

# ENABLING INTEGRATED URBAN FLOOD RISK MANAGEMENT IN DEVELOPING COUNTRIES



## Gathering, sharing and applying Japanese knowledge on urban floods

Site Visit at the Second TDD on Integrated Urban Flood Risk Management. Photo: Tokyo Development Learning Center.

### AT A GLANCE

**Region:** Global

**Risks:** Urban floods

### DEVELOPING COUNTRIES ARE INCREASINGLY TAPPING INTO LESSONS LEARNED FROM JAPAN'S EXPERIENCE BUILDING RESILIENCE TO URBAN FLOODS.

Among the most frequent and most damaging of natural hazards, floods threaten the lives and livelihoods of millions of urban dwellers each year. Between 1998-2017, floods led to economic damages exceeding US\$600 billion, affecting more than 2 billion people, and resulting in around 142,000 fatalities.<sup>1</sup>

As a changing climate increases the frequency and intensity of flood hazards even further, countries are determined to advance integrated urban flood risk management (IUFM) – with an eye to a more resilient future.

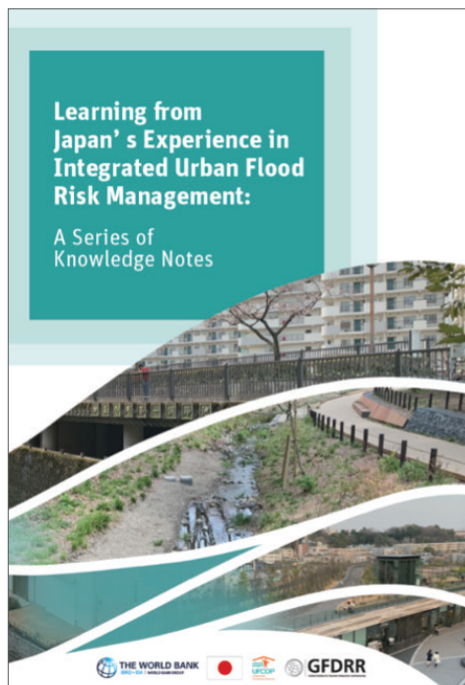
Against this backdrop, the **Japan-World Bank Program for Mainstreaming Disaster Risk Management (DRM) in Developing Countries** has supported the creation of a global knowledge program on IUFM which draws on Japan's experience building flood resilience at home.

The marquee contribution of the global knowledge program has been the development of a series of knowledge notes which synthesizes best practices and lessons

learned from Japan's IUFM efforts. Four knowledge notes have been produced, each of which focuses on a key aspect of the sector.

*Urban Flood Risk Assessment and Risk Communication.* The note emphasizes that planners need to carefully consider their objectives and audience when communicating flood risk based on scientific studies and risk assessments. Japan has accumulated know-how on a variety of approaches to prepare stakeholders, the decision-makers, and citizens, to take timely, effective actions to manage and mitigate urban flood risk.

*Urban Flood Risk Reduction Investment Planning and Prioritization.* A major takeaway from this note is that planning and prioritization of IUFM measures in Japan is anchored in unified goals for flood mitigation through a citywide operational framework, with flood risk management targets for each relevant sector, and which is based on collaboration, consensus-building, and



<sup>1</sup> Wallermaq, P., Below, R., & McLean, D. (2018). UNISDR and CRED report: Economic Losses, Poverty & Disasters (1998-2017).





Bogor Workshop, Indonesia. Photo: World Bank.

responsibility-sharing between a range of stakeholders, including national and local governments, the private sector, and citizens.

*Designing and Implementing Urban Flood Risk Management Investments.* This note highlights, among other key lessons, that IUFMR measures should be designed in such a way that they are multifunctional and bring a range of benefits, in addition to reducing flood risk. For instance, integrating nature-based solutions not only reduces flood risk but also enhances and promotes green spaces, and increases overall livability of cities.

*Operating and Maintaining Urban Flood Risk Management Investments.* The note draws attention to the point that IUFMR can only be effective if there are assurances of sufficient long-term resources as well as policy and institutional frameworks to monitor and evaluate protection measures.

The knowledge note series has been complemented by a Technical Deep Dive (TDD) knowledge and learning series on IUFMR. Through the TDD series, experts and practitioners have had the opportunity to learn firsthand about Japanese expertise in IUFMR through site visits and expert presentations, while also sharing insights on urban floods with fellow practitioners from nearly 20 countries through workshops and interactive sessions.

A TDD on IUFMR was held in April 2019 and organized by the Tokyo Development Learning Center (TDLC) and the World

Bank Disaster Risk Management Hub in Tokyo. Held in Tokyo, Kobe and Osaka, this edition of the TDD enabled delegations to attend presentations and discussion sessions featuring sector experts. In addition, the delegations joined a site visit to Osaka, organized by the Prefectural government, where they were able to see firsthand and thus more deeply understand the comprehensive flood control system of Neyagawa Basin. Participants learned about how the Matsubara Minami Balancing

Reservoir and the Wakae Underground Reservoir contribute to the comprehensive flood control plans of the eastern area of Osaka Prefecture.

A further highlight of the April 2019 TDD was the mini-studio exercise which saw delegations visit one of three designated neighborhoods and project sites in Sumida Ward, Tokyo, each of which offered an array of community-led rainwater harvesting and utilization measures implemented by a wide



Rehabilitating Jakarta's waterways to mitigate flood risk

The Jakarta Urgent Flood Mitigation Project supported dredging, rehabilitation and flow capacity improvement of selected key floodways, canals, and retention basins. Jakarta, Indonesia. Photo: Farhana Asnap / World Bank.



range of stakeholders. Each delegation subsequently proposed design ideas to increase the sites' capacity to manage rainwater using nature-based tools.

Drawing on Japanese experience, the TDD series has highlighted the importance of the following enabling factors for IUFRRM: (i) development of financial strategies and mechanisms to maximize private sector funding toward IUFRRM, (ii) development of risk-informed holistic plans, including social, spatial, technical, and financial plans, (iii) improvement of stakeholder coordination mechanisms in the planning and execution of structural and non-structural measures, and (iv) learning from each disaster to improve institutional capacity and DRM plans.

In addition to the TDD series, the Tokyo DRM Hub has also organized learning and networking events which focus on country-level issues and challenges in IUFRRM. This has paved the way for countries to glean lessons from the global knowledge program on IUFRRM to inform their resilience-building efforts.

This has been most visibly illustrated in Indonesia. This participatory design approach was first introduced in the April 2019 TDD and subsequently shared with Indonesian officials at a July 2019 workshop in Bogor, Indonesia.



**Flooding in Jakarta**

Big floods in Jakarta, Indonesia. Project: JEDI. Photo: Farhana Asnap / World Bank

That workshop saw local government representatives from five Indonesian cities— Ambon, Bima, Manado, Padang, and Pontianak— participate in an interactive mini-studio wherein they collaborated with facilitators to develop a vision and investment proposals for flood-resilient urban development, based on a process of site analysis, stormwater runoff calculation, and conceptual design of nature-based and green solutions.

In January 2020, local government officials and diverse groups (including women and people with disabilities) in three cities across Indonesia — Bima, Manado and Pontianak — participated in additional design "charrettes" to explore nature-based solutions for IUFRRM. Participants appreciated the benefits of this participatory approach, which helped to identify and prioritize a menu of potential structural and non-structural investment options in Indonesian cities.

## RESULTS HIGHLIGHTS

- Japan's best practices in integrated urban flood risk management distilled and synthesized. Four knowledge notes have been produced, each of which focus on key aspects of the sector: Urban Flood Risk Assessment and Risk Communication, Urban Flood Risk Reduction Investment Planning and Prioritization, Designing and Implementing Urban Flood Risk Management Investments, and Operating and Maintaining Urban Flood Risk Management Investments.
- Developing countries' flood resilience-building efforts strengthened. The knowledge exchanges in Indonesia, supported by the Japan-World Bank Program for Mainstreaming Disaster Risk Management (DRM) in Developing Countries, has helped to inform the proposed Indonesian National Urban Flood Resilience Project (NUFRP), which is a US\$400 million investment to establish a national program on IUFRRM and support resilience-building measures in five cities.

## IN NUMBERS

- Participants from nearly 20 countries participated in a series of technical deep dives on integrated urban flood risk management.

## GRANT-SUPPORTED KNOWLEDGE PRODUCTS

- [Learning from Japan's Experience in Integrated Urban Flood Risk Management: A Series of Knowledge Notes](#)
- [Learning from Japan's Experience in Integrated Urban Flood Risk Management: A Series of Knowledge Notes \(Japanese Version\)](#)
- [Technical Deep Dive on Integrated Urban Flood Risk Management: Summary Report](#)
- [E-Learning: Integrated Urban Flood Risk Management \(IUFRRM\): Lessons from Japan](#)
- [Indonesia: Enhancing urban flood resilience investments with healthy and green multi-functional public spaces](#)
- [Urban flood resilience in Indonesia: new approaches through an urban design lens](#)