

GREEN CITIES, INFRASTRUCTURE AND ENERGY PROGRAMME (GCIEP)

# Climate mitigation and adaptation

GCIEP is supporting national and sub-national government counterparts in over 20 low- and middle-income countries to overcome barriers to climate action. Roughly half of GCIEP support contributes to climate change mitigation, helping governments to develop policy, plan, finance and deliver low-carbon infrastructure, particularly for energy and public transport. The other half supports governments to adapt to the increasingly severe impacts of climate change, including flooding, water scarcity and extreme weather. Much of this work is focused on urban resilience and water management.

GCIEP's experience is strengthening the evidence base on the ways national and sub-national governments can create low-carbon and resilient cities and infrastructure. The findings below have been aggregated from 70 projects over the past two years.

## Counterpart governments often need support in overcoming resistance to upfront costs to achieve long-term climate mitigation and adaptation

GCIEP's experience has shown that enabling sustainable and inclusive infrastructure investment depends on overcoming high upfront costs, especially in fiscally constrained contexts. In **Indonesia**, where GCIEP is supporting cities such as **Surabaya** as well as national government stakeholders in

**public transport and flood risk management**, upfront costs were identified as a major barrier to climate-resilient infrastructure investments, particularly during government training on flood risk assessments in Surabaya and Denpasar. By demonstrating the long-term savings and co-benefits of adaptation measures to other stakeholders, governments can reframe investment decisions and explore appropriate financing mechanisms. Supporting governments to adopt investment frameworks that prioritise long-term value creation and tools such as blended finance and concessional capital can unlock finance for resilient infrastructure. Importantly, GCIEP has learned that investing in institutional capacities to conduct cost-benefit analysis is important for governments to assess and justify investments.

## Building municipal government ability to own and use digital tools is vital role for improved climate change adaptation and disaster risk reduction

GCIEP has demonstrated that integrating innovative technologies such as using drones for rapid data collection can significantly strengthen disaster response and climate-resilient urban planning. Following cyclone damage in **Mozambique**, drone technology enabled GCIEP to conduct quick and accurate damage assessments that informed fast, evidence-based decision-making as part of training to the municipality of Beira on data-driven urban planning and disaster preparedness. This highlighted the importance of real-time, high-quality data for identifying infrastructure



vulnerabilities and guiding effective resource allocation for local disaster response systems. In **Ghana**, GCIEP developed a real-time dashboard to enable government stakeholders to better understand multi-hazard climate risk maps and take appropriate action. The digitisation of risk mapping greatly increased government ownership and engagement with climate risk data for urban planning and resilience-building activities.

### **The boundary between mitigation and adaptation often blurs in smaller economies and small island developing states**

GCIEP projects have repeatedly found that mitigation and adaptation measures overlap in some contexts, particularly in smaller states where greenhouse gas emissions are lower. A combined outcome can support stronger buy-in from government stakeholders and international climate finance providers. In the **Caribbean, which was supported by GCIEP in the design of the UK Caribbean Resilient Infrastructure Programme**, increasing the disaster resilience of islands via decentralised clean energy also directly reduces reliance on imported fossil fuels, contributing to mitigation. GCIEP's programming in these contexts highlights the

synergies between decarbonisation and resilience goals, particularly vital for highly vulnerable economies. In **Tanzania**, the Dar es Salaam Urban Resilience Project demonstrated how solid waste management can bridge the adaptation and mitigation divide by focusing both on reducing greenhouse gas emissions (mitigation) through biogas capture, and strengthening community resilience to flooding (adaptation), thereby advancing both climate outcomes simultaneously.

### **Integrating climate action into municipal infrastructure project cycles unlocks additional financing sources and climate finance opportunities**

Technical and strategic guidance from potential funders often focuses on integrating climate risk and resilience into all project phases, from appraisal and financing through to implementation. Criteria for municipal infrastructure project selection for financing mechanisms, that set clear requirements for climate impact, should be systematically applied. When climate-positive outcomes are mandated for funding eligibility, this approach can unlock new sources of infrastructure financing that benefit municipal governments and their communities.

In **India**, GCIEP's work in designing the **Project Support Facility for the National Bank for Financing Infrastructure and Development** stands out for improving access to finance for climate mitigation and adaptation at city scale. By requiring city governments to meet climate resilience criteria integrated via Green Guidelines before obtaining investment, the Project Support Facility institutionalised climate-focused design and empowered cities to access international climate finance sources. This is especially transformational for smaller, lower-capacity municipalities.

In **Ghana**, targeted training on variable renewable energy integration and environmental and social impact assessment practices equipped the Ghana Grid Company (GRIDCo) with the technical and environmental expertise needed to plan and operate a climate-resilient power system. This strengthens GRIDCo's role in achieving Ghana's climate goals and enables the development of future grid infrastructure and energy projects that are not only low carbon but adaptive to climate risks, marking a shift toward proactive, sustainability-aligned energy planning.



## Strong climate policies alone are not enough, as the lack of enforcement remains a major barrier to meaningful action

In Egypt, while building government capacity to use the UK's Five Case Model for robust and sustainable investment business cases for infrastructure, GCIEP found strong government understanding of the climate change policy set out in Egypt's Vision 2030. However, government participants indicated that there were limited mechanisms to enforce or incentivise the relevant mitigation actions, such as the use of natural cooling systems in building designs or flood mitigation measures, particularly in informal development or rural areas. This experience flagged the limits of policy without robust enforcement and the imperative for context-responsive technical assistance to translate policy into practice.



Macurungo-Miquejo neighbourhood plans. © GCIEP

## Opportunities to implement nature-based solutions are often limited by poor understanding of technical and financing solutions

The first year of GCIEP's delivery has highlighted the transformative potential of nature-based solutions (NbS) in both climate mitigation and adaptation. Despite this, stakeholders' awareness and understanding of NbS benefits remains limited. GCIEP has learned that involving local authorities, communities and finance providers at the project preparation stage helps build trust, secure buy-in and communicate the financial and environmental value of NbS. In Mozambique, where GCIEP is working with the cities of Beira, Nacala and Pemba to improve participatory and data-driven

urban planning and accelerate infrastructure investments, interest in NbS from development partners and financing sources was increased introducing well-articulated NbS early, providing clear explanations of how they would work and aligning them with existing infrastructure projects. This is creating valuable opportunities for collaboration, integration, co-financing and long-term impact.

## Promote climate-smart design that goes beyond existing national or sub-national standards

As the impacts of climate change accelerate, integrating climate-smart design principles beyond existing national standards is often necessary to make infrastructure

resilient to flooding, extreme heat and other stresses. In Ghana, the GCIEP-supported road and associated drainage designs in the cities of Sekondi-Takoradi were aligned with climate mitigation and adaptation best practices, taking into consideration future rainfall projections and measures to reduce greenhouse emissions. These elements were not included in existing road design standards in some contexts. This approach demonstrates the importance of supporting city and national governments to embed climate risk vulnerability assessment from the feasibility stage to future-proof infrastructure, minimise lifecycle costs and align national investments with global climate resilience and sustainability goals.

GCIEP is a demand-driven initiative focused on sustainable green cities and climate-resilient infrastructure in lower-income countries. As the flagship programme of the UK's Centre of Expertise for Green Cities, Infrastructure and Energy, GCIEP supports the UK Government's mission to accelerate investment in, and delivery of, infrastructure and urban development that is responsible, reliable, inclusive, low-carbon and climate-resilient.

A significant proportion of GCIEP's work is carried out in seven priority countries: Ethiopia, Ghana, Indonesia, Philippines, Mozambique, Vietnam and Zambia, where a Deep Offer programme provides long-term, systemic interventions focused on transformative change and infrastructure financing.

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The UK's Green Cities, Infrastructure and Energy Programme will accelerate the delivery of sustainable green cities and climate-resilient infrastructure – tackling climate change and extreme poverty.