Resilient Transport Strategic Assessment for Dar es Salaam

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Aim of the project

The project aimed to assist transportation planners and investors in identifying and addressing current and potential future flood risks to existing infrastructure and planned investments in Dar es Salaam's Bus Rapid Transit. The project included the following aspects:

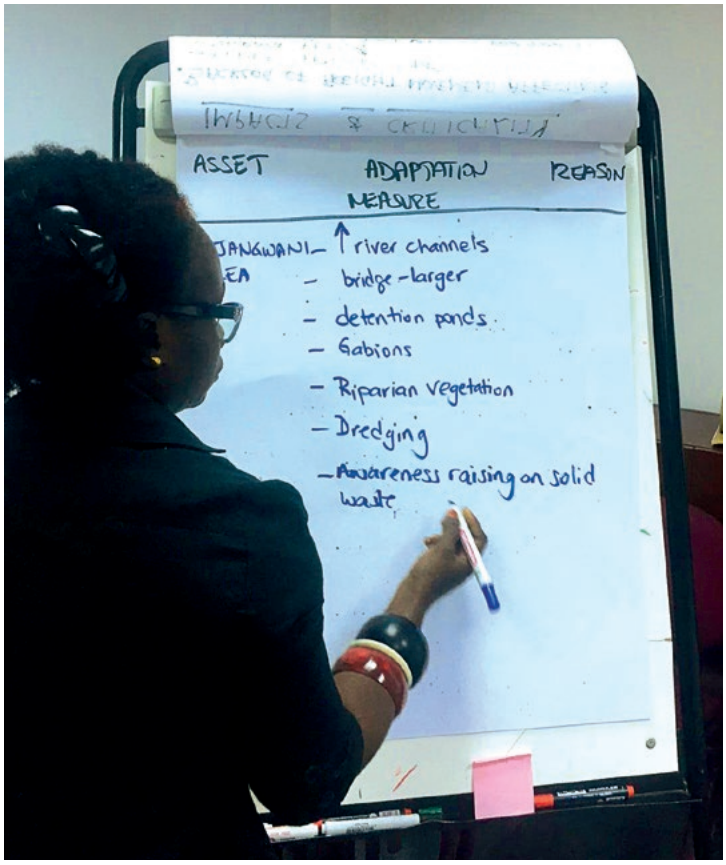
- Assessing the current and future climate vulnerability of the existing transport infrastructure to flooding in Dar es Salaam under a broad range of potential future conditions.
- Identifying immediate and cost-effective adaptation solutions to increase the robustness of the new BRT system's operational elements as well as the port access roads.

Dates

October 2016–February 2019

Countries

Tanzania



Stakeholders identified a range of adaptation measures to address priority vulnerabilities. *(Source: ICF, 2018)*

Aim of co-production:

The co-production aimed to connect relevant decision-makers and experts in order to consider the ramifications of climate change and consequent flooding impacts on Dar es Salaam's Bus Rapid Transit (BRT) network and services currently, and in the future, and identify adaptation solutions. Co-production included the following aspects:

- Validating and enhancing the flood risk modelling by incorporating local knowledge of historical flood extent and duration.
- Improving information on specific flood impacts on transportation services.
- Improving information on broader economic and social impacts when roads become impassable.
- Identifying and evaluating adaptation measures to mitigate flood risk.

The co-production process attempted to guide stakeholders along the path from assessing vulnerabilities, to identifying and evaluating adaptation measures, to the practical integration of these measures into transport planning. Close collaboration with stakeholders throughout the project was intended to build capacity for thinking through climate impacts and adaptation approaches, and was intended to build buy-in for implementing adaptation measures and addressing flood risk.

Context:

The co-production was done at the level of the project, which was at the scale of Dar es Salaam's transport network. The co-production process was highly collaborative and involved two intensive, interactive workshops involving a broad range of stakeholders. The co-production process and overarching project were essential for helping BRT stakeholders make decisions around BRT investment priorities related to climate resilience.

Who was involved and what were their roles?

The World Bank initiated, managed and funded the project, including the co-production process, over a two-year period. Climate and flood risk management consultants (ICF and COWI) acted as intermediaries in designing and facilitating workshops with stakeholders, translating technical climate change projections into decision-relevant information, and facilitating feedback on impacts, criticalities, and effective adaptation strategies.

The co-production process brought together transportation and city planners, transportation engineers, disaster risk managers, climate scientists, and flood risk managers, among others. Specifically, key actors included: Dar es Salaam Rapid Transit (DART) Agency; the **World Bank**; Tanzania National Roads Agency (TANROADS); Dar es Salaam City Council (DCC); Tanzania Port Authority (TPA); Ministry of Works, Transport and Communication (MOWTC); Vice President's Office (VPO); Ministry of Lands, Housing and Human Settlements Development (MLHHSD); consulting and engineering firms **ICF**,

What was co-produced?

- **Recommendations to increase climate resilience:** Recommendations on near-term actions to increase the resilience of the BRT system's assets, which are presently vulnerable to floods and hence to frequent disruptions, were co-produced.
- **Recommendations to incorporate climate resilience in the future**: Recommendations on how to incorporate climate resilience into the design of BRT lines under planning were co-produced.

Benefits of the co-production approach

- The greatest benefit of the co-production approach is the improved ability of transportation managers, planners and investors to conduct transport planning that is informed by flood risk maps that incorporate climate projections. The flood risk maps and transportation assessment allowed for the identification of areas at high risk, and an understanding of key flood risk management strategies.
- The co-production of information created the most value within two phases: (i) the multi-stakeholder interpretation and ground-truthing phase; and (ii) communication. Within these two phases, co-exploring knowledge from climate scientists and decision-makers improved the knowledge of flood risk extent and impacts, critical transportation nodes, current levels of adaptive capacity, and identified adaptation priorities which will serve as a basis for enhancing the resilience of the BRT system.
- All parties benefited from the co-production, as the process enhanced the resulting products as well as the capacity of local stakeholders to adapt to climate change.

COWI and Ecorys; President's Office – Regional Administration and Local Government (PO-RALG). ICF also engaged the Tanzania Meteorological Agency at the outset of the project to discuss historical flood risks, and to gather historical precipitation data.

How was co-production done?

The co-production method is designed to produce more useable climate information and to tailor scientific information to the decision-making context through regular consultation between climate information providers and transportation planners.

Identify key actors and build partnerships; build common ground; co-explore need

The co-production process brought together organisations with a stake in the BRT system – including investors, operators, city planners – and those with specific relevant expertise – including disaster risk managers and engineers – who could contribute to the identification of critical road segments, assets and areas at risk, and to the prioritisation of solutions to address these risks. These actors were identified by the DART agency.

Co-develop solutions

The co-production approach involved developing climate data. This was done through retrieving historical climate data and using stakeholders' local knowledge to map areas at risk of flooding. Multiple stakeholders were involved to validate and further develop the findings, including direct impacts to transport infrastructure and services, identification of critical transportation links, and broader social and economic impacts resulting from transport disruption. Stakeholders were engaged in order to identify plausible strategies to mitigate flood impacts to critical BRT assets and services.

Co-deliver solutions

The co-production approach involved communicating with stakeholders in order to increase their awareness of potential climate change impacts on transport, and the types of response measures, thereby building local stakeholders' capacity to undertake adaptation.

Lessons to learn from:

- **Establishing relationships and buy-in takes time**: Stakeholder consultations were limited, in part due to competing priorities, which required modifying the engagement strategy to focus as much as possible on eliciting feedback on risks and adaptation measures, and less on providing lengthy background information on the approach or on climate change.
- **Flexibility should be anticipated in project design and approach:** Building in flexibility into the approach can be challenging, as it can alter project scope, including timing and cost. At the same time, in order to be responsive to stakeholder needs or availability, and data constraints, flexibility must be built into the process. In the case of this project, stakeholders wanted information beyond what the models provided, which resulted in additional analysis, but more useful information.
- **Making better decisions in the face of uncertainty**: While it can appear daunting to make sense of uncertain climate change information in decision-making, stakeholders were able to partially bridge this gap given their experience with current flood risk. The idea that future flood risks may change was not a barrier for stakeholders, but rather seemed to be best interpreted as an opportunity to improve resilience of both current and future infrastructure.

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