



The Africa Centre of Excellence for Sustainable Cooling and Cold-Chain



Why sustainable cold-chains matter



Ensure Safe and Nutritious Food for All



Shift to Sustainable Consumption Patterns



Boost Natural Positive Production



Advance Equitable Livelihoods



Build Resilience to Vulnerabilities, Shocks and Stresses

Background

Food availability must increase 70% by 2050 to feed the rapidly growing global population. Up to 40% of food is lost between farm and market in sub-Saharan Africa, two thirds in the first mile. 80% of African farms are smaller than two hectares.

ACES was established in 2020 by the Governments of Rwanda and the United Kingdom (UK), the United Nations Environment Programme's United for Efficiency (U4E) initiative, the Centre for Sustainable Cooling, and the University of Rwanda (UR). With a growing array of regional and international partners, ACES will advance sustainable development through unprecedented Pan-African collaboration on cooling and the cold-chain. It aligns with many Governments' commitments on climate change, the Kigali Amendment to the Montreal Protocol, and sustainable development priorities.

Enhancing agricultural exports is a priority for many African governments. For example, Rwanda's National Agricultural Export Development Board has a five-year strategy to double agri-exports by 2024-2025. It targets a nine-fold increase in high-value horticulture exports. While a new wholesale market in the capital affords access to cold storage, the cold chain is limited from farms to the points of aggregation and export, resulting in a loss of produce and quality. Such cold chain shortcomings are common in a variety of markets, and ACES will focus on scalable solutions to help governments reach their ambitious export targets and to enable farmers and local businesses to thrive.

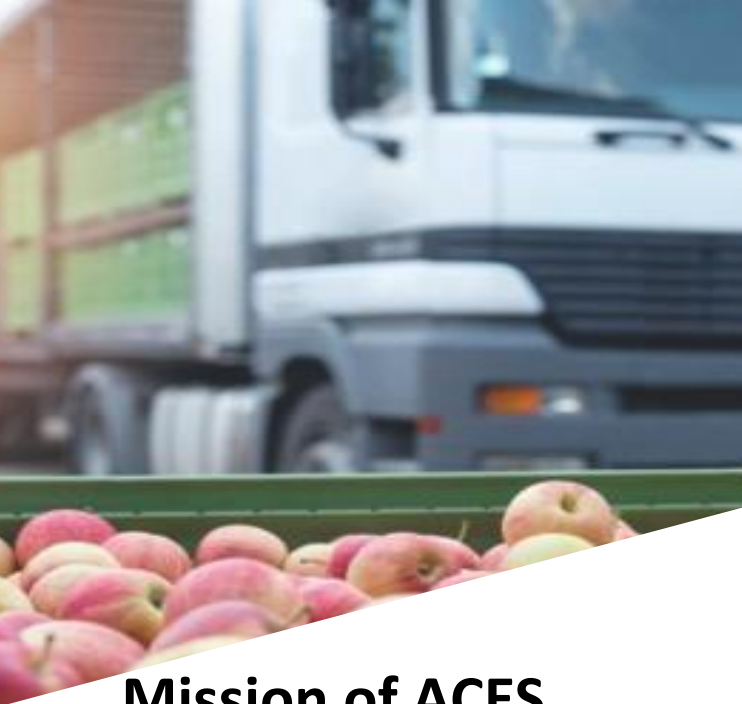
Supporting Agri-economy opportunities



“Rwanda is proud to host ACES that aims to economically empower farmers, increase export revenues, and enhance job creation in high value-added fields, while mitigating adverse climate and environment impacts.”

Dr Jeanne d' Arc Mujawamariya
Minister of Environment,
Government of Rwanda





Mission of ACES

The Centre has been established to develop and accelerate uptake of sustainable cold chain solutions in the agriculture and health sectors throughout Africa. In doing so, ACES will economically empower farmers, increase export revenues, enhance job creation in rural areas, mitigate climate and environment impacts, and foster low-carbon development.

ACES will connect local and international experts, investors, private companies, farmers' organisations, and energy and logistics providers. Living Laboratories will be deployed in strategic locations in pan-Africa markets to provide technical assistance, demonstrations and knowledge transfer to rural communities. The first Living Laboratory is in development for Kenya in 2021, with others to follow.

Key focus



Developing integrated **post-harvest biology and technology** within the system, with training in management to minimize losses and ensure food security.



Improving access to **sustainable cooling**.



Enhancing **flexibility for local cooling needs**, including domestic services where applicable, and unlocking secondary agriculture as well as new crop choices.



Integrating **energy vectors**, such as solar energy, waste heat and bioenergy directly converted into cooling, together with integrated thermal energy storage.



Providing **other vital services**, such as storage of medicine and vaccines and providing a safe shelter for people during extreme heat waves, can be integrated into the systems and buildings.

Impact



Economic Benefits

- Market connectivity
- Energy savings
- Greater disposable income
- Productivity
- Job and investment opportunities



Societal Impacts

- Decreased poverty
- Reduced food loss
- Increased access to vaccines and medicines
- Energy resilience
- Community resilience and inclusivity



Environmental Benefits

- Lower greenhouse gas emissions
- Less waste and resource consumption
- Food loss reduction
- Less pollutants

ACES will test, adapt, demonstrate and transfer the different technologies and strategies to the real-world scenario, from farm to fork.



Approach

ACES will provide the applied research and dissemination, learning and teaching, and industrial collaboration to advance the widespread adoption of energy-efficient and climate-friendly cold-chain solutions in agriculture and health sectors.

Solutions will be deployed via Living Laboratories throughout Africa

From the ACES Headquarters and Living Labs to Market



Holistic and Integrated Solutions

- Post-harvest handling, storage, processing and packing zone
- Distribution, cold-chain and logistics zone
- Energy and energy storage center
- Data and digital transformation
- Business start-ups and incubation suite
- Quality control and certifications



Cold storage, alone, is not cold-chain

ACES Living Lab



ACES Living Lab



ACES Living Lab



ACES Headquarters



ACES Living Lab



Key Interventions



Demonstrate best available technologies

Technologies proven at ACES will be adapted to local needs and demonstrated at Living Labs



Increase market connectivity and investment

- Sustainable business models to attract uptake and investment
- Add value for farmers by turning food loss into sales, and new product opportunities
- Utilize standards and certifications



Comprehensive food and vaccine cold-chain design

- Research future-proof, localised solutions for food loss reduction & supply chain resilience
- Sustainable low-carbon, pack-house and logistics design and best practices
- Generate design data and design of retail, professional and domestic refrigeration
- Integrate renewable energy, e-logistics and other advanced solutions
- Data acquisition and use



Enhance capacity and raise awareness of rural communities

- Capacity building in the field
- Skills development and innovation support
- Chilling/freezing advice

Phases

ACES is executed in four Initial phases:

- **Phase I (Q3 2020 – Q2 2021, completed)** Cooling Needs Assessment conducted (and other studies reviewed) to underpin the concept of the Centre. Establish governance structure and formalize agreements across core partners.
- **Phase II (2021/2)** - HQ campus design, technology definition, staffing definition, hire initial staff. Build and commission facilities, procure and install equipment, expand staffing. Initiate RDD&D, academic research and learning programmes, etc.
- **Phase III (2022)** Living Lab (Kenya) design, technology definition, staffing definition, hire staff. Build and commission facilities, buy and install equipment, train local technicians, raise awareness of farmers and agribusinesses, initiate operations.
- **Phase IV (2023 onwards)** Scale-up to include pan-African Living Labs. Disseminate ACES solutions more broadly in communities beyond Living Labs. Exchange lessons learned across Living Labs and externally via HQ.

Supporting the Africa Union's Agenda 2063 aspiration of, "a prosperous Africa based on inclusive growth and sustainable development"

Progress

ACES has reached major milestones since its launch in November 2020, including:

- Completion of a comprehensive cooling needs assessment report
- Drafting of an initial headquarters master plan, comprehensive assessment of Rubirizi campus with refurbished buildings, installation of signage
- Establishment of the governance structure (Steering Committee, National Technical Advisory Committee, Academic Research and Learning Committee)
- Hiring of first key staff at the Centre
- Partnerships with industry, local, regional and international organisations and governments (Memoranda of Understanding, Heads of Terms)
- High-profile outreach via major events, webinars, workshops, social media, website, etc.
- Multiple rounds of successful fundraising from multiple donors yielding significant investment toward capacity, equipment and facilities

Goal



Ensure Safe and Nutritious Food for All

- Help preserve food and its safety
- Maintain food's nutritional value
- Reduce food loss and waste



Shift to Sustainable Consumption Patterns

- Efficient use of farming inputs
- Reduce energy consumption
- Reduce waste of food and vaccines in distribution
- Promote low carbon agriculture value chains and vaccine distributions



Boost Natural Positive Production

- Additional income fosters more sustainable practices
- Supports local circular economy efforts



Advance Equitable Livelihoods

- Increase farmers' incomes
- Enhance opportunities for entrepreneurs from all backgrounds
- Reduce food access and income inequality



Build Resilience to Vulnerabilities, Shocks and Stresses

- Stabilise food supply
- Increase supply chain resilience
- Stabilise food prices



Become a Partner

ACES offers a platform for food system stakeholders to steer the future to sustainable cold-chains and support development of cutting edge financial and business structure and capacity building for entering new markets and expanding current markets. Engaging with ACES will specifically provide the opportunity to find market opportunity, demonstrate and prove technology in-market, build after-sales capability, engage with the financing mechanisms and shape policy.

Founder partners will be embedded in the design, technology specification and operation of the Centre and the development of train-the-trainer and research programmes.



Additional partnership details
are in the [industry flyer](#)



“Climate change is the greatest challenge facing the world today, and agriculture is vital to the livelihoods of so many Africans and to economic development across Africa. I’m proud that this partnership of world leading experts from the UK, Rwanda and beyond will find solutions to the challenge of sustainable cooling.”

Omar Daair

British High Commissioner to the
Republic of Rwanda



**For more
information**

[ACES Webpage](#)



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