep learning cybersecurity framework for Photovoltaic power grids in Uganda.

Objectives

- To develop and validate a physics-based mathematical anomaly detection and correction model for Uganda PV power grids.
- To develop and validate an interpretable hybrid deep learning anomaly detection model for Uganda PV power grids.
- To deploy the developed integrated mathematical-Deep Learning anomaly detection framework into Uganda grid-connected PV power sites.

Key Activities

- Conducted a scoping literature review on Machine Learning for intrusion detection in Smart Grids in developing countries.
- Engaged solar PV engineers at Uganda Electricity Distribution Company Limited, Bufulubi solar plant, and Busitema solar plant to determine the feasibility of my study and as well collect requirements needed for PV power grid cybersecurity research.
- I have mentored 2 master's degree students in how to carry out sustainable research.
- Defended my proposal before the Busitema University Higher Degrees Committee.

Key Achievements

- A scoping literature review paper on Machine Learning for intrusion detection in Smart Grids in developing countries drafted, pending journal submission.
- I have mentored 2 master's degree students in how to carry out sustainable research.
- Defended my proposal before the Busitema University Higher Degrees Committee.

Next Steps

- Gain clearance from Busitema University Research Ethics Committee and Uganda National Council of Science and Technology to begin data collection.
- Develop and validate a mathematically grounded interpretable, scalable and real-time deep learning cybersecurity framework for Photovoltaic power grids in Uganda.
- Publish my pending research articles resulting from this PhD study as well as others to come from the in the future.
- Mentor engineers and early career researchers in energy cybersecurity using Machine Learning. Priority will be given to women and underrepresented communities.

POSTDOCTORAL FELLOWS

Postdoctoral Fellow 1



Postdoctoral Fellow
Dr. Veronica Waithira Kariuki

Award Ref: ARISE2563173-PD-05

Project Title: AI-Enabled Personalised Care Systems for Pregnant Students in African Universities: Implications for Health Outcomes and Academic Retention

Total Award Amount: $38,400

Home Institution: United States International University – Africa, Nairobi, Kenya

Host Institution / University: Jomo Kenyatta University of Agriculture and Technology, Kenya

Area of Study: Responsible Artificial Intelligence, Data Science and Analytics for Health and Higher Education

Programme: Postdoctoral Fellowship

Thematic Area: Health, Education and Technology

Supervisor / Mentor: Prof. Anthony Waititu

Research Focus

This research investigates how artificial intelligence can be used to deliver personalized, holistic support for pregnant students in African universities by integrating academic assistance, maternal health guidance, and psychosocial support within a single intelligent care system. The study aims to develop a responsible, gender-inclusive AI framework that improves student retention, maternal wellbeing, and equitable access to higher education while ensuring ethical, culturally appropriate, and privacy-preserving AI deployment.

Goal

The goal of this project is to design, implement, and evaluate AI-enabled personalized care systems that integrate academic, health, and psychosocial support for pregnant students in African universities.

Objectives

- To design an integrated care framework.
- To develop and pilot a machine learning–driven personalization system.
- To evaluate its effectiveness in improving retention, reducing stress, and enhancing maternal health outcomes.
- To assess cultural adaptability across diverse African contexts.
- To disseminate findings through publications, policy briefs, and workshops

Key Activities

- Developed a detailed research roadmap and work plan outlining the phases of the fellowship from evidence synthesis through framework development, AI system design, pilot implementation, and evaluation.
- Conducted a comprehensive scoping review planning process, including identification of search strategy, eligibility criteria, databases, and reporting approach.
- Identified and compiled an initial corpus of recent peer-reviewed literature on AI in higher education, maternal health, mental health support, learning analytics, and responsible AI to establish the project's evidence base.

Key Achievements

- Established a strong evidence foundation for the project through completion of the preparatory literature identification phase and development of the review protocol.
- Produced a comprehensive research implementation roadmap that clearly defines project milestones, expected outputs, and evaluation strategy.
- Positioned the project for the next phase of systematic evidence synthesis and framework development, reducing implementation risk and strengthening methodological rigor.

Next Steps

- Complete the scoping review following PRISMA-ScR guidelines and identify evidence gaps.
- Develop the AI-enabled holistic support framework informed by the review findings and stakeholder input.
- Engage universities, healthcare professionals, counsellors, and students to refine system requirements.
- Design and prototype the machine learning personalization engine.
- Prepare ethics applications and pilot study protocols.
- Begin pilot implementation, evaluation, and dissemination activities.

Postdoctoral Fellow 2



Postdoctoral Fellow
Ekle Francis Adoba

Award Ref: ARISE2563173-PD-01

Project Title: Explainable Machine Learning Model for Early Cardiovascular Disease Prediction in Nigeria with Culturally Adapted DASH Dietary Recommendations

Total Award Amount: $38,400

Home Institution: University of Nigeria, Nsukka Nigeria

Host Institution / University: Obafemi Awolowo University, Ile-Ife, Nigeria

Area of Study: Artificial Intelligence/ Postdoctoral Fellowship / Computing and Intelligent Systems Research Group (CISRG) Lab at the Faculty of Computing Science and Engineering

Programme: Postdoctoral Fellowship

Thematic Area: Health; Education and Technology; Digital Economy and ICT

Supervisor / Mentor: Prof. Abimbola R. Iyanda

Research Focus

The research investigates how machine learning can accurately predict cardiovascular disease among Nigerians, identify key risk factors across different demographic groups, determine the best-performing prediction model, and develop culturally adapted DASH dietary recommendations using indigenous Nigerian foods.

The study promotes responsible, gender-inclusive AI by incorporating demographic diversity (sex, age, education, and geopolitical zones), using explainable AI (SHAP and LIME) to enhance transparency, and reducing algorithmic bias to support fair, interpretable, and culturally appropriate healthcare decisions for all Nigerians.

Goal

The proposed research aims to develop and deploy an explainable machine learning-based clinical decision support system for the early prediction of cardiovascular disease among Nigerians, integrated with culturally adapted, personalized DASH dietary recommendations using indigenous Nigerian foods. The goal is to improve early detection, enhance clinical decision-making through transparent AI, and support effective CVD prevention and management in Nigeria.

Objectives

- To collect primary CVD datasets from teaching hospitals, federal medical centres or primary healthcare centres across the different geo-political zones in Nigeria to build an open-access Nigerian CVD data repository based on the findable, accessible, interoperable, and reproducible (FAIR) data principles.
- To develop traditional and ensemble ML models for CVD prediction using a Nigerian indigenous dataset.
- To carry out a comparative analysis of the developed ML models for CVD prediction.
- To implement and integrate XAI methods, such as SHAP and LIME, to interpret the models' predictions.
- To co-create a personalised culturally adapted DASH dietary recommendation framework with Nigerian nutritionists and community members, based on locally available and consumed foods.
- To develop a prototype clinical decision support tool that integrates the XAI model and the culturally adapted DASH framework, providing clinicians with an interpretable CVD status and printable, personalised daily dietary guidance.
- Deploy and test the developed tool and make it available to the research community on a cloud infrastructure.
- Compare the performance of the proposed system with the existing systems.

Key Activities

- Literature review

Key Achievements

- Creation and validation of data collection instrument (In-person questionnaire)

Next Steps

Two-Year Plan of Activities

Activity	Expected Output	Timeline
Project initiation, stakeholder engagement, recruitment of research assistants, ethics approval, and research protocol development	Approved protocol and ethical clearance	Months 1-2
Literature review, tool development (questionnaires, data collection forms), pilot testing	Validated research instruments	Months 2-3
Primary data collection from Teaching Hospitals, Federal Medical Centres or Primary Healthcare Centres across the six geopolitical zones	Indigenous CVD dataset	Months 3-8
Data cleaning, preprocessing, feature engineering, dataset integration, FAIR repository preparation	Cleaned and labelled dataset	Months 8-9
Development and training of traditional and ensemble ML models	Initial predictive models	Months 9-10
Hyperparameter optimisation, feature selection, SMOTE, cross-validation, and comparative model evaluation	Optimised best-performing ML model	Months 10-11
Integration of SHAP and LIME for explainability and interpretation	Explainable ML model	Months 11-12
Co-creation of culturally adapted DASH dietary framework with nutritionists and community stakeholders	Indigenous DASH recommendation framework	Months 12-13
Development of the integrated clinical decision support system (Django web application)	Prototype clinical decision support tool	Months 13-17
System deployment, usability testing, performance evaluation and refinement	Validated prototype	Months 17-18
Manuscript preparation, conference presentations, policy brief development and dissemination workshops	Journal articles, conference papers and policy briefs	Months 18-19
Final report writing, cloud deployment of datasets and software, project close-out	Final report and open-access	Months 19-24

Postdoctoral Fellow 3



Postdoctoral Fellow
Dr. Barimwotubiri Ruyobeza

Award Ref: ARISE2563173-PD-02

Project Title: Developing a Responsible and Gender-Inclusive Framework for the Collection of High-Quality, Representative and Labelled Health Datasets for AI in Sub-Saharan Africa

Total Award Amount: $38,400

Home Institution: Stellenbosch University, Stellenbosch, South Africa

Host Institution / University: University of Cape Town, South Africa

Area of Study: Biomedical Engineering/From Reactive to Proactive Primary Healthcare/Human Biology

Programme: Postdoctoral Fellowship

Thematic Area: Health; Digital Economy and ICT

Supervisor / Mentor: Professor Sudesh Sivarasu

Research Focus

This research investigates how high-quality, representative, and ethically governed healthcare datasets can be developed in sub-Saharan Africa to inherently foster responsible and gender-inclusive artificial intelligence. It directly addresses critical limitations in current health data, such as gender blindness and the systematic exclusion of vulnerable populations, which currently risk reinforcing health inequities through data and algorithmic bias. By proposing an evidence-based framework for inclusive data collection and governance, this project establishes a prerequisite for AI systems that are truly representative and ethically responsive to the region's diverse healthcare needs.

Goal

This project aims to design and validate an evidence-based framework for developing high-quality, representative, and gender-inclusive health datasets to enable responsible AI deployment across sub-Saharan Africa.

Objectives

- To systematically synthesise existing evidence on the main SSA community health settings and dataset limitations, biases, and governance challenges.
- To design the proposed data collection framework based on the best context-driven design principles, governance mechanisms, and operational practices for responsible and gender-inclusive dataset development.
- To empirically evaluate quality and relevance, as well as validate the feasibility and acceptability of the proposed data collection framework among diverse population groups and key stakeholders in SSA.

Key Activities

- Finalising a scoping review protocol to identify and set the research question, the processes for identifying relevant studies, the study selection mechanism (including inclusion and exclusion criteria), quality assessment, methods for data charting, and the approach for collating, summarising, and reporting the evidence. This includes the registration and potential publication of the protocol.
- Conducting the scoping review as per the protocol and submitting it for publication in a peer-reviewed journal.
- Initial conceptual design of the proposed framework and iterative reviews to verify its adequacy in overcoming identified barriers and meeting the framework's objectives. Implementing resultant, related incremental improvements.
- Demonstrating the framework through the validated Cancer Pre-Screening portal and,
- Validating the framework via a Delphi study with a multidisciplinary team of experts.

Key Achievements

- A general literature review which 1. established the need for Sub-Saharan Africa to focus on the development of high-quality, ethically collected, representative datasets and that 2. there currently exists no empirically validated, SSA context-appropriate framework that specifically supports the design and collection of high-quality, representative, ethically labelled, and potentially anonymised health datasets for AI/ML training in sub-Saharan Africa, with explicit consideration of vulnerable. populations and gender inclusivity.
- Advanced development of a protocol to conduct a scoping review to map the main diverse African community healthcare settings, and for each setting, identify the key technical, ethical, cultural, social, and institutional drivers of responsible and gender-inclusive health datasets.

- Developed an early prototype for the Cancer Screening portal to later demonstrate the framework for dataset collection and curation.

Next Steps

- Finalizing a scoping review protocol and submitting it for potential publication [November 2026].
- Identifying, contacting, and inviting collaborators/co-authors within the ARISE network to participate in this scoping review [October 2026].
- Improvements of the Cancer Screening portal prototype to include integration with selected Primary and Tertiary institutions in South Africa [February 2027].
- Implementation of the article search strategy to identify relevant articles for the scoping review [December 2026].
- Working with co-authors to implement the inclusion and exclusion criteria to select the relevant articles, extract the relevant data, and analyze it [April 2027].
- Writing the Scoping review manuscript and submitting it to a peer-reviewed journal for publication [June 2027].
- Designing and demonstrating the proposed framework through the cancer prescreening portal [December 2027].
- Evaluating and validating the developed framework [September 2028].

Postdoctoral Fellow 4



Postdoctoral Fellow
Anne Achieng Osio

Award Ref: ARISE2563173-PD-04

Project Title: Quantifying the Evolution of Waste Dumping Sites in Africa Using IoT, Artificial Intelligence and Time-Series Analysis

Total Award Amount: $38,400

Home Institution: Technical University of Kenya (TU-K), Nairobi, Kenya

Host Institution / University: University of Kwa Zulu Natal, South Africa

Area of Study: East Africa, South Africa, West Africa /Postdoctoral fellowship/School of Agricultural, Earth & Environmental Studies

Programme: Postdoctoral Fellowship

Thematic Area: Climate Change and Environment

Supervisor / Mentor: Prof. Michael Gabraslasie

Research Focus

Using Internet of Things (IoT) technologies, artificial intelligence (AI), and multi-temporal geospatial data, my research aims to quantify the spatial dynamics and evolution of waste in selected disposal locations in Africa. I intend to use time series analysis, remote sensing, and Earth observation to identify, track, and forecast shifts in solid waste disposal trends, offering evidence-based insights for public health and sustainable environmental management.

Goal

The main goal is to develop intelligent, data-driven monitoring systems that assist well-informed policy decisions, advance a circular economy, and improve environmental sustainability in Africa.

Objectives

- To develop and evaluate an Artificial Intelligence (AI)-driven framework integrated with Internet of Things (IoT) technologies for the automated detection, classification, and real-time monitoring of waste dumping sites, thereby improving the accuracy and efficiency of environmental surveillance
- To map and quantify the spatial and temporal evolution of waste dumping sites across selected regions in Africa using multi-temporal Earth Observation data and time series analysis to identify trends, hotspots, and patterns of expansion.
- To detect and classify different categories of waste from UAV and satellite imageries using AI-based computer vision models, by developing and training machine learning and deep learning algorithms for automated waste identification.
- To assess the environmental and socio-economic implications of waste dumping and develop a geospatial decision-support system that provides evidence-based recommendations for sustainable waste management, environmental policy formulation, and circular economy initiatives in Africa.

Key Activities

Key Activities	Action
Literature Review	**Identifying Research Gaps:** Analyzing existing publications to locate unresolved questions, unaddressed variables, or methodological limitations that justify the study. **Peer Reviewing:** Acting as an expert reviewer or co-reviewer for scientific journals to evaluate the validity of literature submitted by peers. **Supervising & Mentoring**: Guiding graduate or postgraduate students on how to synthesize, analyze, and cite relevant literature for their own theses.
Data collection	Data collectors will capture: Waste type (photographic evidence) Location coordinates Estimated volume Dumping frequency Activity patterns (burning, dismantling, transport) IoT-assisted measurements (temperature, particulate matter, and gas indicators) will provide continuous environmental context. Data will be collected monthly or quarterly to establish consistent temporal coverage.

Time-Series Analysis and Forecasting (Objective 1 & 2)	Collected observations will be aggregated into temporal datasets and decomposed into trend, seasonal, and residual components. Analytical steps: 1. Data cleaning and outlier detection using regression and statistical filtering 2. Temporal decomposition of dumping activity 3. Identification of cyclical dumping patterns 4. Forecast modelling using ARIMA and exponential smoothing methods Outputs will include projected growth rates and early warning indicators of site expansion
AI-Based UAV and Satellite Image Analysis (Objective 3)	Drone imagery will be processed through a computer vision workflow: 1. Image tiling and annotation 2. Dataset preparation (training, testing, validation sets) 3. Training object detection models (YOLO architecture) 4. Classification of waste categories (industrial, domestic, electrical, medical) 5. Estimation of object counts and density Model performance will be evaluated using precision, recall, F1 score, and confusion matrices.
Produce decision-support indicators with stakeholders (Objective 4)	Indicator Co-design & Definition Engaging stakeholders from the City Counties and environmental experts to formulate specific, measurable, and relevant (SMART) environmental, social, and economic indicators (e.g., carbon sequestration, urban heat island metrics, green space accessibility). Data Collection & Integration: Gathering localized datasets (e.g., local air pollution levels, population density, impervious surface ratios) using remote sensing (Earth Observation), field sensors, and geographic information systems (GIS) Modeling & Scenario Analysis: Utilizing spatial modeling and multi-criteria decision analysis (MCDA) to simulate how different urban planning decisions will impact the environment over time. Stakeholder Workshops & Validation: Hosting review sessions with planners and local environmental bodies to test, calibrate, and validate the indicators to ensure they are actually usable within operational, financial, and regulatory constraints.

Creation of an integrated AI framework	Ground observations, sensor data, and aerial classification outputs will be merged into a unified geospatial database. This database will support: • Dynamic mapping • Temporal dashboards • Predictive alerts The integration enables both near-real-time monitoring and long-term trend analysis.
Honours and MSc PhD Students Supervision	These include but not limited to the following; Day-to-Day Research Mentorship: -Technical training, Experimental design & Data analytics. Progress & Project Management: -Routine-check-ins, Task delegation & Timeline tracking. Academic writing and Publishing: -Manuscript draft Review, co-authoring &Presentation skills. Teaching Assistance
Conducting workshops	Conceptualization & Curation Drafting Concept Notes: Fellows define the theme, scope, and objectives of the workshop, often writing proposals to justify the event's relevance to the research community. Selecting Speakers & Topics**:** Identifying and inviting keynote speakers, panelists, and leading experts in the specialized field Planning & Logistics Budgeting & Funding**:** Assisting in drafting budgets, identifying funding bodies, and writing grant applications to support the workshop. Marketing & Registration**:** Creating flyers, and managing participant invitations and abstract submissions. Venue & Platform Management: Booking seminar rooms or configuring virtual meeting platforms, and organizing catering or technical support Facilitation & Execution **Moderating Sessions:** Chair sessions to guide discussions, manage Q&As, and keep the event on schedule. Leading Breakouts**:** Facilitating hands-on exercises, methodology discussions, or early-career development sessions Post-Workshop Activities Evaluating Feedback: Creating post-event surveys to assess the workshop's impact and gather data for future events. Publishing Proceedings: Summarizing discussions, editing working papers, or compiling research proceedings to be shared with stakeholders.

Establishing AI-Based STEM Groups for Female Students	Establish AI Based STEM Groups Identify participating departments and recruit female students interested in AI, STEM, and innovation. Form AI clubs and elect student leaders. Build AI and Digital Skills Organize introductory workshops on Artificial Intelligence, Python programming, Machine Learning, Data Science, GIS, and Earth Observation. Invite experts from academia and industry. Develop AI innovation projects Support students in identifying community challenges and developing AI-based solutions through team projects and hackathons. Promote Research & Innovation Encourage students to conduct research, publish findings, present at conferences, and participate in innovation competitions. Community Outreach Organize AI awareness programs for secondary schools to inspire girls to pursue STEM careers. Conduct coding camps and AI demonstrations. Monitor, Evaluate & Sustain the initiative Regularly evaluate progress, collect feedback, document success stories, and develop sustainability plans, including fundraising and institutional integration.
Journal writing, Publication and AI workshop attendance	Conduct workshops on scientific and academic writing. Train students on manuscript preparation, journal selection, and the peer-review and publication process. Establish peer-review and writing groups to support collaborative learning and manuscript development. Submission of manuscripts to peer-reviewed journals, with subsequent and presentations of research output scientific conferences.

Postdoctoral Fellow 5



Postdoctoral Fellow
Ugwu Celestine Ikechukwu

Award Ref: ARISE2563173-PD-03

Project Title: Development of a Smart Technology-Aided Crop Rotation System Using IoT and Machine Learning in Nigeria

Total Award Amount: $38,400

Home Institution: University of Nigeria, Nsukka Nigeria

Host Institution / University: Kwame Nkruma State University of Technology Kumasi, Ghana

Area of Study: IOT and Machine Learning/Computer Science

Programme: Postdoctoral Fellowship

Thematic Area: Agriculture, Food and Nutrition Security; Climate Change and Environment; Digital Economy and ICT

Supervisor / Mentor: Prof. Eric Tutu Tchao

Research Focus

The research aims to determine whether the Internet of Things improves crop rotation efficiency and yield, which machine learning algorithm is most appropriate for crop rotation, and whether the new system performs better than the current approach. The project is a localised, inclusive innovation for rural farmers (male and female) and supports early-career African researchers in the Internet of Things and Artificial Intelligence through policy analytics.

Goal

To develop a smart technology aided crop selection technique for agricultural crop rotation based on the degree of available macro nutrients and relevant environmental factors.

Objectives

- Design and implementation of soil monitoring system that steadily monitors the soil status using appropriate sensors.
- Integration of device that transfers the gathered soil status information to the Google Drive for cloud storage
- Build predictive models for soil status, based on historical and real-time data.

Key Activities

- Literature review, though not sufficient
- System Architectural Design

Key Achievements

- **Research Gap:** A literature review of related work found that, despite growing research in smart farming, highly systematic, real-time crop rotation optimisation using the Internet of Things and Machine learning remains underexplored in sub-Saharan African countries. Our research seeks to bridge this gap by digitally transforming African Agriculture using a context-aware, low-cost IoT and machine learning approach. Second, an intelligent crop rotation framework that integrates real-time data will address the limited availability of African crop-rotation and sustainable-agriculture datasets. This issue of the lack of locally generated datasets was not adequately addressed in the reviewed works. In addition, the research will provide a web or mobile application or dashboard for farmers' interaction as an added feature.
- Design of the architecture of the proposed system: To monitor soil conditions within the experimental plot, a range of sensors, as shown in Figure 18 below, were installed to measure soil temperature, moisture, pH, and NPK levels. These sensors, embedded at various depths, provided valuable data on current soil conditions and enabled targeted management strategies for optimal crop yield.

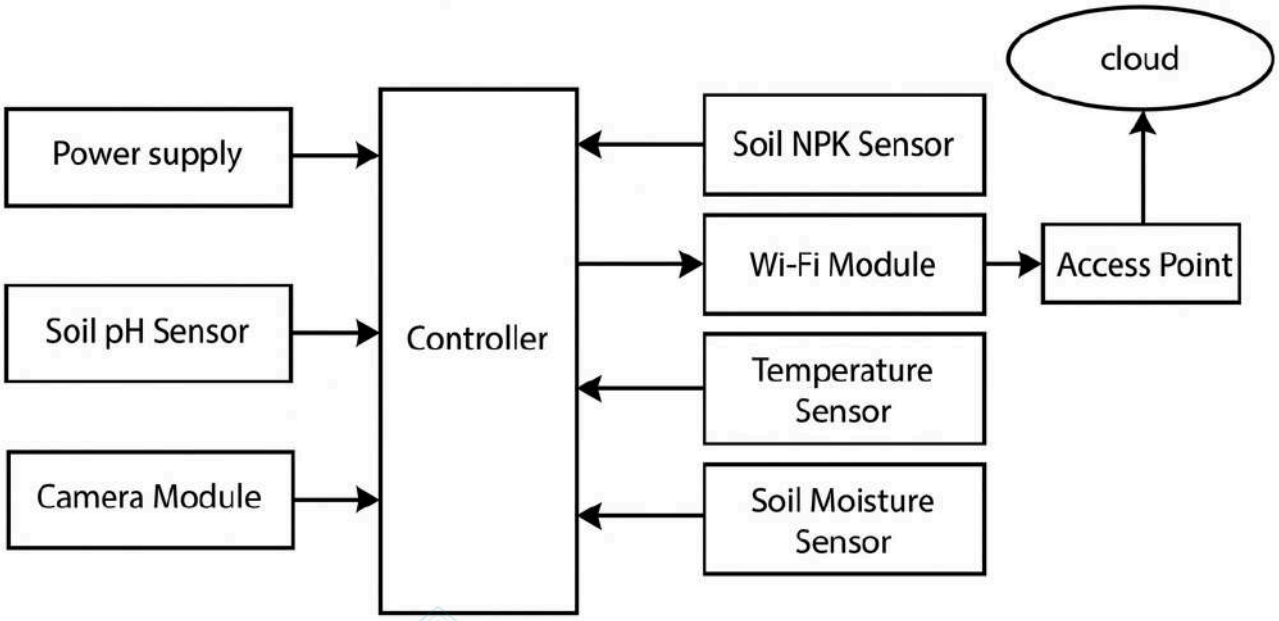


Figure 18. Distribution of reviewed publications across thematic areas.

Next Steps

- Additional Review of Literature
- Historical data collection
- IoT Implementation
- Deployment and Data Collection
- Data Processing and Feature Engineering
- System Integration
- Testing & Validation
- System Evaluation
- Documentation
- Report Writing

Postdoctoral Fellow 6



ARISE Project Coordinator

Azubuike Aniedu

Award Ref: ARISE2563173-PD-06

Project Title: Advancing Responsible and Gender Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem

Total Award Amount: $59,400

Home Institution: Nnamdi Azikiwe University Awka, Nigeria

Host Institution / University: African Technology Policy Studies Network (ATPS), Nairobi, Kenya

Area of Study: Postdoctoral Fellowship – ARISE Project Management and Programme Coordination

Programme: Postdoctoral Fellowship – ARISE Project Management and Programme Coordination

Thematic Area: Responsible and Gender-Inclusive Artificial Intelligence; AI Capacity Building in African Higher Education

Supervisor / Mentor: Prof. Nicholas Ozor

Research Focus

The postdoctoral fellowship focuses on strengthening responsible and gender-inclusive AI capacity within Africa's higher education ecosystem through institutional mapping, evidence-based capacity assessment, curriculum development, and coordinated support for AI research and training. The work contributes to identifying institutional strengths and gaps while developing practical frameworks to strengthen AI education, research, and innovation across African higher education institutions.

Goal

To contribute to the effective implementation of the ARISE Project by strengthening the capacity of African higher education institutions to develop and support responsible, ethical, and gender-inclusive AI education, research, and innovation.

Objectives

- To map AI institutions, programmes, resources, expertise, infrastructure, and capacity needs across Africa's higher education ecosystem.
- To develop evidence-based instruments and frameworks for assessing AI capacity and identifying institutional strengths, gaps, and priority areas for support.
- To support the development and strengthening of AI curricula, particularly at the Master's and PhD levels, in participating African higher education institutions.
- To support the development and influence of AI policies and strategies at the national and regional level in Africa

Key Activities

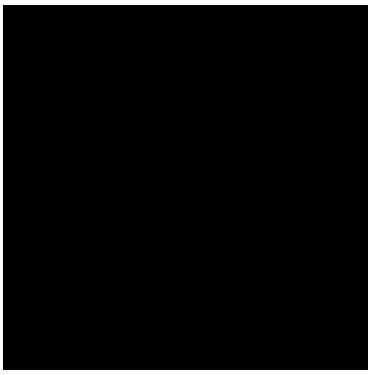
- Supported the coordination of the competitive, merit-based selection of the inaugural cohort of 15 ARISE grantees, ten PhD scholars and five postdoctoral fellows, from the call for applications through screening, external review and final selection.
- Planned and coordinated the ARISE Grantees Onboarding Webinar (26 August 2026), including the onboarding framework and orientation materials, and prepared its event report.
- Developed the AI Capacity Assessment questionnaire and consolidated the desk review and survey evidence into the Comprehensive Report of AI Resources and Institutions in Africa's Higher Education Ecosystem.
- Developed draft standardised Master's and PhD AI curriculum templates, drawing on the desk review and on international reference frameworks, as the first output of Activity 4.
- Developed the seven-module responsible AI training manual for ARISE workshops, including a dedicated module on gender-inclusive AI.
- Organised and moderated Webinar 3, "Responsible AI by Design" (23 September 2026), and the first fellows' workshop, the ARISE Fellows' Research Progress and Mentorship Workshop (21–22 October 2026), and prepared the event reports.
- Issued reporting templates and monitored fellows' progress.

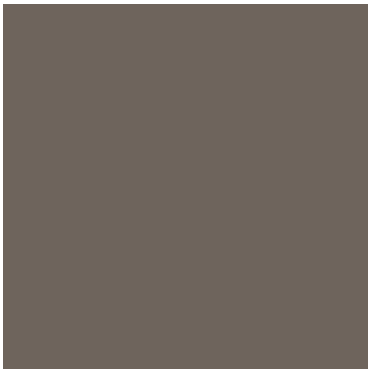
Key Achievements

- Contributed to delivering the fellowship programme in full: all 16 awards were made and the cohort, six of them women, was onboarded on 26 August 2026.
- Contributed to producing the evidence base for ARISE. The Comprehensive Report (Version 1.0, October 2026) combines a desk review of 407 AI-related programmes in 32 African countries, including a register of 54 dedicated AI degrees, with 242 valid survey responses from 73 institutions in 13 sub-Saharan countries and six documented university-origin success stories.
- Surfaced findings that now guide the project. 63.5% of respondents rate AI research opportunities and funding as poor or fair, and only 21.4% report AI scholarships for women. These findings underpin the report's five strategic recommendations on fellowships, training, curriculum, policy and continued mapping.
- Completed draft Master's and PhD AI curriculum templates that give partner institutions a common reference for core competencies, responsible AI and gender-inclusive pedagogy.
- Brought the responsible AI training manual to the final draft stage, ready for use in the ARISE workshops.
- Supported delivery of three webinars and the first fellows' workshop. Webinar 3 was rated 4.6 out of 5 by participants who completed the feedback form. Workshop 1 drew 35 participants on Day 1 and 26 on Day 2 and averaged 4.4 to 4.6 out of 5 for quality, relevance and content.
- Established performance-linked reporting for fellows and assisted in the submission of ARISE's first annual technical progress report, covering progress against all five project activities.

Next Steps

In Year Two, the focus will shift from evidence gathering to application. The standalone AI doctorates will be verified, and the institutional register will be published on the ATPS Interactive Collaborative Environment (ICE). Where possible, field learning visits to selected African AI use cases will be undertaken. The draft Master's and PhD curriculum will be validated with partner institutions as the first step towards supporting at least ten higher education institutions. Further activities will include Workshop 2, the next webinars (including the public "AI for Africa's Grand Challenges" series), support for fellows' conference participation, and the first policy dialogue and policy brief.













CONTACT INFORMATION

Prof. Nicholas Ozor:

Executive Director, African Technology Policy Studies Network (ATPS) | Principal Investigator, ARISE

WEBSITE
https://atpsnet.org/

EMAIL
executivedirector@atpsnet.org
info@atpsnet.org

CONTACT
+254 (020) 2714092

LOCATION
P.O. Box 10081-00100, Nairobi, Kenya
8th Floor, The Chancery, Valley Road

GET IN TOUCH

Proudly an ATPS-led Initiative, Funded by the **Andrew Carnegie Foundation**

ISBN 978-9966-124-01-2