Addressing gaps in availability of and access to climate information in climate-related disaster management

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Who is ICF International?

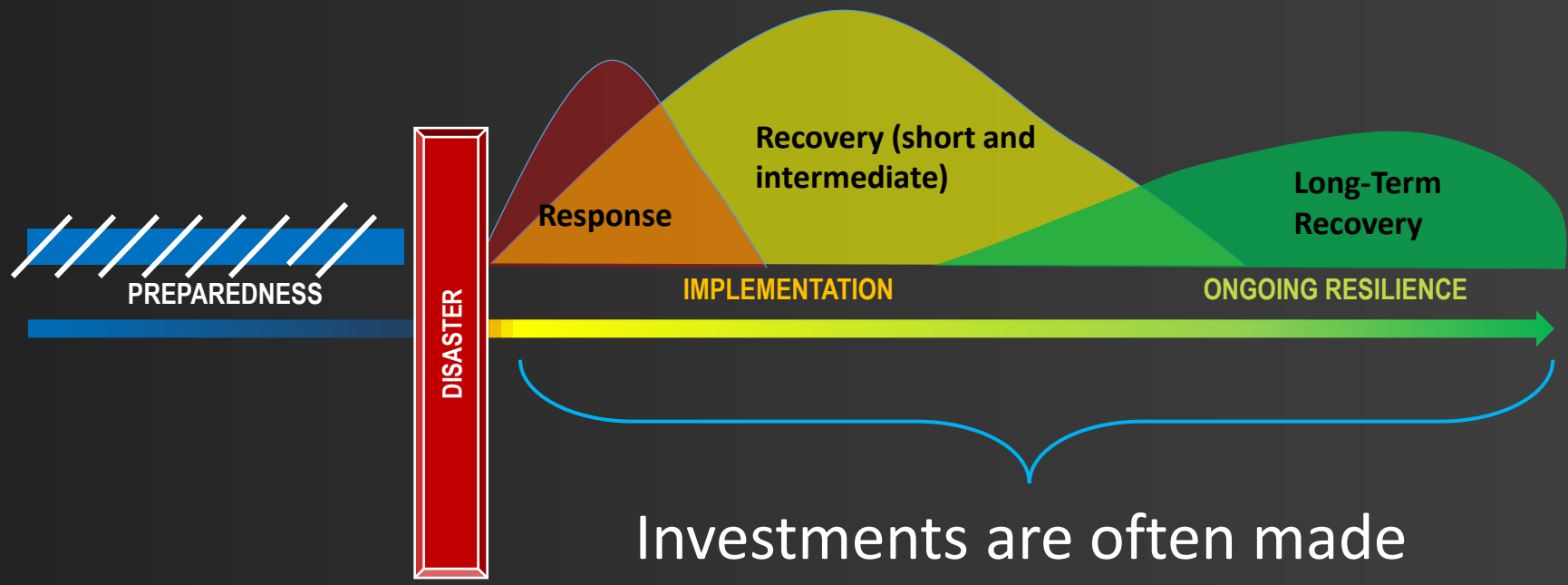
70+
Offices

5,000
Employees

ICF International Overview

- Supporting climate change projects since 1981
  - Cutting-edge projects for key agencies in US, UK, Canada, EC, IFIs, plus private sector
  - 300+ climate change experts covering all key disciplines and sectors
- Supporting international development since 1985
  - Supporting bilateral, multilateral aid agencies in over 100 countries
  - 300+ development experts covering health, climate change, governance, sustainable cities, energy, and the environment
  - Clientele includes DfID, WB, ADB, other key players at climate/ development interface

ICF helps agencies invest in preparedness before a disaster strikes



Investments are often made

post-disaster

Disasters can create opportunities to rebuild stronger, but pre-planning is critical

Without pre-planning, rebuilding will be done rapidly, at lowest cost, perpetuating prior vulnerabilities

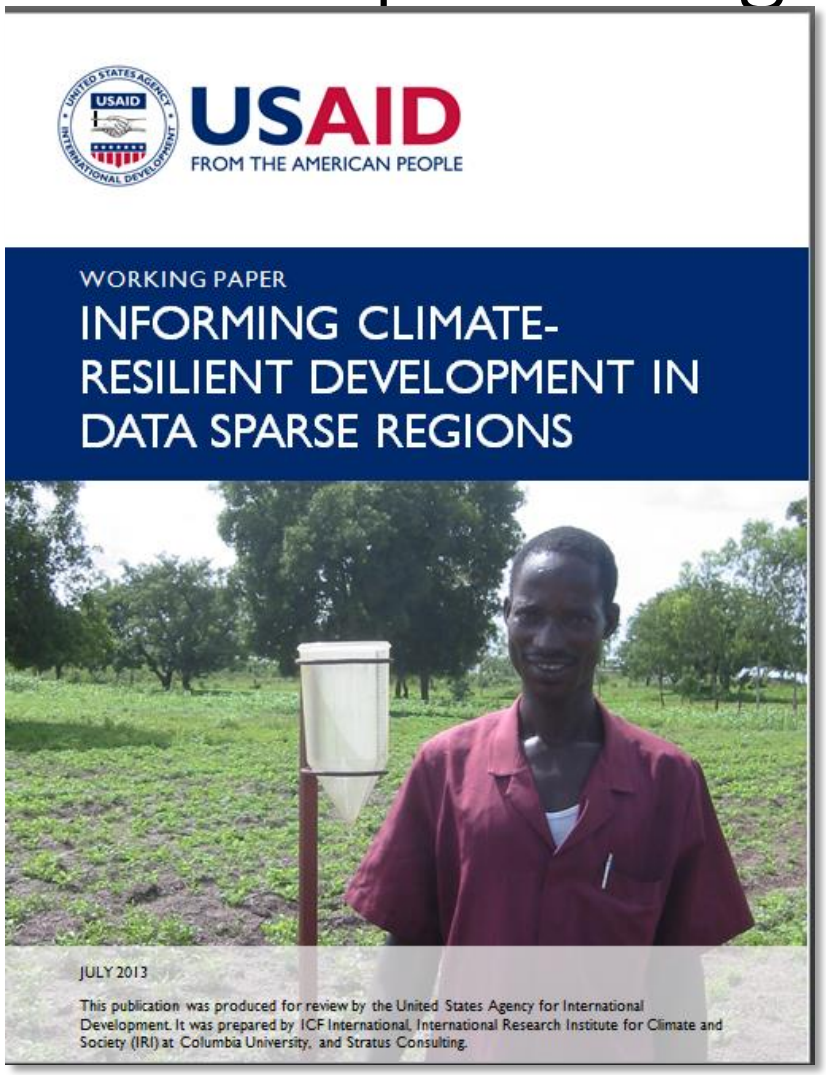
Pre-event recovery planning has traditionally focused on building resilience to future disasters; not climate change

ICF has developed approaches for climate-resilient pre-planning and **improved use of climate information in climate-related disaster management**

Today's Topics

- Barriers to improved use of climate information in climate-related disaster management
  - availability
  - accessibility
  - usefulness
- Solutions, including examples from regional and local communities
  - short-term
  - long-term

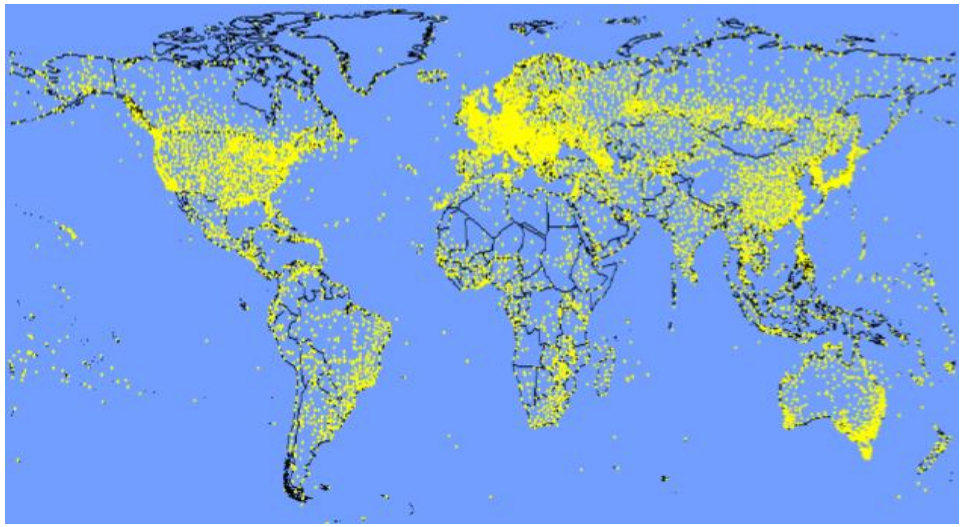
Informing Climate-resilient Development in Data Sparse Regions



- Working paper developed under USAID Climate Change Resilient Development (CCRD) program
- Data sparsity is the lack of available, accessible, and useful data
- It hampers effective climate resilient development and climate-related disaster management

Barriers To Availability of Observed Data

- Difficult and Remote Geography
  - Deters investment in observation stations
- Dispersed Rural Populations
  - Construction of existing and new stations skewed toward urban centers
- Conflict-Prone Areas
  - Missed observations and therefore gaps in the data record
- Lack of Investment
  - Can be difficult to articulate the value of climate information to real development
  - When investments are made, operation and maintenance is problematic (due to capacity or funding constraints)



Locations of stations reporting data on daily basis. Shows the uneven distribution of observation stations with higher densities in more developed areas. (Source: www.ncdc.noaa.gov/cgi-bin/res40.pl#Z)

Barriers To Access Climate Information

- Non-Digital Records
  - Historical record may be documented on paper or microfiche
- Cost
  - Some data sets require cost-prohibitive licenses
- Lack of Internet Access
  - Many data sets require a computer and Internet availability or a stable broadband Internet connection
- Lack of Technical Skills
  - Some level of technical expertise is needed to identify, navigate, and download data

Paper records. This photo from IEDRO.com shows Kenya met services.

Barriers to Usability of Climate Data

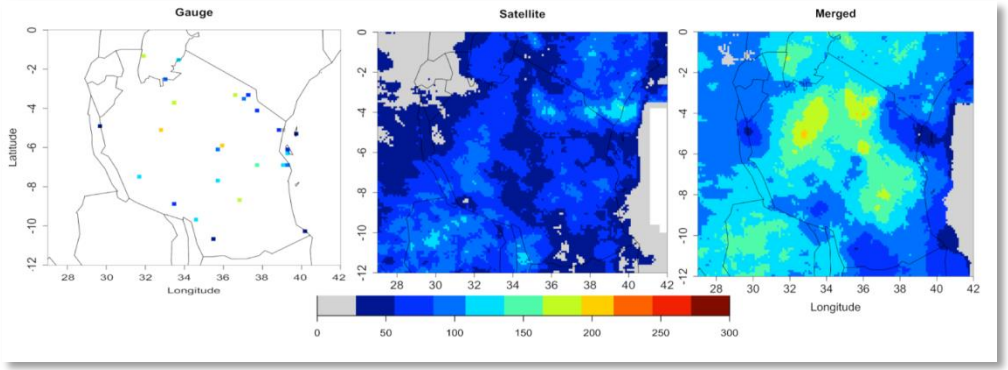
- Lack of Capacity to Use Data
  - Trained personnel and technical skills needed to tailor climate information products to meet the needs of decision makers
- Poor Data Quality
  - Time-series gaps, low density, lack of timeliness, poor accuracy or precision, and temporal and spatial mismatches
- Lack of Data Processing Ability
  - Data often require both human and computer resources to process
- Limited Trust
  - Poor communication and limited trust between the suppliers and users of information reduce the likelihood and productivity of data use

Short-term Solutions

- Interpolation
  - Fill gaps by interpolating station measurements onto regular grids (useful for larger areas)
- Reanalysis
  - Combine observational data with a physics-based climate model to produce gridded time series, producing a long time series (i.e., several decades or longer) of hundreds of climate variables with global coverage
- Using Satellites
  - Remotely sensed data (sometimes freely available) can provide global or regional coverage and may have sufficient temporal and spatial resolution and quality to inform decisions

Short-term Solutions (continued)

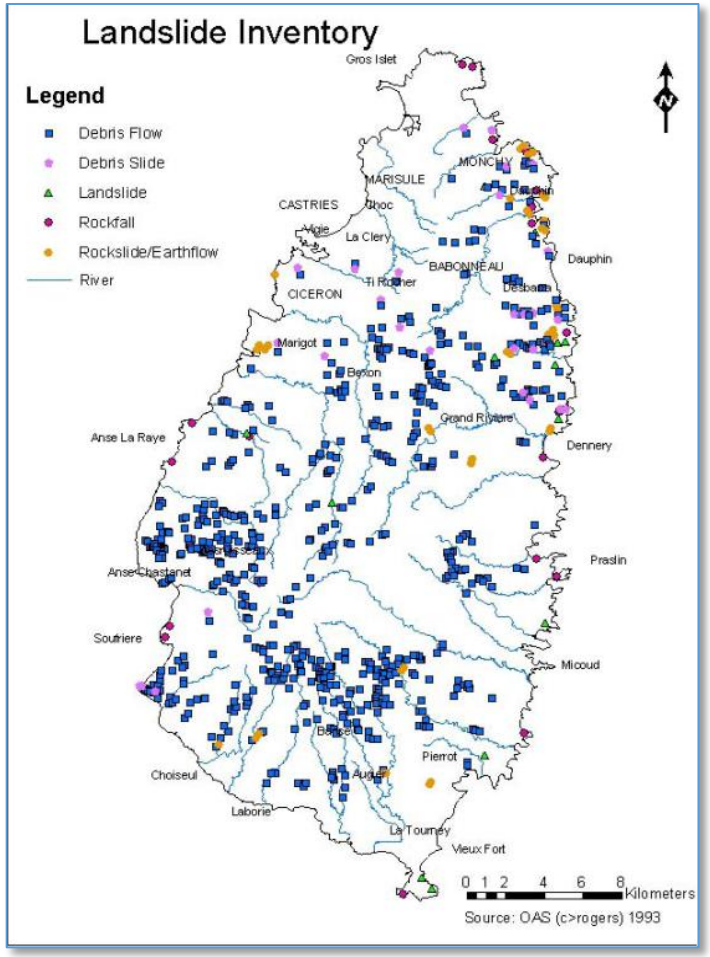
- Using Indigenous Knowledge
  - Observation and monitoring of specific indicators (animal behavior, birds, plants, insects) and other local knowledge can inform climate-related disaster risk management at both operational and strategic time scales.
- Using Non-Traditional Data Sources
  - Sources not typically used for weather reporting (e.g., ship data and aircraft data) can be assembled to get a rough picture of the ocean and atmosphere.
- Combining Data from Different Sources
  - Combining different data types to create a “merged product” can provide a consistent, gridded data set for a country or region.



Station observation (left), satellite estimate (center) and merged product (right) over Tanzania for Dec 1 to 10, 1997. Developed by International Research Institute for Climate and Society (IRI) and partners.

Climate Change Adaptation Planning in Latin American and Caribbean Cities (World Bank)

- The project team consulted non-traditional data sources to:
  - Identify hazards of concern
    - Local National Weather Service office – records of past events
    - Newspaper clippings
    - Engineers, operators, etc. with “on the ground” knowledge
  - “Quantify” identified hazards
    - Design standards
    - Damage functions
    - Early warning systems
    - Impacts observed during/after past events
    - Expert anecdotal evidence/understanding within the system
    - Drawing from analysis conducted at similar municipalities
    - Urban planning tools (zoning)
    - Hazard susceptibility maps



Locations of landslide occurrences, Saint Lucia, Source: Provided by the Physical Planning Unit.

Long-term Solutions (1) – improve *availability* of climate data and information

- Invest in additional observation stations in data sparse regions
  - Incentivize investment in spatially distributed stations, despite geographic challenges and urban/rural considerations
- Foster collaboration between information providers and users
  - Coordination will increase the likelihood for investment in climate data (benefits of climate data and information are often indirect and spread out across time, geography, and sectors)

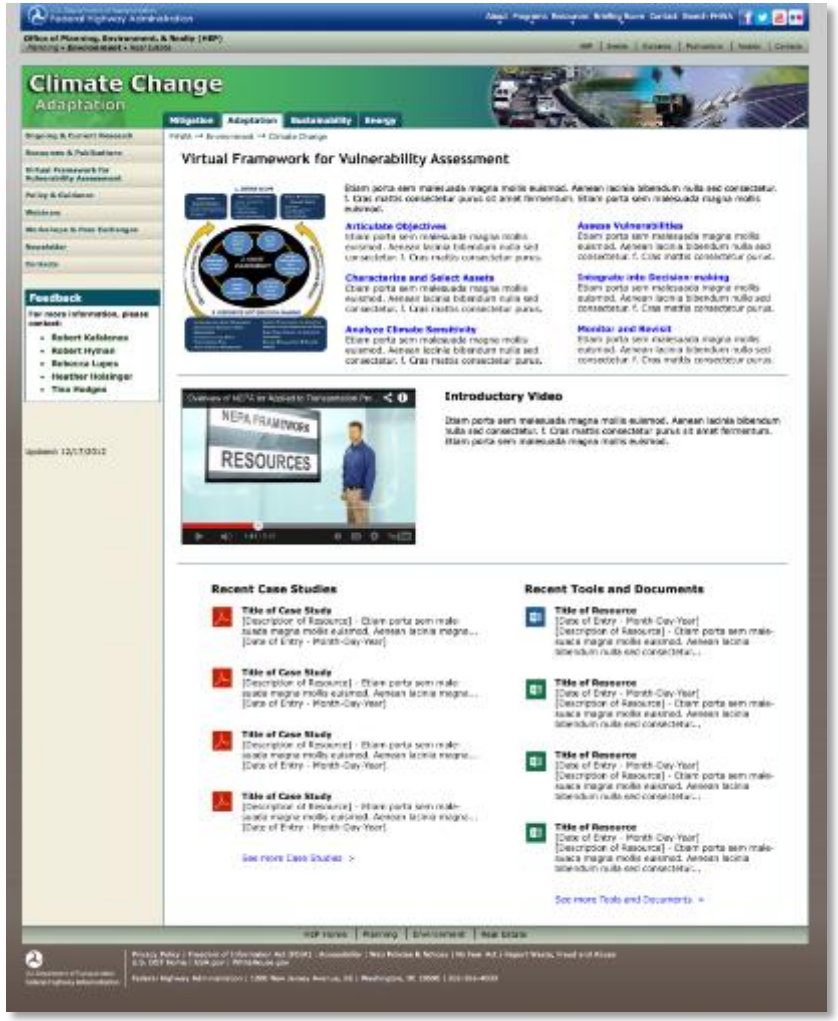
Piura Municipality members collaborating with climate experts during USAID Climate Resilient Infrastructure Services workshop. Credit: Joanne Potter, ICF International

Long-term Solutions (2) – improve *accessibility* of climate data and information

- Invest in data rescue (digitize climate data) and quality control of existing observations to improve quality of historical data and information
- Invest in making climate data sets freely available
- Improve internet access and other technical capabilities so that users are better able to access online resources
- Build capacity to access, navigate, and download data sets
- Provide access to information products and tools through different media including the internet and mobile devices

Long-term Solutions (3) – improve *usefulness* of climate data and information

- Make information products available in more readily usable formats
- Develop actionable climate information in consultation with the user community
- Develop practical guidance on what types of information are available in data sparse regions and how to use it for different development applications
  - Test the guidance for one or two high priority development applications in data sparse regions
- Train users (remotely and in person) on specific uses of information products and tools

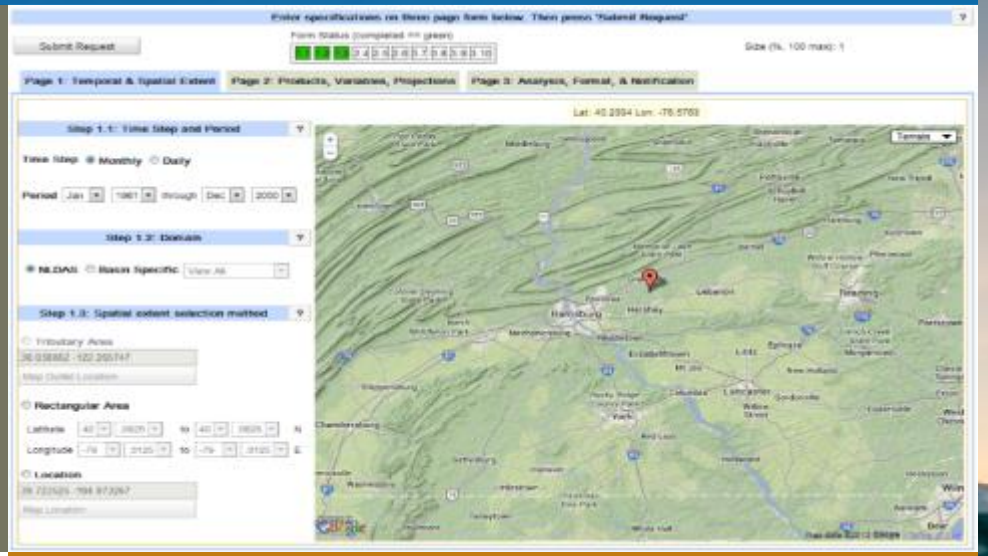


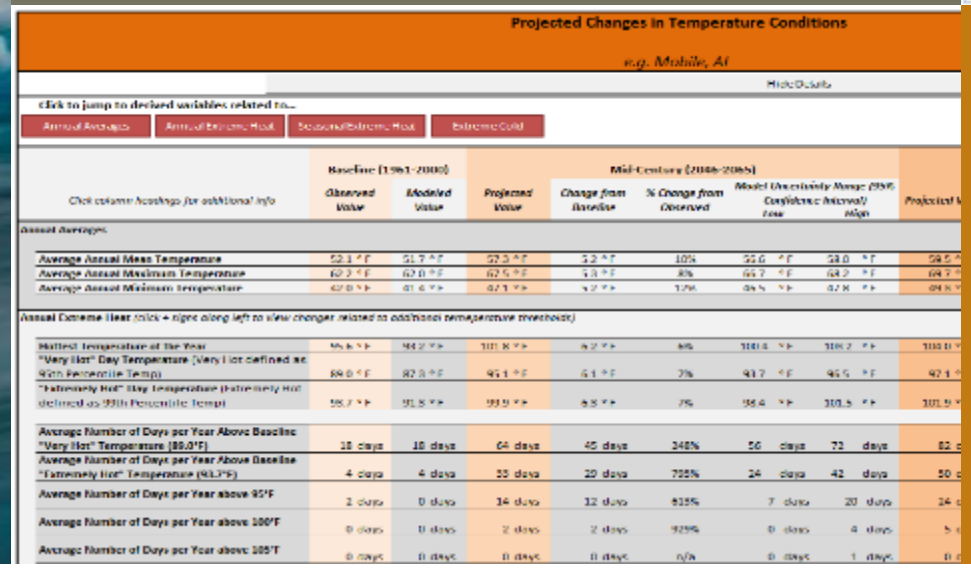
Long-term Solutions (3) = improve *usefulness* of climate data and information

- Complex information must be translated into more easily accessible and useful formats
- Decision support tools that offer that translation can take the form of:
  - maps and other visualizations
  - data processing and other tools
  - compilations of information in the forms of guidance, factsheets, and case studies (when tailored to meet specific needs)

The CMIP Climate Data Processing Tool helps departments of transportation access and use relevant climate data

Tool works with climate data from downscaled CMIP3 and CMIP5 Climate and Hydrology Projections (DCHP) website





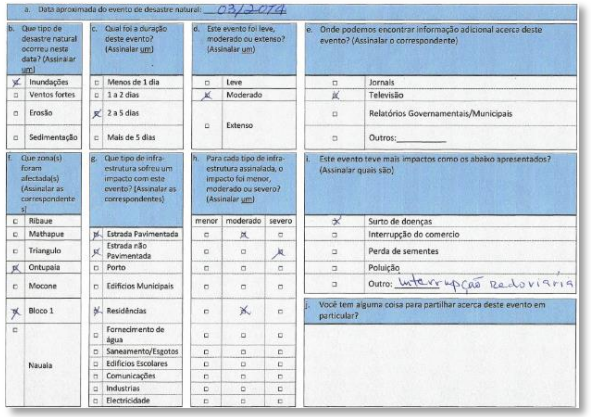
Translates climate model outputs into relatable terms

Working with USAID in four Climate Resilient Infrastructure Services (CRIS) pilot cities, we developed tools and guidance and provided direct technical assistance in using available climate information

Overcoming Data Sparsity in Nacala-Porto, Mozambique

Nacala –Porto, MZ

Severe damage to bridge (missing middle support)



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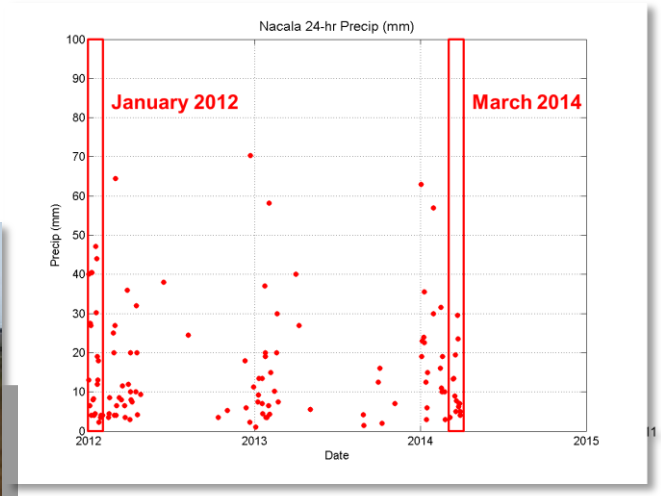
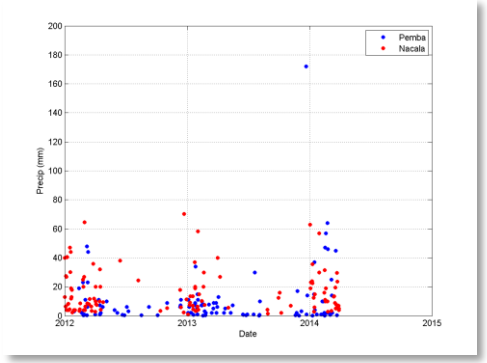
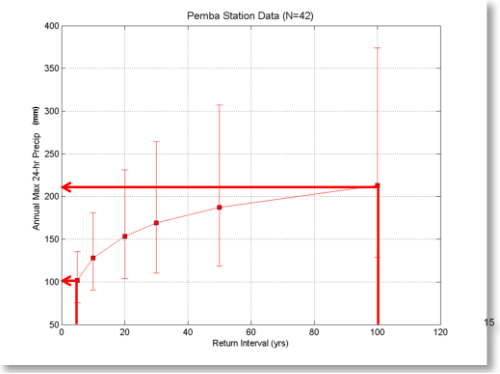
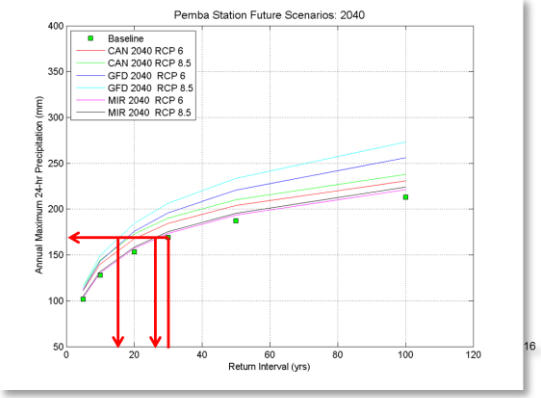


Survey of damages (top)
+ 3 years of daily data







Flooding and Erosion Vulnerability Screening and Adaptation

Module 1: Screening for Project and Downstream Vulnerabilities

Step 1: Exposure rating of project location and areas downstream of the project to climate stressors

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Step 2: Rating of potential impact of climate stressors on project assets and downstream assets

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Step 3: Rating of adaptive capacity in Nacala-Porto

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Step 4: Rating of overall project and downstream vulnerability given current and future climate

Module 2: Identification and Evaluation of Adaptation Measures

Step 1: Identification of adaptation measures that address identified or known vulnerabilities

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Step 2: Evaluation and prioritization of adaptation measures

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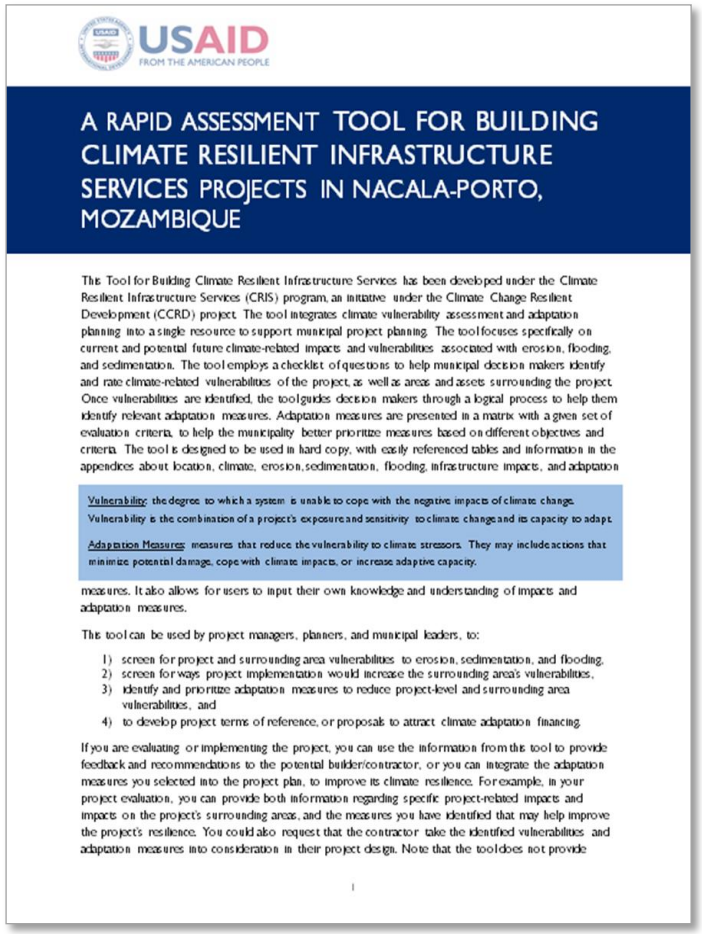
Next Steps: Consideration of actions based on prioritized adaptation measures

New factory in Triangulo, Nacala-Porto, Mozambique



USAID
FROM THE AMERICAN PEOPLE

A RAPID ASSESSMENT TOOL FOR BUILDING CLIMATE RESILIENT INFRASTRUCTURE SERVICES PROJECTS IN NACALA-PORTO, MOZAMBIQUE

This Tool for Building Climate Resilient Infrastructure Services has been developed under the Climate Resilient Infrastructure Services (CRIS) program, an initiative under the Climate Change Resilient Development (CCRD) project. The tool integrates climate vulnerability assessment and adaptation planning into a single resource to support municipal project planning. The tool focuses specifically on current and potential future climate-related impacts and vulnerabilities associated with erosion, flooding, and sedimentation. The tool employs a checklist of questions to help municipal decision makers identify and rate climate-related vulnerabilities of the project, as well as areas and assets surrounding the project. Once vulnerabilities are identified, the tool guides decision makers through a logical process to help them identify relevant adaptation measures. Adaptation measures are presented in a matrix with a given set of evaluation criteria, to help the municipality better prioritize measures based on different objectives and criteria. The tool is designed to be used in hard copy, with easily referenced tables and information in the appendices about location, climate, erosion, sedimentation, flooding, infrastructure impacts, and adaptation

Vulnerability: the degree to which a system is unable to cope with the negative impacts of climate change. Vulnerability is the combination of a project's exposure and sensitivity to climate change and its capacity to adapt.

Adaptation Measures: measures that reduce the vulnerability to climate stressors. They may include actions that minimize potential damage, cope with climate impacts, or increase adaptive capacity.

measures. It also allows for users to input their own knowledge and understanding of impacts and adaptation measures.

This tool can be used by project managers, planners, and municipal leaders, to:

1) screen for project and surrounding area vulnerabilities to erosion, sedimentation, and flooding,
2) screen for ways project implementation would increase the surrounding area's vulnerabilities,
3) identify and prioritize adaptation measures to reduce project-level and surrounding area vulnerabilities, and
4) to develop project terms of reference, or proposals to attract climate adaptation financing.

If you are evaluating or implementing the project, you can use the information from this tool to provide feedback and recommendations to the potential builder/contractor, or you can integrate the adaptation measures you selected into the project plan, to improve its climate resilience. For example, in your project evaluation, you can provide both information regarding specific project-related impacts and impacts on the project's surrounding areas, and the measures you have identified that may help improve the project's resilience. You could also request that the contractor take the identified vulnerabilities and adaptation measures into consideration in their project design. Note that the tool does not provide

World Bank Climate & Disaster Risk Screening Tools

- Web-based tools provide step-by-step guidance for risk screening at an early stage of program and/or project development


National/Policy Tool


Agriculture


Energy


Roads


Coastal Flood Protection


Health

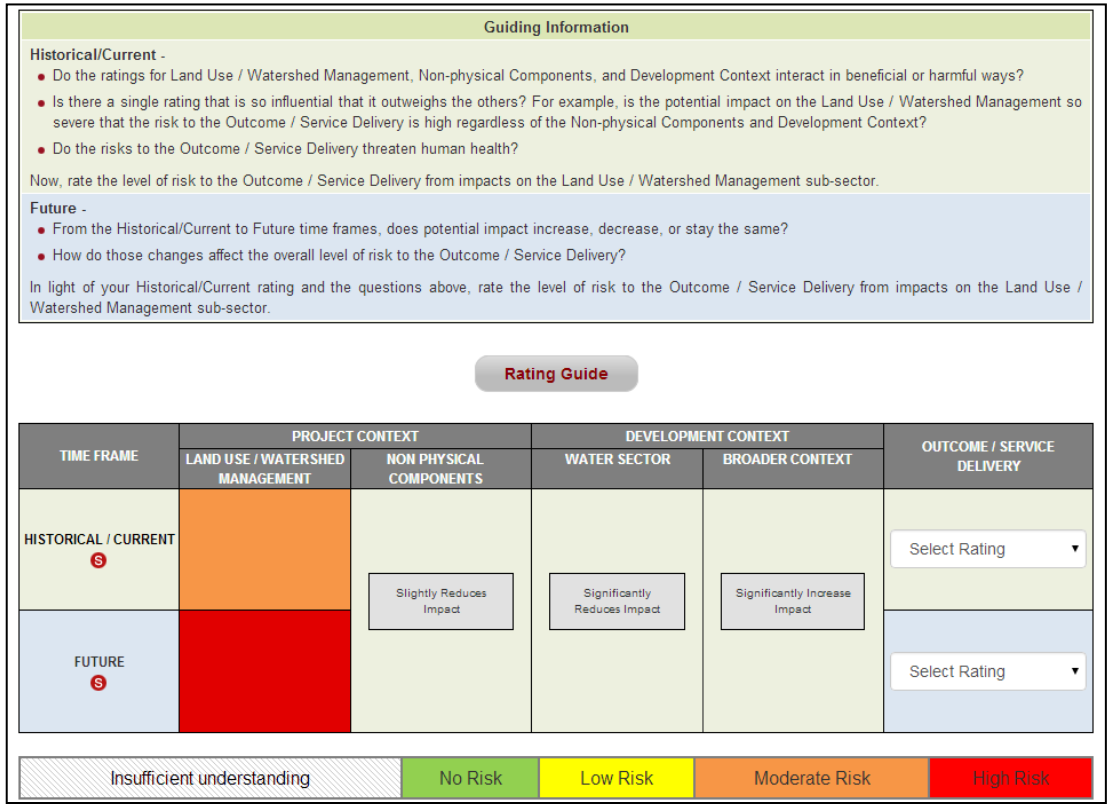

Water

General

World Bank Climate & Disaster Risk Screening Tools

Quick application (1- 3 hours)

- Tailored for developing countries
- Relevant climate and disaster information through the World Bank Climate Change Knowledge Portal (CCKP)
- Guide to complementary tools and useful resources
- Training videos



For More Information

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