

Case Study 1: Innovative Approaches to Urban Flood Risk Reduction

Training Workshop on Building Resilient Cities: Strategies for Effective Urban Flood Management

28 January 2024



SAARC Disaster Management Center

SEDAI FRAMEWORK
FOR DISASTER RISK REDUCTION 2015-2030



Who we are

Where we work

Resilience roadmap

News

Get Ready

**My city is getting ready.
Is yours?**

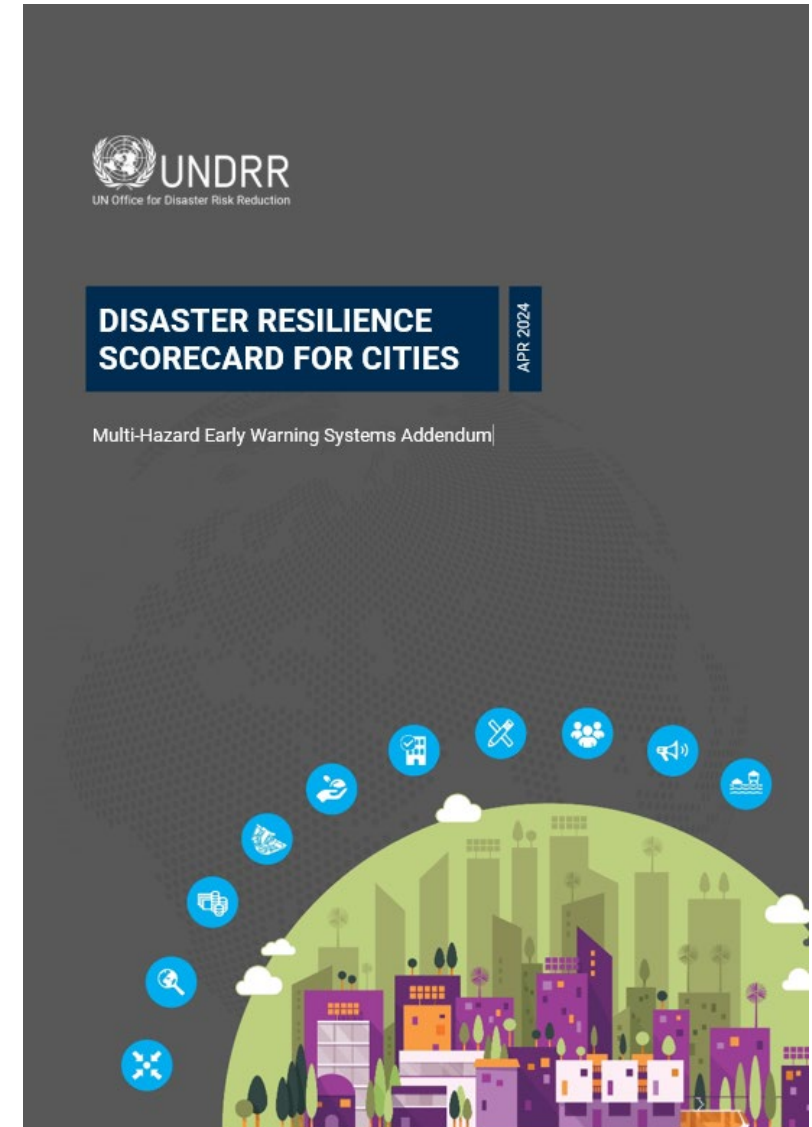
What is MCR2030?

1786 cities
and 400
partners

580 million
urban
population

Multi-Hazard Early Warning Systems Addendum

- **Self-assessment tool** supporting **local** governments to develop people- and nature-centred, **multi-hazard approaches to early warning systems**.
- It is complimentary to and should be **used in conjunction with the Disaster Resilience Scorecard for Cities** (the City Scorecard) – supports flood prevention and management



Knowledge Sharing

MCR2030 Webinar

Strengthening city data for resilience - ISO 37123 Indicators for Resilient Cities



Thursday, 19 May 2022

7:30–8:30 Toronto | 13:30–14:30 Geneva | 20:30–21:30 Incheon



English, with French, Portuguese & Spanish simultaneous interpretation

 For more information, visit:
<https://www.unclp.org/en/mcr/MCR2030-WCDD-webinar>

#MCR2030
#ResilientCities



Patricia McCarney
President and CEO
WCDD



James Palawa
Vice President
WCDD



Justine Hamblin-Arivals
Manager, City Relations
& Strategic Projects
WCDD



Eleanor Schoeffel
Coordinator
City Certification
WCDD









MC2030 Webinar

Preventing cascading failures of critical assets: Using the Open-Source Critical Asset Management System to build resilience

 **Tuesday, 12 April 2022**

 **9:00-10:00 London | 17:00-18:00 Incheon**

 **English, with French simultaneous interpretation**

For more information, visit: <https://www.uscib.fr/en/act/mc2030-cams-webinar>

#MC2030 #ResilientCities

Speakers:



Luke Peeney
Lead Operating Officer
2020-2024, Sea Frontier
Terminville



Kitty Jose
Senior Knowledge Engineer,
Terminville








#MCR2030

MCR 2030 Making Cities Resilient

Webinar | Nature-Based Solutions: Tools for Europe and Central Asia

9 December, 15:00 CET










JOINT CERTIFICATE PROGRAMME
UNDRR GETI, UNOSSC & WHO

BUILD BACK BETTER:

Harnessing South-South cooperation and risk reduction planning for resilient and healthy cities in the post COVID-19 era

An introductory training for local authorities and urban development practitioners

8, 15, 22, 29 JUNE 2021 (TUESDAYS)
07:30 NEW YORK | 13:30 GENEVA | 20:30 CINCINNATI

(Four 90-min online sessions, one end-of-course assessment, and one post-course survey)

Event Language

 English with simultaneous interpretation in Arabic, Chinese, French, Portuguese and Spanish

Organized by

- United Nations Office for Disaster Risk Reduction Global Education and Training Institute (UNDRR GETI)
- United Nations Office for South-South Cooperation (UNOSSC)
- World Health Organization (WHO)

Course Certificate

Certificate of completion will be given to participants who attend at least 3 live sessions (75%), complete a feedback survey and an end-of-course assessment (80% success).

How to Enroll

Apply here: <https://bit.ly/3nQZeJn> or Scan this QR Code







World Health Organization
 United Nations
 Department of Economic and Social Affairs
UNDRR

WHO Partner
 Institute for Health and Research
 International
 Center for
 Resilient
 Cities



MCR2030 Webinar

City Resilience Program (CRP): Supporting cities in building resilience

.....

 **Wednesday, 02 February, 2022**

 **7:00 - 8:00 EST | 13:00 - 14:00 CET | 21:00 - 22:00 KST**



Mameela Chigapinnio
Senior Operations Officer,
World Bank



Steven Louis Rubinyi
Disaster Risk Management
Specialist, World Bank



Megha Mukim
Senior Urban Economist,
World Bank





For more information, visit:
<https://bit.ly/MCR2030-CRP>



<https://mcr2030-undrr.org> #MCR2030 #ResilientCities




Making Cities Resilient 2030 (MCR2030)

Engaging with local governments in Africa

Oct 12, 2021 11:00 AM, Nairobi Time

Is your city ready?




#MCR2030 #ResilientCities
mcr2030.undrr.org





Making Cities Resilient

E-LEARNING COURSE









**Training academy
for politicians
on adaptation and
mitigation**

16-17 June 2022
10:00-12:30





unitar
United Nations Institute for Training and Research


UNDRR
United Nations Office for Disaster Risk Reduction

Making Cities Resilient:

DEVELOPING LOCAL DISASTER RISK REDUCTION AND RESILIENCE STRATEGIES



Credit: UN Photo
Loren Seawort



SENDAI FRAMEWORK










World Health Organization

United Nations

UN Office for South-South Cooperation

UN Office for Disaster Risk Reduction

UNEP Office for South-South Cooperation

UNEP Office for Disaster Risk Reduction

UNEP Office for South-South Cooperation

UNEP Office for Disaster Risk Reduction

Resilience Learning Module II:

Strategies and Actions

Wednesday, October 13th

15:00 – 16:30 CEST

LEARNING GAMES & #LOCAL4ACTION

Unlocking a global resilience roadmap for local and regional governments






UCLG
United Cities and Local Governments

UNDRR
UN Office for Disaster Risk Reduction

UNEP HABITAT
United Nations Human Settlements Programme

MCR 2030
Making Cities Resilient

Practical approaches to resilience building for local, metropolitan and regional governments

register now for fully virtual conference

innovate4cities.org/2020

MCR2030 Webinar

Getting to know the City Climate Finance Gap Fund

An aerial photograph of a city street, likely in London, showing a wide road with a central green space and historic buildings on either side. A large purple rectangular overlay is positioned on the left side of the image, containing white text and icons. The text reads: 'MCR2030 Event', 'Setting up risk governance and cross-sectoral collaboration for resilience building', '30 June 2022', '9:00 - 11:45', and 'ICC Multifunction Hall: Room 14'. There are also icons for a calendar, a clock, and a person. A small white icon of a person is visible on the right edge of the purple overlay.

MCR2030 Event

Setting up risk governance and cross-sectoral collaboration for resilience building

 30 June 2022

 9:00 - 11:45

 ICC Multifunction Hall: Room 14



United Nations
 Department of Economic and Social Affairs



cifal
City of Innovation for All



unitar
United Nations Institute for Disarmament Research



UNDRR
UN Office for Disaster Risk Reduction



MCR 2030
Making Cities Resilient


Online Workshop on






Risk-informed Governance, Climate Action, and Finance Mechanism for Local Resilience

5 - 14 July 2022
(Tuesdays and Thursdays)
14:00 - 17:30 | Seoul Time

Joint Certificate Programme






Local Resilience to climate change and COVID-19: No one left behind in urban resilience building

4 April 2022
 1:15PM - 2:45PM


 UNDRR
 UN Office for Disaster Risk Reduction

Example of Scorecard Application for flood risk reduction

Best Practice from the Republic of Korea



UNDRR

UN Office for Disaster Risk Reduction

With the support of



Ministry of
the Interior and Safety



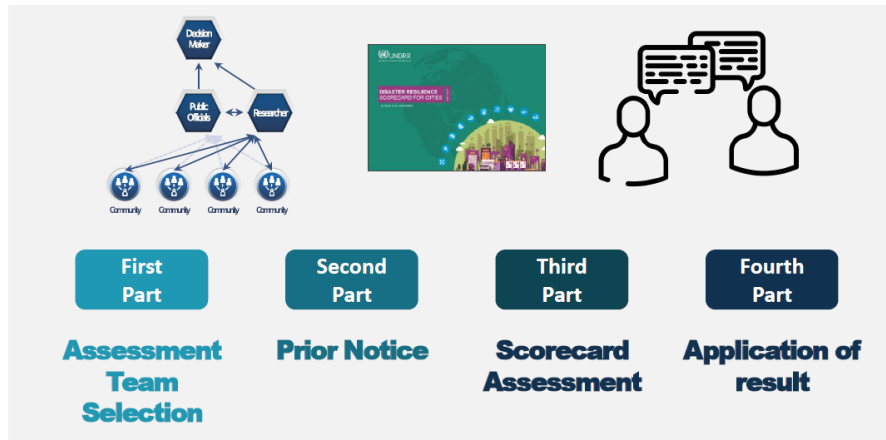
Incheon
Metropolitan City



SENDAI FRAMEWORK
FOR DISASTER RISK REDUCTION 2015-2030

Ulsan City

- Ulsan Metropolitan City has been applying the Disaster Resilience Scorecard for Cities every year since 2018, through scorecard assessment workshops led by Ulsan Research Institute.
- The consultations bring together 15 departments of the city, 5 agencies managing city infrastructure, academia, as well as civil society involved.



Ten Essentials for Making Cities Resilient



Ulsan Inventory for Disaster Risk Reduction



- ✓ Law
- ✓ Project
- ✓ Service..ect

provide
→

More than 15 Department

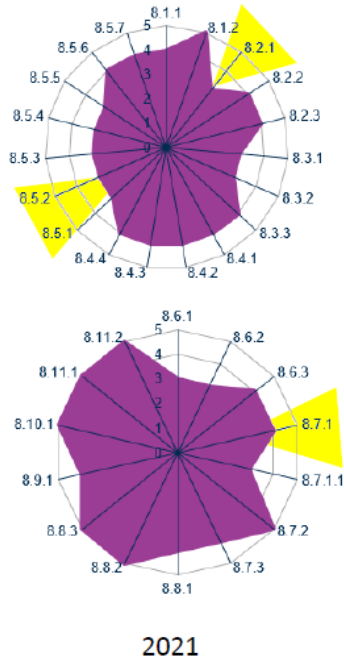


5 Agencies



Local NPOs





Vulnerable essentials

Problem

Improvement Policies

8.2.1

Water resource loss occurs due to typhoons



✓ Curve the single water resource supply chain by 2035

8.5.1

Decreased mobility of citizens after the disaster



✓ Installation of automobile breakers, and waterproof film

8.5.2

Decreased mobility of citizens after the disaster



✓ Announce bypass or another routes
✓ Designate evacuation road

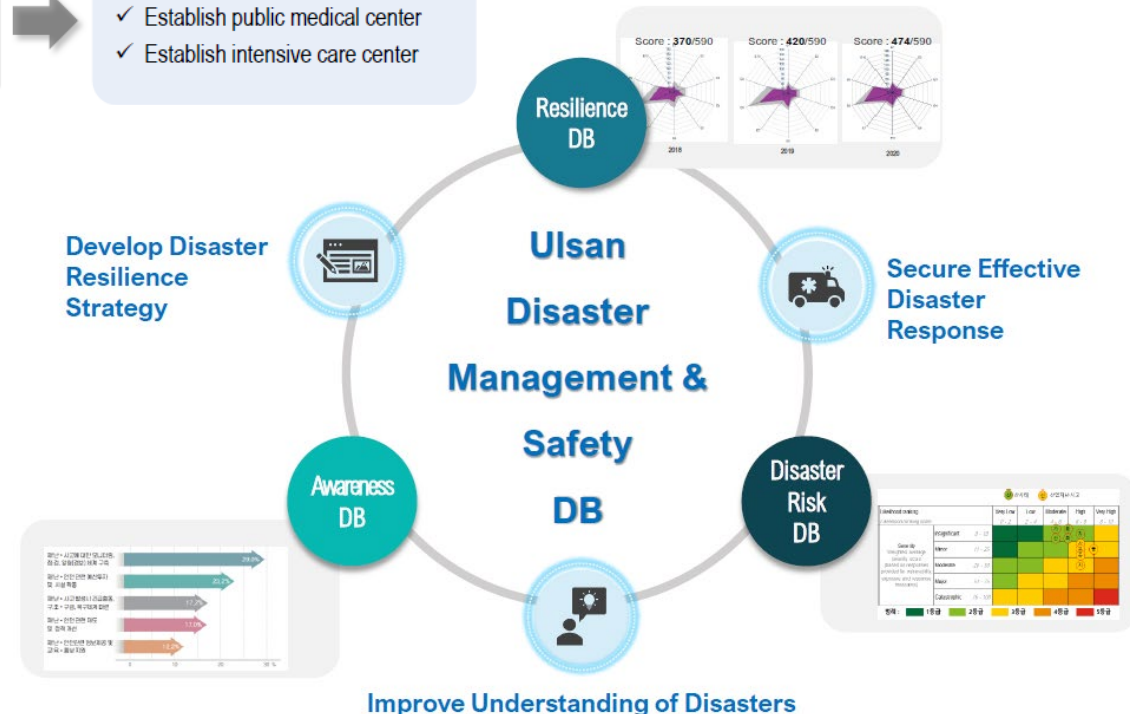
8.7.1

Hospital bed loss due to complex disaster like fire or infectious disease



✓ Establish public medical center
✓ Establish intensive care center

- The scorecard assessment results are applied to improve existing policies and develop new plans for Ulsan Metropolitan City.



Essentials 4 and 5

Essential 1

Organize for disaster resilience

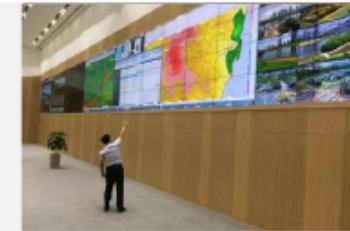
- The Will of the Chief Manager
- Expansion of Civil Safety Division Operation
- Establish Plan in Each Field for Disaster Risk Reduction



Essential 2

Identify, understand and use current and future risk scenario

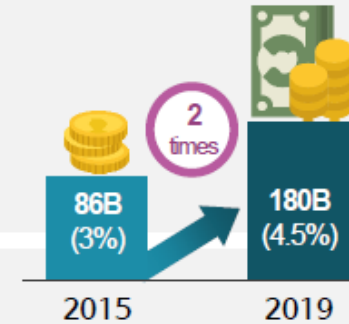
- Development of Integrated Flood Disaster Management System Based on ICT
- Development of Urban Flood Monitoring System



Essential 3

Strengthen financial capacity for resilience

- Expansion of Disaster Management Funds
- Increasing Disaster Management & Safety Budget



Essential 4

Pursue resilient urban development

- Establish Urban Master Plan based on Risk Analysis
- Establish Urban Management Plan for Disaster Risk Prevention
- Manage Disaster Risk Management Zone
- Disaster Risk Management for Development Projects

Essential 5

Safeguard natural buffers

- Develop Ecological City around Taehwa River
- Preserve 40km-Bamboo Forest as Habitat of Migratory Birds, and Natural Buffer to Natural Disasters



Essential 8

Essential 6

Strengthen institutional capacity

- Establish Cooperate System to National Disaster Management Research Institute
- Establish Consultive Group for Special Disaster Manage
- Host U.N. Typhoon Committee



Essential 7

Strengthen societal capacity

- Support Vulnerable Group in case of Disaster
- Sentimental Disaster Education by Establishment of Ulsan Safety Experience Center
- Strengthen Governance Activities



Essential 8

Increase infrastructure resilience

- Strengthening Green Infrastructure through Water Circulation Leading City Project
- Seismic Reinforcement of Public Facilities
- Strengthen Lifeline and Public Service Resilience



Essential 9

Ensure effective disaster response

- Establishment of On-Site Action Manual for each Disaster
- Establishment of Advanced Alarm Control Center
- Educate Safety Guidelines to Citizens



Essential 10

Expedite recovery and build back better

- Establish a Rapid Relief System
- Prepare Future Disaster Risk Mitigation Measures





Applications of Technology for flood risk reduction





< Rainfall Observation Station >



< Warn Alarming Station >



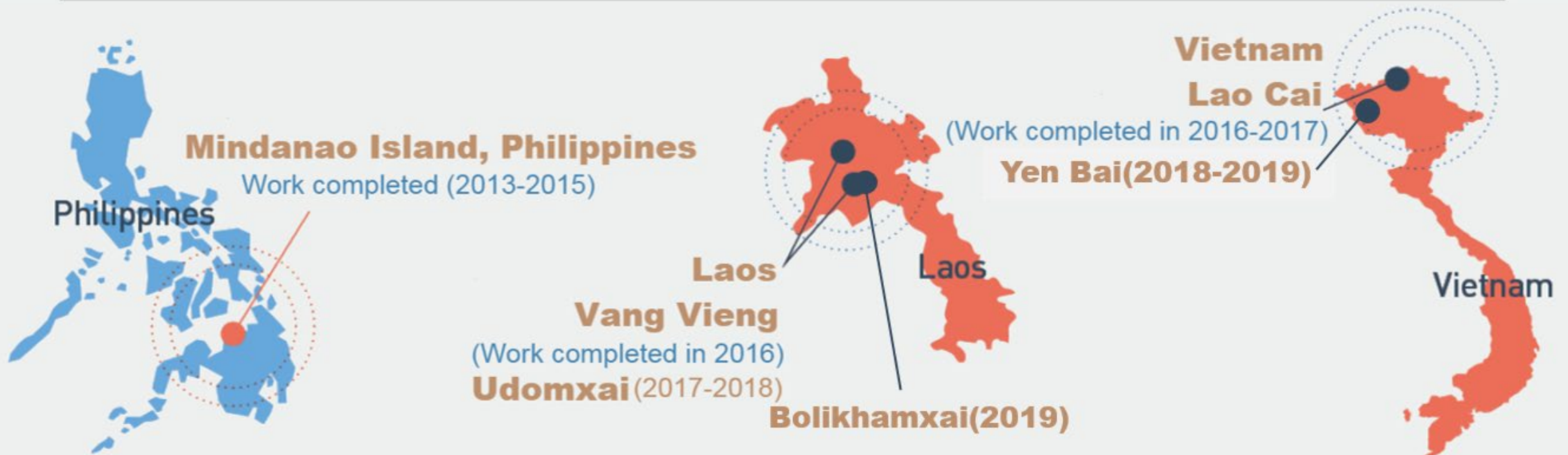
< Control Station >



< Monitoring Station >

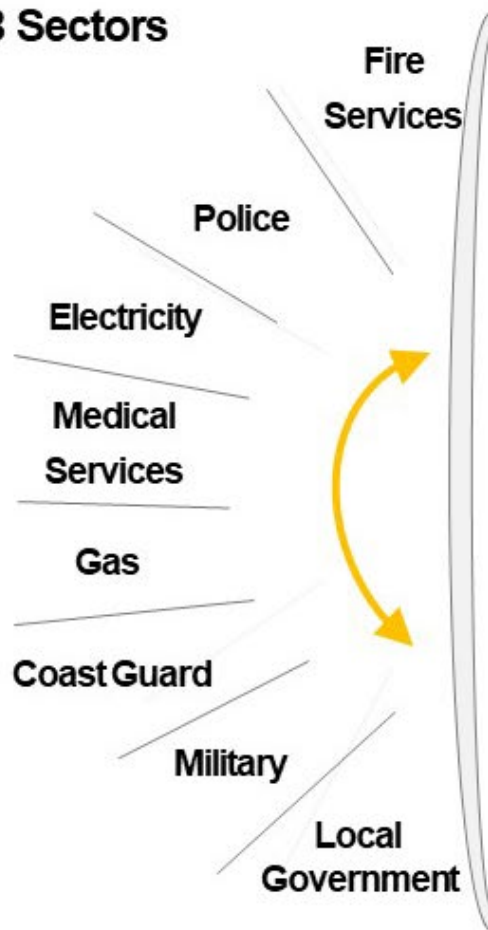


Countries that have adopted our flood outbreak forecast & warning system



01 Concept of Korea Safe-Net

8 Sectors



Nationwide
Unified PS-LTE Network

Integrated
Command & Control

Unified Broadcast Call & Quick Response



PS-LTE based Multiple Media Communication



GPS based Optimized Resource Allocation



※ PS-LTE(Public Safety – Long Term Evolution)

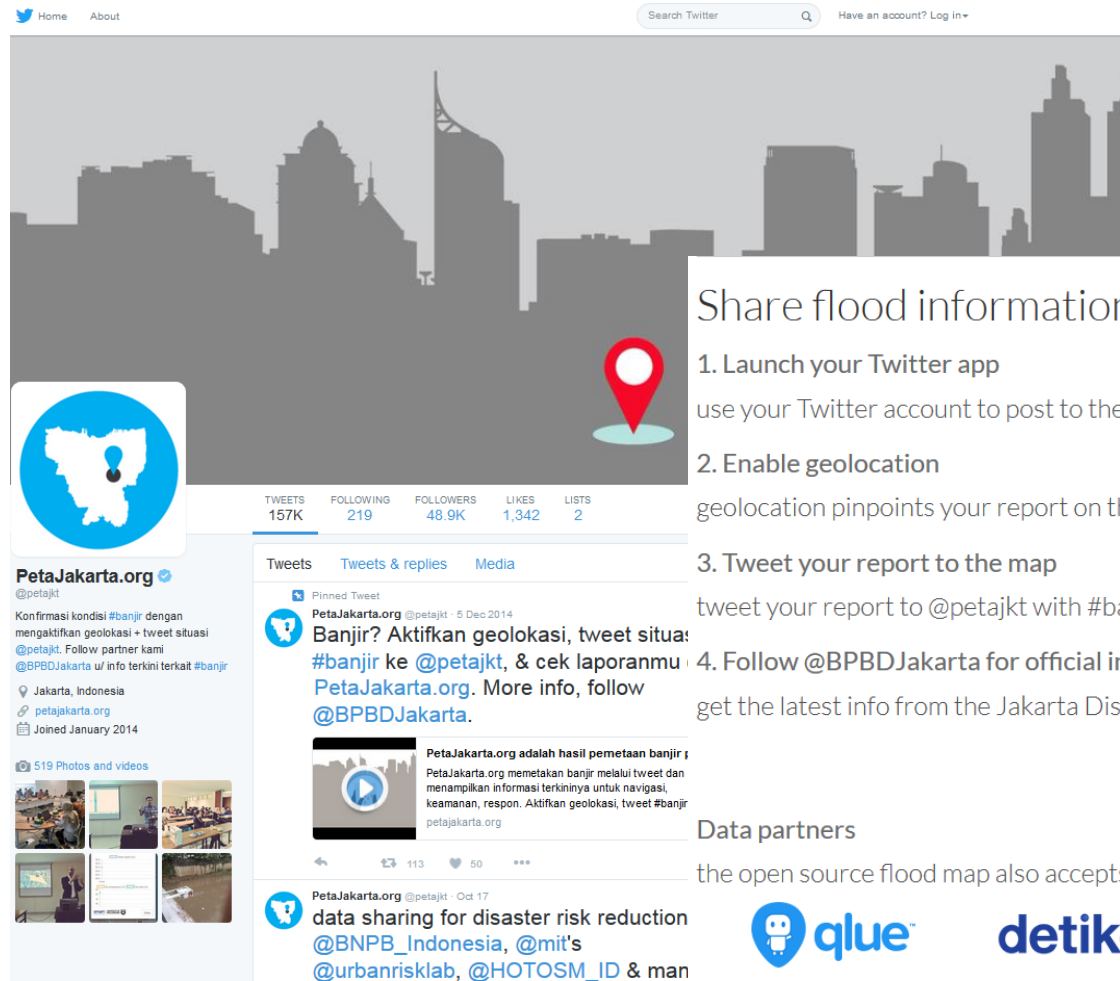
Be part of the solution

Smart Emergency Response Systems

CASE: Jakarta, Indonesia

- Using a number of crowdsourced platforms and installing them in the emergency control room.

- Petajakarta:** real-time flood response management with citizen participation



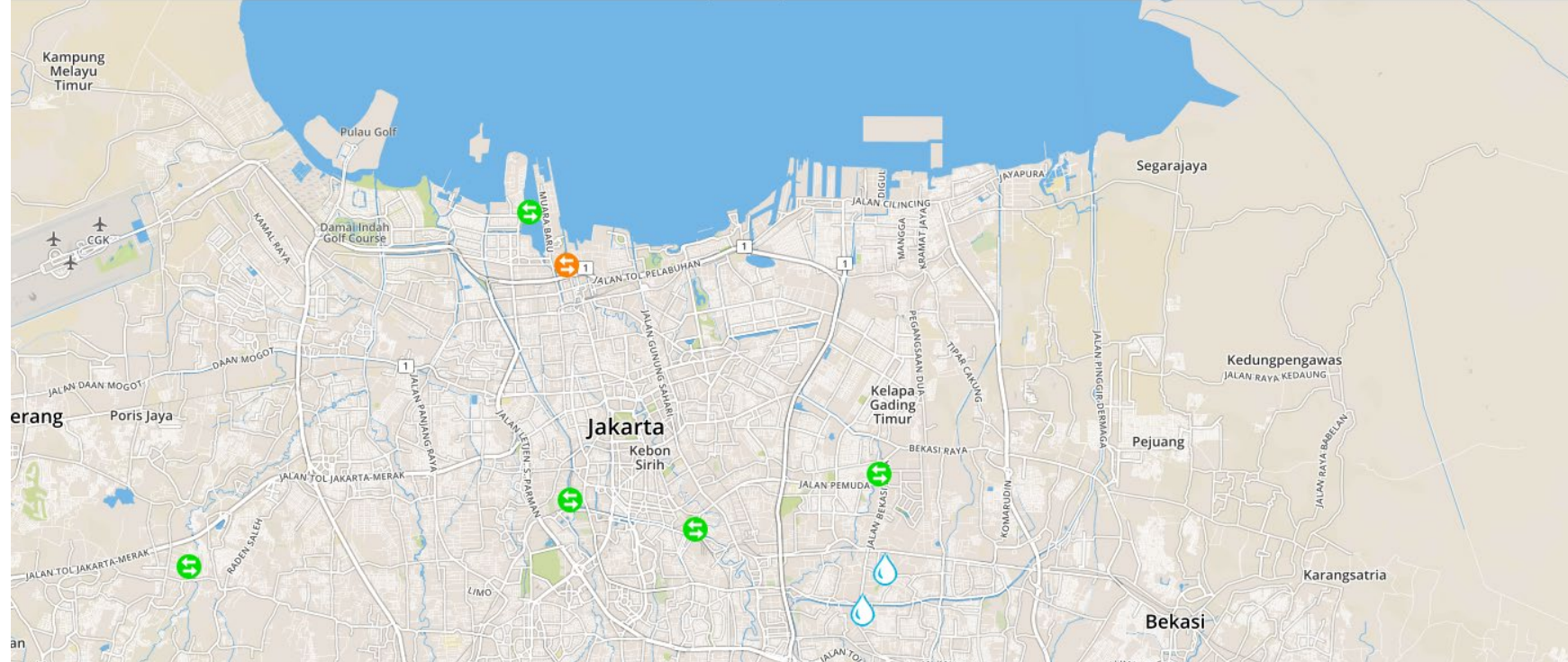
Share flood information

1. Launch your Twitter app
use your Twitter account to post to the open source flood map
2. Enable geolocation
geolocation pinpoints your report on the map
3. Tweet your report to the map
tweet your report to @petajkt with #banjir
4. Follow @BPBDJakarta for official information
get the latest info from the Jakarta Disaster Management Agency

Data partners

the open source flood map also accepts reports from these data partners





Share flood information

See a flood? Share your report on the open source map

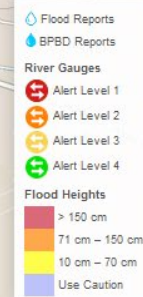
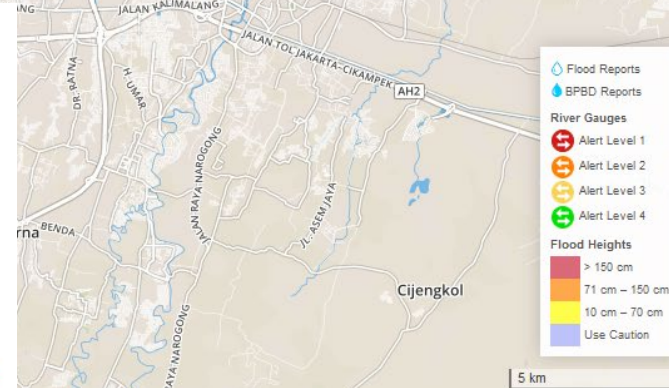
Share »



View the map

Check the map to see where the floods are right now

Map »

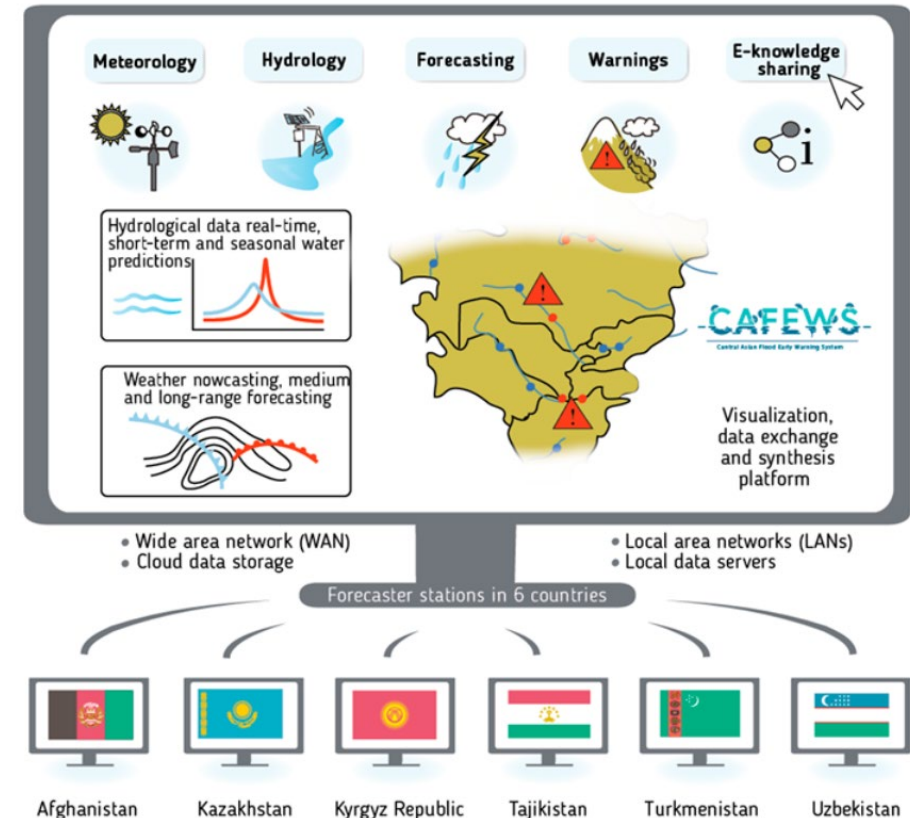


5 km



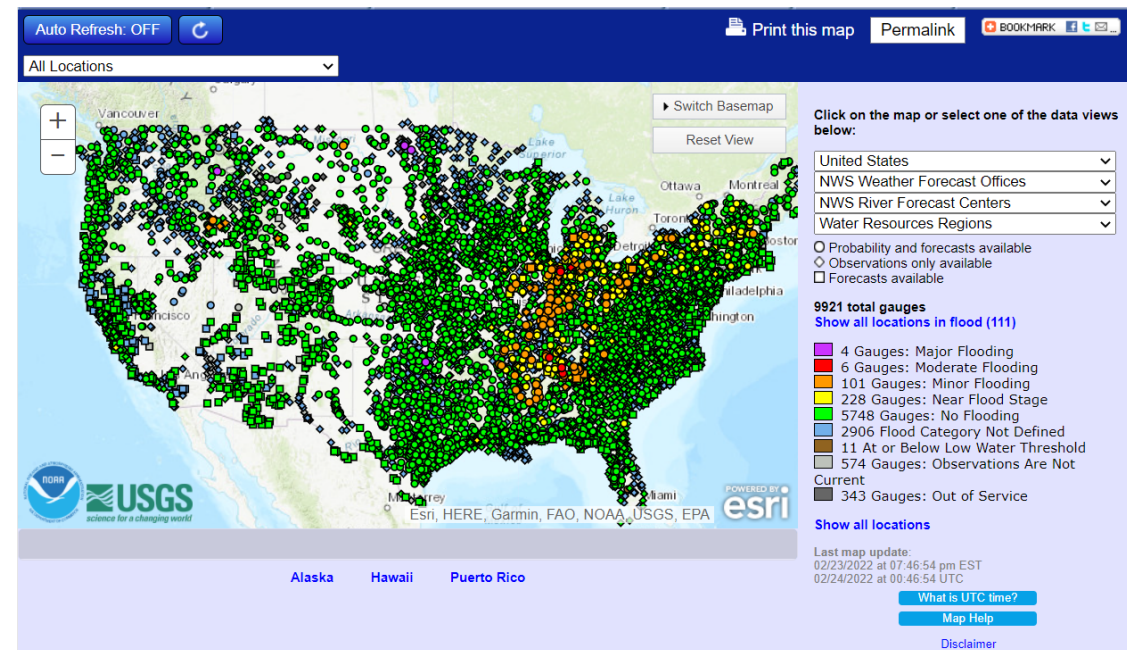
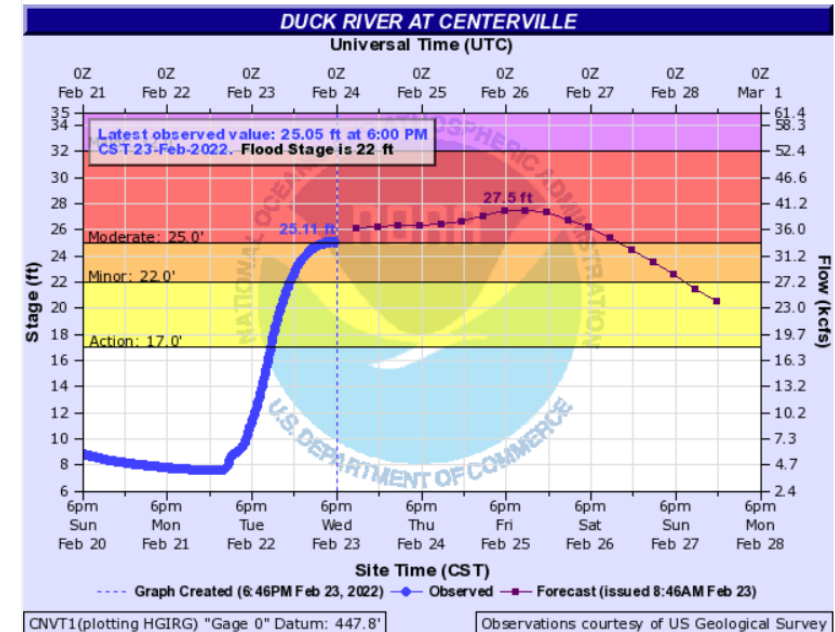
Cross-Border Warnings Exchange: CAFEWS

- The Central Asian Flood Early Warning System provides a shared virtual platform for data exchange and weather and flood forecasting to better manage the transboundary risks
- CAFEWS provides improved information on transboundary and national hydrometeorological events to forecasters in all Central Asian countries and Afghanistan.
- <https://www.youtube.com/watch?v=HIFxkgfRy90>



Monitoring networks: USA

- The US National Weather Service maintains an active national network of more than 9900 flood gauges.
- This network is called the Automated Flood Warning System Network. Managed by the US HydroMet Services
- Each flood gauge is accessible to any user
- <https://water.weather.gov/ahps>



Dire Dawa, Ethiopia: Using nature-based solutions

- Following floods killing 256 people and causing immense damage one of the priorities in the DRR action plan was to improve watershed management.
- The city constructed 17 kilometers of retention walls either side of the Dechatu river. The river passes through the city and the retention walls reduce the threat of flooding.
- The city terraced and planted trees on the hillsides surrounding the city to prevent soil erosion.
- Other infrastructure projects include the construction of small dams that capture and conserve rainwater and recharge underground reserves.



Albay Province: Local Government Makes Risk Reduction a Formal and Permanent Priority

The Albay provincial government in the Philippines established a permanent disaster risk management office in 1995 to deal with the high risk of typhoons, floods, landslides and earthquakes.

Disaster risk reduction was institutionalized, funded, and mainstreamed into local government planning and programs, making it clear that disaster reduction was a formal and permanent priority within regular planning.

As a result, disaster prevention, preparedness and response have been well coordinated and, casualties have reduced

Kisumu Kenya: Engaging the youth

This is the third largest city with 600,000 population swelling to over one million during the day.

60% of the city's residents live in slums or informal settlements.

The city placed emphasis on engaging communities in DRR activities.

By involving young people in **digging or clearing drainage channels** the city increased employment and created a sense of responsibility.

The city dump extended over ten acres. In 2018 it was moved to a managed site on a disused quarry where town engineers have prepared to ensure it does not affect the water table.

North Vancouver: Innovation and Community Practice in Holistic Disaster Risk Reduction and Policy

North Vancouver, Canada formed a natural hazards task force comprised of eight volunteer district residents.

Their mandate was to recommend to the Council the community's tolerable level of risk from natural hazards.

The task force received presentations from subject matter experts and consulted the public for their input.

The resulting recommendations make up the District's policy for risk tolerance.



Hazards and risks are considered when granting building and development permits.



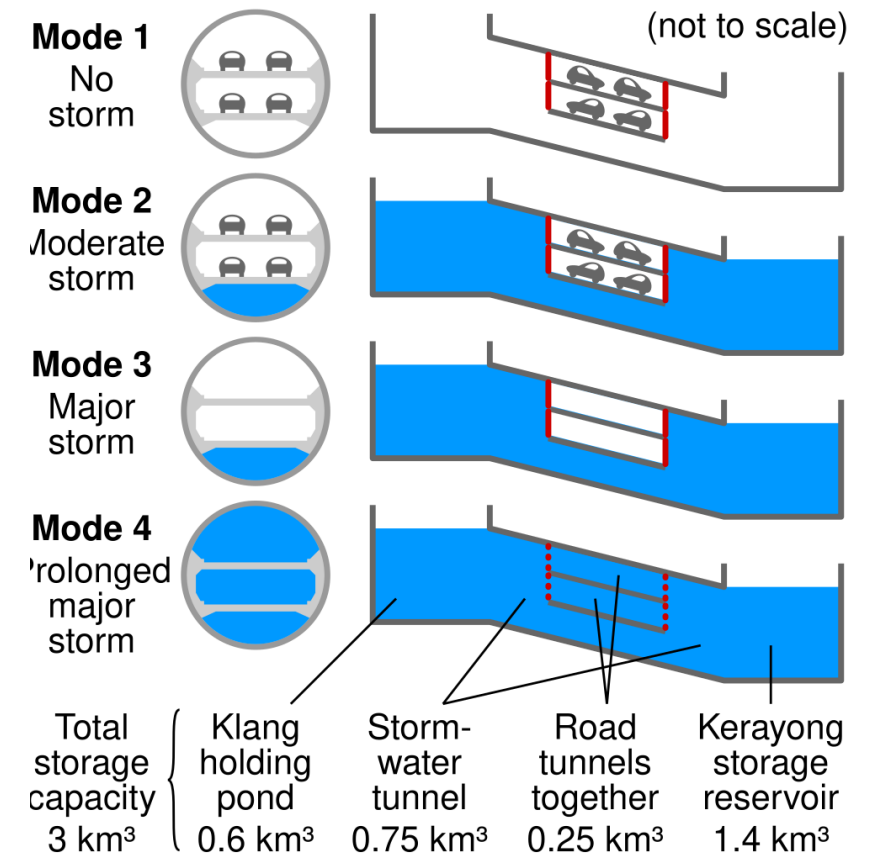
Risk is compared with the risk tolerance criteria and further reduced to as low as is reasonable.



The District works with residents, private corporations and landowners to reduce risk from landslides and forest fires by taking action to improve drainage on slopes and create defensible spaces along the urban-wild land interface areas.

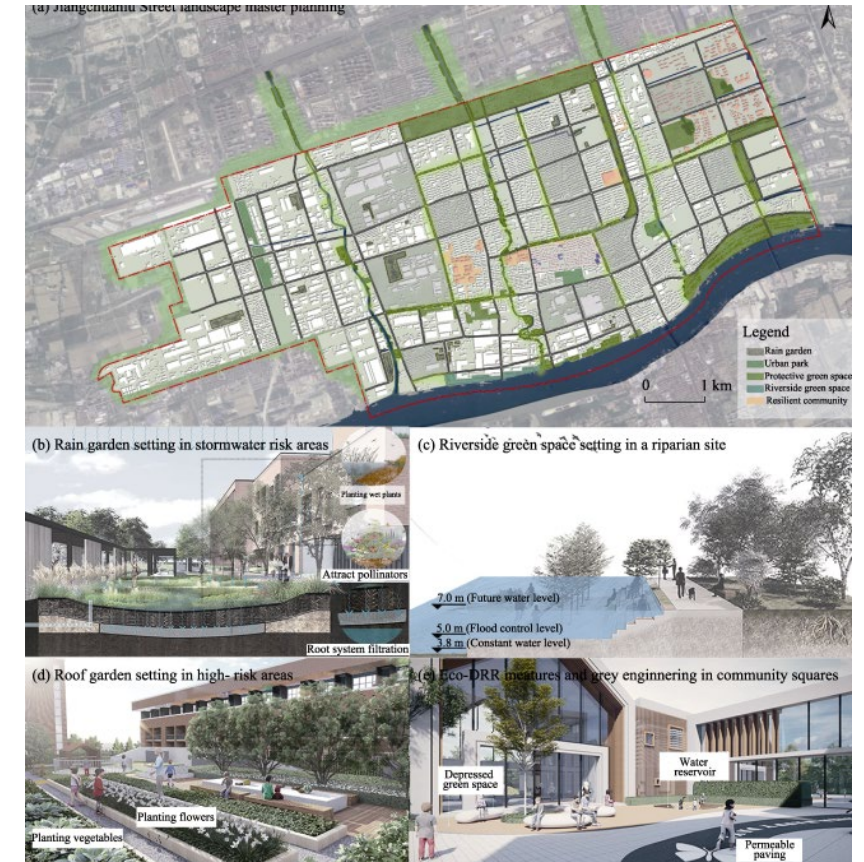
Kuala Lumpur's Stormwater Management and Road Tunnel (SMART)

- Multipurpose infrastructure projects, such as Kuala Lumpur's Stormwater Management and Road Tunnel (SMART). Floods from heavy rains are a hazard, and the 9.7 km. long, \$514 million tunnel has three levels, the lowest for drainage and the upper two for road traffic.
- The drain allows large volumes of flood water to be diverted from the city's financial district to a storage reservoir.
- Combining the drain with the road has two advantages: it ensures that this "critical infrastructure" is subject to higher-than-usual margins of safety (the extra strength that engineers build into designs).
- The SMART operations was used 114 times to divert excess water and have successfully averted at least seven flash floods and have saved hundreds of millions in potential losses.



Hubei Province (China) Ecosystem-based Disaster Risk Management

- A wetland restoration programme reconnected lakes to the Yangtze River and rehabilitated 448 sq.km of wetlands with a capacity to store up to 285 million cubic meter of floodwater.
- The local government reconnected eight more lakes covering 350 sq. km.
- The local administration has designated lake and marshland areas as natural reserves.
- In addition to contributing to flood prevention, restored lakes and floodplains have enhanced biodiversity, increased income from fisheries by 20-30% and improved water quality.



New York (United States) Ecosystem-based Disaster Risk Management

- Untreated storm water and sewage regularly flood the streets because the ageing sewerage system is no longer adequate.
- After heavy rains, overflowing water flows directly into rivers and streams instead of reaching water treatment plants.
- Traditional pipe improvements are estimated to cost US\$6.8 billion.
- Instead, New York City invested US\$5.3 billion in green infrastructure on roofs, streets and sidewalks. This saved over \$1 billion.
- The new green spaces absorb more rainwater and reduce the burden on the city's sewage system.



Cartoon by Chris Britt/SJ-R

Thank You

UNDRR

Global Education and Training Institute (GETI)

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