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GHANA

THE CAPACITY ASSESSMENT
TOOL FOR INFRASTRUCTURE
(CAT-I): GHANA AND ITS
ROADMAP FOR RESILIENT
INFRASTRUCTURE IN A
CHANGING CLIMATE



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The Sustainable Infrastructure Tool Navigator

is an online platform that connects infrastructure practitioners with over 100+ relevant tools that can assist them in evaluating and making decisions at various phases of the infrastructure life cycle. This case study demonstrates the use of a tool in a country context, to better understand the process involved as well as good practices, challenges and lessons learned.

THE CAPACITY ASSESSMENT TOOL FOR INFRASTRUCTURE (CAT-I) ADAPTATION THEME

The Capacity Assessment Tool for Infrastructure (CAT-I) (<https://cati.unops.org>) supports countries' development through better infrastructure planning, delivery and management. The tool is designed to help governments identify the key challenges within their enabling environment that are inhibiting their ability to deliver sustainable, resilient and inclusive infrastructure. Based on these key challenges, the tool can be used to support the identification of solutions and to develop a pipeline of projects to build national, state, city or ministerial capacity using technical and advisory services, and show progress against a measured baseline.

CAT-I covers the full life cycle of infrastructure, recognizing the importance and interdependence of three distinct stages of development: planning, delivery and management. Each stage is divided into a number of indicators, each representing processes required to develop and implement that particular stage of the infrastructure.

The CAT-I Adaptation theme was developed as a more focused assessment methodology to support governments in developing climate-resilient and inclusive infrastructure, by identifying adaptation challenges in their infrastructure enabling environment and helping them to address them.

1. BACKGROUND

Ghana is the second most populous country in West Africa and home to 31.7 million people (United Nations Department of Economic and Social Affairs 2019). It borders Côte d'Ivoire to the west, Togo to the east, Burkina Faso to the north, and the Atlantic Ocean to the south. One of the key drivers of the Ghanaian economy is the agricultural sector, accounting for almost 20 percent of its exports in 2020 (Observatory of Economic Complexity 2021). Like agriculture, infrastructure is key for both economic and social development. However, additional effort is needed, as significant disparities still exist in Ghanaians' access to basic services. In 2015, around 20% of the population of Ghana still did not have access to drinking water and 14.1% of the population lacked access to electricity (World Bank 2022).

Key factors determining the country's ability to adapt to climate change threats and associated hazards will be Ghana's planning, design, execution and operation of numerous infrastructure projects. In 2019, the Notre Dame Global Adaptation Initiative ranked Ghana

115th out of 182 countries¹ on its list of countries most vulnerable to climate change.² Considering that Ghana depends heavily on climate-sensitive sectors such as agriculture (18.3% according to a 2017 estimate) and infrastructure (including industry and services), climate change presents considerable risks to the country's socio-economic development and growth (Asante & Amuakwa-Mensah 2015; United States Central Intelligence Agency 2022).

2. GHANA AND ITS ROADMAP FOR RESILIENT INFRASTRUCTURE IN A CHANGING CLIMATE

It is critical for Ghana to climate-proof its infrastructure systems and make them resilient to various disruptions. The Roadmap for Resilient Infrastructure in a Changing Climate initiative (Adshead *et al.* 2022) has supported Ghana in identifying its infrastructure adaptation needs in the energy, water and transport sectors. It provides guidance on how those needs can be met to enhance the long-term resilience

¹ Vulnerability measures a country's exposure, sensitivity and ability to adapt to the negative impact of climate change. The lower the number, the less vulnerable the country is.

² The Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. The latest data (2019) is available here: <https://gain.nd.edu/our-work/country-index/rankings/>.

of Ghana's infrastructure to the threats of climate change.

To do this, the initiative is broken down into three well-defined goals:

1. Assess the need for climate adaptation in the energy, water, and transport sectors across Ghana's built, natural and enabling environments.
2. Plan a prioritized roadmap of appropriate, government-led investments and policies to respond to key needs.
3. Identify potential sources of financing for projects in the roadmap, helping them advance from concept to implementation.

The initiative used different tools to meet the aforementioned objectives and analyse the impacts of climate change on infrastructure systems. The Capacity Assessment Tool for Infrastructure (CAT-I) Adaptation Theme was used to assess the enabling environment, the National Infrastructure Systems Model (NISMOD) was used to assess the built and natural environments, and the Sustainable Infrastructure Finance Tool (SIFT) was used to identify sources of finance. CAT-I contributed to the needs assessment and the prioritized roadmap of adaptation options for the enabling environment. NISMOD contributed to the needs assessment and the prioritized roadmap of adaptation options for the built and natural environments. SIFT complemented the outcomes of CAT-I and NISMOD by identifying potential sources of finance for the prioritized roadmap of adaptation options in the enabling, built and natural environments. The adaptation options can be incorporated into Ghana's National Adaptation Plan and revised Nationally Determined Contributions (NDCs). Doing so will help develop a pipeline of climate-resilient projects that bring greater confidence to external investors seeking to fill the infrastructure funding gap, estimated at US\$0.4 billion per year and chiefly related to power and water (World Bank 2021).

3. USING THE CAPACITY ASSESSMENT TOOL FOR INFRASTRUCTURE (CAT-I) ADAPTATION THEME

As part of the Government of Ghana's commitment to enhance resilience, the Ministry of Environment, Science, Technology and Innovation (MESTI) led this assessment with the support of a Technical Working Group.³

Assessing and making improvements to the enabling environment (i.e. laws, programmes, standard operating procedures and more) is critical as it is the only way to institutionalize change in how governments plan, deliver and manage their infrastructure systems to be climate-resilient.

The CAT-I Adaptation Theme was used to gather evidence on the challenges and needs within the enabling environment to plan, deliver, operate and maintain climate-resilient and inclusive infrastructure systems. CAT-I was chosen because it holistically assesses the challenges and needs within the enabling environment and across the infrastructure life cycle.

The adaptation needs were identified across three stages of the infrastructure life cycle (planning, delivery and management stages) because of their ability to impact national development objectives. The identification of the challenges and needs informed the priority areas within the enabling environment that should be candidates for improvement to support climate adaptation.

The methodology used was based on six key steps: (i) Setting up the assessment, including the definition of scope, objectives, resources, research methods and timelines to accomplish the assessment; (ii) Desk review to collect, organize and assess the information on energy, transport and water infrastructure sectors; (iii) Interviews with key stakeholders aimed at eliciting a description and evaluation of the adaptation planning and infrastructure development processes in the country; (iv) Analysis of the information collected to identify capacity-related strengths and challenges; (v) Validation and recommendations, including a presentation of the preliminary results of the assessment to key stakeholders; and (vi) Adaptation options and roadmap composed of a list of recommended adaptation options to address the selected needs.

The CAT-I assessment can be completed for one sector by a technical expert over three to four months. In Ghana, the overall project duration was one year due to the remote nature of the assessment and the fact that it was carried out for three sectors. It was completed by two technical experts working part-time. An in-country expert, working part-time, facilitated data collection and stakeholder engagement over the course of this initiative.

³ The Technical Working Group was formed by partners and stakeholders in the country, including national and local government ministries and agencies, utilities and the academic community.

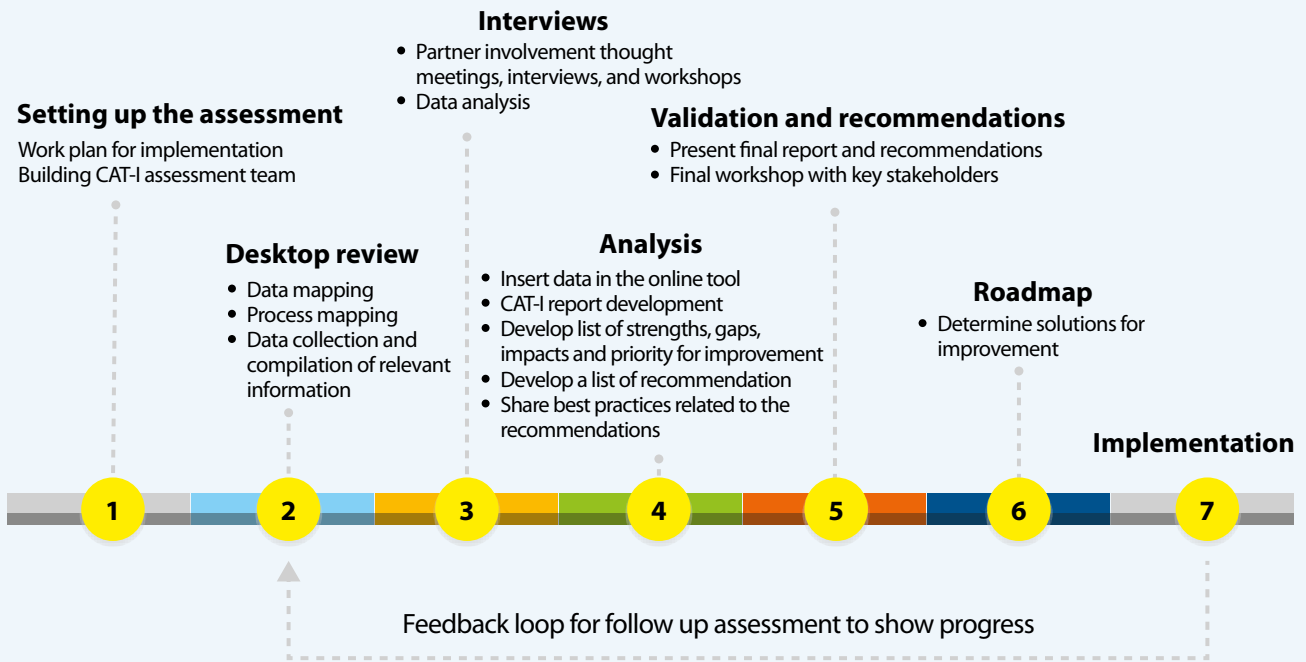


FIGURE 1: IMPLEMENTATION METHODOLOGY

Note and source: To complete an assessment using the CAT-I methodology the user should follow the eight steps indicated. For detailed guidance on how to complete each of the steps please see the guidance document (United Nations Office for Project Services (UNOPS) 2021).

**FIGURE 2: INSTITUTIONAL AREAS ASSESSED
IN THE STUDY ON GHANA'S
INFRASTRUCTURE ENABLING
ENVIRONMENT**



Note: 11 sub-indicators are considered within the planning, delivery, and management stages of the infrastructure lifecycle.

CAT-I assessment relies on stakeholder interviews and data collection and analysis. These data and information included national and sectoral policies, legislation, plans, annual progress reports and research reports. The assessment team held 20 interviews with government officials, academic researchers and non-governmental organizations working in the water, transport and energy sectors in Ghana. The data collected was input into the CAT-I tool for analysis. There are three life cycle stages – management, planning and delivery – that are further broken down into indicators and sub-indicators. For questions linked to the sub-indicators, a scoring scale of 0-4 is used, and the tool generates diagrams to show results and areas of need.

This assessment was carried out remotely due to the COVID-19 pandemic and travel restrictions. The assessment team carried out virtual interviews; however, there were often network and connectivity issues which impacted data collection.

4. RESULTS

The assessment of Ghana’s infrastructure enabling environment for climate adaptation identified and prioritized areas that can be strengthened to better support the planning, delivery and management of sustainable, resilient and inclusive infrastructure, and to help guide resources where they are most needed. Eleven indicators were considered within the planning, delivery and management stages of the infrastructure life cycle. The indicators were prioritized for each sector (energy, water and transport) based on the indicator’s potential to support sustainable, resilient and inclusive development.

Twelve adaptation options within the energy, water and transportation sectors were identified. For instance, in the transport sector under the design indicator, there is a need to enhance technical capacity to integrate climate risk considerations during the design process, for example by using more resilient materials. To address this need, the assessment prioritized the adaptation option of “research, capacity building, and the creation of a design manual to support resilient design and construction of roads”.

Another identified need is in the strategic planning indicator for all three sectors. There is a lack of access to data on water, climate risk and natural infrastructure, as well as limited access to scenario models developed by sector institutions to

inform long-term, evidence-based, risk-informed infrastructure planning, delivery and management. To address this need, the assessment prioritized a cross-sectoral adaptation option of a “centralized climate-risk data management system”.

The adaptation options respond to the government’s prioritized needs, and they also provide co-benefits that contribute to broader sustainable development objectives, including UN Sustainable Development Goal targets, NDCs under the Paris Agreement, and gender equality-related outcomes. In addition to coverage across the three key sectors, the adaptation options have broader relevance for the enabling environment, helping improve and deploy greater resilience strategies country-wide.

Through a dedicated workshop and five-month consultation, the Technical Working Group reviewed all potential adaptation options for technical feasibility and contextual appropriateness for Ghana specifically.

5. LESSONS LEARNED

One of the key lessons is to ensure governmental buy-in of the assessment, and understanding of the importance of mainstreaming resilience into the enabling environment. This is also determined by the willingness of government stakeholders to share data and supporting information required for the assessment (infrastructure sector report, policy and regulatory documents, sector plans, etc.).

6. REPLICABILITY

CAT-I focuses on assessing the enabling environments within governments and their capacities to effectively plan, deliver and manage infrastructure systems. As such, it can be applied to any country and any context.

In addition to Ghana, CAT-I has been applied to different countries. The tool was developed through pilots completed in collaboration with the governments of Nepal, Serbia, and the state of Mato Grosso (Brazil). Further assessments have been conducted in Nepal, Serbia, the Gambia, Turkana County (Kenya), North Macedonia, Indonesia and Honduras. These successful collaborations are the foundation for future initiatives that will improve infrastructure enabling environments and support governments’ sustainable development aspirations.

KEY INSIGHTS



- > Assessing the infrastructure enabling environment is critical to making well-informed systemic changes that improve the ways infrastructure is planned, delivered and managed so that it can be more climate-resilient.
- > CAT-I is a structured framework developed with international experts that identifies the key elements of the enabling environment that are critical for supporting resilient infrastructure systems.
- > Using the infrastructure life cycle as a basis for the needs assessment and prioritized roadmap of adaptation options encourages a holistic approach to embedding climate resilience throughout an infrastructure asset's life, not just at one or two key stages.

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