ANNUAL REPORT 2020

TANZANIA URBAN RESILIENCE PROGRAM

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Tanzania Urban Resilience Program 2020

“In Tanzania, disasters stop us from achieving sustainable development. With science and innovation, we can make our people, city, and country more resilient for future generations.”

Hon. Josephat Kandege, Deputy Minister,
Presidents Office - Regional Administration and Local Government

TANZANIA URBAN RESILIENCE PROGRAMME

WORLD BANK GROUP

UKaid from the British people

Tanzania Urban Resilience Program (TURP) was established in 2016 from a partnership between the Foreign, Commonwealth and Development Office (FCDO) of the UK Government and the World Bank to support the Government of Tanzania in its endeavor to increase resilience to climate and disaster risk.

This publication is available at:
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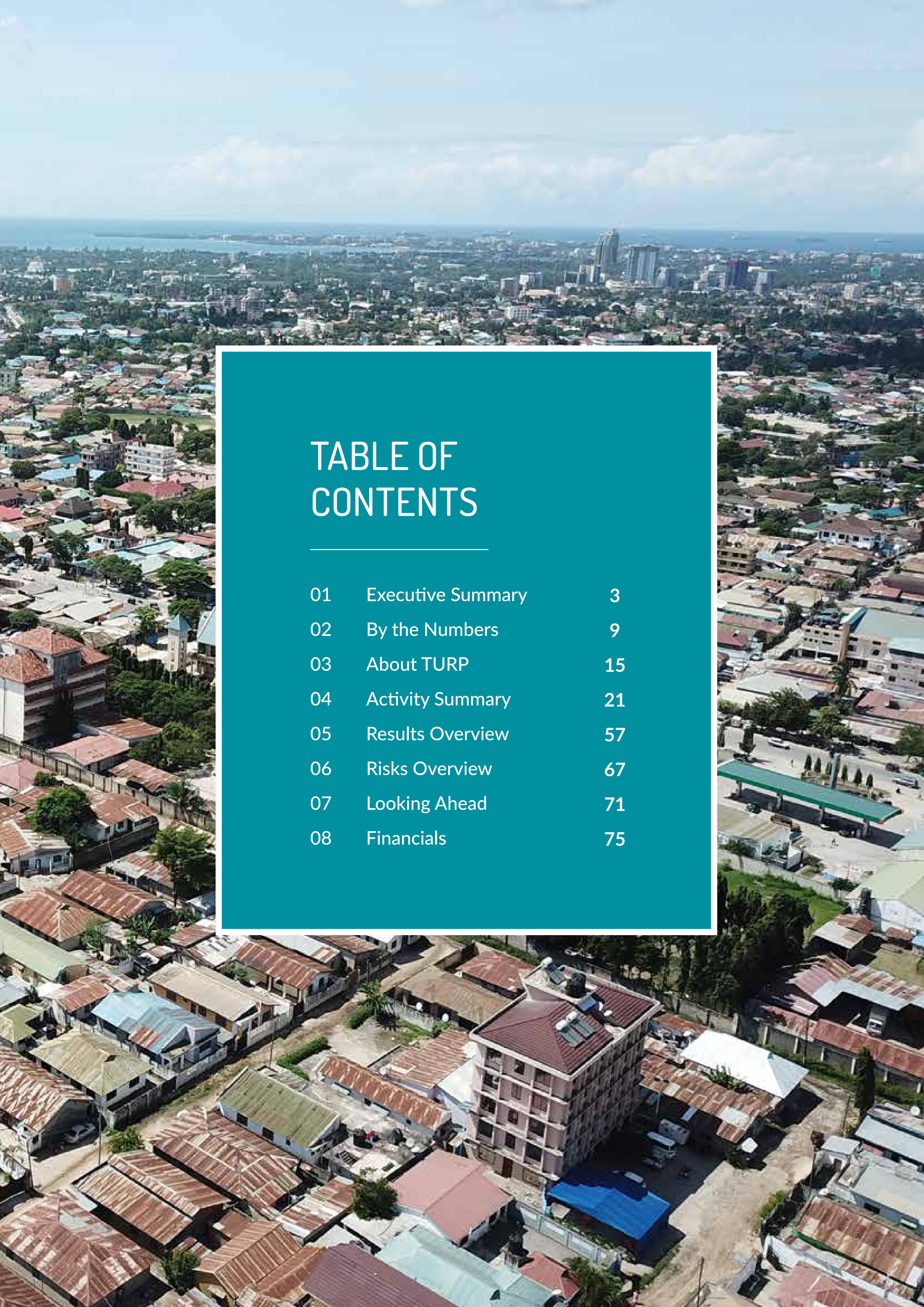

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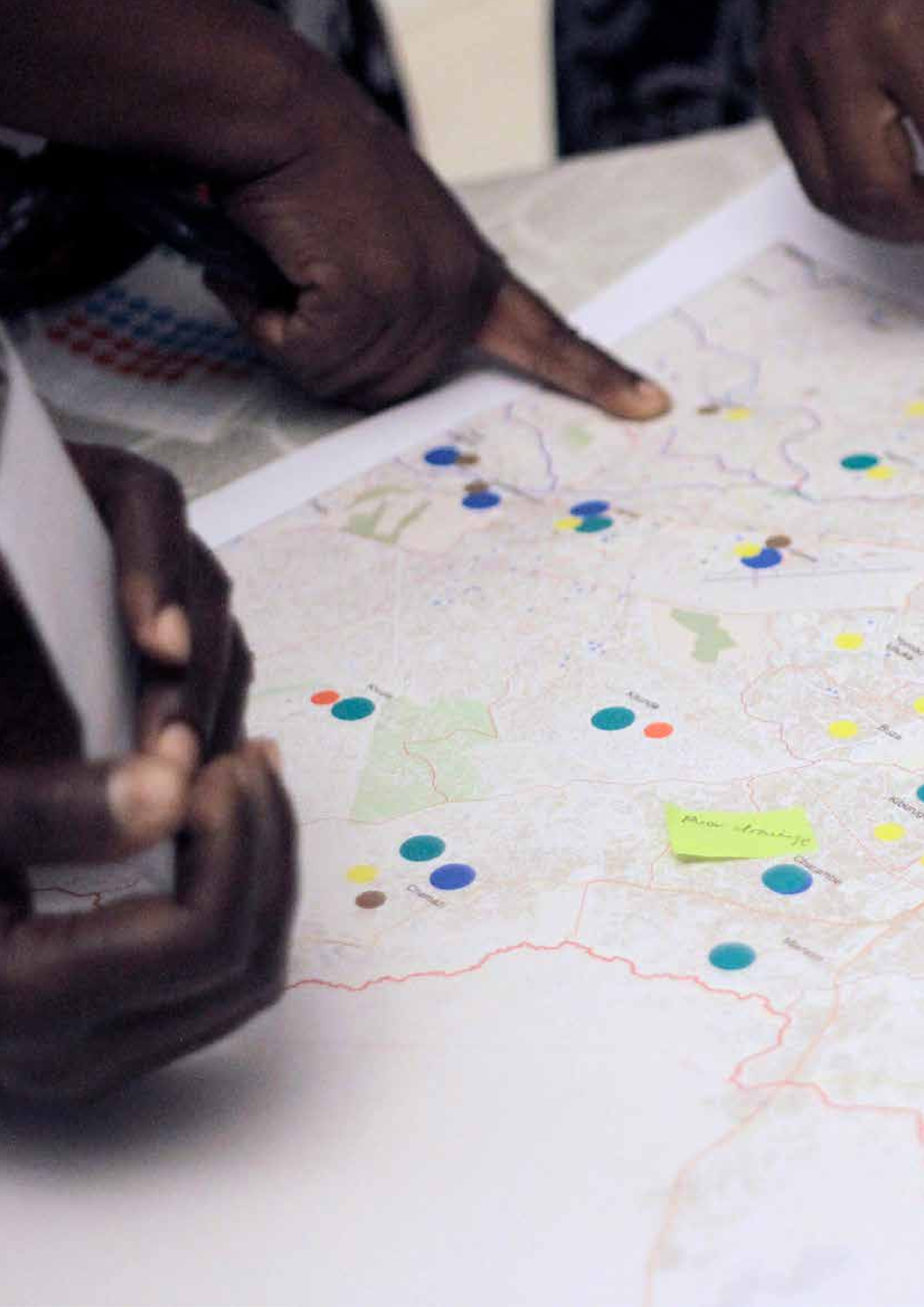
ACRONYMS

AAL	Average Annual Loss
AI	Artificial Intelligence
BRT	Bus Rapid Transit
CRD	Climate Risk Database
DarMAERT	Dar es Salaam Multi-Agency Emergency Response Team
DART	Dar es Salaam Rapid Transit Agency
DMD	Disaster Management Department
DRM	Disaster Risk Management
DRMI	Disaster Risk Management Index
DRRP	Disaster Risk Reduction Plan
DSM	Digital Surface Model
DTM	Digital Terrain Model
EMI	Earthquakes and Megacities Initiative
EMIS	Emergency Management Information System
EOC	Emergency Operation Center
EP&R	Emergency Preparedness and Response
ERF	Emergency Response Function
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
EWS	Early Warning System
FCDO	Foreign, Commonwealth & Development Office, Government of the United Kingdom
FY	Fiscal Year
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GIS	Geographic Information System
GoT	The Government of Tanzania
IEC	Information, Education and Communication
ICF	Investment Climate Facility
KPI	Key Performance Indicator
M&E	Monitoring and Evaluation
MoH	Ministry of Health
MOP	Msimbazi Opportunity Plan
MoU	Memorandum of Understanding
MoWI	Ministry of Water and Irrigation
MSc	Master of Science
PO-RALG	President's Office – Regional Administration and Local Government
PMO-DMD	Prime Minister's Office - Disaster Management Department
RA	Resilience Academy
RAS	Regional Administrative Secretary
REOI	Request for Expression of Interest
RFP	Request for Proposal
RoGZ	Revolutionary Government of Zanzibar
SWIFT	Survey of Well-being via Instant and Frequent Tracking
SWM	Solid Waste Management
TAHMO	Trans-African Hydro-Meteorological Observatory
TANROADS	Tanzania National Roads Agency
TARURA	Tanzania Rural and Urban Roads Agency
TED	Training, Exercises, and Drills
TEPRP	Tanzania Emergency Preparedness and Response Plan
TF	Trust Fund
TMA	Tanzania Meteorological Authority
ToR	Terms of Reference
TURP	Tanzania Urban Resilience Program
UAV	Unmanned Aerial Vehicle
UNICEF	United Nations Children's Fund
ULGA	Urban Local Government Authority
WBG	Word Bank Group
WHO	World Health Organization



01

EXECUTIVE SUMMARY

Tanzania is experiencing rapid population growth. Its current population of nearly 54 million is expected to reach 100 million by 2040, and the urban population is growing particularly fast. While only about one-third of Tanzanians live in cities today, the urban population is projected to reach 50 percent of its total population by 2030[1]. With an urban population growth rate of around 5.2 percent, Tanzania is today considered among the fastest growing urban populations in the world[2].

Dar es Salaam accounts for around 40 percent of the urban population and is the third fastest growing city in Africa, growing at an average rate of 5.8 percent annually from 2002-2012. It is expected to become a mega city by 2030 with a population over 10 million. However, Dar es Salaam is not the only city that is experiencing rapid growth. Five secondary cities with more than 250,000 people and 30 tertiary cities with less than 250,000 people are growing at an average of 4.1 percent, with wide variation between cities[3].

The breakneck speed of urbanization, compounded by limited planning and constrained investments for critical infrastructure, could have a choking effect on future development. Overall, Tanzanian cities are increasingly vulnerable to disasters and climate-related hazards, with many urban areas having experienced widespread flooding in the recent decades. Of the 62.5 percent of residents living in informal settlements[4], many are occupying hazardous land prone to landslides or flooding issues. With the anticipation of more intense and concentrated rainfall patterns and rising sea levels, climate change impacts will likely exacerbate flood and drought events. This can place significant social and economic stress on cities and households.

To date, the Tanzania Urban Resilience Program (TURP) funded by the Foreign, Commonwealth & Development Office (FCDO) of the U.K. government has demonstrated marked success in its key pillars of Risk Identification, Risk Reduction, Emergency Management and Response, and the Resilience Academy in Dar es Salaam, Mwanza, Tanga, and Zanzibar with total disbursement of US$ 12.3 million as of June 30, 2020.

[1] World Bank Group, Country Partnership Framework for the United Republic of Tanzania, FY18-FY22

[2] Tanzania Urbanisation Laboratory (TULab), 2019. Harnessing Urbanisation for Development: Roadmap for Tanzania's Urban Development Policy. Paper for the Coalition of Urban Transitions. London and Washington DC.

[3] Derived from NBS Census, 2012.

[4] The United Republic of Tanzania, Habitat III National Report, July 2016.

Between July 2019 and June 2020, US$ 3.8 million of program funding, provided by FCDO, was disbursed under TURP's four pillars of implementation:

Activities under Pillar 1, which focuses on innovative methods for the collection and dissemination of actionable climate risk data, continued to support community engagement and mapping to inform risk reduction. A cornerstone of this pillar is the Ramani Huria community mapping project, which completed a second phase in December 2019. Swahili for "Open Map," Ramani Huria supported the development of maps and atlases covering 44 wards in Dar es Salaam. The maps were finalized through shareback sessions with community leaders, which provided an opportunity to train local leaders on map reading and identify areas of intervention in collaboration with the community. A new phase of the project has begun performing data collection in additional municipalities in Dar es Salaam, with a priority on collecting flood history data to inform flood risk evaluation.

Pillar 2, designed to fill gaps in the planning and coordination of risk reduction activities at the city level, produced actionable plans for increasing resilience in FY20. To pragmatically address recurrent flood risk in the Msimbazi Valley, a participatory design process was undertaken in previous fiscal years to develop the Msimbazi Opportunity Plan (MOP). In FY20, activities focused on obtaining the official endorsement of the plan and advancing engagements with various decision makers to implement the plan and develop it as a project. As part of this exercise, a pre-feasibility economic analysis was conducted to assess the economic viability of the proposed investments under the MOP. In addition, multiple coordination meetings were organized between the main stakeholder agencies – The Tanzania National Roads Agency (TANROADs) and the President's Office - Regional Administration and Local Government (PO-RALG) – to help finalize the terms of reference (ToR) for detailed design of the MOP. Design services for the Jangwani bridge has been procured by TANROADs, and PO-RALG is currently finalizing ToR for the rest of MOP investments and will proceed with procurement of design services in the coming few months. One major achievement in FY20 towards the long-term management and sustainability of the Msimbazi Valley was the publication of the Msimbazi Special Area Designation, which will define a clear boundary for the lower Msimbazi and open doors for establishing new management modalities. The completion of the mangrove study and the procurement of sediment monitoring system will also help inform the detailed design for the MOP.

Activities under Pillar 3, which is dedicated to improving emergency management across the country, provided support to emergency preparedness at institutional and community levels. In FY20, significant investments have been made to support operations of the Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT).

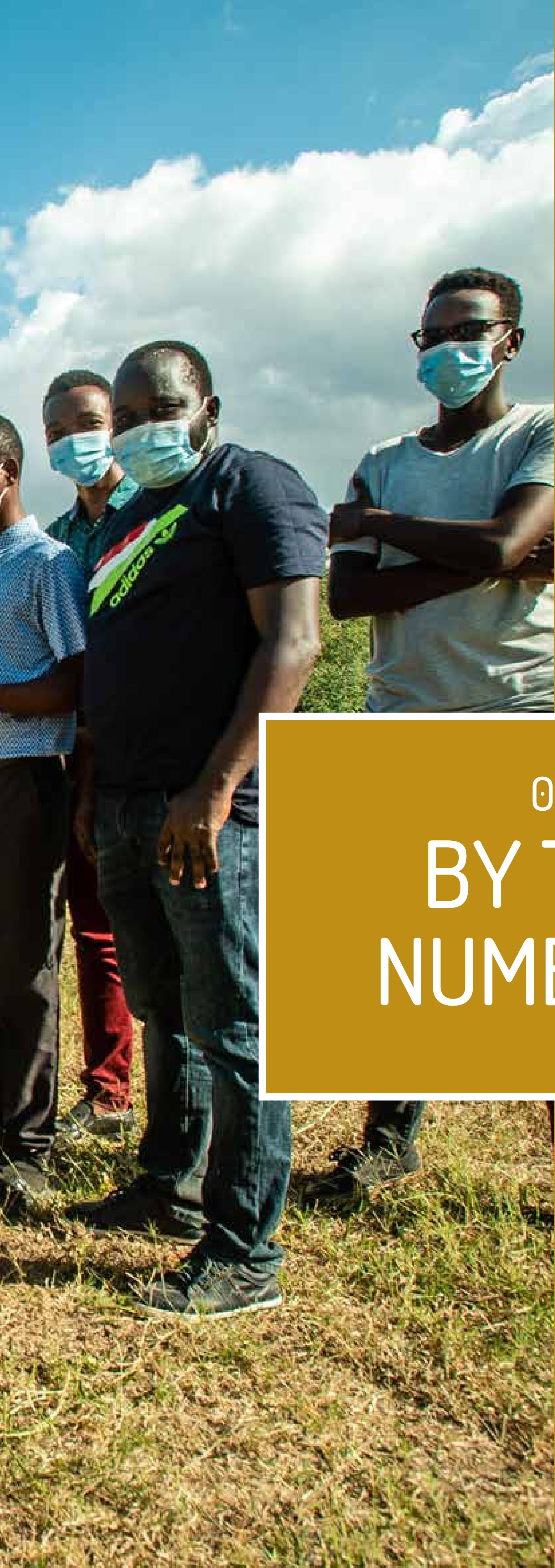
The Training, Exercises, & Drills (TED) program was successfully completed and resulted in the finalization of an Emergency Operations Center (EOC) Handbook, Standard Operating Procedures (SOPs) for the DarMAERT, as well as an updated Emergency Response Plan. An Emergency Management Information System (EMIS) has also been installed for the EOC and activation of the system was instrumental in the dispatching and tracking of ambulances in Dar es Salaam when the city was focused on COVID-19 emergency response.

The updated Emergency Response Plan helped inform the development of a Local Early Warning and Early Action Tool to disseminate warnings and advice to affected communities during emergency events. The Tool was piloted by sending flood alerts during the March-May 2020 rain season. Emergency preparedness has also been enhanced at the community level, where trainings were conducted with Ward Disaster Management Committees from nine wards to develop Disaster Risk Reduction Plans and Disaster Preparedness and Response Plans.

Pillar 4 consists of activities undertaken through the Resilience Academy. This Pillar aims to curate and transfer data, tools, and models of the program to universities and other end-users. In FY20, the Resilience Academy was strengthened through the establishment of a Secretariat consisting of representatives from member universities to guide development of programs as the Academy continues to grow. Training on disaster risk management protocols, theory, practice, and data management has been delivered to more than 200 students. The Climate Risk Database is in final stages of development and now contains more than 70 data points from over 100 users. Overall, engagements supported by the Resilience Academy are contributing to the development of young disaster risk management experts and providing students with exposure to real-world challenges.

As the impacts of the COVID-19 pandemic continue to unfold, TURP has provided critical support to the immediate response in Tanzania. The support to the DarMAERT EOC helped activate the center for COVID-19 response, allowing for better coordination between health workers, rapid response teams, and emergency coordinators and directors across municipalities. Support to DarMAERT also included servicing existing and configuring new communications equipment for staff and volunteers. For local governments, a COVID-19 Resource Planning Toolkit was developed, which identifies specific preventative measures that may be relevant at local level. A contingency plan to support the continuous and safe provision of solid waste management services was also developed. This plan establishes health and safety considerations to workers and flexibility for service provision, which can support continuity of services in the event of floods or disease outbreaks.

TURP has demonstrated marked success in its key pillars of Risk Identification, Risk Reduction, Emergency Management and Response, and the Resilience Academy in Dar es Salaam, Mwanza, Tanga, and Zanzibar. As the Government of Tanzania and the World Bank look toward the next generation of urban projects, a core priority is the mainstreaming of resilience concepts into institutions and physical infrastructure developments, particularly in secondary and tertiary cities. The next set of TURP investments will take the lessons learned so far and apply them to secondary and tertiary cities and explore for opportunities to mainstream the innovative data collection and planning techniques tested and refined under TURP into all investment projects. Strengthening TURP's linkage to upcoming urban development and resilience projects will ensure the scale up and sustainability of TURP investments.



02

BY THE NUMBERS

INNOVATIONS IN RISK IDENTIFICATION

49 wards and 253 sub-wards and 278 individuals engaged in Ramani Huria 2.0 and **200,000** buildings were digitized

500+ trees mapped in Dar es Salaam

25 disaster risk managers trained in Disaster Risk Management Index

**358km², ** covered in 92,000 images through Zanzibar DTM processing

4 Probabilistic Flood Risk Modeling Workshops with 70 participants

COMMUNITY ENGAGEMENT FOR REDUCED RISK

225 members from 12 Ward Disaster Management Committees trained

Determined that Investments in Msimbazi have net positive economic value with approximately **13%** internal rate of return

12 Community Disaster Risk Reduction Plans drafted

400 hectares of land in lower Msimabzi designated as a Special Planning Area

18 plots in Lower Msimabazi sampled to assess of fauna and flora abundance; The study determined 16 hectares of mangrove have been lost since mid-2000 due to heave sediment deposition

STRENGTHENING EMERGENCY RESPONSE

50
emergency radio (VHF) and solar power backup procured and installed at DarMAERT EOC

34
DarMAERT members participated in Training, Exercise and Drills

12
Community Disaster Preparedness and Response Plans drafted

6
video animations and 6 posters created for flood awareness campaigns on flood related drowning and death

51
Government officials and non-government institution representatives trained and conducted the Post Disaster Needs Assessments for Tanga 2019 floods

Early Warning Early Action:

250+ Emergency Actions Digitized and Catalogued; 50+ Communication Contacts Collected; 10+ SMS based Alerts Issued

Emergency Management Information System:

7 Officers Trained, 4+ Technical Workshops

RESILIENCE ACADEMY

71
datasets uploaded to the Climate Risk Database

40+
university courses targeted for resilience learning material

3
academic modules developed

500+
students trained on participatory mapping methods

350
students from 4 universities participated in internship/industrial training programs

104
users have joined Climate Risk Database

12
TURP-related MSc research titles identified

5
universities engaged in partnership

COVID 19 RESPONSE

6
posters and two educational video animations developed

64
emergency communication equipment serviced

2
response planning toolkit/guidelines were developed

38+

Disaster Coordinators, Health Workers, and Ambulance Dispatchers trained to use EMIS

718

water points in Dar es Salaam were tagged and mapped


SMIRNOFF
tigo

03

ABOUT TURP

Tanzania is experiencing rapid population growth. The total population of nearly 54 million is expected to reach 100 million by 2040, and particularly the urban population is growing fast. While only about one-third of Tanzanians live in cities today, by 2030, estimates see the urban population to reach 50 percent of its total population[5].

With an annual urban population growth rate of around 5.2 percent, Tanzania is today considered among the fastest growing urban populations in the world. Tanzania's urban system consists of Dar es Salaam, followed by secondary and tertiary cities with high growth rates. Dar es Salaam alone, with a current population of about 6 million[6] is expected to see an increase to over 10 million residents within the next 15 years[7].

TURP was developed in 2016 with an overall objective of supporting national and local governments of Tanzania in strengthening management of climate risk in cities and enabling climate-resilient urbanization across the country. The program is structured to improve risk identification, systems planning for risk reduction, and coordination and emergency management activities. Engagements in each of these areas and specifically in emergency management have shown greater benefits beyond addressing natural disaster risks and in supporting relevant agencies to respond to the recent COVID-19 outbreak.

The partnership between the Government of Tanzania (GoT), the World Bank, and FCDO to support national and local governments in strengthening management of urban climate risk have established a systematic mainstreaming of risk management principles across government and civil society stakeholders operating at community, municipal, and national levels.

TURP continues to work through a structure of four Pillars to effectively foster engagement and dialogue surrounding urban resilience. These Pillars are:

(1) Risk Identification
(2) Risk Reduction
(3) Emergency Preparedness
(4) The Resilience Academy (RA)

Since March 2020, it has also responded to emerging COVID-19 related threats by engaging closely with Dar es Salaam Multi Agency Emergency Response Team (DarMAERT), the World Health Organization (WHO), the United Nations Children's Fund (UNICEF) and the Ministry of Health (MoH). A steering committee, composed of key stakeholders from the Prime Minister's Office Disaster Management Department (PMO - DMD), the President's Office — Regional Administration and Local Government (PO-RALG), the FCDO, and the World Bank continue to oversee the implementation of projects that fall under these Pillars.

[5] World Bank Group, Country Partnership Framework For the United Republic of Tanzania, FY18-FY22
[6] *https://www.cia.gov/library/publications/the-world-factbook/geos/print_tz.html*
[7] Tanzania Urbanisation Laboratory (TULab), 2019. Harnessing Urbanisation for Development: Roadmap for Tanzania's Urban Development Policy. Paper for the Coalition of Urban Transitions. London and Washington DC.

Higher-level objectives to which the program contributes include:

Increasing Resilience to Climate and Disaster Risk: TURP directly contributes to the GoT's commitment on climate risk management and strengthening climate resilience through adaptation and building human capital. The engagement is aligned with the strategic objectives and interventions in the National Climate Change Strategy, Zanzibar Climate Change Strategy, Disaster Management Act 2015, the Disaster Management Policy, and the Tanzania Emergency Preparedness and Response Plan.

Promoting Shared Prosperity and Ending Extreme Poverty: Climate change and adverse natural events have the greatest impact on the poorest populations who generally live in higher-risk areas and have a diminished capacity to recover from disaster. In the case of Tanzania, even frequent, low-intensity events such as a heavy rainfall can have crippling and cumulative effects on livelihoods and communities of the bottom 40%. Impediments to development gains as a result of climate hazards that particularly impact the poorest communities can be minimized by reducing the exposure to hazardous events and decreasing the vulnerability of the poor to climate disturbances.

Responding to emerging threats: On January 30, 2020, the WHO declared the 2019 coronavirus disease (COVID-19) outbreak a public health emergency of international concern. TURP has participated in the WHO and UNCIEF-led development partner coordination meetings on Risk Communication and Community Engagement, and has closely worked with DarMAERT to support response efforts. TURP has contributed to the overall response in alignment with the World Bank Crisis Response Framework by focusing on risk communication, community engagement, and coordination, which are aligned with the relief stage of the Framework.

DESCRIPTION OF PROGRAM ACTIVITIES

The following is an overview of activities supported by the World Bank through the TURP Trust Fund (TF):

PILLAR 1 – Risk Identification

Pillar 1 supports identification and understanding of climate risk and uncertainty in the local context and enhances coordination between risk management stakeholders. To make decisions that ultimately strengthen physical, social, and financial resilience, a thorough understanding of disaster and climate risks in the local context and their implications is vital. Outputs from this pillar inform decision makers about the risks they face and the drivers of those risks. Pillar 1 also supports open access to comprehensive information on physical and societal exposure to climate risks, which inform implementation of structural and non-structural mitigation measures.

Key activities in under Pillar 1 are the collection and organization of climate risk data as well as the development of visualization tools and risk models. Socioeconomic data include the mapping of people, assets such as houses or critical infrastructure, and urban services and livelihoods. Environmental data and models include the historical data and current monitoring of hydro-meteorological phenomena, the geophysical characteristics of the urban environment such as soil types, land use, and river basin profiles, and application of the best climate models to identify future impacts of climate change.

PILLAR 2 – Risk Reduction

Guided by the data and management tools of Pillar 1, Pillar 2 functions to strengthen cities' capacity to plan for and reduce climate risk using both structural and non-structural measures addressing long-term systemic risk. In partnership with government entities, civil society, and the private sector, activities supported by Pillar 2 focus on the reduction of the vulnerability of people, households, and communities. This is accomplished by providing analysis of measures, such as creating or improving policies and legislation, better land use planning, environmental protection and basin plans, hazard zoning, and the design of risk reduction works, such as drainage upgrades, ponding schemes, slope stabilization, and retrofitting or reinforcement programs.

The activities support communities and various authorities with the development of a pipeline of investments to reduce urban risk. These investments support the resilience of critical infrastructure, and specifically target measures aimed at protecting priority river basins and improving flood management infrastructure.

PILLAR 3 – Disaster Preparedness and Emergency Management

Pillar 3 supports stakeholders to effectively prepare for and respond to disaster events and emergency scenarios. Also guided by Pillar 1 data, Pillar 3 uses risk information to establish best practices on identifying vulnerable groups, preparing emergency response plans, establishing operations centers, and designing Early Warning Systems (EWSs). It also supports capacity assessment including requirements for equipment, tools, and infrastructure, and simulations, drills, and damage assessment capacities. Stakeholders in this Pillar support activities to improve civil protection, disaster management, community coordination for response, and recovery.

Although initially the focus of this Pillar was on strengthening of emergency management and preparedness to respond to climate and natural disaster risks, the Pillar is now also addressing multi-hazard risks including health related emergencies to provide a more comprehensive technical assistance to relevant agencies and stakeholders.

PILLAR 4 – Resilience Academy

The Resilience Academy aims to equip young people with the tools, knowledge, and skills to address Tanzania's urban challenges and ensure resilient urban development. The Resilience Academy is anchored in Tanzanian universities and training institutes to deliver digital curricula, practical experience, training placements and courses, and equipment to support surveying, maintenance, risk monitoring, and research and analysis activities. The objective of the Resilience Academy is to ensure the transfer of skills and tools developed through TURP and to build partnerships between academia and practitioners.

The program works through four major areas including internship programs, development of e-learning materials, curation of climate risk data, and research and innovation. The internship program engages Tanzanian university students in 8-week trainings in digital geospatial data collection to narrow the data gap for informed resilience planning and management in cities. The program also gathers and shares educational materials for e-learning of practical data and analysis skills. The data repository work is aimed at transferring datasets and risk analysis tools to university programs and ensuring its free and open use. Finally, the Resilience Academy also collaborates with universities to advance practical research and provide technical support to graduate students.


Pendo tuvuke haraka tuwahi namba shuleni. Tutachapwa fimbo tukichelewa!!!!
NYIE WATOTO MSIVUKE!! BORA MCHELEWE KULIKO KUHATARISHA UHAI WENU

04 ACTIVITY SUMMARY

PILLAR 1
RISK IDENTIFICATION

Objective

To strengthen the identification and understanding of climate risk and uncertainty in the local context.

Overview of Progress

Activities under Pillar 1 continued to play an important role over the course of FY20. The Ramani Huria community mapping methodology has been expanded to Tanga, Mwanza and Zanzibar. The scope of work has been expanded from flood resilience to cover a broader set of data needed for sustainable area-based urban planning and upgrading, urban greening and rockfall mapping. The probabilistic flood risk assessment has been launched, which is utilizing and applying data collected in the program. Some of the activities under Pillar 1 were delayed for several months towards the end of the fiscal year because of the COVID-19 pandemic but have since resumed under COVID-19 protective guidelines.

In the next few years, it is expected that data collected under Pillar 1 will increasingly be used to inform urban upgrading, disaster risk management or climate adaptation projects Dar es Salaam, Zanzibar and other secondary and tertiary cities in Tanzania.

ACTIVITY	STATUS	PROGRESS
Community Mapping - Ramani Huria 2.0	**COMPLETED**	The large-scale community mapping project, covering 44 wards in Dar es Salaam, was finalized in December 2019. Final maps and atlases were shared with ward and subward leaders across the city (see Spotlight story).
Community Mapping - Ramani Huria 2.5	**ONGOING**	The Ramani Huria activities were expanded to collect data at smaller scale in the municipalities of Kigamboni and Temeke, which were not mapped under Ramani Huria 2.0.
Dar es Salaam and Zanzibar City Probabilistic Flood Risk Modeling and Evaluation	**ONGOING**	Tender was awarded in December 2019 and the consortium consisting of Deltares Research Institute, Oxford Policy Management and Upande held an inception workshop in Dar es Salaam and Zanzibar city in February 2020. The implementation was delayed by several months due to inability to conduct use-case workshops due to COVID-19.
Risk Management Index & Updates	**ONGOING**	A two-day workshop was conducted with 26 disaster risk managers to provide an orientation to the Disaster Risk Management Index (DRMI) toolkit and a revised DRMI was scored for all five municipalities.
Mwanza Urban Risks Mapping	**ONGOING**	A consortium was selected and introduced to the Regional Commissioner's office in Mwanza in June 2020, the inception report has been delivered, and mapping work has begun.
Hydrological Study and Monitoring	**ONGOING**	Testing and validation of the TAHMO weather stations has been done with Tanzania Meteorological Authority (TMA) field engineers at Kibaha weather observatory.
Spatial Data Management and Hosting	**ONGOING**	Turku University has hired a digital assets manager in charge of data quality of TURP data sets and established data management protocols to be applied in data acquisition.
Area Based Urban Studies Zanzibar	**ONGOING**	The Terms of Reference was split to two activities: mapping and flood hazard assessment. The mapping component has been awarded and the inception report has been finalized. The flood hazard assessment is being conducted through internal consultants. The third activity of developing recommendations on integrated and sustainable urban upgrading will commence after the first two activities are completed.
Tree Mapping Pilot	**ONGOING**	Methodology report finalized, backend and app upgrade finalized. Phase II is on hold due to COVID-19.
Processing of Digital Terrain Models (DTM) from Unmanned Aerial Vehicles	**ONGOING**	Firm contracted to produce terrain imagery for Zanzibar City and Unguja. The output will be one of the largest sets of DTM data produced in the region from drone photogrammetry survey.
Developing Summary Note on Comprehensive Sediment Management and Conducting Sediment Monitoring Study	**ONGOING**	Sediment Management Summary Note is completed. Contract is issued to TAHMO for installation of the sediment monitoring equipment. Fieldwork delayed because of COVID-19. The revised plan is for TAHMO to support the installation remotely from the Netherlands in FY21.

Community Mapping - Ramani Huria 2.0

The Ramani Huria community mapping project started in June 2017 and spanned over two years, during which hundreds of students were trained in using open and accessible mapping methodologies. The final report was delivered in December 2019 by the Humanitarian OpenStreetMap Team. The project was finalized through community shareback sessions, where the maps and atlases that were produced under the project were shared with (sub)ward offices in the 44 wards (See Spotlight Story Pillar 1).

Community Mapping - Ramani Huria 2.5

Following Ramani Huria 2.0, Humanitarian OpenStreetMap was contracted in May 2020 to perform additional data collection in Dar es Salaam, notably in the Kigamboni and Temeke municipalities which were not covered by Ramani Huria 2.0. Flood history data to be collected in this project will inform hydrological models in the probabilistic flood risk evaluation (see below). However, field work activities were put on hold due to the COVID-19 pandemic and are expected to commence in FY21.

Dar es Salaam and Zanzibar City Probabilistic Flood Risk Modeling and Evaluation

A consortium consisting of Deltares, Upande and Oxford Policy Management was selected in December 2019 to perform city-wide flood risk assessments of Dar es Salaam and Zanzibar City. The primary objective of the project is to develop a probabilistic flood hazard model for both cities by quantifying flood risks from all sources of flooding, including pluvial, fluvial and any coastal flooding or tidal influence. The project will also develop suitable, versatile and effective data visualization and spatial analysis tools within a dashboard platform.

The dashboard will serve as a tool to support the ongoing efforts of the World Bank and GoT in reducing the negative impacts of flooding through the provision of visualized data, information and analysis. The inception phase commenced in February 2020 and initial consultation workshops were held with 34 stakeholders in Dar es Salaam and 28 in Zanzibar City to introduce the project. A mapping session was held with stakeholders to establish a flood narrative for the areas of interest, which encompasses a qualitative understanding of where flooding occurs, what exposed assets or communities exist (including livelihoods, infrastructure and critical infrastructure) and qualitatively to what level these are vulnerable to flooding. The following workshop on user requirements was delayed because of COVID-19 and was recently completed through multiple smaller virtual focus-group workshops to ensure safety of participants.

Risk Management Index & Updates

Since 2018, the World Bank has worked with the Earthquakes and Megacities Initiative (EMI) to develop and apply a Disaster Risk Management Index (DRMI) in the Dar es Salaam region for the years 2018, 2019 and 2020. In partnership with Ardhi University, EMI developed and applied a DRMI Reference Handbook and software application for the comprehensive assessment of institutional capacities and performance to identify, manage and finance disaster risk reduction strategies in the Dar es Salaam region. The software platform further allows for a comprehensive assessment of institutional capacities in DRM and the performance of the Dar es Salaam region in urban disaster resilience.

During FY20, the DRMI Reference Handbook and software platform were finalized and utilized to conduct DRMI assessments in five municipalities. Additionally, a series of workshops were held with 25 representatives from Municipal Councils, DarMAERT, Core Group members, and other participants to present the DRMI Reference Handbook and software system and ensure the sustainability of the toolkit. A training program on implementation and customization of the DRMI toolkit for further applications was also delivered to key government institutions.

"The handbook serves as an action plan to our municipality as it has key activities set for each department during disaster."

Suzan Philemon Swai, Municipal Disaster Coordinator, Kigamboni Municipal Council

Mwanza Urban Risks Mapping

Building upon the Ramani Huria project in Dar es Salaam, community mapping activities expanded to Mwanza in the second half of FY20. The objective of this project is to design, train and manage mapping campaigns in Mwanza to help generate up-to-date, open, and accurate exposure data actionable for flood risk modelling and flood scenario generation purposes. A consortium consisting of the Humanitarian OpenStreetMap Team and Spatial Collective was hired in May 2020, and a kick-off meeting was conducted in June with all stakeholders. The activity will involve training students from the Institute of Rural Development Planning, Saint Augustine University of Tanzania, government officials, and community members of flood prone wards in Ilemela and Nyamangana municipalities. Government counterparts in this project are Mwanza Regional Commissioner's office, Ministry of Land's lake zone office, Ilemela and Nyamangana municipal councils, Lake Victoria Basin Water Board and Tanzania Rural and Urban Roads Agency (TARURA).

The project will build upon previous knowledge on community mapping practices developed through TURP, with an emphasis on using low-cost technology to demonstrate how locally accessible tools and devices can be used to produce high-quality spatial information and support resilience building and planning

This data is intended to support local authorities by informing planning and preparedness actions and socio-economic exposure analysis of the TURP flood risk assessment for Mwanza city. The project will produce high-quality, ground truth spatial information and urban risks data for selected wards in Ilemela and Nyamangana municipalities, focusing on four core mapping campaigns:

i) Digitization services for 2020 building exposure updates

ii) Drainage infrastructure and river mapping

iii) Participatory Mapping of Unplanned Communities

iv) Household flood and rockfall historical incidents mapping.

The project is in the stage of reviewing the inception report. The Consortium was introduced to the Regional Commissioner's office in June 2020 and is projected to proceed with training of students and government officials during the first half of FY21.

"This project is good for us, as the nature of Mwanza is hills and we need data for the design and implementation of drainage. So far, we only have data on the number of culverts, so we are interested in collecting geolocation data for each culvert like point features."

Eng. Jane Mdula - Road Engineer, TARURA

Hydrological Study and Monitoring

TURP contracted the Delft University of Technology in FY19 to demonstrate and deploy weather stations through the Trans-African HydroMeteorological Observatory (TAHMO) project to enhance the monitoring capacity of the PMO-DMD and the Ministry of Water and Irrigation (MoWI) of the GoT. Through the project, a total of 9 ATMOS 41 All-in-One Weather Stations have been installed. Additionally, ECRN-100 Rain gauges and Em60G Data Loggers have been set up at Msimbazi valley and Kibaha. Two Ijinus Ultrasonic sensors and one Sommer RQ30 Radar Sensor were also installed in Ubungo. In FY20, testing and validation of the TAHMO weather stations was completed by Tanzania Meteorological Authority (TMA) field engineers at Kibaha weather observatory. A number of discussions were also conducted on the long-term use and sustainability of the equipment. Given that all equipment are new to TMA, it was agreed that a periodic validation process will be conducted in selected sites to ensure data quality. The modality of these validation exercises will be finalized in FY21.

Spatial Data Management and Hosting

In FY20, activities to support the Climate Risk Database (CRD) focused on conducting quality reviews and data clean-up for content as well as metadata of the datasets. New layers have been uploaded when collected through TURP projects or discovered from other relevant sources. The CRD, hosted by the Resilience Academy under TURP, now includes 71 raster and vector layers representing phenomena in both Dar es Salaam and Zanzibar. In addition to enhancing the content, the database platform itself has also been improved to enhance user experience.

Through this project, procedures for creating geospatial data standards and for importing data to the database have been developed. The roles and responsibilities of the data providers, CRD data managers and the service platform has also been well defined. All information is also being integrated to the online learning platform that provides open-access learning opportunities for university students, in courses varying from GeoNode platform development to quality issues of geospatial data.

Area Based Urban Studies Zanzibar

Nungwi is one of the fast-growing villages in Zanzibar with high potential for tourism growth. While the beach fronts are well developed, the village lacks basic urban infrastructure. This study aims to produce base maps and spatial data to better understand the physical environment of Nungwi, which is critical to fulfil Nungwi's potential to grow into a well-planned, economically viable, and sustainable town. At the same time, the study intends to improve digital skills and create job opportunities for Zanzibari youth by engaging students to support map development through industrial training at the State University of Zanzibar. The study is intended to help support more integrated and sustainable urban development by understanding and integrating the physical features of the village and the climate risk of the area to develop viable recommendations for area-based urban upgrading works. The immediate tasks were split to two sub-activities: mapping and flood hazard assessment. The mapping activity is intended to use low-cost technology drawing on previous knowledge on community mapping and open-source digital spatial data collection produced through TURP. The contract for this activity has been awarded and inception report finalized. The flood hazard assessment is being conducted through internal consultants. The third activity of developing recommendation on integrated and sustainable urban upgrading will commence after the first two activities are completed.

Tree Mapping Pilot

This project aims to achieve two objectives in parallel: i) develop a replicable, open source and cost-effective workflow for mapping trees using locally available smartphones to establish and manage an urban tree database and, and ii) help track and quantify trees and greening efforts in Dar es Salaam to inform urban forest management. Once complete, a full map of all trees in the city will be available. The data collection process involves photographing and defining attributes about each tree, including: geopoint (geospatial location of the tree); species; tree health; and proximity of tree to electricity, roads, and structures. Tree height was identified as an important data point for several improved urban forestry management practices, however, given the lack of clinometers, smartphones, photos, and free software were used to develop a method to accurately measure tree height.

In FY20, tree mapping was conducted on a pilot scale in Mikocheni, Dar es Salaam, where 561 trees were mapped with the attributes identified above. Areas around Morogoro Town and Sokoine University of Agriculture have been identified as the next location to be mapped. The full subward-level mapping pilot of Dar es Salaam has been postponed due to the COVID-19 pandemic.

Processing of Digital Terrain Models from Unmanned Aerial Vehicles

TURP contracted Cleveland Metroparks to create highly accurate Digital Terrain Models (DTMs) from photogrammetry to be used for both the probabilistic flood risk assessment of Zanzibar City and the Area-Based Urban Studies in Nungwi. This is a promising, low-cost approach to producing aerial imagery through drones, and subsequently deriving terrain information. Terrain data for the entire area of Zanzibar City and the northern part of Unguja at Nungwi area will be available. Given the sheer size of the data, there were several challenges of processing the data that caused some delays in project execution.

Sediment Monitoring Study

The sustainable management of floods in the Msimbazi river basin cannot be achieved without a thorough understanding of the role of geomorphological processes along the river. This sub-project aims to precisely quantify sediment loads and rates of sedimentation through regular surveying, sampling of sediments and continuous monitoring of flows and sediment loads in the Msimbazi. The produced data will inform geomorphological modelling of the river by providing calibration data to the previously developed model in order to understand how the river system functions, and what the impact of proposed interventions will be. In FY20, the contract to begin this work was awarded to TAHMO and the necessary equipment for the project, such as sediment samplers, cameras and water level sensors, was procured. However, the launch of the project, including shipping and installation of the equipment, has been delayed because of COVID-19 related flight interruptions. The equipment—5 weather stations and 6 water level stations—is expected to arrive in Tanzania in October 2020 to be installed with support of TAHMO field engineers.

SPOTLIGHT STORY

In December 2019, the Ramani Huria team conducted sharebacks, which are organized meetings to share with community leaders and members all data collected by Ramani Huria to be used by first responders to flooding at the community level. The shareback process involved community and local leaders who had the opportunity to be trained on map reading, identifying affected areas on the map, and possible uses of maps for their benefit. Communities were also trained in how to access the maps online and how to update information on the map by using the mobile application, Maps.me.

After years of data collection, processing, validation, and visualizations, the results of the community mapping were given back to the community members themselves, so they can make decisions about how they respond to flooding issues. Each community received two maps: wards received two A1-sized maps (one with aerial imagery and one with OpenStreetMap), and subwards received two A2-sized maps (one aerial imagery and one with OpenStreetMap). Maps were printed on imported polyart synthetic paper, which consists of a high-density polyethylene film coat, making it both water and tear resistant.

Sharebacks were conducted in four municipalities in Dar es Salaam that are affected by both pluvial and fluvial flooding.

District	Number of Wards and Subwards
Ilala	21 wards, 90 subwards
Kinondoni	15 wards, 77 subwards
Temeke	2 wards, 16 subwards
Ubungo	11 wards, 70 subwards

TOTAL: 49 wards and 253 subwards received maps and training

A total of 278 individuals participated (41% female, 59% male). Based on a survey taken after the sharebacks, 91% of community members found them to be useful.

Shareback sessions in Segerea Subward, December 2019

During the shareback sessions, community members provided insights and comments on the maps, including additional information that they thought would be beneficial to their community. The team then cleaned the data based on community feedback such as names, flooding zones, and new assets on the grounds. In total, 250 maps were cleaned and reproduced through the shareback sessions.

After the shareback sessions, attendees shared their thoughts about the process and the project in general. The following are some of the quotes from community members and leaders:

"To me, the map is like a mirror. I can see my subward clearly and all services available."

Peter Kika mjumbe Magomeni

"These maps will help in solving land disputes and speed up the economic development by writing proposals - maps being the evidence of the problem."

Johnson, Ada Estate, Kinondoni

Challenges and Lessons Learned

A few notable challenges in Pillar 1 were: COVID-19 fieldwork: Delays and uncertainties were caused for projects that require fieldwork and extensive stakeholder engagement, particularly the probabilistic flood risk assessment. Validation of TAHMO weather stations has been delayed despite multiple engagements to secure certificates for all the stations. The results of the validation process in Kibaha is promising and the next step is to agree on the validation modality for the rest of the stations.

Financials

Pillar 1 projects have disbursed US$ 1,515,425 in FY20, with a total of US$ 4,315,910 since the program started. Financial summaries are detailed in Section 8.

PILLAR 2
RISK REDUCTION MEASURES AND PLANNING

Objective

To strengthen cities' capacity to plan for and reduce climate risk through the use of both structural and non-structural measures addressing long-term systemic risk.

Overview of Progress

Several ongoing activities under Pillar 2 were advanced and completed in FY20. Progress has been made towards better understanding of flood risk problems and reduction in the Msimbazi river basin area. The Msimbazi Opportunity Plan (MOP), which was developed through extensive community engagement and technical inputs, was formally endorsed by stakeholders in August 2019. Several coordination meetings on the MOP were conducted with decision makers throughout the fiscal year to discuss next steps of developing the project. The Msimbazi Special Planning Area order was also published in January 2020, creating a legal boundary of the lower Msimbazi Valley.

Preparatory work also began on optimizing solid waste management (SWM) practices in Zanzibar. Sustainable SWM practices have been identified as a critical intervention to address risks from floods and disease outbreaks as well as to help boost economic activity. Another highlight of Pillar 2 is the development of the Disaster Risk Reduction Plans for 12 wards, which was delayed due to COVID-19, but is now being finalized through virtual workshops.

ACTIVITY	STATUS	PROGRESS
Msimbazi Mangrove Health and Reforestation Potential Assessment	**COMPLETED**	Study completed and delivered to the Government of Tanzania.
Msimbazi Opportunity Plan Pre-Feasibility Economic Analysis	**COMPLETED**	Study completed and presented and shared with TANROADS and TARURA.
Msimbazi Special Planning Area Designation, Msimbazi Feasibility and Detailed Design, Land Use Planning and Resettlement Framework	**ONGOING**	The Msimbazi Special Planning Area order was published in January 2020, creating a legal boundary of the lower Msimbazi Valley. After long pause, the procurement process for the Jangwani bridge design was completed by TANROADS. The finalization of ToR and procurement of the feasibility and detailed design for the comprehensive Msimbazi Opportunity Plan is underway by PO-RALG. Initial analysis on land use and real estate market potential of the use of reclaimed terraces has been advanced.
Solid Waste Management in Zanzibar	**INITIAL STAGES**	The study is currently under procurement. A Request for Expression of Interest (REOI) was published and 5 firms have been shortlisted. Additional consultations are currently being conducted. The final Request for Proposals (RFP) will be published in October 2020 and the study is expected to be completed in FY21.
Community Disaster Risk Reduction Plan	**ONGOING**	12 Ward Disaster Management Committees trained on development of Community Disaster Risk Reduction Plans.

Msimbazi Mangrove Health and Restoration Potential Assessment

This technical assistance has supported the GoT with providing up-to-date information on mangrove extent, health, cover changes and vulnerability to anthropogenic pressures, and informing about management strategies and plans in the lower, middle and upper Msimbazi river basin and surrounding community. The study has been completed, and a detailed management plan has been provided to the GoT to support the MOP. The report and plan focus on five strategic areas:

- Determining the key ecological and physical parameters under which the mangrove ecosystem can prosper in the area (soil and water quality, water quantity, sediments, nutrients, others);
- Defining thresholds that would impede mangrove growth;
- Determining the highest potential of mangrove extent/cover under improved circumstances using the flood models and health data;
- Identifying where mangroves can be restored and/or replanted in the lower Msimbazi basin; and
- Recommending management strategies (in the upper middle and lower basin sections) that could help improve the habitat status in the lower Msimbazi river.

The report and data will be used in the detailed design of the final MOP and will be used in the future development of a management framework for the area.

Msimbazi Opportunity Plan Pre-Feasibility Economic Analysis

An economic evaluation was conducted to estimate the value-for-money of the project investments identified under the MOP. The analysis considered various benefit streams including: a) reduction of damages on properties, infrastructure and assets, b) improvement of connectivity along the bridges and roads that cross the river valley, including reduction of damages to the Dar Rapid Transit system depot and bus fleet (DART), and c) better management of sediments transported by the floods and accumulated in the riverbed. The result of the analysis shows that the project is economically viable under various scenarios, with an internal rate of return of 13%, and is expected to bring positive impact on the economic development of Dar es Salaam and on the quality of life of its population.

It is also expected that the project will bring additional benefits that were not quantified in the study, including reduction of waterborne diseases associated with flooding; creation of open spaces for public recreation and for future urban expansion; potential reuse of the sediment taken out from the riverbed; and improvement of the environment.

Msimbazi Special Planning Area Designation, Msimbazi Feasibility and Detailed Design, Land Use Planning and Resettlement Framework

TURP supported a Charrette—a participatory design process—from January to August 2018 involving more than 200 people from 59 institutions and communities across 30 working sessions. Led by PO-RALG, the process yielded the MOP – a comprehensive blueprint for transforming the basin from a flood prone area into a beacon of urban resilience.

The MOP comprehensively addresses all aspects of resilience including environmental, social and economic. The two main outputs from the process are a Strategic Development & Management Framework and a Detailed Plan for the Lower Msimbazi.

During FY20, TURP organized several coordination meetings and workshops to galvanize support from all levels of decision makers and stakeholders in order to bring the concepts and plans in the MOP to fruition. A formal handover of MOP full documents and endorsement was completed in August 2020. Since then, several meetings have been held to advance the preparation of the project. In January 2020, the Msimbazi Special Planning Area was legally established. After a long pause, the procurement process for the Jangwani bridge design is now completed by TANROADS. The finalization of ToR and procurement of the feasibility and detailed design for the comprehensive MOP is underway by PO-RALG. Initial analysis on land use and real estate market potential of the use of reclaimed terraces has been advanced. The study identified 57 hectares of land in the Msimbazi Valley that could be available for development, including space for 14,500 real estate units across a range of typologies, sizes, and places.

Solid Waste Management in Zanzibar

SWM is an essential public service to maintain environmental and human health. Development of sustainable SWM has been identified by the Revolutionary Government of Zanzibar (RGoZ) as critical to help the tourism sector, particularly as the economy recovers from COVID-19. Under the Zanzibar Urban Services Project, the World Bank has supported the RGoZ to develop a SWM Strategy that provides a set of strategic objectives for SWM service improvement. However, there remains a gap of datasets and analysis needed as a basis to implement these objectives. In response, TURP is procuring a consulting firm to conduct a SWM Optimization Study to identify the most viable SWM service chains for urban, peri-urban, urban poor and rural areas in consideration with detailed financing options to assist in establishing an affordable and inclusive SWM service provision to all communities in Zanzibar. The REOI for this study has been published and five firms have been shortlisted. Additional consultations are currently being conducted. The final RFP will be published in October 2020 and the study is expected to be completed in FY21.

The study will make use of Geographic Information Systems (GIS) to analyze complex spatial phenomena related to SWM such as siting of transfer stations and landfills, optimizing the collection/transportation and local forecasting of waste, analyzing the costs for service provision depending on model type, and thus developing a greater understanding of subsidy requirements for servicing peri-urban and rural areas. Such modelling could dramatically enhance the existing capacities within the Zanzibar Urban Municipal Council.

Challenges and Lessons Learned

The main challenges under Pillar 2 continue to be coordination of various stakeholder agencies and municipalities for the development of the MOP project and for developing a long-term management strategy for the newly-designated Msimbazi Special Planning Area.

Financials

Pillar 2 projects have disbursed US$ 562,210 in FY20, with a total of US$ 2,542,215 since the program started. Financial summaries are detailed in Section 8.

PILLAR 3
EMERGENCY MANAGEMENT AND RESPONSE

Objective

To strengthen the capacity of stakeholders involved in short-term disaster events and preparedness to cope with specific emergency scenarios.

Overview of Progress

Activities under Pillar 3 have largely supported DarMAERT with capacity development trainings as well as enhancements to the EOC. In FY20, a new technical assistance was initiated to support the Prime Minister's Office – Disaster Management Department (PMO-DMD) with review of disaster risk management policies and emergency preparedness and response plans. The technical assistance will also extend support to strengthen emergency management capacity of PMO-DMD. TURP also provided technical assistance to DarMAERT and the MoH to respond to the COVID-19 pandemic. Community resilience has also been supported through workshops with local leaders to develop community disaster preparedness response plans.

ACTIVITY	STATUS	PROGRESS
Training, Exercises, & Drills	**COMPLETED**	Training program completed and the 2017 Emergency Response Plan updated.
Emergency Operations Center Support- Structure	**COMPLETED**	EOC Handbook and Standard Operating Procedures (SOP) finalized.
Developing EMIS for EOC	**ONGOING**	EMIS installed and activated. It was also adjusted to help DarMAERT respond to COVID-19.
Community Disaster Preparedness and Response Plan	**ONGOING**	12 Ward Disaster Management Committees trained on development of Community Disaster Preparedness and Response Plans.
Local Early Warning and Early Action Tool	**ONGOING**	Tool developed and tested during Masika rain season.
PDNA and DRF Training	**COMPLETED**	51 participants trained in PDNA and DRF methodologies.
Tanga 2019 Floods PDNA	**ONGOING**	Assessment completed and PDNA report in final stages.
Lessons Learned Exercise for Emergency Preparedness and Response in Tanzania	**COMPLETED**	Workshop conducted with 55 participants to identify lessons learned from 2014/2016 floods.
Strengthening Emergency Preparedness and Response Capacity in DarMaert and PMO-DMD	**ONGOING**	Inception report completed to develop multi-hazard contingency plans including for health-related risks and for review of national disaster risk management policies.
Flood Awareness Campaign	**ONGOING**	Animation and posters created for awareness campaigns on flood-related drowning and deaths. Campaign to be launched next rain season of October - December 2020.

Training, Exercises, and Drills

FY20 saw the implementation of the second and final year of the Training, Exercises and Drills (TED) Program, which has supported the improvement of emergency response capabilities of key agencies that form DarMAERT. The Program was facilitated by an international consulting firm from the Philippines (Earthquakes and Megacities Initiative-EMI) in partnership with Ardhi University from Tanzania.

The TED Program completed six main activities:

I. Designing and implementing a structured training program comprised to build competency in the field of emergency response and recovery;

II. Designing and facilitating a series of exercises and drills aimed at operationalizing and testing the 2017 DarMAERT Emergency Response Plan (ERP);

III. Preparing Standard Operating Procedures for core DarMAERT members;

IV. Developing the structure of the EOC and protocols for its operation and management;

V. Providing suggestions for improving emergency preparedness for effective response and recovery; and

VI. Identifying strengths and challenges in implementation of the DarMAERT ERP and providing suggestions for improvement.

The TED Program consisted of five Field Investigations (FIs), during which four training modules with 34 officials from DarMAERT agencies and organizations were executed. During FY20 three of a total four training modules were delivered. These workshops provided critical co-design inputs into the content and mechanics of each training session, as well as the key deliverables described above. Through write up sessions, DarMAERT revised and updated their 2017 ERP.

The Program closed in May 2020, however, additional activities for strengthening emergency preparedness and response of DarMAERT and PMO-DMD were derived from it and will be implemented through February 2021. Activities are being undertaken by the same international firm (EMI) along with Ardhi University.

"The TED [Program] has brought up the interest of people for emergency management. Through the TED [Program], DarMAERT members have begun to understand more what their job entails and how the organization and its operations can be improved. Now, DarMAERT members are ready to take on another level of training to operationalize and make practical the concepts they learned from Modules 1-4, that is to understand, plan, practice and execute the DarMAERT Emergency Response Plan."

Dr. Christopher Mnzava, DarMAERT former Coordinator

Emergency Operations Centre Support

As part of the TED Program, a proposal for the structure of the EOC and Standard Operating Procedures (SOP) for its operation and management were prepared in the form of two respective Handbooks.

The EOC Handbook establishes physical layout recommendations, operations and management protocols, and protocols for EOC activation, EOC deactivation, and planning and reporting criteria. The Handbook also outlines emergency response functions and Damage Assessment protocols. The Handbook is aligned with international standards and was shaped by a design thinking process throughout a series of trainings, exercises, and drills, which culminated in a catastrophic cyclone and flood-oriented functional exercise for DarMAERT in March 2020.

Preparation of the EOC Handbook was synchronized with development of SOPs for Command and General Staff EOC Positions and Emergency Response Functions and tested during the functional exercise. The SOP Handbook functions as a companion to the EOC Handbook by describing the actions required of individuals who are responsible for setting up, activating and operating the DarMAERT EOC. The SOP Handbook is intended to be a living, organic document meant to be updated and further developed by DarMAERT to ensure that the SOPs remain relevant to those working in the EOC and to any other personnel and/or organization working with DarMAERT for emergency operations.

Proposed DarMAERT EOC Re-Design

"Now it is easy for me to work with Municipalities and other stakeholders. Roles and responsibilities of each stakeholders are well known to everyone. No more duplication of resources."

Grace Mawalla, Regional Coordinator, Tanzania Red Cross Society

Emergency Management Information System for EOC

EMIS is a collaborative technical platform that can facilitate communication, planning, and actions before (to mitigate and prepare), during (to improve response), and after (to aid recovery) a disaster. It consists of components that collectively provide data and tools to process and analyze emergency responses. In FY20, EMIS was installed at the DarMAERT EOC in close consultation with DarMAERT members to ensure that the system addresses their data needs and is fit for context. The system has been used to dispatch and track ambulances and was helpful for DarMAERT's operations as the city was responding to COVID-19. Operationalization and customization of EMIS for day-to-day EOC operations is ongoing.

Community Disaster Preparedness and Response Plan and Community Disaster Risk Reduction Plans

In order to strengthen disaster response capacity and overall community resilience, the Ward Disaster Management Committees were trained on and facilitated to develop their own Disaster Risk Reduction Plans (DRRPs) and Disaster Preparedness and Response Plans (DPRPs). The community led process for developing such plans was first piloted in 3 wards of Kigogo, Kawe and Tandale in FY19. The lessons learned from the pilot were used to improve the process for the additional 9 wards during the roll-out phase between January and March 2020. Trainings included a total of 86 female and 139 male members of the Ward Disaster Management Committees from Kinondoni Municipal Council (Mzimuni, Mwananyamala, Magomeni, Ndugumbi and Mbweni Wards) and Ilala Municipal Council (Jangwani, Vingunguti, Mchikichini and Mnyamani Wards). The DRRPs and DRRPs are drafted. The project end date has been extended from May to December 2020 to allow for community consultation, which was delayed because of COVID-19.

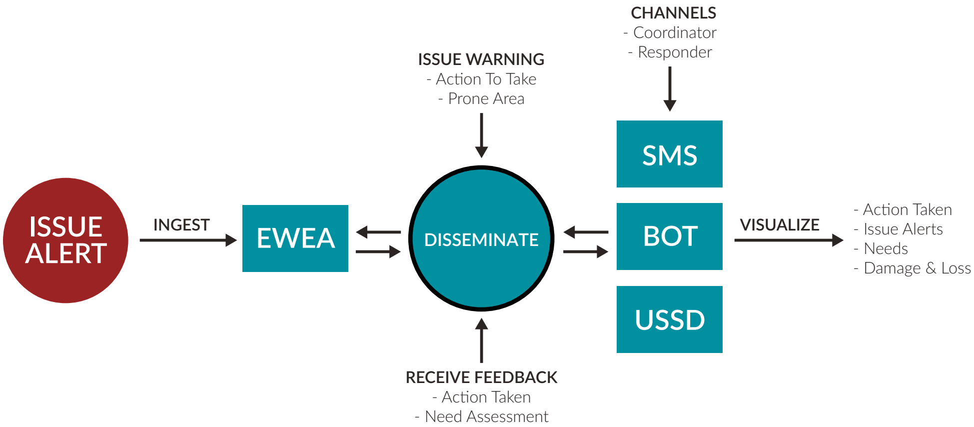
"We are grateful for the training. Before the training, I did not know how we can help communities in disaster risk areas, but after the training I have better awareness of disaster management such as identifying evacuation routes to use and which ward stakeholders we can reach out to for assistance. The training has taught us that we can also take action at the ward level to help communities, and that taking disaster management action should not only be at national level, as we previously thought."

Aisiliza. E. Tibesiguja - Mzimuni Ward Accountant

Local Early Warning and Early Action Tool

This project is supporting the development of Local Early Warning and Early Action Tool to facilitate the dissemination of warnings and associated actions to be taken while also collecting feedback from emergency responders. The tool works by matching alerts issued from trusted sources, such as the Tanzania Meteorological Agency (TMA), with actions to be taken by each responder and then disseminated through SMS. The list of actions is drawn from the 2017 DarMAERT ERP. Feedback from responders regarding needs and whether actions were taken are then collected and analyzed in order to generate insights for local authorities and communities to better manage disasters and increase resilience to disaster risk.

The tool has been tested with a small group of people by sending forecasts and flood alerts during the Masika rain season (mid-March to May 2020). Next, the tool will be operationalized at the EOC during the Vuli rain season (November to mid-January 2020). Since developing the tool, over 250 emergency actions were digitized and catalogued, more than 50 communication contacts were collected, and over 10 SMS-based alerts have been issued. A scale up of the tool is being discussed with a potential additional feature for further development and training planned for FY21.



Post Disaster Needs Assessment and Disaster Recovery Framework Training

This project implemented a national Post Disaster Needs Assessment (PDNA) and Disaster Recovery Framework (DRF) training in July 2019, organized by PMO-DMD, with a joint support from TURP and the Global Facility for Disaster Reduction and Recovery (GFDRR). The objective of the national training was to build capacity of selected government officials from the Prime Minister's Office, Urban Local Government Authorities (LGAs), and non-governmental organizations (NGOs) on PDNA and DRF methodologies. As a result of the training, 51 participants (7 women and 46 men) were equipped with skills to be able to undertake in-country post disaster needs assessment and recovery planning.

"This training will help to guide us, as government officials and disaster risk management stakeholders, to have a joint system and a common vision in conducting assessment activities, especially on economic impacts that touch individual levels, national and international, infrastructure disruptions and thus have a common recovery plan."

Col Jimmy Matamwe, Director, Disaster Management Department

Tanga 2019 Floods PDNA

Heavy rains between late October and December 2019 in the Tanga region resulted in extensive flooding that caused 38 deaths, displaced about 300 families and damaged major infrastructure. The government through the PMO-DMD requested support for a PDNA and DRF - the first PDNA conducted in Tanzania. The assessment was led by the government and supported by various organizations. A team of 42 representatives from ministries and government agencies, Tanga Regional Commissioner's Office, NGOs, World Bank, UN and the EU participated in the assessment. The assessment was conducted in January and February 2020 and determined the total recovery needs based on the economic and human impact of the floods. This PDNA also served as a capacity building activity for officials who had participated in the July 2019 PDNA training. The draft assessment (June 2020) estimates total damages at TSh 31,518.3 million (US $13.7 million) and total losses at TSh 11,692.8 million (US $5.1 million). The estimated recovery cost for all sectors is TSh 65,671.2 million (US $28.6 million). The finalization of the report was delayed because of COVID-19 but is in the final stages of publication.

Lessons Learned Exercise for Emergency Preparedness and Response in Tanzania

The Lessons Learned Exercise was initiated as a collaborative learning opportunity driven by the need to address gaps identified in emergency response after the 2014/2016 floods in Kilosa District in Morogoro. The project facilitated discussions of systems, procedures and experiences related to Emergency Preparedness and Response (EP&R) capacity in Tanzania with 55 participants from key government, private sector and disaster relief agencies. The discussions and workshop produced 29 recommendations for EP&R capacity improvements in areas of Legal and Institutional Framework, Personnel, Information, Equipment and Facilities. The PMO-DMD has begun implementing some of the recommendations including the updating of the 2012 Tanzania Disaster Preparedness and Response Plan and conducting the Capacity Needs Assessment of the National Emergency Operations and Communications Center through TURP in collaboration with GFDRR.

"The EP&R Lessons Learned Exercise was an eye-opening event, which was the first of its kind, involving a wide variety of key stakeholders. Such initiatives are highly encouraged in the future."

Bashiru Taratibu, Assistant Director, PMO- DMD

Strengthening Emergency Preparedness and Response Capacity

Following the Lesson Learned Exercise and PDNA training, the PMO-DMD requested the World Bank's support to strengthen EP&R capacity both at the national and regional level. In response, TURP, jointly with GFDRR, is providing support at the national level in the following aspects:

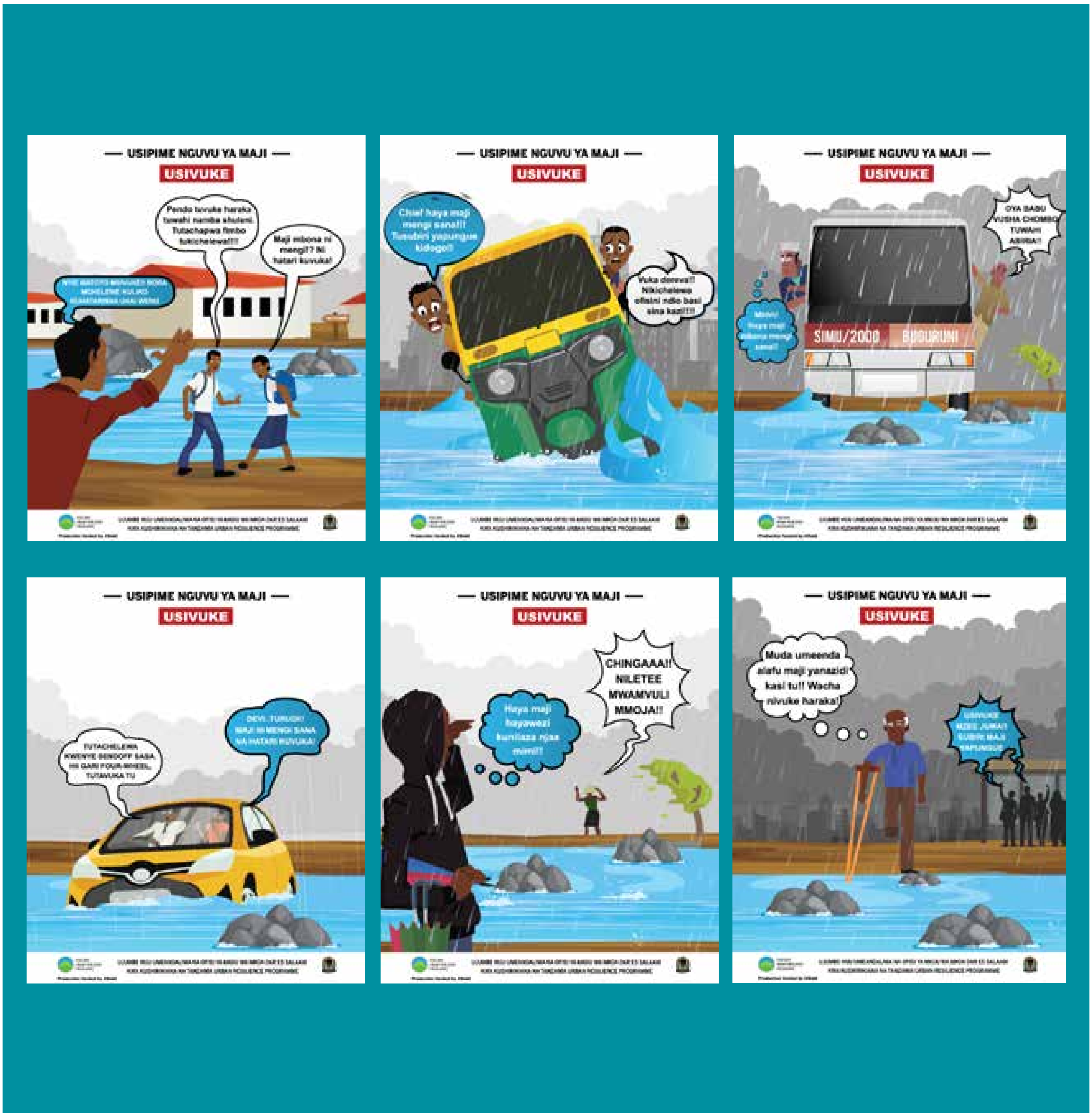
1. Reviewing and updating the Tanzania Emergency Preparedness and Response Plan (TEPRP) and Tanzania Disaster Communication Strategy (both isued in 2012) to accommodate current needs, including developing SOPs for the TEPRP; and
2. Contributing to strengthening the National Emergency Operations and Communications Center by conducting Capacity Needs Assessment.

Building on ongoing support to Dar es Salaam city through the DarMAERT such as the TED program, TURP continues to strengthen the EP&R capacity of DarMAERT by developing and testing multi- hazard contingency plans, including pandemics, to complement the updated DarMAERT Emergency Response Plan 2020 (ERP) and developing and testing Emergency Response Functions (ERFs) to complement the ERP and preparing specific SOPs for each ERF. Initial activities including the Inception Report were completed remotely due to the COVID-19 pandemic.

Flood Awareness Campaign

Drowning is the leading cause of death during floods. Tanzania is no exception to this challenge, as deaths from drowning are commonly reported during floods across the country. In Dar es Salaam alone, 14 deaths occurred in April 2018 floods and 4 deaths in December 2019 floods.

TURP has provided support to the GoT in its endeavor to educate and inform communities about the risks from flooding. Working together with DarMAERT, TURP developed a public awareness campaign centered on the message "Usipime Nguvu ya Maji," which translates to "don't test the strength of the water." Using this message TURP has supported the production of educational videos and posters that will be used to help to inform and educate the community on risks of crossing moving water in order to reduce the number of deaths. The campaign targets specific groups, including children, women, vehicle drivers (for both individual and public transport), employers and employees, and motorcyclists, as well as community members in general. The campaign will utilize social networks to capitalize on vast access to mobile phones in the country to reach as many people as possible. The campaign is planned to launch in October 2020 ahead of the October-December rainy season.



SPOTLIGHT STORY

LEARNING FOR RESILIENCE: BOLSTERING EMERGENCY PREPAREDNESS AND RESPONSE IN TANZANIA[8]

One of the workshops at the Lessons Learned Exercise

Affecting an average of 150,000 people every year in Tanzania, flooding is, by far, the most devastating of any natural hazard in the country.

The Kilosa district in the Morogoro region has been especially hit hard over the past decade. In 2016 alone, 14,000 households were displaced by flash floods. That came on the heels of flash floods in 2014 which displaced nearly 2,000 households in the district.

Eager to draw lessons from the recent past on how to bolster Tanzania's emergency preparedness and response capacity, over 55 high-level participants across 20 different government departments gathered in Arusha on July 15 and 16, 2019 for a lessons learned exercise workshop focusing on the 2014 and 2016 Kilosa district floods.

The participants represented key public sector entities engaged in the country's disaster risk management efforts, including fire and rescue services, police and military, the Ministry of Water and Agriculture, as well as the Tanzania Red Cross Society. The initiative was organized by Tanzania's Disaster Management Department within the Prime Minister's Office, together with GFDRR and the World Bank disaster risk management team in the Africa region.

Pairing collaborative discussions with field visits, interviews and surveys, the exercise served as an invaluable opportunity for participants to explore how

[8] Link to full story: https://www.gfdrr.org/en/feature-story/learning-resilience-bolstering-emergency-preparedness-and-response-tanzania

Tanzania's emergency preparedness and response systems fared in the aftermath of the floods. It was a key priority for the organizing team to design the discussions in a way that enabled the participants to gain a better understanding for the strengths, gaps and opportunities, not only through their own perspective, but also through the eyes of other participants. The workshop included a simulation exercise based on a fictional flood event.

Participants across the board commended the workshop for creating an opportunity for targeted, collaborative, and honest review of the country's EP&R systems.

"This workshop gave us an opportunity to discuss the government's systems, procedures and experiences related to emergency preparedness and response and to understand each agency's perspective, capacities and placement within the response operation,"

Makame Khatib Makame, Director of Disaster Management Department (DMD) in Zanzibar

Challenges and Lessons Learned

Almost all the activities in emergency preparedness and response require multiple workshops and table-top exercises, and the COVID-19 pandemic posed a challenge to implementation. As a solution, some contracts were restructured to shift resources from planned workshops to purchase necessary equipment that will help government counterparts with remote connectivity.

Financials

Pillar 3 projects have disbursed US$ 924,655 in FY20, with a total of US$ 2,248,529 since the program started. Financial summaries are detailed in Section 8.

PILLAR 4
RESILIENCE ACADEMY

Objective

To maximize program impact and sustainability through the establishment of university partnerships that transfers skills and risk management tools to the next generation of urban planners.

Overview of Progress

The Resilience Academy is supporting Tanzania to expand its talent base through the establishment of university partnerships that teach skills in disaster risk management to university students. Four universities are involved in the project: University of Dar es Salaam - Dar es Salaam, Sokione University of Agriculture - Morogoro, The State University of Zanzibar - Zanzibar and Ardhi University - Dar es Salaam. The project is led by the University of Turku in Finland.

ACTIVITY	STATUS	PROGRESS
Establishment Resilience Academy Secretariat	**COMPLETED**	The secretariat has been established with representatives from member universities.
Climate Risk Database (CRD) for Research	**ONGOING**	Climate Risk Database is in final stages of development.
Curriculum for Risk Mapping	**ONGOING**	Eight academic modules divided over four themes are currently in development based on content of the Ramani Huria cookbook released in FY18
Capacity Building and Training in Risk Data and Systems	**ONGOING**	Industrial placement equipped over 250 students with community- mapping skills and tools.
Research and Innovation	**ONGOING**	12 research projects have been identified. Microworking pilot project has been tested with 120 students working in remote digital tasking and skilling.

The Resilience Academy is structured around 4 components:

1. **Online Training Materials Development:** 3 modules have been completed and 4 are in progress. Four online trainings have been conducted for data managers, and more than 170 students have been trained overall. The online platform for the Academy is also being used as a training platform during the COVID-19 pandemic.
2. **Industrial Training:** 200 students from four universities participated in an industrial training to learn digital skills while supporting the project to map areas for flood resilience. A sustainability model is also being prepared for institution-managed delivery through the Resilience Academy.
3. **Climate Risk Database:** a full installation of Geonode has been installed and upgraded, and more than 70 data points have been uploaded from 104 users. University experts and data managers have also received training on how to use the platform and are developing operational guidelines for an ownership system and data quality control..
4. **Research:** 12 TURP-related research projects have been identified and at least 8 MSc students have been admitted to join the RA research program.

The role of the Resilience Academy has grown to support universities in Tanzania to develop guidelines, protocols, theory and practice in order to contribute to the problem-solving skills of young disaster risk management experts and to provide students with exposure to real-world challenges. In FY20, the Resilience Academy Secretariat was established with a membership of university coordinators, digital asset managers, and online learning support experts. Through industrial training opportunities, students are able to support World Bank projects in the field. Due to travel restrictions related to COVID-19, industrial training for 2020 has been revised into a 6-week deployment and delayed to mid-September to end-October 2020. COVID-19 guidelines have now been developed to commence activities.

The Research and Innovation workstream has developed a demand-based research roadmap – a set of perennial urban resilience challenges for which local youth equipped with local devices have good opportunities to address. These challenges center on the use of digital services to support resilient urban planning, informed communities, green neighborhoods and early warning. The set of Master's level research projects identified for 2020-2021 are:

- Calibrating of River Flood Rating System using low cost cameras;
- Study on Rainwater harvesting opportunities to reduce run-off;
- Rainfall Prediction using Machine Learning;
- Image Classifier customization for Dar es Salaam Tree cover mapping;
- Draining Updates for Land Use plans using community data;
- Automated Green Urban Canopy Cover Mapping;
- Solid Waste GIS Optimization Planner;
- Remote Sensing with radar for Flood Monitoring;
- Urban Heat Street Low cost Sensor Surveys;
- 3D Street Mapping in Zanzibar;

In addition to the Master's student focused projects, the Resilience Academy also launched in May and June 2020 a pilot project engaging 115 students from the four universities to test the use of micro-tasking tools and mobile payment for conducting remote digital tasks and urban analytics. The shift towards introducing microworking tools – which enable taskers to conduct short digital tasks on mobile phones or laptops remotely – was driven by the need to enable more online work under social distancing conditions.

The objective of the Digital MicroWork Program was to i) create high quality geographic data that will be used to inform future urban planning and disaster risk reduction efforts while ii) creating and demonstrating new workflows to create employment opportunities for Africa's vulnerable youth, and iii) providing learning opportunities on valuable digital skills and geospatial technology. Task based micro-work can be the first step in developing more advanced digital skills that when linked to micro-credentialing can lead to future work prospects.

The activity relies on local talent being engaged on digital tasks to support and enhance existing digital services. In this case the World Settlement Footprint 3D (WSF-3D) was the target product which Resilience Academy sought to improve by providing validation and qualification data. WSF was created by the German Aerospace Center and estimates the average height of built-up structures at 12m spatial resolution globally. It captures the spatial distribution and pace of urban exposure growth as an input to understanding size, location, and change in urban risk in African cities. In this project, a crowd-labeling application has been developed from scratch to label images captured from the level of the street, assigning the number of floors to the highest building in view, and using this information to ground truth the WSF prediction and improve the accuracy within Tanzanian cities.

During the pilot, 1,331,825 labels were collected for more than 75,000 street-view images worldwide. Approximately US$ 15,000 were distributed as compensation to the students depending on the quality and quantity of their work. The collected number of labels exceeded expectations by 50% and resulted to be substantially cheaper to obtain with respect to commercial labeling platforms (by at least 68%). A preliminary analysis has shown that the collected data is very accurate and consistent, leveraging on the exceptional student involvement, dedication and participation to the training activities.

Challenges and Lessons Learned

The COVID-19 pandemic and uncertainty about opening of schools at the early stages of the pandemic has delayed some of the activities.

Financials

Pillar 4 projects have disbursed US$ 563,400 in FY20, with a total of US$ 1,482,340 since the program started. Financial summaries are detailed in Section 8.

COVID-19 RESPONSE

Objective

To support government agencies with development of risk communication and community engagement materials and share relevant global knowledge about COVID-19 response.

Overview of Progress

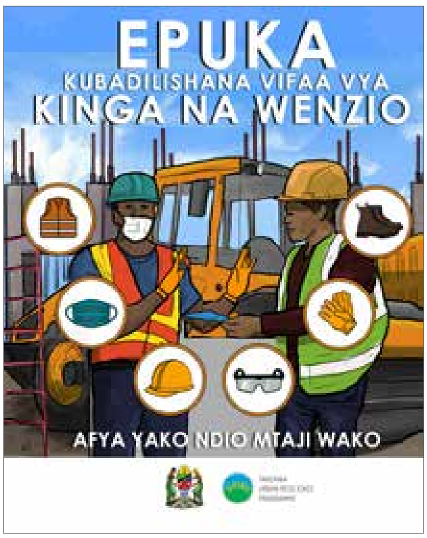
TURP has supported multiple activities to strengthen Tanzania's response to the COVID-19 pandemic. In discussion with the WHO and UNICEF, TURP developed two educational animation videos and several posters focusing on COVID-19 preventative measures relevant to construction workers and market interactions. The final product was officially delivered to the MoH for approval. TURP is also helping DarMAERT with preparation of a pandemic contingency plan. DarMAERT has received and installed a total of 50 emergency radios and solar power backup systems to support the testing of ERFs and preparing specific SOPs for each ERF as part of strengthening EP&R. EMIS functionality was also adjusted to support coordination, dispatch and tracking of ambulances. Additionally, two reports were quickly prepared. The first is a report that has inventory of best practices of COVID-19 response in various cities around the world and the second is a solid waste management guideline to be used during COVID-19.

ACTIVITY	STATUS	PROGRESS
Development of Information, Education and Communication materials for preventing the spread of COVID-19	**ONGOING**	Two educational animation videos and several posters have been developed and officially submitted to MoH and are awaiting formal approval.
Service Provider Guidelines for SWM during Infectious Disease Outbreaks	**ONGOING**	The report is being discussed with government counterparts to ensure ownership of the final product.
Adoption of EMIS for COVID-19 Response	**ONGOING**	EMIS was adopted to help DarMAERT dispatch and in real time track ambulances. Capacity support is ongoing.
Development of COVID-19 Response Planning Toolkit	**COMPLETED**	An inventory of COVID-19 good practices at city level was consolidated to a report and shared with relevant counterparts. A template guide for local governments was also created.
Servicing Existing and New Emergency Communication Equipment	**ONGOING**	Full servicing of existing communication equipment is underway to improve performance of DarMAERT.
Mapping and Tagging of Water Points in Dar es Salaam	**ONGOING**	The dataset collection and digitization is ongoing.

COVID-19 Educational Messages for Vulnerable Sectors of the Society

The COVID-19 pandemic continues to spread throughout the world with significant impacts on human health, livelihoods, and the global economy. In Tanzania, the MoH has encouraged citizens to take standard preventive measures. Containment of the spread of the disease heavily depends on peoples' ability to heed recommended preventive measures.

TURP agreed to contribute towards COVID-19 risk communication to support and complement the efforts of the MoH and other partners such as the WHO and UNICEF. As part of this support, TURP has facilitated the production of Information, Education and Communication (IEC) materials with contextualized messages that can be used by both government and other actors in risk communication and community engagement activities. The materials, targeting construction workers and market goers (both consumers and vendors) take the form of posters and animated videos which will be used to increase community awareness on COVID-19 preventive measures for self and community protection.

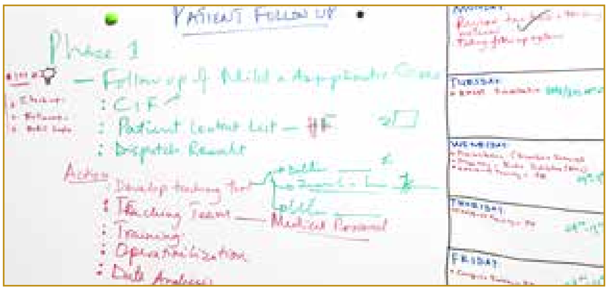


Service Provider Guidelines for Solid Waste Management During Infectious Disease Outbreaks

The provision of safe SWM services is essential for protecting human health during infectious disease outbreaks. Ensuring quality, reliable, and universal waste management services helps prevent human-to-human infectious disease transmission and mitigates risks of secondary diseases associated with poor SWM practices.

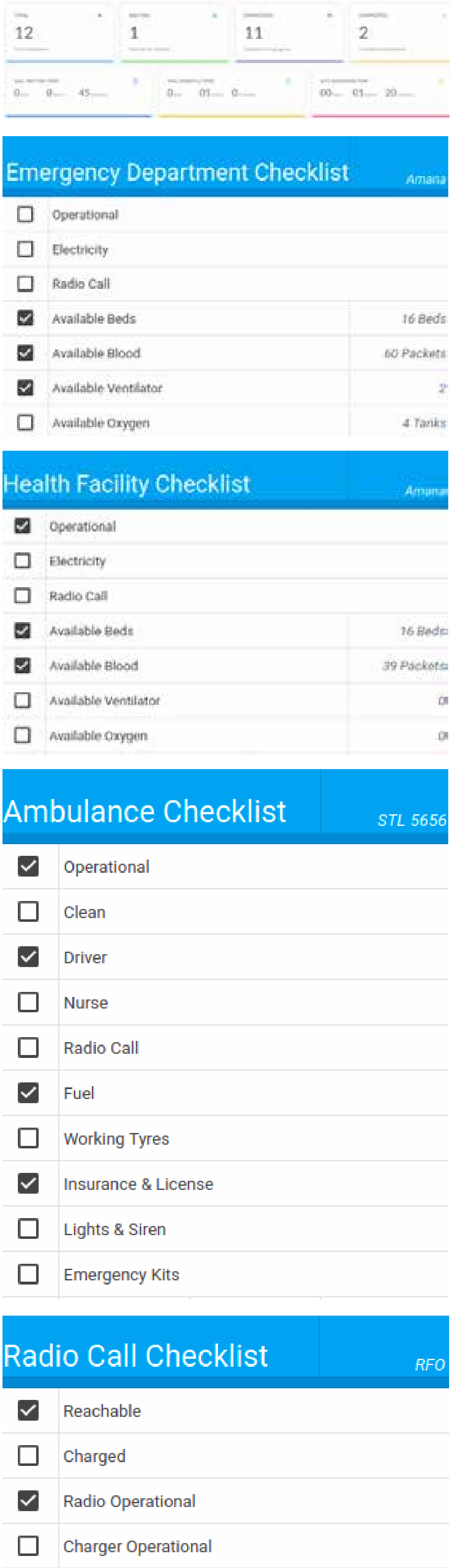
A guidance document was created in collaboration with the Vice President's Office which summarizes and adapts the leading international advice for the SWM sector as it relates to the prevention and mitigation of infectious disease outbreaks in the Tanzanian context. It is intended to support SWM service providers in urban and peri-urban settings to identify effective approaches to ensure safe continuity of service provision.

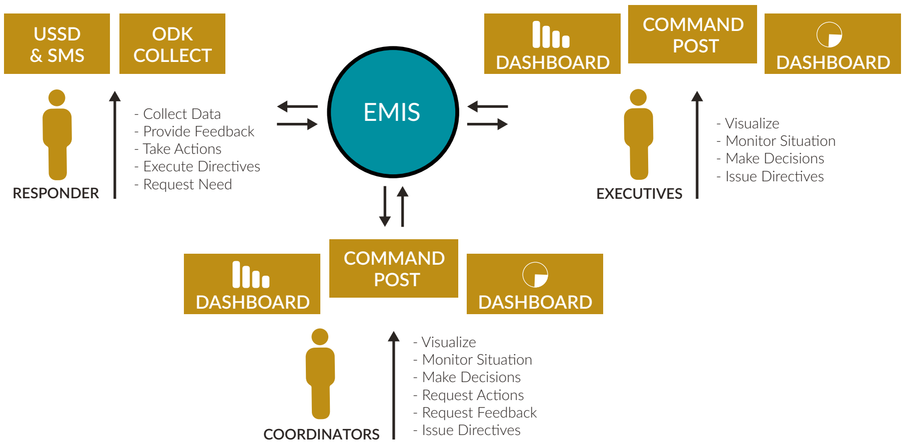
> "The provision of safe solid waste management services is essential for protecting human and environmental health during infectious disease outbreaks."
>
> *Dr. Hussein Omar, Environmental Officer, Vice President's office.*



Adoption of EMIS for COVID-19 Response

The support to the DarMAERT EOC helped activate the center for COVID-19 response, allowing for better coordination between health workers, rapid response teams, and emergency coordinators and directors across municipalities. Daily checklists were also established for critical resources and supplies (i.e ambulances, health facilities, emergency departments, blood banks and ICUs). The assistance will continue to address data collection and analysis gaps, strengthen emergency operations and communications between all response teams, and help DarMAERT visualize and analyze COVID-19 emergency data. EMIS was also adopted to help DarMAERT dispatch and in real time track ambulances.





Development of COVID-19 Response Planning Toolkit

The COVID-19 pandemic has globally presented challenges in a range of areas – such as economy, food security, education, and other essential services – which are also the domain of urban local governments. TURP supported the development of a COVID-19 Resource Planning Toolkit for resource constrained local governments. The Toolkit comprises two documents – a template for a COVID-19 Response Plan and an accompanying Inventory of Emergency Response Measures taken by various cities around the world – that focus on local government functions including but not exclusive of public health services.

The Toolkit was developed between April and June 2020. The Template guides resource constrained local governments to develop a COVID-19 Emergency Response Plan that is tailored to their specific context, and the Inventory presents specific measures that may be relevant for consideration and adaptation to a local context, with the intention to inspire local governments as they consider opportunities for deepening and strengthening their response to current and potential future impacts of the COVID-19 pandemic. The Toolkit has been shared with local stakeholders and was also made available to other African governments.

Support for DarMAERT - Servicing Existing and New Emergency Communication Equipment

TURP continues to provide technical support to DarMAERT to strengthen the team's ability to prepare for and respond to emergencies in Dar es Salaam. As part of this broad engagement and to complement the TED technical assistance that has been carried out over the past few years, new emergency equipment such as communication radios were purchased, and existing equipment were serviced. This equipment was instrumental for a coordinated COVID-19 response. A follow up training, that was delayed because of COVID-19, will further improve communication among DarMAERT staff and volunteers during emergency response activities. The exercise will include the further testing of the use of 50 handheld radio sets and backup power supplies for effective emergency response.

Mapping and Tagging of Water Points in Dar es Salaam

TURP collected and digitized data relevant for COVID-19 response, including adding and tagging water points as features in the Dar es Salaam Open Street Map. This work is ongoing, and future plans involve engaging students and youths in similar digitization work. This approach is inspired by public works and cash for work programs, but in a digital space. The following innovative way of operating will be employed: (i) Micro tasking - breaking digital work dataflow into micro tasks and use the digital platform to match workers and tasks, (ii) Micro-learning – skills building through mobile phones – technical skills, topical skills and soft skills, (iii) Micropayments – less transaction intensive way payoff paying the workers. The objective is to generate data for better risk information, and in the process build local digital skills.

PROGRAM MANAGEMENT

Objective

The main objective of this component of the program is to support program governance arrangements and TF-related meetings; planning and executing work plans and budgets; managing communication and conducting outreach; disseminating lessons learned; reporting on progress; and monitoring and evaluating the program.

Overview of Progress

During FY20, with the global spread of COVID-19, TURP had to reprogram some of its technical assistance activities halfway through the FY, requiring continuous consultation with government counterparts to identify needs, prioritize new initiatives, and design and implement various programs while keeping ongoing technical assistance on track. Delays caused by the inability to hold workshops and interruption of flights also required continued adjustment, extension of several contracts, and close supervision of activities.

One of TURP's main priorities this FY was to help move the MOP to next stage of project preparation. To raise awareness among various decision makers, TURP developed a virtual reality experience for the MOP to provide a simulated view of the project and help key decision makers visualize what the lower Msimbazi valley would look like after the project is implemented. The approval of the plan and development of the sub-projects under the MOP is critical for the launching of the Recipient-Executed Trust Fund (RETF) part of TURP.

ACTIVITY	STATUS	PROGRESS
International Conference	**COMPLETED**	URTZ, TURP's annual conference, took place in October 2020 at the National Museum and House of Culture in Dar es Salaam and was attended by more than 250 participants.
Steering Committee Meeting	**COMPLETED**	2 Steering Committee meetings were conducted in FY20.
Resilience Academy Secretariat Established	**COMPLETED**	A secretariat/technical committee to oversee activities under the Resilience Academy was established by four Tanzanian universities.
Annual Review and Annual Work Plan Update	**ONGOING**	Annual Review and work plan are planned to be finalized in October 2020.

Understanding Risk Tanzania: October 2-3, 2019

Each year, TURP hosts URTZ, a conference associated with the GFDRR Understanding Risk community that convenes experts, decision-makers, and community to discuss and debate issues of risk and resilience. In FY20, the URTZ conference gathered 250+ people at the National Museum and House of Culture in Dar es Salaam to exchange knowledge and participate in dialogue on sustainable, climate-smart solutions for improved resilience in Tanzania.

The theme of this year's conference was "Zero Waste" to help promote sustainable use of resources and proper management of solid waste in Tanzania. All conference branding, signage, and materials were creatively composed of upcycled, recycled, or compostable materials, and no waste-to-dump was produced over the course of the forum.

Day one of the conference aimed to effectively build a case for climate smart infrastructure and planning in Tanzania, featuring presentations on interventions being implemented across the country and the continent to secure sustainable urban resilience. Keynote speakers acknowledged the complex challenges that Dar es Salaam is facing and applauded TURP's innovative and integrated approach.

Experts presented relevant case studies and cutting-edge research around urban development and resilience. Practical sessions provided a more in-depth exchange of knowledge on topics ranging from exploring the science behind flood management to putting zero waste in action. The day concluded with the opening of Creating Resilience, an exhibition showcasing the works of local artists that highlighted the connection between solid waste and flooding.

Day two concentrated on innovation and education for sustained resilience-building. Academic leaders and practitioners kicked off the sessions with an introduction to the Resilience Academy – a program that aims to equip students with tools, Knowledge and skills to address urban development and resilient challenges. Local and international presenters proceeded to stress the importance of tools, technology, and data that are open, affordable, and locally adaptable. An emphasis on the role of universities in building capacity and information sharing between students, local communities, and government was also discussed in detail. The event closed with the grand finale of the Resilience Academy's Data Visualization Challenge, during which students presented their work to a panel of academic leaders and data users.

Engaged participants included:

70+ government officials from Tanzania

90+ donor partners, CSO reps, and experts in the field of urban resilience

30+ academic leaders

60+ artists and students

Four priorities of intervention in Tanzania:

RISK IDENTIFICATION
Applying best practices and embracing new technology

RISK REDUCTION
Strength through structural and non-structural changes

EMERGENCY PREPAREDNESS
Building capacity in local government departments and communities

RESILIENCE ACADEMY
equipping the next generation to ensure sustainability

SPOTLIGHT STORY

CREATING RESILIENCE

Last year, the world's cities generated more than two billion tons of solid waste.

For developed cities with effective waste management systems in place, this is an easy stat to ignore. Once trash is binned, it is quickly forgotten – and users can rest assured that it will make its way to an appropriate disposal site.

Emerging hubs like Dar es Salaam, however, do not share this privilege – and the reality of waste production is increasingly apparent.

Approximately 4,500 tons of waste is produced every day in Dar es Salaam – but only about one quarter makes it to the dump site. The rest is buried, burned, or dumped in open spaces and waterways. When waste makes its way into those waterways, it directly increases the city's risk of flooding. Although the presence of waste in waterways is impossible to ignore, there continues to be a lack of awareness on the connection between solid waste and flooding in the city – allowing the issue to proliferate. This is something that TURP has aimed to address through a series of creative engagements.

As part of URTZ, Tanzanian creatives were invited to make art out of the top polluting materials identified in the 2018 waste audit. Emerging artists such as Nickson Jerimiah were inspired to put the obstructed waterways of the country on display, demanding the attention of the community, producers and decision-makers attending the conference.

Pieces submitted for the exhibition varied in form and in messaging. Some were abstract, others direct. Many carried elements of shock, including several works that featured medical waste found polluting urban beaches. Two immense pieces starkly alluded to the disproportional impact of flooding on urban poor people, children, and women.

As agents of change and cultural shift, artists like Jerimiah are vital to the betterment of society. Art invites its audience to confront reality, question the status quo, and envision alternative futures.

Recognizing this potential, the exhibition has been mobile for an extended reach. Images of the pieces have co-opted advertising spaces on Dar es Salaam's Bus Rapid Transit (BRT) System, accompanied by behavioral change messages that urge the campaign's audience of over 60,000 per day to rethink their consumption habits.

This messaging is also being transferred to youth through interactive workshops and challenges for secondary and post-secondary students.

After participating in a URTZ workshop on production lifecycles and flooding, 20 secondary students have returned to their schools where they continue to lead their own creative educational initiatives, collectively informing more than 1,200 students about the connection between solid waste and flooding, and advocating for a "circular" or "zero waste" economy through art.

Post-secondary students involved in the Data Visualization Challenge hosted by the Resilience Academy, an initiative aiming to mainstream education on resilient urban planning at URTZ, have further transformed raw data into informative designs that can guide the work of those within the field of Disaster Risk Reduction. The winning team, student founders of Taka Cycle, took advantage of the forum as a platform to present their digital app that compiles community data points to improve waste management across Dar es Salaam.

05

RESULTS OVERVIEW

RESULTS LOG FRAME

IMPACT LEVEL

Impact Indicator 1:
Extent to which Investment Climate Facility (ICF) intervention is likely to have a transformational impact.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	3	3 Tentative evidence of change – transformation judged likely	FY20 and the threat of the COVID-19 pandemic demonstrated the value of investments made by TURP. DarMAERT's ability to support various government agencies by leveraging the TED program, the operationalization of the EP&R plans and use of EMIS shows local ownership of the program. Similarly, the close collaboration of Tanzanian universities through the Resilience Academy and the formation of a secretariat show that the legacy of the program will outlive the life of the Trust Fund. The preparation of the Msimbazi Opportunity Plan has also begun after several years of pause, demonstrating political ownership of one of the main deliverables of TURP. TURP has introduced various innovative approaches to urban planning and resilience. It has continued the use of affordable equipment for data collection and measuring resilience at municipal level through structural approaches and using low-cost software. The recent assessment of Dar es Salaam's municipalities' capacity using the DRMI score shows marked improvement, which in part is the result of the various technical assistances advanced by TURP. The achievements of low cost and actionable data collection in Dar es Salaam are now being replicated in Zanizibar, Mwanza and Tanga and there is a plan to further scale this in various secondary and tertiary cities. The success of years of support to DarMAERT also led to extension of support to the PMO-DMD and there is a plan to apply the lessons learned to other cities. To ensure sustainability, all activities under TURP are aligned with upcoming urban development and resilience projects that will be implemented by the government. In addition, the Resilience Academy will ensure that all the lessons learned through TURP will continue through the engagement of Tanzanian universities.

Impact Indicator 2:
Improved capacity of government agencies to identify, reduce, finance and cope with disaster risks.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	Appreciable	45%	The average DRMI score for Dar es Salaam has increased to 45% for the year 2019, reaching the set target. This has been calculated by the fact that none of the Municipal Councils remained at Level 2 (20% -40%) in 2019, and at least three Municipal Councils achieving scores at the mid-Level 3 range (above 45%). Overall, this indicates that a deeper understanding of the mainstreaming process of DRM is emerging and there is willingness to continue to take action in key areas of DRM. In particular, improvements in the areas of Risk Information, Risk Governance and Capacity Building shows a drastic shift from a response-only approach towards creating processes for building disaster resilience.

Impact Indicator 3:
Modelled Economic losses in the Msimbazi basin reduced as a result of planned risk mitigation measures.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	n/a	Initial Economic Analysis demonstrated for planned public investment options	An economic analysis was conducted to estimate the economic benefit of MOP. Results of the evaluation showed that the project will yield positive returns. The highest benefits will be the reduction of damages to properties, infrastructure, and roads. Based on this analysis, the internal rate of return is expected to be 13%.

OUTCOME LEVEL

Outcome Indicator 1:
Number of persons benefiting from improved flood resilience as a result of ICF support.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	1 million	350,000 indirect beneficiaries of flood and rock fall mapping (in delay due to Covid 19 outbreak)	Approximately 1.2 million indirect beneficiaries will benefit from the exposure mapping currently under implementation in Dar es Salaam, Zanzibar and Mwanza.

Outcome Indicator 2:
Number of Wards planning or implementing flood risk reduction and response measures identified in community level risk management plans.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	15 sub-wards	On hold due to Covid 19	The preparation of the MOP project has now begun in August 2020 after several years of pause. This will allow for incorporating risk reduction plans as part of the overall program of flood risk reduction in the Msimbazi valley.

Outcome Indicator 3:
Climate Risk data in sustainable use.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	n/a	Dar es Salaam Emergency Operation Center using preliminary probabilistic flood risk analysis results.	The flood hazard model for Msimbazi is completed and the flood hazard model for the whole of Dar es Salaam will be completed in October. However, the use case workshop that serves as a basis for tailoring outputs was delayed by several months because of COVID-19 and was recently completed through virtual focus-group consultation. Flood hazard information will be provided to the Dar es Salaam Emergency Operations Center by end of October 2020.

OUTPUT LEVEL

Output 1:
Information and Data Management for Climate Risk Identification.

Output Indicator 1.1: Improved access to climate risk information in Dar es Salaam.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	Probabilistic flood risk information published online for Dar es Salaam including climate scenarios.	Probabilistic flood model pilot version developed for Dar es Salaam and Zanzibar.	The flood hazard model for Msimbazi is completed and the flood hazard model for the whole of Dar es Salaam will be completed in October. The flood hazard model for Zanzibar was delayed because of unexpected technical delays in processing the DTM and COVID-19. The Zanzibar hazard model is expected to be completed in November. The use case workshop (that was delayed because of COVID-19) will be used for developing the mock-up version of the visualization dashboard, which will be completed in November 2020.

Output Indicator 1.2: Exposure or Risk assessments applied in major cities (cumulative number of cities).

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	At least 3 cities using exposure or risk monitoring service	On hold due to COVID-19 outbreak	These activities have been advanced although they were delayed because of COVID-19. Mapping activities are being advanced in Dar es Salaam, Zanzibar, Mwanza and Tanga to generate up-to-date, open, and accurate exposure data that can be used for flood risk modelling and flood scenario generation purposes.

Output 2:
Disaster Risk Reduction Plans Delivered.

Output Indicator 2.1: Solid Waste Management Plans and Area Based Studies for Dar es Salaam and Zanzibar delivered.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	500 people	Solid Waste Management Plan and Area Based Development Plans under procurement	The procurement process for the Solid Waste Management Study is underway, the request for expression of interest was issued and 5 candidate firms have been shortlisted. Additional consultations are currently being conducted with relevant government counterparts. The procurement is planned to be finalized by November. Activities under the Area Based Studies were contracted separately. The first component, "Mapping for Integrated Local Area Development of Nungwi," is finalized and inception report has been completed. The second component, flood hazard modeling, is being developed internally using World Bank consultants. The third component of the study that focus on urban development is planned to commence once the two studies are completed.

Output Indicator 2.2: Community risk reduction plans developed using improved risk information (cumulative number of wards and municipalities endorsing plans).

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	30 sub-wards	On hold due to Covid 19 outbreak	12 wards comprising of 42 Sub-wards have developed their Disaster Risk Reduction Plans which include low cost measures that could be implemented with limited support from the government and donors. The flood risk information collected by Ramani Huria were used in the planning process. The plans are currently being finalized and translated to Kiswahili.

Output 3:
Emergency Preparedness and Response Management.

Output Indicator 3.1: Dar es Salaam emergency contingency plan (Regional level).

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	Dar Emergency response Plan Updated to version 2	Dar Emergency response Plan Updated to version 2	The DarMAERT Emergency Response Plan of 2017 has been updated. The 2020 updated version is expected to be endorsed by RAS by November or December of 2020.

Output Indicator 3.2: Covid-19 Urban resilience response operationalized.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	n/a	DarMAERT and other relevant agencies able to better coordinate and respond to COVID-19 through use of adequate communication equipment and appropriate training.	DarMAERT was able to use communication equipment (radios) to improve ambulance dispatching services within the city. It also used the EMIS to track ambulances online and in real time. Although DarMAERT was not mandated with overall coordination of COVID-19 response, these capabilities have boosted the city's ability to respond to all emergencies.

Output 4:
Resilience Academy Established and Operationalized.

Output Indicator 4.1: Cumulative number of students completing industrial placement or similar skills building internships.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	1,000 students completing industry placement	On hold due to coronavirus – schools and universities shut	About 900 students have benefitted from Resilience Academy activities. In 2019, 500 students were trained on participatory mapping methods and 200 participated in the industrial training program. Currently, there are about 210 students participating industrial training in Mwanza, Zanzibar and Dar es Salaam.

Output Indicator 4.2: Climate Risk Data and Tools Use in approved curriculums.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	Innovation Challenge Using Risk Data launched	Online Innovation Challenge Using Risk Data launched	Two rounds of data visualization were launched. The first one was in 2019, where 259 students from 5 universities in Tanzania Mainland and Zanzibar participated in the challenge. The 2020 data visualization challenge is currently ongoing with participation of 171 students from the universities.

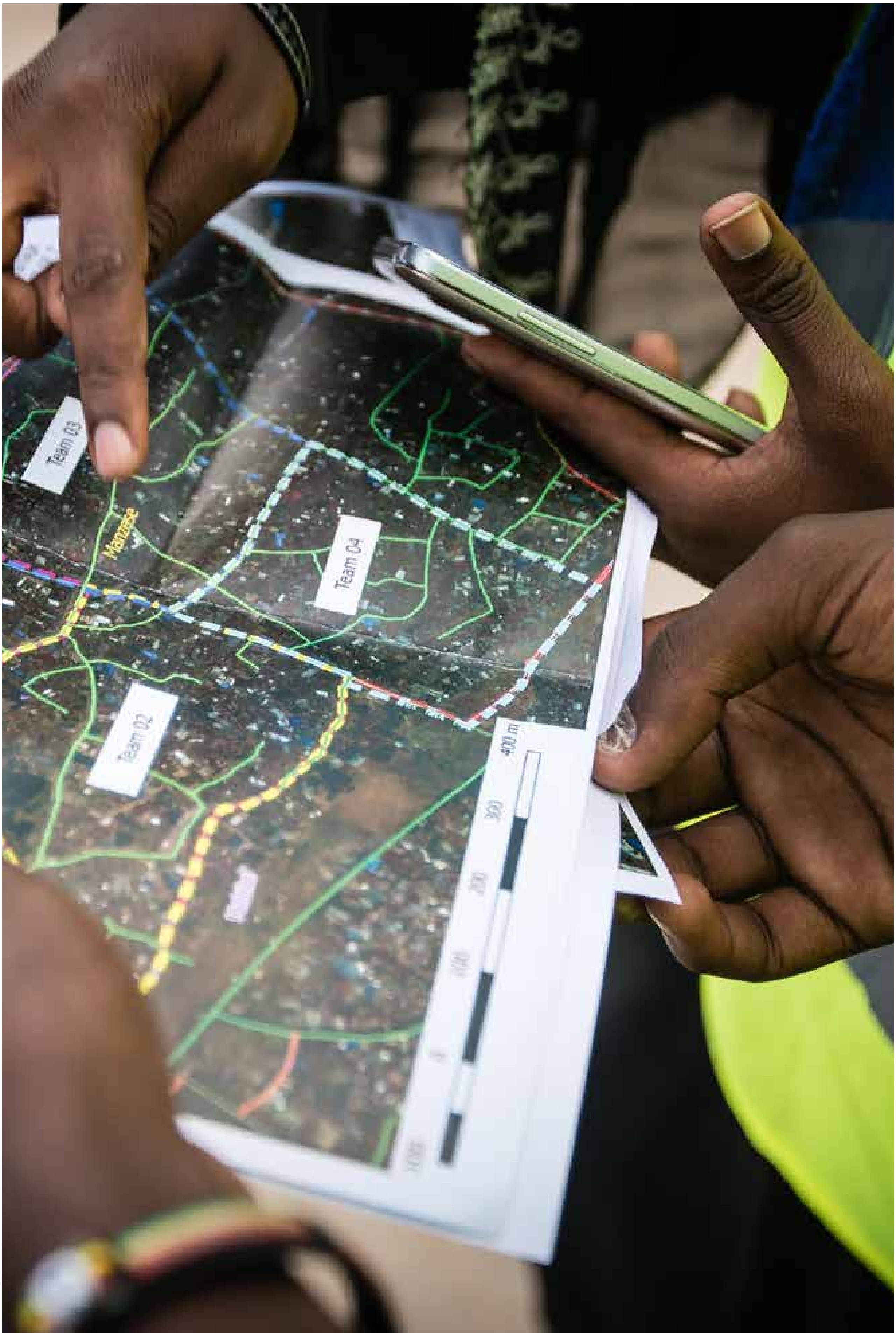
Output 5:
Government Risk Reduction Activities Designed and Operationalized.

Output Indicator 5.1: Government Risk reduction Activities in Msimbazi Valley are designed and operationalized.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	Msimbazi Flood mitigation priority actions implemented	Msimbazi lower basin feasibility study procured	The MOP investment procurement is being carried out as two complimentary contracts by TANROADs and PO-RALG. After a long pause, TANROADs has contracted a consulting firm to complete the Jangwani bridge feasibility study and detailed design. PO-RALG is currently finalizing ToR for rest of the MOP project. The final RFP for feasibility study, detail engineering designs and Environmental and Social Impact Assessment (ESIA) will be ready by October 15, 2020 and is expected to be issued soon after.

Output Indicator 5.2: Msimbazi valley management studies delivered.

YEAR	ORIGINAL MILESTONE	REVISED MILESTONE	ACHIEVEMENT FY 2020
Nov 2020	n/a	Concept notes for sediment management and terrace development underway.	A concept note for sediment management and terrace development has been developed and will be completed in October 2020.


Team 03
Team 04
Team 02
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06

RISKS OVERVIEW

STAKEHOLDER ENGAGEMENT AND PRIORITIES

The COVID-19 pandemic has limited and will continue to limit timely implementation and completion of the program activities as a result of restricted travelling and face-to-face meetings. All stakeholder engagements and workshops were delayed by several months and are currently being conducted virtually in small focus-group settings. The effectiveness of these consultations is yet to be assessed. All team members are also working virtually, and this has served as an alternative means, however, this has its limitations in Tanzania particularly because it is a relatively new practice and access to the internet may be limited, especially for community level engagements. Several activities were significantly delayed because of inability to organize workshops and the need to get critical input from stakeholders. Given the global nature of the pandemic, the impact on consulting firms also varies based on restrictions put in place in their respective countries. Some consulting firms have expressed concern that they would not be able to meet deadlines because of the extra personal and professional workload caused by COVID-19 requiring contract extensions or adjustments.

Prioritization and staggering of sub-activities will be critical for the success of implementation of TURP in the coming couple of years until the COVID-19 pandemic is under control. Given the large number of ongoing programs and the virtual nature of all meetings and workshops, the risk of conflicting schedules for missions, meetings, and workshops has increased. This challenge is exacerbated because the same stakeholders might be involved in multiple technical assistances which might put undue pressure on government counterparts. Sub-activities will be prioritized and staggered to minimize these conflicts, and it is expected that some contracts will need to be extended to allow for adjustment in project implementation.

FINANCIAL MANAGEMENT AND PROCUREMENT

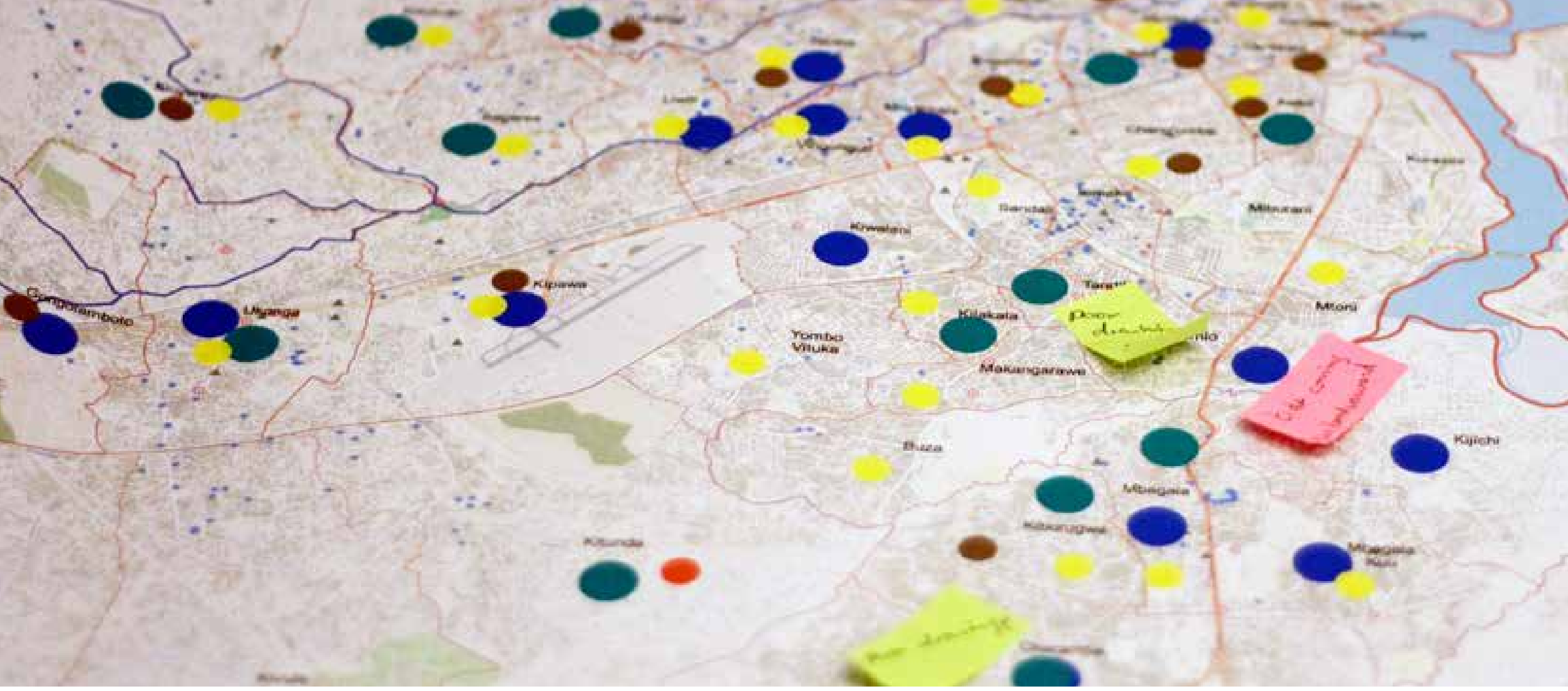
The Bank Executed Trust Fund (BETF) part of TURP is almost fully utilized with 94% of the funds either disbursed or committed. As of November 2020, approximately US$ 1 million unallocated funds are available. Given than there are many ongoing projects with total commitment of more than US$ 2.5 million, the available funds will only allow the supervision and finalization of these projects, leaving no room for new commitments or initiatives. However, the need to invest in risk identification, reduction and emergency response remains, especially in secondary and tertiary cities. Additional funds will be needed if TURP is going to keep the same level of engagement with government counterparts in mainstreaming resilience and improving disaster risk management in Tanzania.

Delays in procurement have been a challenge since some of TURP activities are designed to provide relevant knowledge and information-base for future government-led or recipient-executed activities. The boundaries between the BETF and RETF activities are not always clear. This has required several internal consultations and rewriting of programs while at the same time ensuring the final outputs add value to advancing the resilience agenda in Tanzania.

ENVIRONMENTAL, SOCIAL, AND SECURITY

TURP has worked with the GoT and key implementing agencies to highlight relevant environmental and social concerns and ensure that, where applicable, World Bank safeguard policies are adhered to. TURP has also conducted several studies that contribute to better understanding of environmental issues, especially in the Msimbazi valley. The completion of the mangrove study will, for example, contribute to the government-led ESIA that will be conducted for the MOP project. TURP has also participated in review and technical discussion of government-led studies such as the soil toxicology and pollution study in the Msimbazi valley, that will again support the drafting of the government-led ESIA. The MOP charrette that was supported by TURP will also be an important input for social impact assessment part of the ESIA.

07
LOOKING AHEAD



WORKPLAN OVERVIEW

TURP has demonstrated marked success in its key pillars of Risk Identification, Risk Reduction, Emergency Management and Response, and the Resilience Academy in Dar es Salaam, Mwanza, Tanga, and Zanzibar. As the Government of Tanzania and the World Bank look toward the next generation of urban projects, a core priority is the mainstreaming of resilience concepts into institutions and physical infrastructure developments, particularly in secondary and tertiary cities. The next set of TURP investments will take the lessons learned so far and apply them to secondary and tertiary cities and explore for opportunities to mainstream the innovative data collection and planning techniques tested and refined under TURP into all investment projects. Strengthening TURP's linkage to upcoming urban development and resilience projects will also ensure the scale up and sustainability of TURP's investments. Details of the priority investments have been described in detail in the following paragraphs and table. As discussed above in the Financial Management section, the unallocated funds (approximately US$ 1 million) under the BETF part of TURP will only be enough for the supervision of already committed activities and will not allow development of new programs. The proposed workplan below is presented to demonstrate the existing needs in secondary and tertiary cities.

Pillar 1 activities have already scaled up to three cities in addition to Dar es Salaam. There is a need to take the lessons learned and apply them to other fast secondary and tertiary cities. The three main activities anticipated under pillar one are (i) development of city multi-hazard risk profiles, (ii) development of GIS-based inventory of known hazards/resilient infrastructure needs facing Tanzanian cities, and (iii) inputs to risk informed drainage studies. The objective of these activities is to have deeper understanding of flooding problems in cities and their impact on infrastructure to inform better adaptation measures. The pillar will also aim to make this information available in one GIS platform for ease of access and usage

Pillar 2 activities will build on the lessons learned from the MOP and conduct participatory integrated flood control and open space planning in Mwanza. The objective is to produce an integrated flood protection and open space plan for Mirongo/Kirumba rivers, Furahisha grounds, and the lakefront park called for in Mwanza's master plan that would include open space, drainage, and economic infrastructure through a participatory approach. The output would guide subsequent climate and natural hazard adaptation investments. Another anticipated investment under Pillar 2 is development of a tailored sustainable drainage systems, greening, erosion control and litter management guidelines that will provide a starting point for PO-RALG managed projects to eventually finalize and implement through an iterative process that involve stakeholder workshops and piloting.

Pillar 3 will strengthen emergency response coordination in secondary and tertiary cities. The objective is to apply the lessons learned in Dar es Salaam and apply it in other cities. The activities will include one or a combination of the following, (i) development and testing of city emergency response plans, and hazard-specific contingency/continuity plans, (ii) provision of support for setting up multi-sectoral emergency response teams, including preparation of related SOPs, (iii) design and implementation of a TED Program, (iv) preparation of the proposed physical layout and structure of the city EOC, as well as protocols for its operation and management, (v) formulation and testing of SOPs for emergency response functions, and (vi) customization and operationalization of EMIS for other cities.

Pillar 4 will focus on Concept Development and a Pre-feasibility Report for an Urban Conservation Corps Development Program while finalizing the development of the training modules. The objective of this task is to prepare for and support exploratory discussions with government stakeholders on establishment of potential Urban Conservation Corps program that will bring about jobs and environmental rehabilitation in Tanzania. The plan is to continue to engage youth and develop a program that will allow for environmental education, social awareness of environmental assets, as well as civic pride in the investments to protect them. Resilience Academy will facilitate this discussion together with its partner Universities in Tanzania.

WORKPLAN

Total - FY21 & FY 22 Estimates*	**$3,800,000**
Pillar 1 - Risk Identification	**$1,650,000**
City Multi-Hazard Risk Profiles	$450,000
Development of GIS-based inventory of known hazards/resilient infrastructure needs facing Tanzanian cities	$200,000
Inputs to Risk Informed Drainage Studies: Digital Elevation Modeling, household level flood histories, and hydrometeorological data for resilient infrastructure planning	$1,000,000
Pillar 2 - Risk Reduction	**$500,000**
Participatory Integrated Flood Control and Open Space Planning for a Resilient Mwanza	$100,000
Preliminary Inputs to GREEN Tanzanian Cities Preparation (Greening for Resilience, Erosion, Environment and Neighborhoods)	$200,000
Improvement of Building Codes and Standards	$200,000
Pillar 3 - Disaster Preparedness & Emergency Mgmt	**$500,000**
Strengthening Emergency Response Coordination	$500,000
Pillar 4 - Resilience Academy	**$250,000**
Concept Development and Pre-feasibility Report for an Urban Conservation Corps Development Program	$100,000
Industrial placement and resilience data challenge	$200,000
Extension to Turku contract, research, and development climate smart cities course	$200,000
Resilience labs equipment, training and handover	$100,000
Secretariat	**$550,000**
Steering Committee Meetings	$5,000
Communications, Websites, and Media	$125,000
M&E Baseline Data Collection	$15,000
Publications (update resilience report/editing/printing)	$15,000
Annual Review	$15,000
Staff	$375,000

**Unallocated BETF is approximately US$ 1 million, which will be used for supervision of already committed projects. These figures are solely provided to give estimated cost of the current needs for potential new engagements.*

07

FINANCIALS

FINANCIAL OVERVIEW

Total disbursements up to June 30, 2020 from the TF amount to US$ 12,280,969. In FY20, a total of US$ 3,843,242 was disbursed, with US$ 329,248 remaining available. Outstanding commitments of US$ 2,807,687 is carried over into the next fiscal year.

	REPORTING PERIOD ENDING JUNE 30, 2020 (USD)
Total Funds Received from FCDO as of June 30, 2020	15,608,425
Disbursements FY20	3,843,242
Total TF Disbursements	12,280,969
Outstanding Contract Commitments	2,807,687
Cash Balance at the End of FY20	329,248

DISBURSEMENTS

BETF ACTIVITY		TOTAL BUDGET ALLOCATED	TOTAL DISBURSED	FY20 BUDGET ALLOCATION	FY20 DISBURSED	COMMITTED	AVAILABLE	% TOTAL DISBURSED + COMMITTED
PILLAR 1: Risk Identification								
TF0A4139	Risk Evaluation and Information Management	$5,430,500	$4,166,581	$1,100,500	$1,515,425	$1,211,570	$52,350	99%
TF0A3559	Urban Exposure Mapping Data Services	$149,329	$149,329	$0	$0	$0	$0	100%
Total Pillar 1		$5,579,829	$4,315,910	$1,100,500	$1,515,425	$1,211,570	$52,350	
PILLAR 2: Risk Reduction								
TF0A4691	Risk Mitigation Planning	$2,210,000	$1,634,619	$1,000,000	$562,210	$404,937	$170,443	92%
TF0A3571	Msimbazi River Revitalization	$659,753	$659,753	$0	$0	$0	$0	100%
TF0A4575	Urbanization Review - Resilience Planning	$57,848	$57,848	$0	$0	$0	$0	100%
TF0A5676	SWIFT Surveys on Poverty and Floods	$189,995	$189,995	$0	$0	$0	$0	100%
Total Pillar 2		$3,117,596	$2,542,215	$1,000,000	$562,210	$404,937	$170,443	
PILLAR 3: Emergency Preparedness								
TF0A3828	Emergency Planning and Response	$2,835,000	$2,248,529	$875,000	$924,655	$584,268	$2,203	100%
Total Pillar 3		$2,835,000	$2,248,529	$875,000	$924,655	$584,268	$2,203	
Resilience Academy								
TF0A4238	Resilience Academy	$2,120,000	$1,482,340	$500,000	$563,400	$559,702	$77,958	96%
Total Resilience Academy		$2,120,000	$1,482,340	$500,000	$563,400	$559,702	$77,958	
Program Administration								
TF0A3742	Technical Review and Design	$330,000	$329,478	$0	$0	$0	$522	100%
TF0A2973	Secretariat and Conferences	$1,436,000	$1,362,497	$306,000	$277,552	$47,210	$26,293	98%
Total Administration		$1,766,000	$1,691,976	$306,000	$277,552	$47,210	$26,815	
OVERALL Total Activities		**$15,418,425**	**$12,280,969**	**$3,781,500**	**$3,843,242**	**$2,807,687**	**$329,770**	**96%**

DELIVERY CHAIN

PILLAR 1- Risk Evaluation and Information Management (TF0A4139)	FY20 disbursements
Tanzanian Consultants	114,033.15
International Consultants	271,212.84
Cleveland Metropolitan Park Distric	23,226.00
Earthquakes & Megacities Initiative	118,865.00
Humanitarian OpenStreetmap Team	213,146.50
CDR International B.V.	59,990.40
Stichting Deltares	169,963.16
Spatial Collective Ltd	24,498.00
Delft University of Technology	118,854.00
Stiching THAMO	42,300.00
Elscolab BV	27,940.67
DeskTop Productions Limited	27,390.04
Tanzania Meteological Agency	4,466.22
Greenstand	10,000.00
Jeremy Benn Associates Ltd.	18,200.00
TOTAL	**1,244,085.98**

PILLAR 2 - Risk Mitigation Planning (TF0A4691)	FY20 disbursements
Tanzanian Consultants	145,898.55
International Consultants	19,543.68
SEGURA Consulting LLC	16,660.00
COWI Tanzania Ltd	61222.52
Stichting Deltares	33,130.00
NETICS B.V.	10,000.00
External Printing	17,747.71
TOTAL	**304,202.46**

PILLAR 3 - Emergency Planning and Response (TF0A3828)	FY20 disbursements
Tanzanian Consultants	132,451.96
International Consultants	79,276.63
Stichting Deltares	126,425.60
Earthquakes & Megacities Initiative	202,418.02
New Reality Technologies Pty (Ltd)	3,990.00
Techup (T) Ltd	55,889.96
iDev Tanzania Limited	7,475.00
Ardhi University	18,190.88
TOTAL	**626,118.05**

PILLAR 4 - Resilience Acadamy (TF0A4238)	FY20 disbursements
Tanzanian Consultants	23,767.34
International Consultants	59,900.75
Humanitarian OpenStreetmap Team	95,942.50
Spatial Collective Ltd	5,000.00
University of Turku	240,000.00
SenseFly Ltd.	4,950.00
TOTAL	**429,560.59**

SECRETARIAT (TF0A2973)	FY20 disbursements
Tanzanian Consultants	3,124.00
International Consultants	109,550.70
New Reality Technologies Pty (Ltd)	35,672.70
Fraym, Inc.	24,250.00
TOTAL	**172,597.40**

TANZANIA
URBAN RESILIENCE
PROGRAMME

WORLD BANK GROUP

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from the British people