

# SSARMO, represented by SGCI & IIASA

## Facilitating research collaborations with Sub-Saharan Africa

**The Sub-Saharan Africa Regional Member Organization (SSARMO) can access IIASA’s extensive expertise, models, and analytical tools to address global risks such as climate change and biodiversity loss. Recognizing that Sub-Saharan Africa is both highly impacted and rich in innovative perspectives, there is great potential in combining IIASA resources with local insights to co-create transformative solutions and drive meaningful, inclusive impact.**

The Science Granting Council Initiative (SGCI) in Sub-Saharan Africa participating councils became members of the International Institute for Applied Systems Analysis (IIASA) regional network in 2022, marking the first-ever regional membership of this kind. This partnership provides SGCI participating countries with direct access to IIASA’s advanced analytical tools, systems modeling expertise, and global networks, offering a valuable science-driven approach to address complex challenges in Sub-Saharan Africa (SSA).

Sub-Saharan countries demonstrate a collective focus on advancing agriculture, health, ICT, and environmental sustainability through science, technology, and innovation (STI). Countries in the region emphasize enhancing food security, expanding renewable energy, and promoting water and resource management. Many also prioritize digital and infrastructure improvements, support for local innovations, and climate-resilient technologies. Capacity strengthening, inclusive governance, and partnerships—both within Africa and beyond—are essential across the region to drive these STI objectives, fostering economic resilience and sustainable growth.

This document aims to guide our upcoming conversations by introducing areas where IIASA’s research strengths may align with the priorities of SGCI participants. It builds on an internal IIASA workshop in which IIASA researchers shared current projects and ideas for future collaborations with Sub-Saharan Africa. These activities revealed common themes and highlighted expertise areas where IIASA has experience in the region (see below ‘Joint areas of research interest’). This document aims to foster constructive dialogue, inviting direction and insights from stakeholders and collaborators in sub-Saharan Africa to shape future projects that are both relevant and aligned with the region’s evolving priorities. Together, we aspire to co-develop and co-produce research, training, and policy initiatives that meet the needs and goals of the region (see below ‘Knowledge sharing and impact’).

IIASA brings unique strengths to this partnership. Supported by 20-member organizations globally and 300 researchers working at the institute, IIASA offers an independent, international platform that leverages a wide portfolio of models, datasets, and analytical tools. By adapting our tools and methodologies to the context of Sub-Saharan Africa, we aim to support a systems approach to address the challenges in the region. Through this collaborative approach, we seek to co-create impactful research that not only aligns with SSA’s priorities but also advances global understanding and solutions for the challenges we face together.

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### Joint Areas of Research Interest

To align IIASA’s expertise with the priorities of SGCI participating countries, we examined each country’s key STI goals. We also consulted IIASA researchers, gathering their input on ongoing projects and potential collaborations with the SSA region. This process led to a set of joint themes of research interest that reflect both the region’s priorities and IIASA’s expertise:

**Agriculture and Food Systems Sustainability:** Current IIASA projects focused on enhancing agricultural productivity, food security, sustainable land use, and the resilience of food systems in response to climate and socio-economic challenges. For example, IIASA researchers together with partners such as the Central African Forest Commission and the International Food Policy Research Institute (IFPRI) conducted regional analyses through the Global Biosphere Management Model (GLOBIOM) focusing on food system transformation in Ethiopia and Uganda, as well as the effects of trade, urbanization, and sustainability on these systems.

**Climate Change Adaptation and Resilience, Water Security:** This encompasses IIASA research on climate adaptation, climate impacts, water security, and strategies to enhance resilience against environmental risks like droughts, flooding, and extreme weather events in vulnerable regions. For example, projects like ScaleWAYS in the Lake Victoria Basin focus on scaling sustainable practices in agriculture, while partnerships, such as with Uganda’s Ministry of Water and Environment, enhance national water quality management.

**Health, Social Inequality, and Wellbeing:** This covers health-related research at IIASA that connects social inequalities, climate vulnerability, and economic impacts, focusing on improving standards of living, access to resources, and overall wellbeing in African communities. For example, IIASA colleagues are working on building resilience to floods and heat in the maternal and child health system in Brazil and Zambia in the REACH project with the regional partners: the Ifakara Health Institute in Tanzania, the University of Zambia, and Chancellor College, University of Malawi.

**Renewable Energy and Sustainable Development:** IIASA research focuses on the transition to renewable energy sources, integrating sustainable practices in agriculture and urban settings, and the intersection of energy needs with socio-economic development. For example, together with collaborators from the Universities of Rwanda, Zambia and Cape Town, and IIASA researchers, the RE4AFAGRI project supports African smallholder farmers by promoting sustainable agriculture through integrated water, energy, food, and economic planning.

**Ecosystem Services, Nature Based Solutions, and Waste Management:** This includes research focusing on ecological networks, ecosystem services, and nature-based solutions, examining how environmental factors and road infrastructure impact natural habitats, resource sustainability, and community well-being across African regions. For example, IIASA, Stellenbosch University, and the African Centre for Clean Air are collaborating with Uganda’s National Environment Management Authority and Ministry of Water and Environment to develop a national organic waste management strategy (2024–2026) that aligns with national policies and NDC goals, enhances institutional capacity, and promotes waste separation, landfill diversion, and value extraction from organic waste.

Between 2019 and 2023, IIASA researchers published 64 scientific articles focused on the SSA region and 102 articles together with SSA researchers. IIASA researchers are eager to collaborate further within the region. The attached document entitled *Strengthening Collaborative Research with Sub-Saharan Africa and IIASA*, brings together these inputs, introduces current projects and ideas for future collaborations in four potential areas for collaboration.



IIASA is also in the process of publishing a Special issue in the Environmental Development Journal on IIASA and Systems Analysis in Africa showcasing the latest advancements in systems analysis and its application to environmental and societal challenges in the continent. This included submissions from the region as well as IIASA researchers.

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## Knowledge Sharing and Impact

When SSARMO was established in 2022, members led by South Africa’s NRF aimed to strengthen systems analysis capacity across Sub-Saharan Africa. Building on initiatives in the region, IIASA remains committed to continue supporting these efforts through mentorship, expertise, and training opportunities. Previous initiatives include:

**South African Young Scientists Summer Program (SA-YSSP, 2012-2015):** Jointly organized by the University of the Free State, the NRF South Africa, and the South African Department of Science and Technology, this three-month capacity-building program in South Africa benefited 83 doctoral students from 30 countries. Modeled after IIASA’s YSSP, the program paired students with both IIASA and South African mentors, creating a unique mentorship experience. This innovative initiative enhanced systems analysis capacity in the continent, where young scholars and mentors adapted their research to African contexts and priorities.

**South African Systems Analysis Center (SASAC, from 2015):** A joint initiative with four South African universities, SASAC aimed to strengthen systems analysis capacity in Africa, having offered training to over 100 doctoral and 100 master's South African and African students, supervisors, early career academics and postdoctoral fellows. IIASA supported this effort by hosting all program participants for an institutional visit.



The work from these programs was published in 2018 in a book: *Systems Analysis for Complex Global Challenges*, which summarizes systems analysis research and its policy implications for issues in South Africa.

**Joint Mentorship of PhD Students (2024):** The NRF-SASAC Call for Doctoral Students targets applicants from 18 SGCI affiliated countries. The NRF South Africa and the British Council will be supporting 20 students through this call. Students are required to have a South African supervisor specializing in systems analysis and a co-supervisor or mentor from the UK, IIASA, or IIASA alumni.

Capacity development focuses on training the next generation of systems thinkers, expanding the SSA research network, and building a strong community of practice. Addressing logistical challenges, such as visa restrictions, delivering capacity-development activities locally is crucial for enhancing participation. This approach also enables alumni from these programs to co-lead training, providing locally relevant insights necessary for adapting IIASA models and methodologies to African contexts.

IIASA is actively engaged in research projects across Sub-Saharan Africa and is mapping its regional network to enhance policy impact. By collaborating with SGCI participating councils and regional partners, we aim to broaden this network and strengthen policy influence through joint stakeholder mapping and workshops, focusing on effective strategies to engage diverse stakeholders in impactful, policy-driven research.

By fostering collaboration and sharing knowledge, IIASA aims to enhance the region's capacity to tackle complex challenges through systems analysis. This commitment includes organizing workshops, developing training programs, and facilitating networking opportunities that empower emerging researchers and practitioners. Through these initiatives, IIASA and SSARMO will cultivate a robust community of experts equipped to drive sustainable development and address pressing issues in Sub-Saharan Africa. Together, they will ensure that local perspectives and innovative solutions are integral to the region's future research and policy frameworks.



IIASA Deputy Director  
**Karen Lips**  
[krlips@iiasa.ac.at](mailto:krlips@iiasa.ac.at)



IIASA Head of Communications  
and External Relations  
**Barbara Kreissler**  
[kreissler@iiasa.ac.at](mailto:kreissler@iiasa.ac.at)