



SESSION 2.3: Introduction to climate and disaster risk tools for investment decision-making

Regional Workshop on Climate and
Disaster Risk-Informed Investments

Johannes Hunink, Yannis Fourniadis, Peter Droogers

June 2023



MentiMeter Questions

Code: 5265 8243

a. How many web pages with “climate and disaster risk tools”

- Less than 100,000 (hundred thousand)
- Less than 1,000,000 (one million)
- Less than 10,000,000 (ten million)
- More than 10,000,000 (ten million)



Mentimeter

The image shows a browser window with a Google search page. The search bar contains the text "climate and disaster risk tools", which is highlighted with an orange box. Below the search bar, there are several filter buttons: "Images", "News", "Free", "Pdf", "Videos", "Books", "Maps", "Flights", and "Finance". At the bottom of the search results area, a box indicates "About 44.800.000 results (0,41 seconds)". The browser's address bar shows the URL "google.com/search?q=climate+...". The browser's bookmark bar includes "Photo editor online...", "SEP Evaluation", "GPS Visualizer", "captive.apple.com", "FutureWater", and "SharePoint".

MentiMeter Questions

Code: 5265 8243



b. I use (have used) “climate and disaster risk tools” by myself

- Yes
- Only a bit
- No

c. My organization uses “climate and disaster risk tools” by myself

- Yes, quite often
- Sometimes
- Never

d. Give one or more names of “climate and disaster risk tools”

Contents

1. Types of tools
2. An example for each type of tool
3. Demonstration of one tool



- > You have received a handout with existing tools
- > Only tools in the public domain – accessible freely
- > Excluding commercial tools
 - typically focused on physical risks on infrastructure
- > Excluding self-assessment tools, methods or approaches
 - See <https://www.resilienceshift.org/tool/> for a list of these



Type of tool	Name	Organization	Link	Allows downloading data	Summary
1. Data exploration and visualisation	Natural Hazards Viewer	NOAA – National Centers for Environmental Information	https://www.ncei.noaa.gov/maps/hazards/?layers=0	No/limited	The National Ce and mitigation. 1 recorded losse
1. Data exploration and visualisation	WESR-RISK Data Platform	UNEP GRID-Geneva (United Nations Environment Programme - Global Resource Information Database - Geneva)	https://wesr.unepgrid.ch/?project=MX-XVK-HPH-OGN-HVE-GGN&language=en	Yes	The WESR-RIS extract data on million) and rela
1. Data exploration and visualisation	ClimateWizard	The Nature Conservancy	https://climatechange.ita.org/tnc-climate-v	No/limited	Offers historici
1. Data exploration and visualisation	Climate Data Online (CDO)	NOAA	https://www.ncdc.noaa.gov/cdo-web/	Yes	Provides acces
1. Data exploration and visualisation	Climate Explorer	World Climate Research Programme (WCRP)	https://climexp.knmi.nl/start.cgi	No/limited	Offers access

1. Data exploration and visualization tools

2. Screening and assessment tools

3. Decision-support tools

> **Objective:**

- Easy access to risk information by general public, decision-makers and analysts.

> **Characteristics**

- Maps of hazards and climate variables
- Statistics of climate indices
- Historic (baseline or reference) climate versus future (projected) climate
- Many portals: some offer basic functionalities, others more advanced

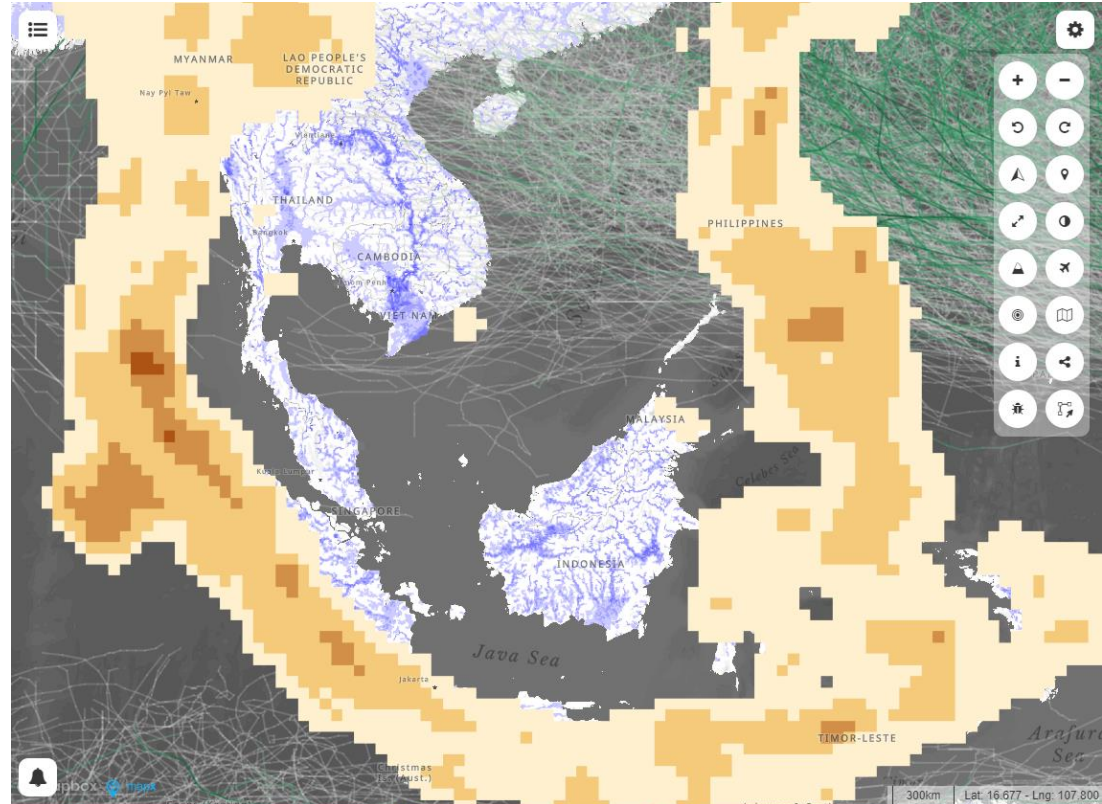


- > Only few portals allow **downloading** the accessible data, for further analysis, modeling, etc.



1. Data exploration and visualization tools - example

- > The WESR-RISK Data Platform is a multiple agencies effort to share spatial data information on global risk from natural hazards
- > Users can visualise, download or extract data on past hazardous events, human & economical hazard exposure and risk from natural hazards
- > Risk is expressed as average annual loss (in USD\$ million) and relative average annual loss (%)
- > Hazards covered include earthquakes, flooding, tropical cyclones and tsunami
- > A limitation of the tool is the lack of climate hazards for future climate scenarios; and the inability to export the datasets as digital files for import into GIS



- > **Objective:**
 - A site-specific report with risk indicators.
- > **Characteristics**
 - Users can select a location (e.g. province or point)
 - Generates a report (web or downloadable)
 - Covers Hazard, exposure and vulnerability
- > Still very few tools available in the public domain
- > ADB is developing a climate and disaster risk screening and assessment tool (est. 2025 external launch)



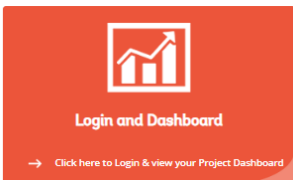
2. Risk screening and assessment tools - example

- > Launched in July 2014
- > Tools
 - **In-Depth Screening:**
Recommended for detailed consideration of climate and disaster risks. Good for new users for step-by-step guidance.
 - **Rapid Screening**
For experienced users with good understanding of risks. Also, for screening projects with no physical components

The Climate and Disaster Risk Screening Tools

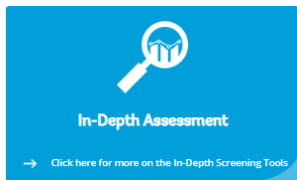
The Climate and Disaster Risk Screening Tools offer two types of assessment. The In-Depth assessment provides a detailed evaluation of current and future climate and disaster risks. It is the recommended assessment option for users who may need additional guidance on the climate and disaster risks that may impact a project or program.

The Rapid Assessment Screening Tools provide a faster assessment of current and future climate and disaster risks. This screening assessment is a good option for users who are familiar with risk screening considerations, already have knowledge on the climate and disaster risks that may impact their project or program, and/or are screening projects with no physical components.



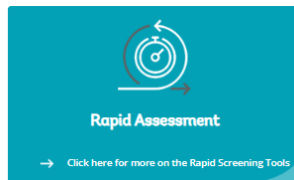
Login and Dashboard

→ Click here to Login & view your Project Dashboard



In-Depth Assessment

→ Click here for more on the In-Depth Screening Tools




Rapid Assessment

→ Click here for more on the Rapid Screening Tools



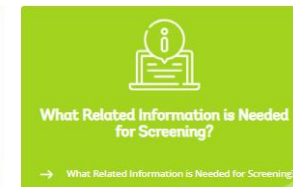
What is Climate and Disaster Risk Screening and why is it important?

→ Click here to learn more



What does the Screening Process look like?

→ Click here to learn more



What Related Information is Needed for Screening?

→ What Related Information is Needed for Screening?



THE WORLD BANK
WHO WE ARE WHAT WE DO WHERE WE WORK UNDERSTANDING POVERTY WORK WITH US COVID-19

Climate and Disaster Risk Screening Tools

ABOUT SCREENING + START SCREENING + SCREENING RESOURCES + LOGOUT

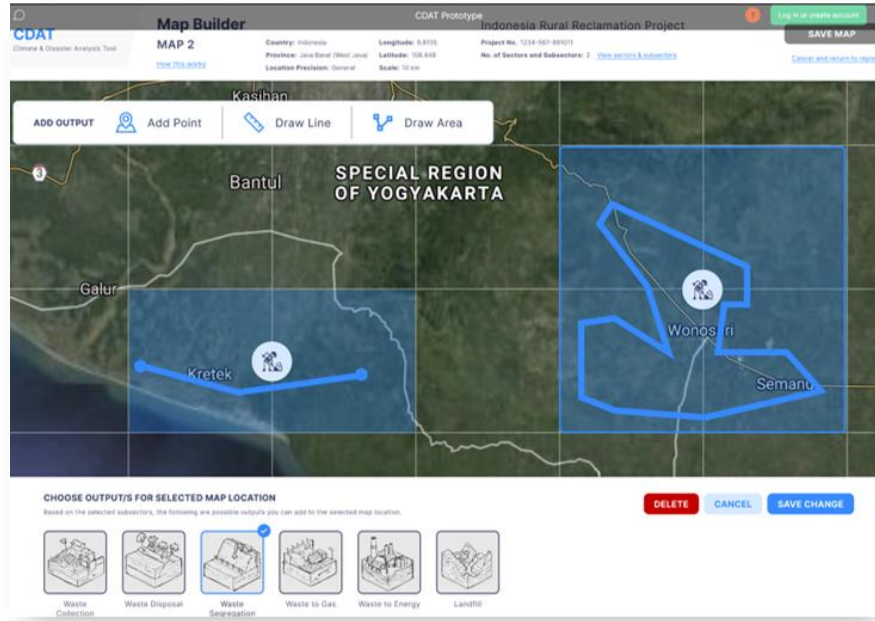
WELCOME TO THE WORLD BANK
CLIMATE AND DISASTER RISK SCREENING TOOLS

The risk screening tools are a **free** online resource offered to all internal and external **registered users** of the site.

If you are new to the website, before you can start using the Risk Screening Tools, you need to create an account. You can do this by clicking 'Login', at the top righthand corner of this page (or select the 'Login & Dashboard' panel below) and follow the steps to register an account. For previously registered users - to access your existing account, follow the same instructions and use your existing login credentials to sign-in.

About Climate and Disaster Risk Screening

Climate and Disaster Risk Screening is a process for identifying short and long term climate and disaster risks to build resilience in development projects, policies, and programs. Identifying risks and proactively incorporating resilience measures - at an early stage of project design - can help projects achieve their development objectives. The Climate and Disaster Risk Screening Tools available on this website, can be used by development practitioners for high-level screening at an early stage of project design or in national level planning processes.



- > Currently under development – initial release 2025
- > Tools:
 - Climate and natural hazard risk screening
 - Climate and natural hazard risk data report
 - ‘Light touch’ Climate risk and adaptation assessment
- > Functionalities
 - Visualization
 - Data acquisition, storage and management
 - Data analysis and computation
 - Report generation

Table 2. Risk ratings for sub-sector "Renewable energy generation - solar".

	Location #1: Guzar solar power plant	Location #2: Sherabad solar power plant		
Geophysical hazards				
Earthquake	L	L		
Tsunami	N/A	N/A		
Volcanic	N/A	N/A		
Seismic-induced (dry) landslide	L	N/A		
Climate-related hazards				
	Baseline risk	Projected risk (2050)	Baseline risk	Projected risk (2050)
River flood	N/A	N/A	N/A	N/A
Wet landslides	N/A	N/A	N/A	N/A
Storm surge	N/A	N/A	N/A	N/A
Tropical cyclone	N/A	N/A	N/A	N/A
Drought	L	L	L	L
Heat wave	H	H	L	H
Wetfire	N/A	N/A	N/A	N/A
Long-term climate change (RPS)				
Surface temperature	H	H	H	H
Water scarcity	H	H	H	H
Sea level rise	N/A	N/A	N/A	N/A

Table 3 Risk ratings for sub-sector "Renewable energy generation - wind".

	Location #3: Zarafshan wind farm	
Geophysical hazards		
Earthquake	H	
Tsunami	N/A	
Volcanic	N/A	
Seismic-induced (dry) landslide	M	
Climate-related hazards		
	Baseline risk	Projected risk (2050)
River flood	N/A	N/A
Wet landslides	N/A	N/A
Storm surge	N/A	N/A
Tropical cyclone	N/A	N/A
Drought	N/A	N/A
Heat wave	L	L
Wetfire	N/A	N/A
Long-term climate change (RPS)		
Surface temperature	H	
Water scarcity	M	
Sea level rise	N/A	

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

2.2 Resilience options

[D] Information box: "Resilience options are presented for hazards that pose medium to high risk to the project subsectors"

The resilience options presented in this section could be considered during project preparation in order to reduce the identified risks to the project. This list is based on ADB databases and is not project-specific. Generally, low-cost resilience options are recommended for hazards that pose low risk to a subsector, whereas medium- and high-cost resilience options are recommended for hazards that pose medium or high risk to a subsector.

A comprehensive review of resilience options should be prepared as part of a climate / disaster risk assessment prepared by a qualified expert, with consideration to the country's national adaptation and Disaster Risk Management (DRM) plans. The below tables present example options. More options can be found in the referenced resources.

Table 4. Resilience options for hazards that pose risk to subsector Renewable energy generation - solar.

Hazard	Resilience option	Time for implementation / Lifetime	Scale of implementation	Relative cost
Subsector: Renewable energy generation - solar				
Earthquake hazard	Ground remediation (e.g. ground improvement, dewatering) to reduce seismic risk in areas underlain by sensitive deposits (e.g. loose alluvial soils with elevated groundwater table)	Short-to-medium-term construction, with long-term impact	Local level	Low cost
Seismic-induced landslide hazard	Develop and implement Early Warning Systems (e.g. earthquake monitoring), identify action thresholds and ensure ongoing management to alert plant operators of pending disasters	Short-term initial effort, revised and sustained over long-term as conditions change	Local level	Low cost
Increased temperature and heatwaves	Establish Climate Information Network to support adaptation planning, including developing observation networks, supporting data "rescue" and archiving, updating resources for forecasting and building capacity for climate projections	Short-term initial effort, sustained over long-term	Local level	Low cost
	Improve airflow beneath mounting structure to reduce heat gain and increase outputs, including installing panels a certain distance above the ground to allow convective air flow to cool the panels down, ensure that panels are constructed with light-colored materials to reduce heat absorber, and moving components like inverters and combiners into the shaded area behind the array	Short-term construction, with medium term impact (lifetime of panels/structures)	Local level	Low cost

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.



INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

for Amu Darya river

Geophysical, climate-related extreme events is accompanied by a good database

Identified risks which can inform project and early consideration of resilience change or disaster risk consultants at Disaster Risk Assessment preparation.

Amu Darya basin - Uzbekistan scenario 8.5, 2050-2080

Report automatically generated on 10 January 2024 at 8:03 by CCDRM.adb.org website

Limitations

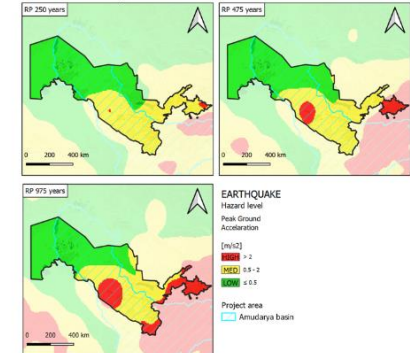
2 Geophysical hazards and climate-related events

2.1 Geophysical hazards

2.1.1 Earthquake

The selected location is in a region of high seismic hazard, where Peak Ground Acceleration (PGA) greater than 2 m/s² may be expected from an event with a return period of 475 years (Figure 2).

Figure 2 Seismic hazard map



Source: GAR 2017, Global Seismic Hazard Map, Return Period 250, 475 and 975 years (Peak Ground Acceleration).

Table 1 Significant earthquakes in the area (within a 300-year time window)

Type of disaster	Year	Hazard magnitude / intensity	Location (Uzbekistan)	Losses (affected, fatalities, monetary)
Earthquake	1799	6.0 magnitude / 9 intensity	Jizzaj (Uzbekistan)	Unknown fatalities, severe economic damage (USD 5 to 24 million)
Earthquake	1907	7.4 magnitude / 9 intensity	Konak (Tajikistan)	12,000 fatalities, severe economic damage (USD 5 to 24 million)

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

> **Objective:**

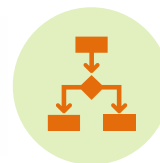
- Provide concrete guidance on resilience options.

> **Characteristics**

- Users can filter or prioritize resilience options based on the local context

> **Also: country-specific tools, like:**

- Multi-criteria spreadsheets
- Decision-trees
- Guidance (<https://toolkit.climate.gov/#tools>)



> **Not included in the handout:**

- ADB Adaptation Options Database (advanced draft; not issued yet)
- ADB Disaster Risk Reduction Options Database (in early development)
- *The Resilience Shift* (links to mostly proprietary adaptation options for infrastructure)
- Portals on sector-specific good practices, e.g. climate smart agriculture, etc.

3. Decision support tools - example

> Multi-Criteria Analysis using spreadsheets

- Easy of use
- Flexibility and customization
- Cost-effective

> Used by govt (national and states) in Australia, UK, U.S., etc s

Sustainability Opportunity & Risk Assessment Tool (SORAT)

This tool is designed to quickly and holistically identify risks and opportunities associated with the design of a capital works project, so that material aspects can be considered early in design responses to maximise positive project outcomes.

Programme: _____ Assessment completed by: _____
 Project Name: _____ Role/ Organisation: _____
 Project Stage: _____ Date Completed: _____

Sustainability Framework			Assessment					
Theme	Impact area	Related SDGs	Risks			Opportunities		
			Question	Answer	Rating	Action (next steps & owner)	Question	Answer
			<i>Is there a real chance or possibility that:</i>			<i>Is there an opportunity:</i>		
Resilience	Climate and Natural Hazards	 • the asset will be vulnerable to a climate hazard (i.e bushfire, drought, extreme heat) now or in the future (operating life)?		Medium		• to incorporate adaptation measures that have multiple benefits into the design (i.e. green infrastructure)?		
	Asset Resilience	 • the operation of the asset will be impacted by a shock or a stressor? • if asset operations ceased it would have a severely negative impact (i.e. on community, environment, economy etc.)?		High		• for the asset to improve the resilience of the community?		
Energy and Carbon	Energy Efficiency	 • the asset's energy use (including during construction) is inefficient? • the asset's energy use will jeopardise the organisation's carbon neutral goals or obligations?				• to design out unnecessary activities that use energy or create emissions? • to pilot and/or implement energy efficient technologies? • to monitor and continually improve energy efficiency across the asset's operating life?		
	Embodied Carbon	 N/A				• to prioritise low embodied carbon materials in the design (i.e. through a lifecycle assessment)?		

MentiMeter Questions

Code: 5265 8243

e. Rank support needed for tools to:

- Visualize data
- Extract and download data
- Assess risk
- Decision-support on resilience options



Mentimeter

> Good Practice Guidance for Climate-resilient Infrastructure Design: Adaptation Options Database – in development

SHOW/HIDE columns
 SHOW ALL columns

GOOD PRACTICE GUIDANCE FOR CLIMATE-RESILIENT INFRASTRUCTURE DESIGN: ADAPTATION OPTIONS DATABASE

TA-9414: Supporting Adaptation Decision Making for Climate Resilient Investments

8680

visible record(s)

OPTION 1: Search by Keywords

Perform SEARCH ROWS by Keyword

Example: Smart, Solar, or Sustainable etc.

SEARCH ROWS
CLEAR Search

OPTION 2: Search by Filters

STEP 1: Filter by Sector

- Agriculture
- Energy
- Transportation
- Urban
- Water

STEP 2: Filter by Subsector (based on ADB PCS)

- Forestry
- Irrigation
- Land-based natural resources management
- Large hydropower generation
- Livestock
- Multi-sectored / cross-subsector

STEP 3: Filter by Climate Hazards

- Acidification
- All current and projected changes in climate in a given location
- Aridity (increase in dry season)
- Cloud cover
- Damaging winds (including from typhoons/tropical cyclones)
- Drought

Tip: For multiple selections: Select an option + Hold the CTRL button + Select the other option(s)

Climate Adaptation Guidance Tool ver 2.7.4 8680 visible record(s)

A. SECTORS and SUBSECTORS				B. CLIMATE HAZARDS and IMPACTS		C. ADAPTATION CATEGORY/GROUP	D. ADAPTATION OPTIONS					
Sectors	Subsectors	Sectors (based on ADB PCS)	Subsectors (based on ADB PCS)	Climate Hazards	Climate Impacts	Adaptation Category/Group	Adaptation Options	Type	Sub-types	Time for implementation / Lifetime	Scale of implementation	Urban / Rural context
Agriculture	Agricultural production	Agriculture, Natural Resources, and Rural Development (ANRPD)	Agricultural production	All current and projected changes in climate in a given location	All locally identified current and potential impacts of climate change	Farmer capacity building on climate smart agriculture	Capacity building workshops with farmers	Human and social capital	Capacity building, Practice and behaviour	-	Farm/Local level	-
Agriculture	Agricultural production	Agriculture, Natural Resources, and Rural Development (ANRPD)	Agricultural production	All current and projected changes in climate in a given location	All locally identified current and potential impacts of climate change	Farmer capacity building on climate smart agriculture	Demonstrations farms	Human and social capital	Capacity building, Practice and behaviour	-	Farm/Local level	-

ADB

FutureWater

Thank you

