WEF Nexus Masterclass 2025: Day 3

Practical case studies

Global Water Partnership

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Focus of the sessions during the day

- Linking Investment and Governance with **Practical** outcomes: case studies

Case study: BUPUSA

The **Buzi, Pungwe, and Save (BUPUSA)** project, a collaborative initiative between Mozambique and Zimbabwe, has achieved significant milestones in transboundary water resource management. Funded by the **Global Environment Facility (GEF)** and implemented by the **International Union for Conservation of Nature (IUCN)**, with regional execution by the **Global Water Partnership Southern Africa (GWPSA)**, the project focuses on strengthening cooperation and sustainable management of shared water resources.joshswaterjobs.com+9Global Water Partnership+9Global Water Partnership+9Global Water Partnership+3Global Water Partnership+3Global Water Partnership+3

A cornerstone of the project is the development of the **Strategic Action Programme (SAP)**, which provides a basin-wide framework for addressing key environmental challenges identified through a comprehensive **Transboundary Diagnostic Analysis (TDA)**. These challenges include reduced water availability, water quality deterioration, land degradation, altered flow regimes, and increased extreme climate events. The SAP outlines prioritized actions and investments to mitigate these issues and enhance resilience.Midweek-Watch+2Global Water Partnership+2Global Water Partnership+2

In May 2023, the **BUPUSA Watercourses Commission (BUPUSACOM)** was established, marking a significant step towards coordinated management of the Buzi, Pungwe, and Save basins. This tri-basin institution oversees the implementation of the SAP and fosters collaboration between the two countries.Global Water Partnership+5Global Water Partnership+5IW:LEARN+5Global Water Partnership+2Global Water Partnership+2IW:LEARN+2

To address climate-related risks, the project has implemented **hydrometeorological monitoring systems**, including the installation of **telemetric stations** in key locations such as Dombe, Gorongosa, Mafambisse, Metuchira, Massangena, and Vila Franca do Save. These stations provide real-time data on river levels, enhancing early warning systems and enabling informed decision-making during flood and drought events.Mozambique

Furthermore, the project has initiated **drought vulnerability assessments** in communities like Takavarasha in Zimbabwe's Chivi District. These assessments aim to identify drought hotspots and inform targeted interventions to build community resilience against prolonged dry spells.IW:LEARN

Through these concerted efforts, the BUPUSA project is fostering **integrated water resources management**, promoting **climate resilience**, and ensuring the sustainable use of shared water resources for the benefit of communities in the Buzi, Pungwe, and Save basins.IUCN+7joshswaterjobs.com+7Global Water Partnership+7

Case study:

CALL FOR ACTION

- Demonstration projects-

WEF Nexus to support crop and livestock production in Botswana and Tanzania

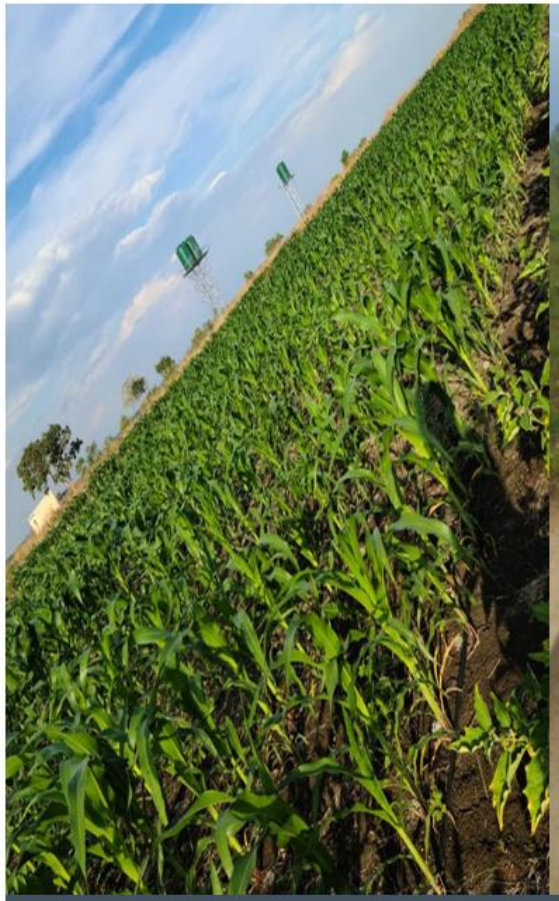
In Botswana and Tanzania, agriculture remains the cornerstone of rural livelihoods. Yet, farmers and pastoralists in both countries are increasingly challenged by water scarcity, unreliable energy access, and the growing impacts of climate change. These pressures are deeply interconnected, and tackling them in isolation has often led to limited, short-term gains. This is where the Water–Energy–Food Nexus approach proves transformative.

In Botswana, the introduction of solar-powered boreholes is providing water for both livestock and small-scale crop production, while reducing dependence on diesel and overgrazed rangelands. These interventions are helping pastoralist communities manage scarce water resources more sustainably and adapt to prolonged drought conditions. In Tanzania, farmers are benefiting from integrated irrigation systems powered by micro-hydropower and solar energy, enabling year-round cultivation even in remote areas. At the same time, livestock corridors are being developed to reduce land-use conflict and ensure equitable access to water points for both farmers and herders.

What makes these interventions effective is not just the technology, but the process. Projects are co-designed with communities, align with national climate strategies, and are informed by spatial planning and local knowledge. They also take gender and social inclusion seriously—ensuring women and marginalized groups, who often bear the brunt of resource shortages, have a voice in how resources are managed and shared.

The experience in Botswana and Tanzania shows that WEF Nexus approaches are not theoretical—they can deliver tangible, cross-cutting benefits: more resilient food and water systems, cleaner and more reliable energy access, and stronger community ownership. These successes offer valuable lessons for other drought-prone regions seeking to build integrated, sustainable, and inclusive climate responses.

Case study:



Katapazi, Zambia

Katapazi, a rural community in Zambia's Southern Province, offers a compelling example of how integrated Water–Energy–Food Nexus thinking can unlock sustainable rural development. Like many semi-arid regions in Zambia, Katapazi faces overlapping challenges: seasonal water shortages, declining soil fertility, energy poverty, and food insecurity. These are compounded by increasingly erratic rainfall and recurrent droughts, making traditional agricultural practices less viable and more risky.

To address these interlinked issues, a community-driven WEF Nexus project was introduced. At the heart of the intervention was the development of a solar-powered water system that pumps groundwater for both domestic use and smallholder irrigation. This reliable access to water has enabled farmers to grow vegetables and staple crops throughout the year, improving household nutrition and generating income from surplus produce. Alongside this, fuel-efficient stoves and solar lighting systems were distributed to reduce dependence on firewood, lessen indoor air pollution, and improve energy access—especially for women and schoolchildren.

What sets Katapazi apart is the way it connects these solutions across sectors. The project actively engaged local leaders, women's groups, and agricultural extension officers to co-design interventions that reflect real needs and local knowledge. Training sessions combined climate-smart agriculture with water conservation techniques, while also promoting community-based water governance structures. As a result, the project didn’t just improve outputs—it strengthened resilience, enhanced livelihoods, and built capacity for long-term resource stewardship.

The Katapazi experience shows that even in small, remote communities, a WEF Nexus approach can deliver real impact. By addressing water, energy, and food challenges together—and placing people at the center—it’s possible to create more adaptive, inclusive, and climate-resilient rural systems. Katapazi offers a scalable model for how integrated solutions can drive meaningful change from the ground up.

Case study:

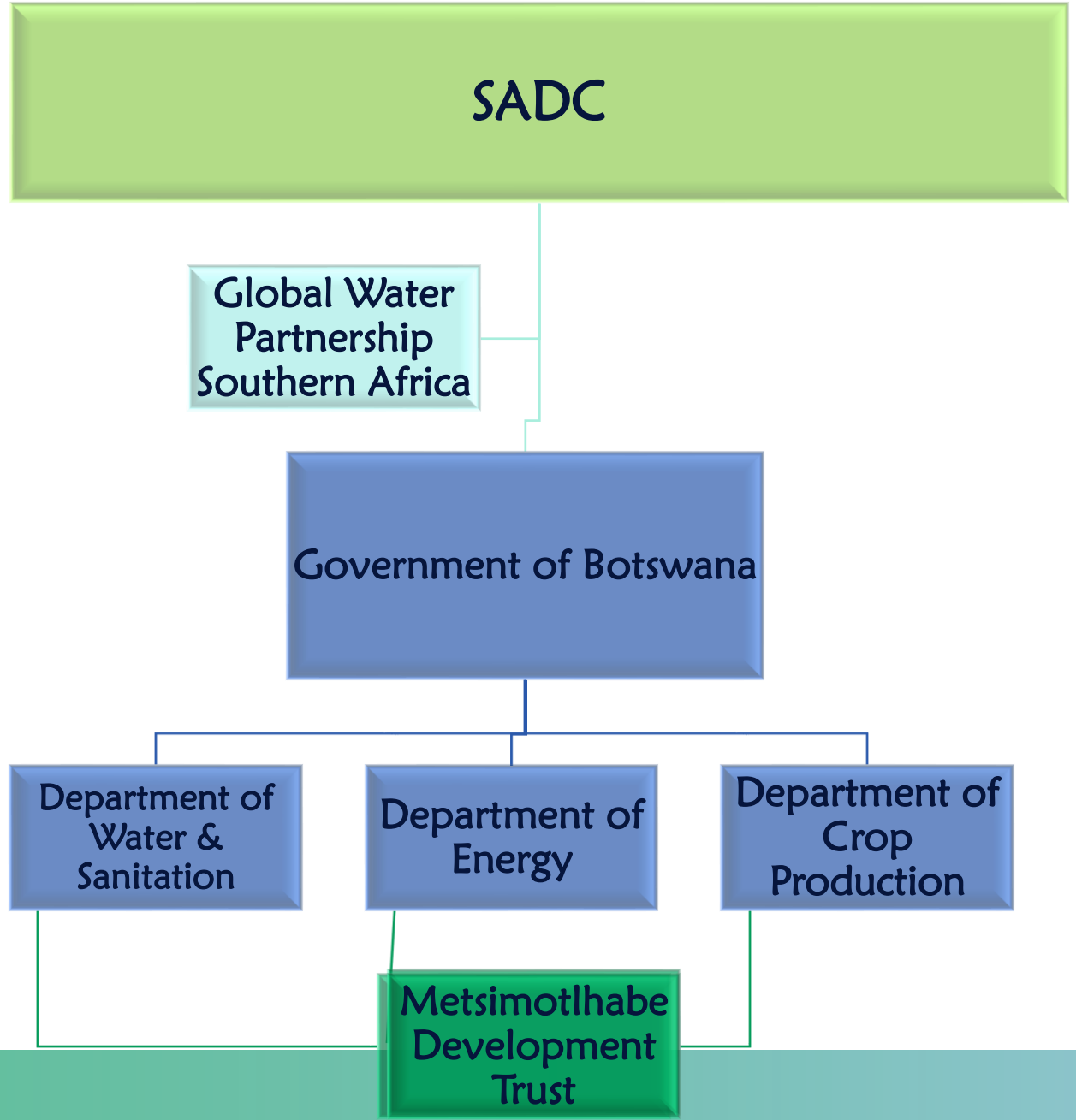
Operationalizing the Water-Energy-Food (WEF) Nexus for Building Climate Resilience for the Metsimotlhabe Catchment, Kweneng District Botswana

Project Organogram

Regional Level

National level

Local level

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In the heart of **Botswana's Kweneng District**, the **Metsimotlhabe Catchment** is experiencing the combined effects of water scarcity, energy limitations, and food insecurity—all exacerbated by the impacts of climate change. To address these challenges, the **Water–Energy–Food (WEF) Nexus** approach is being operationalized to build long-term climate resilience for the region.

The **Metsimotlhabe Catchment**, like many parts of Botswana, faces unpredictable rainfall, high temperatures, and increasing pressure on its natural resources. In response, this initiative takes a holistic, integrated approach that connects water, energy, and food systems to enhance the resilience of both ecosystems and communities.

The project starts with **improving water management** through the development of sustainable, climate-resilient water infrastructure, including **rainwater harvesting**, **efficient irrigation systems**, and **groundwater recharge**. These measures are designed to ensure that water resources are available throughout the year, supporting agricultural activities and providing a reliable source of water for communities.

Simultaneously, the initiative focuses on **clean energy solutions**, particularly solar energy, to power water pumps and irrigation systems, reducing dependency on fossil fuels and grid electricity. By promoting **solar-powered irrigation systems**, the project helps farmers access water for crop production while minimizing environmental impact.

The **food security component** of the WEF Nexus approach is equally vital. Through **climate-smart agricultural practices**, the project encourages the adoption of drought-resistant crops, improved soil fertility management, and **sustainable farming practices**. This ensures that farming remains viable even in the face of climate variability, while enhancing food production and income for local communities.

Community engagement is at the heart of the project. Stakeholders, including local farmers, community groups, and government agencies, are actively involved in the design, implementation, and monitoring of the initiative. By building local capacity and fostering collaboration across sectors, the project ensures that the WEF Nexus approach is not only effective but sustainable in the long term.

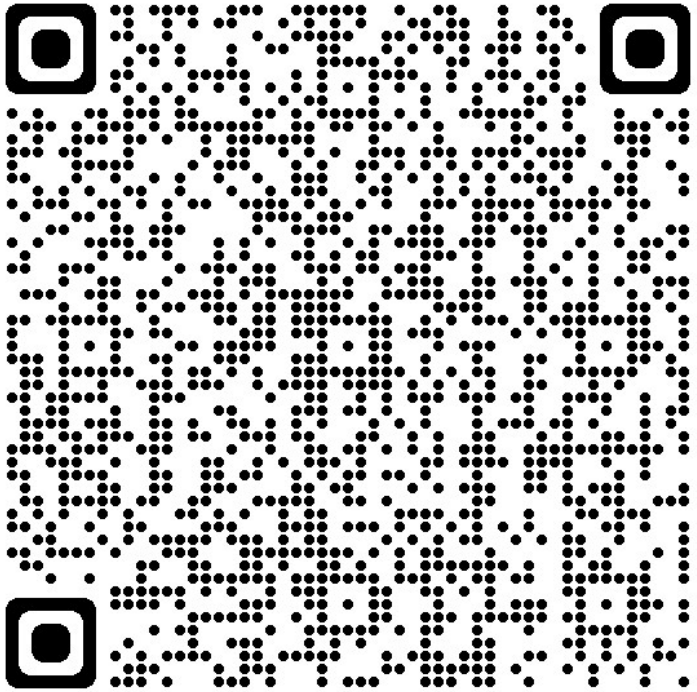
By operationalizing the WEF Nexus for the **Metsimotlhabe Catchment**, Botswana is creating a scalable model for **climate-resilient development**, demonstrating that when water, energy, and food systems are managed together, they can help build stronger, more adaptive communities in the face of climate change.

Implementing climate-resilient Integrated Water Resources Management in Wami/Ruvu basin Tanzania – Through WEF Nexus Approach

Global Climate Change Alliance Plus Program

Chrisogonous Peter
Program Officer
Global Water Partnership Tanzania

Lesson Learnt and Best Practices



- Address issues in an integrated/Nexus approach that is to include all the project stakeholders since the inception phase of the projects
- Engage the communities to identify their challenges and Engage them to participate during solution implementation
- Capacity building to practitioners on designing of projects that address the WEF nexus

In the **Wami/Ruvu Basin** of eastern Tanzania, the community of **Ruvu Darajani village** is vulnerable to the impacts of climate change, particularly water scarcity, fluctuating agricultural productivity, and energy shortages. To tackle these interconnected challenges, the **Integrated Water Resources Management (IWRM)** project, using the **Water–Energy–Food (WEF) Nexus approach**, was introduced to build climate resilience at the local level.

The aim of the project is clear: to enhance the **climate adaptive capacity** of the communities in **Ruvu Darajani village** by promoting sustainable, integrated resource management. This approach takes into account the interdependence between water, energy, and food systems, ensuring that actions in one area support and enhance resilience in the others.

The project was implemented in close collaboration with several key partners, including the **Ministry of Water**, through the **Wami/Ruvu Basin Water Board**, the **Ministry of Livestock**, and the **Ministry of Energy**. These partnerships helped to align national and local policies, ensuring that interventions were context-specific and sustainable.

The initiative focused on improving **water management** practices to ensure reliable access to water for both agricultural and domestic use. This included developing climate-resilient water infrastructure and promoting **efficient irrigation systems** that reduce water waste, while also utilizing **rainwater harvesting** techniques to maximize water availability during dry spells.

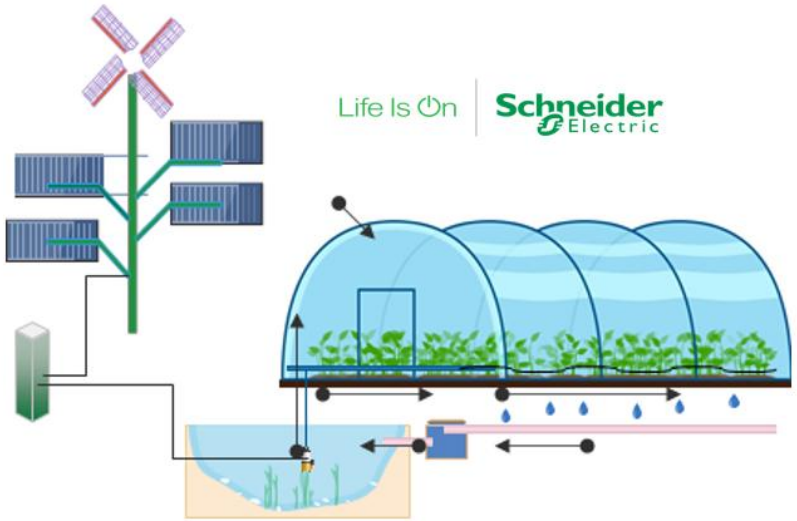
In parallel, the project also integrated **energy solutions**. By promoting **renewable energy technologies**, such as solar power, the project helped reduce the community's dependence on traditional energy sources, providing reliable electricity for water pumping and other essential services.

For **food security**, the project emphasized the importance of climate-smart agricultural practices. By introducing drought-resistant crops, improving soil management techniques, and enhancing livestock practices, local farmers and pastoralists can improve yields and ensure sustainable livelihoods, even under changing climate conditions.

One of the core strengths of the project was the active involvement of local communities. **Village and ward livestock officers** worked alongside the communities to ensure that sustainable practices were adopted and that knowledge was transferred, building local capacity for long-term climate resilience.

Through this integrated **WEF Nexus approach**, the project in **Ruvu Darajani village** demonstrates how linking water, energy, and food systems can effectively address the complex challenges of climate change. By fostering collaboration across ministries and local communities, Tanzania is taking a crucial step toward building **climate-resilient, resource-efficient systems** that can withstand future climate impacts.

Case study:



Solar powered greenhouse with fishpond, growing area for seedlings, a solar panel tree and a charging station for phones and testing equipment.

Nexus Farm Initiative

Egypt – Upper Egypt and Western Desert

In the arid landscapes of Upper Egypt and the Western Desert, the Nexus Farm Initiative is demonstrating how integrated Water–Energy–Food solutions can transform dryland agriculture into a hub of innovation and sustainability. Faced with extreme heat, water scarcity, and limited grid access, rural communities in these regions struggle to sustain livelihoods through traditional farming. The Nexus Farm responds with a model that turns constraints into opportunities.

At the heart of the initiative is a solar-powered greenhouse that enables year-round, climate-resilient vegetable production. Integrated with this is a fishpond system—creating a closed-loop setup where fish waste fertilizes the plants, and plants help filter the water. This approach not only maximizes water efficiency, but also diversifies nutrition and income sources for local farmers. A surrounding nursery area allows for the propagation of drought-tolerant seedlings, further supporting local food production and land rehabilitation.

But the innovation doesn't stop there. Solar panelling provides shaded space for community interaction while generating power for nearby facilities. Adjacent to it is a solar-powered charging station—offering clean energy access for mobile phones, agricultural testing tools, and even cold storage for perishable inputs or harvests. These practical innovations meet real needs while reducing dependence on diesel and fossil fuels.

What makes the Nexus Farm stand out is how it integrates technology, community needs, and environmental stewardship into a single, replicable model. It supports local youth and women with training in sustainable agriculture, aquaculture, and renewable energy management—creating pathways to entrepreneurship and green jobs. The initiative aligns with Egypt's national strategies on climate resilience, food security, and rural development, while providing a practical example of how the WEF Nexus can work in fragile, resource-scarce environments.

The Nexus Farm in Upper Egypt and the Western Desert offers a glimpse into the future of farming in drylands: smart, solar-powered, inclusive, and circular. It shows that with the right design, even the harshest landscapes can become productive, resilient, and full of potential.

Case study:

Urban Nexus – Minaret II

Jordan, Tunisia, Lebanon

- Cities/towns are major consumers of WEF resources
- Municipalities‘ mandate intersect with WEF sectors
- Municipalities play crucial role to raise awareness, engage communities

- **Achievements**
  - 5 Baseline Assessments
  - 3 National Policy Dialogues
  - 3 Finance workshops to mobilize funding
  - 5x Cross-sector SECAPs
  - 5x Membership Covenant of Mayors
  - 1 feasibility study

Across Africa, cities are on the frontlines of climate change, facing growing demands for water, energy, and food in already stressed urban environments. The Minaret II Urban Nexus Initiative—operating in Jordan, Tunisia, and Lebanon—is showing how integrated planning at the city level can unlock practical, climate-resilient solutions for urban sustainability.

Minaret II builds on the recognition that municipalities are key actors in delivering climate and development outcomes. Through the project, five comprehensive baseline assessments were conducted, mapping out the urban resource flows, climate vulnerabilities, and service delivery gaps that cities must tackle. These data-driven diagnostics laid the foundation for strategic action.

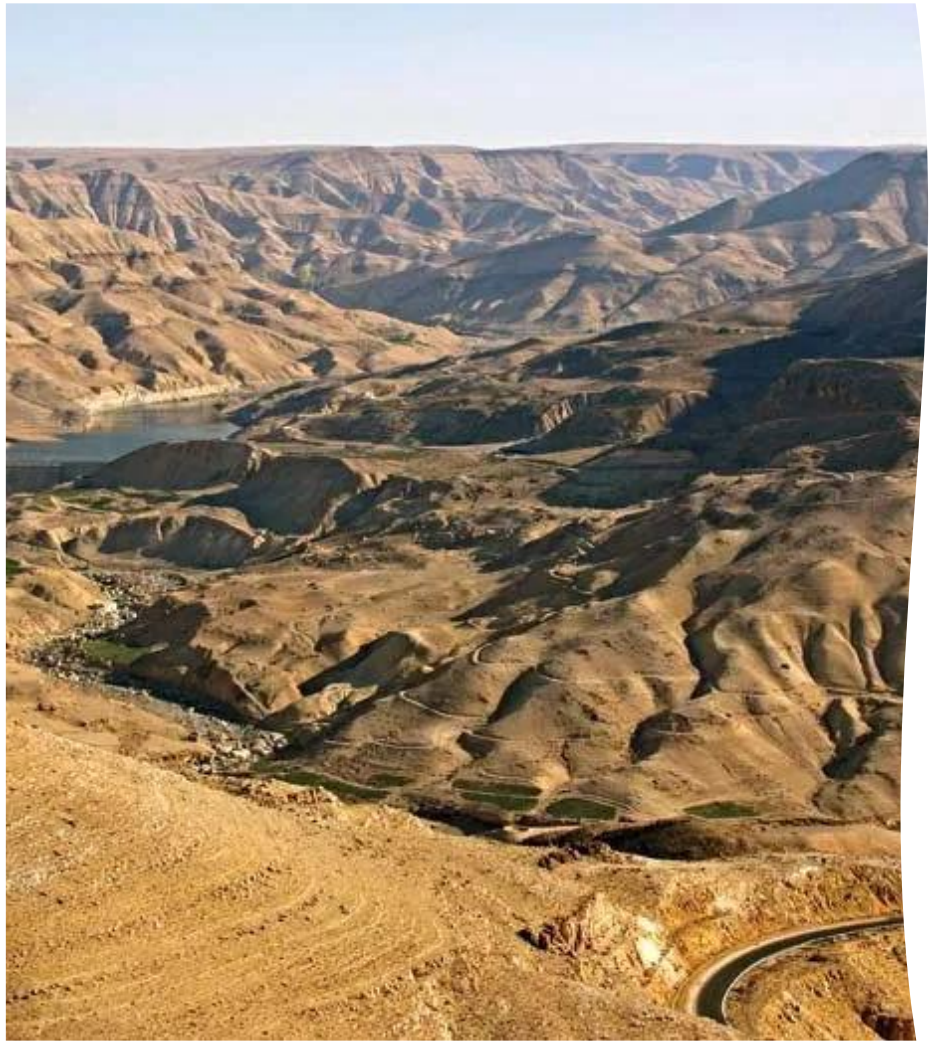
The initiative brought together national and local governments through three high-level national policy dialogues, creating space for alignment across sectors and ministries. In parallel, three dedicated finance workshops helped city officials and planners build the skills to identify, structure, and mobilize funding for Nexus-aligned projects—an essential step in turning plans into action.

At the local level, the project supported the development of five cross-sector Sustainable Energy and Climate Action Plans—or SECAPs—tailored to the unique needs and priorities of each participating city. These plans go beyond energy to integrate water, waste, and food system considerations, grounded in Nexus thinking. Importantly, all five cities also joined the Covenant of Mayors for Climate and Energy, reinforcing their commitment to climate action and giving them access to a global community of peer learning and support.

One feasibility study was completed to prepare an integrated project for investment—bridging the gap between planning and bankability. This pipeline development is critical to ensuring that innovative urban Nexus projects can move forward with the support of public and private finance.

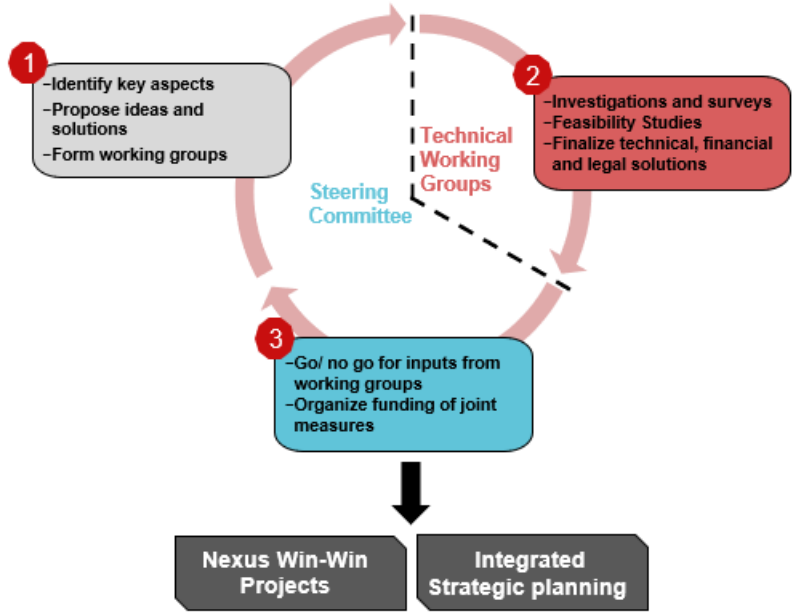
The Minaret II Urban Nexus Initiative highlights the power of city-level action, cross-sectoral planning, and regional collaboration. It shows that even in fragile or resource-constrained settings, municipalities can lead the way in climate resilience—when equipped with the right tools, partnerships, and knowledge.

Case study:



Water-Energy Nexus

Jordan



Jordan, one of the world's most water-scarce countries, is tackling its resource challenges head-on with the **Water–Energy–Food–Environment Nexus approach**. As a nation with limited water resources, high energy demands, and a growing population, Jordan has embraced integrated solutions to ensure sustainable development in the face of climate change and growing resource pressures.

The **Jordan WEFE Nexus** initiative brings together key sectors—water, energy, food, and the environment—to address these interconnected challenges. The project has taken a holistic approach to ensure that interventions in one area do not negatively impact the others. In fact, it shows how carefully planned, cross-sectoral interventions can create synergies, reducing the country's resource dependencies while increasing overall resilience.

Through the initiative, Jordan has achieved significant milestones. For example, **integrated water and energy systems** are being implemented to support both agriculture and domestic use, with renewable energy sources, like solar power, playing a key role. Solar irrigation systems are being introduced in farming communities, helping farmers grow crops with more reliable access to water, while reducing their energy costs and dependence on traditional grid electricity.

Additionally, **agriculture and food security** are being strengthened by introducing **climate-smart practices** that optimize water use, improve soil health, and increase crop yields. This includes the use of **efficient irrigation technologies** and crop varieties that are more resilient to drought and extreme heat, ensuring that food systems remain productive even under changing climate conditions.

On the environmental front, the project has also prioritized the **restoration of ecosystems** and the sustainable management of natural resources, linking land restoration efforts with water and energy conservation to ensure long-term ecological balance.

The success of the **Jordan WEFE Nexus** approach is rooted in **stakeholder collaboration**—bringing together government bodies, private sector partners, and local communities to develop solutions that are locally relevant and feasible. The initiative also includes extensive capacity-building, enabling local actors to take ownership of Nexus strategies and ensure their sustainability over time.

Through its work, Jordan demonstrates how the **WEFE Nexus** can unlock **synergies across sectors**, reduce vulnerabilities, and create a more sustainable, climate-resilient future. This integrated approach provides a **scalable model** that can be replicated in other water-scarce, climate-stressed regions, showing that when sectors work together, they can achieve greater impact than when they act alone.

Case study: SACREEE

www.sacreee.org

Global Water Partnership Southern Africa

SACREEE
SADC CENTRE FOR RENEWABLE ENERGY & ENERGY EFFICIENCY

CCARDESA
Centre for Coordination of Agricultural Research and Development for Southern Africa

SACREEE WEF Nexus Pilot Project in Malawi and Zambia

The **Southern African Centre for Renewable Energy and Energy Efficiency (SACREEE)** has been at the forefront of introducing integrated, sustainable solutions to the water, energy, and food sectors. Through its **Water–Energy–Food (WEF) Nexus approach**, SACREEE is facilitating collaboration among multiple ministries in both **Malawi** and **Zambia** to address critical resource challenges.
The journey began when SACREEE introduced the **WEF Nexus concept** to the Governments of **Malawi** and **Zambia**. The initiative was taken up by the Ministries of Energy (MoE), who played a pivotal role in conducting internal consultations across other key ministries, both at the **national** and **district levels**. These ministries included **Water**, **Irrigation**, **Agriculture**, **Environment**, **Community Development**, and **Fisheries**—ensuring that all relevant sectors were engaged in the planning and design of the project.
After extensive consultations, the next step was to identify districts and areas that would be ideal for piloting the WEF Nexus approach. The selection process involved rigorous criteria to ensure that the chosen locations faced intersecting resource challenges, making them ideal candidates for the Nexus model.
For **Malawi**, the chosen area was **Dedza district**, specifically **Kamuyisa Village**. This village faces significant challenges related to water scarcity, energy access, and agricultural productivity—challenges that the WEF Nexus approach aims to address by promoting integrated solutions.
In **Zambia**, the pilot site was selected in the **Kazungula district**, specifically the **Katapazi area**. Similarly, this region grapples with issues of water management, energy provision, and food security. By focusing on these districts, SACREEE aims to implement tailored solutions that not only address the immediate resource challenges but also create a replicable model for other regions in Southern Africa.
Through this pilot project, SACREEE is helping both countries move towards more **integrated, sustainable**, and **resilient** systems that connect water, energy, and food sectors. These efforts will pave the way for more coordinated policies and investments, ultimately benefiting local communities and contributing to national development goals.

Focus of the sessions during the day

- CuvKun **Case Study** *(Aune Amwaama)*