

Webinar series: Challenges, lessons, and innovations for IFRM

Session 2: Application of an IFRM Approach at a River Basin Level

This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.

Webinar Agenda

1. Welcome and opening remarks from ADB
2. Overview of the KSTA project and introduction to the Webinar series
3. Main content:
 - Ian Wood
 - Ian Munt
4. Discussion, question and answer





Webinar series

Date	Title
March 9	A country-scale view on IFRM and applications of global datasets
March 15	Application of an IFRM Approach at a River Basin Level
March 22	Coastal Flood Risk Assessment
March 30	Economic and Finance for IFRM
April 5	Outlook for IFRM and Ways Forward

Objective:

To share our experiences from implementing the KSTA project and reflect on issues and lessons learned for applying IFRM in practical applications

Pol Question 1

Following a large flood disaster, what are the main causes, failures, and tragedies that are talked about in the press?

Examples:

- 2010 Indus valley floods, Pakistan
- 1970 Boha cyclone, Bangladesh
- 2008 Cyclone Nargis, Myanmar
- 2020 Jakarta floods
- 1999 floods in central Vietnam
- 2011 Thailand floods
- 2019, 2020, 2021 Terai floods in Nepal
- 2020 Typhoon Vamco, Philippines



What are the main issues in the flood aftermath? (How can we learn from these?)

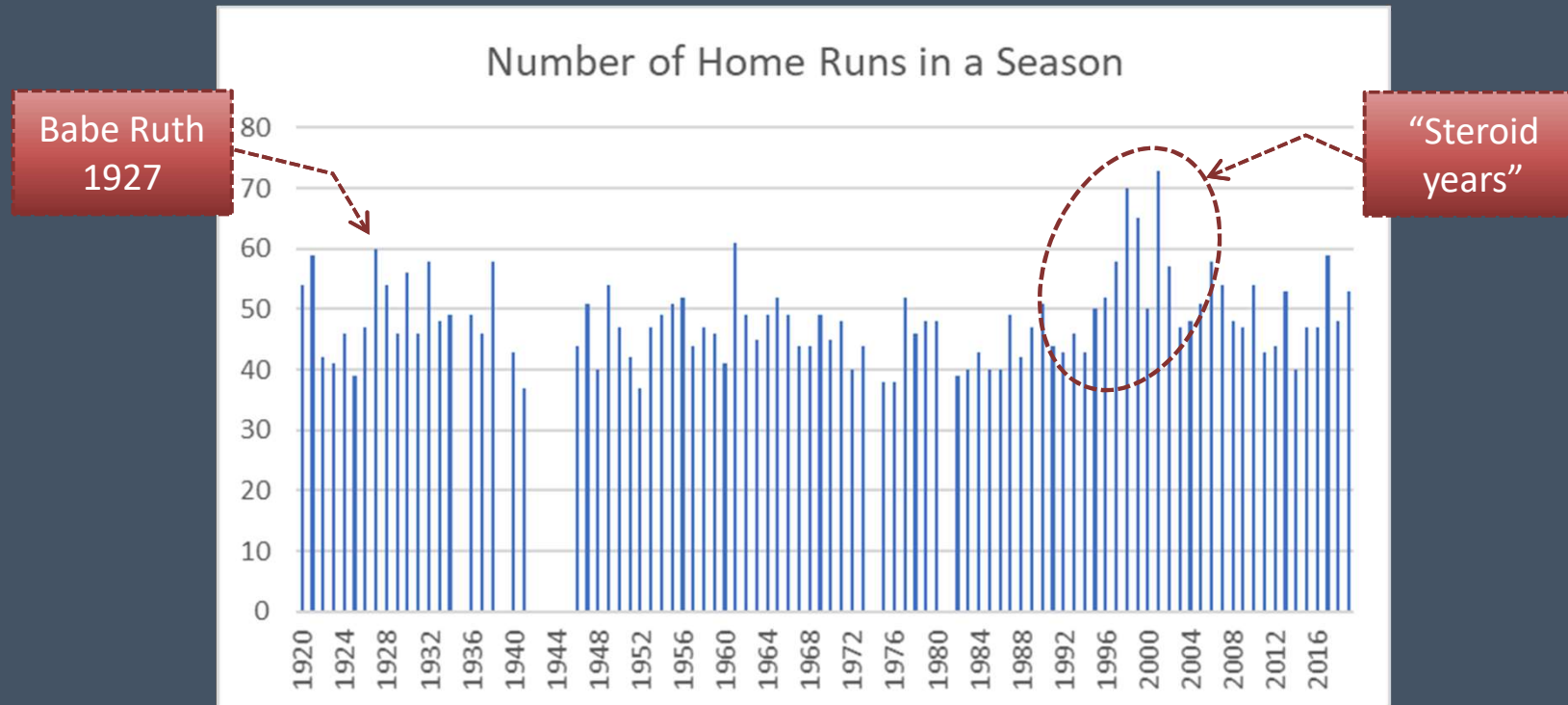
1. Climate change and increased impacts
2. Human impacts
3. Economic losses
4. Forecasting and warning
5. Preparedness and response
6. Operations and maintenance of flood protection systems
7. Recovery and reconstruction

The floods are getting worse – it must be climate change

*Can we say that **this** event was caused by climate change?*

Use the correct choice of words for “attribution”

- CC contributes to the likelihood of more intense rainfall
- Baseball analogy



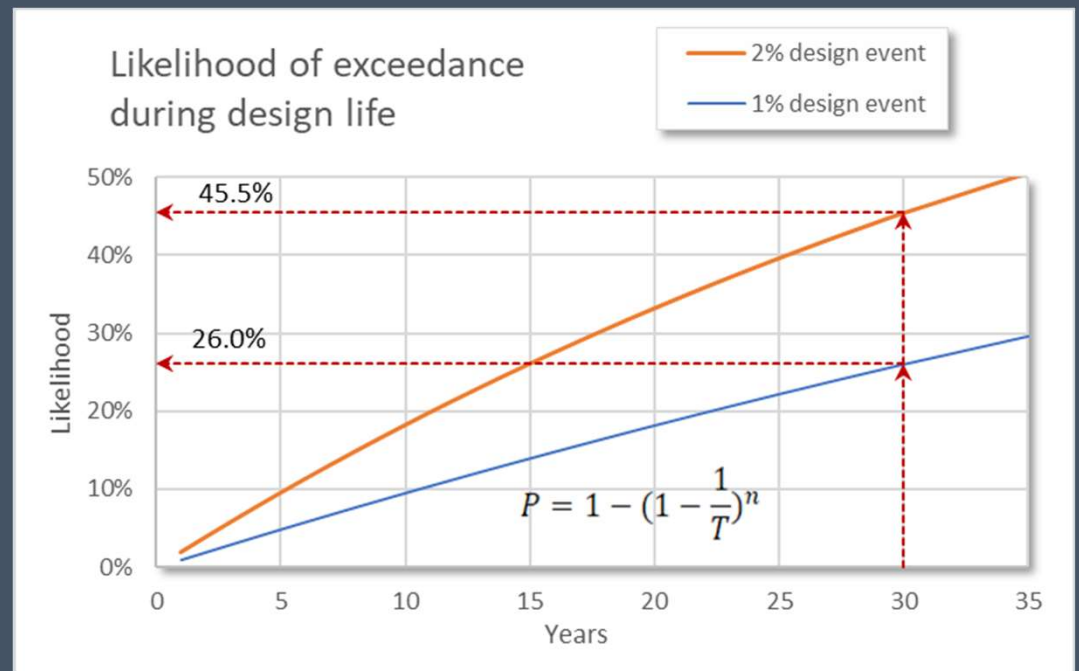
Climate change response

Climate change mitigation

- Seek to reduce emissions in infrastructure (E.g., more nature-based solutions and less concrete)
- Avoid “energy intensive solutions” like pumped drainage

Climate change adaptation

- Progressively strengthen existing flood defenses and capacities
- Allow for uncertainty, no-regret adaptation
- Allow for higher rainfall intensity and sea levels in design
- Reconsider the design standard.
Is 1% frequency enough?



Poll Question 2

How much more will it cost to ensure our urban infrastructure is low carbon and climate resilient?

The floods are getting worse – it must be climate change?

But what about...

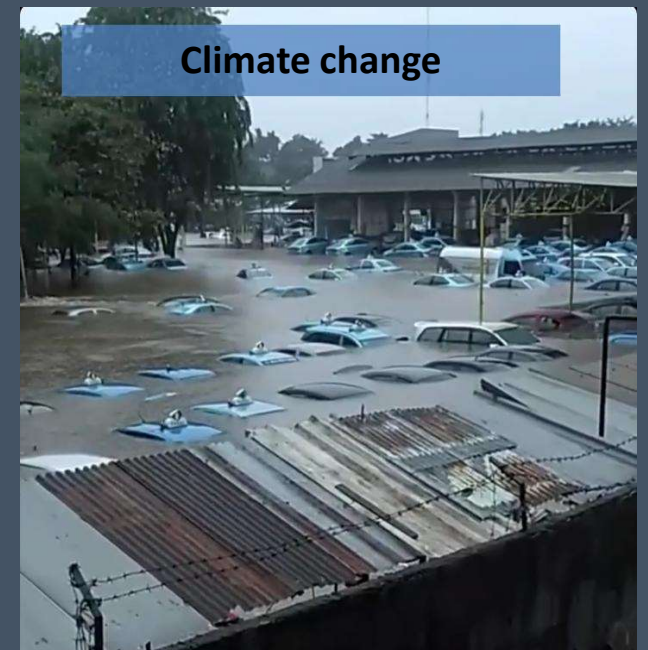
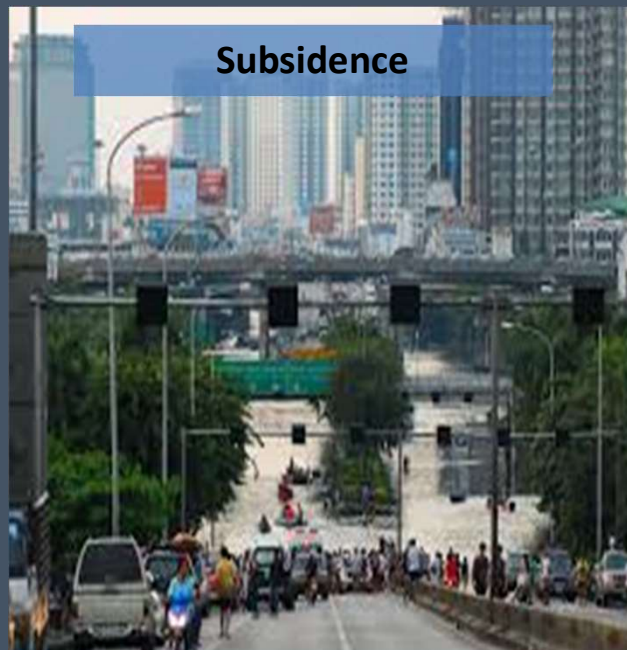
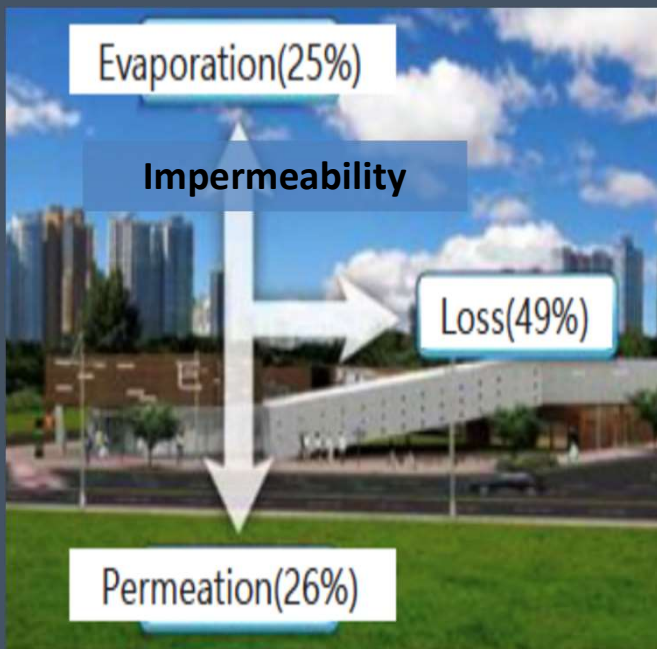
- Urbanization
- Land-use change and watershed degradation
- Siltation and degradation of rivers and waterways
- Land subsidence



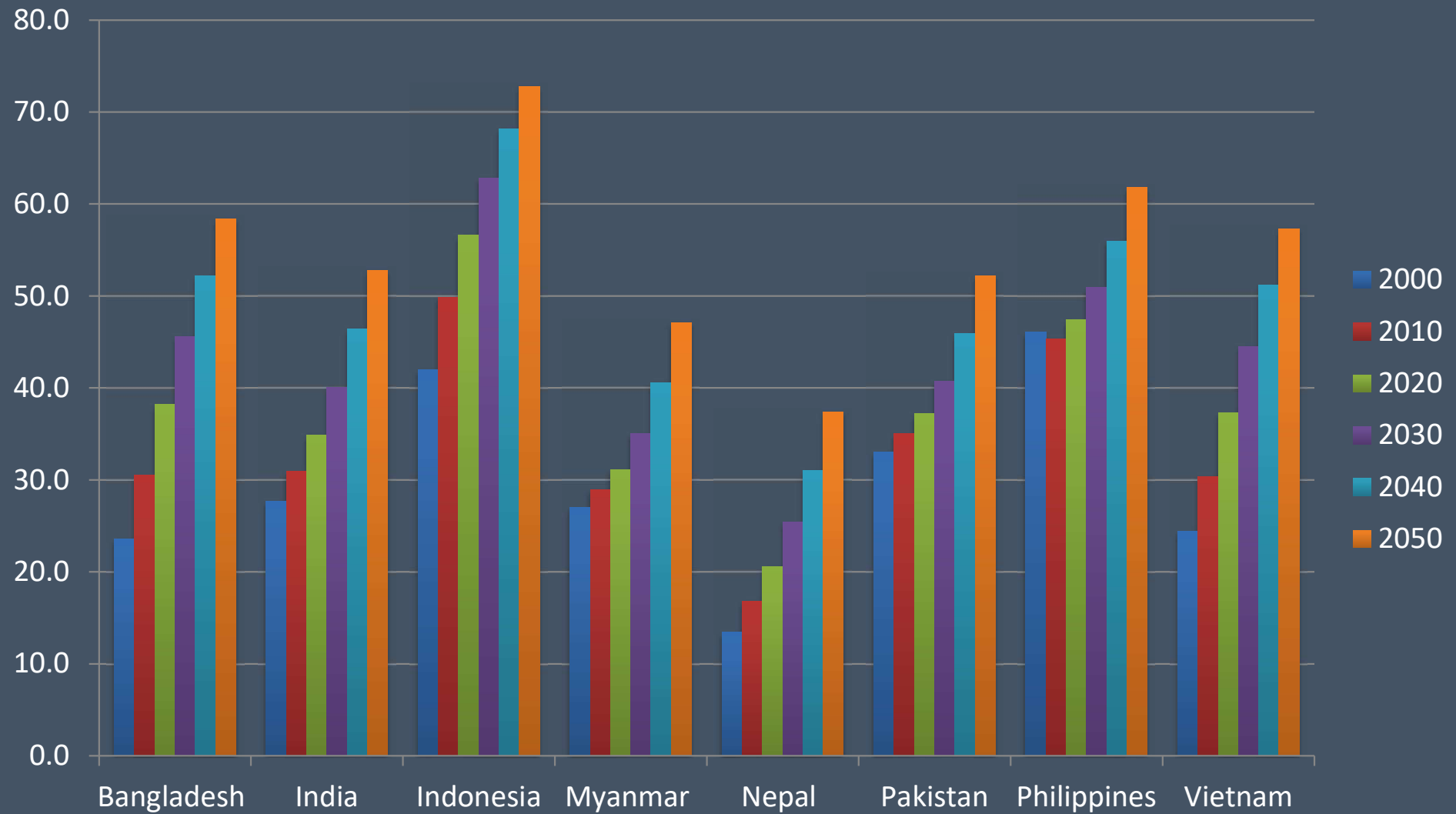
Urban flooding is



multi-causal, complex, compounded



Urbanisation offers opportunities and challenges ...



Annual Percentage of Population at Mid-Year Residing in Urban Areas, 2000-2050

2. Human Impact of Flooding

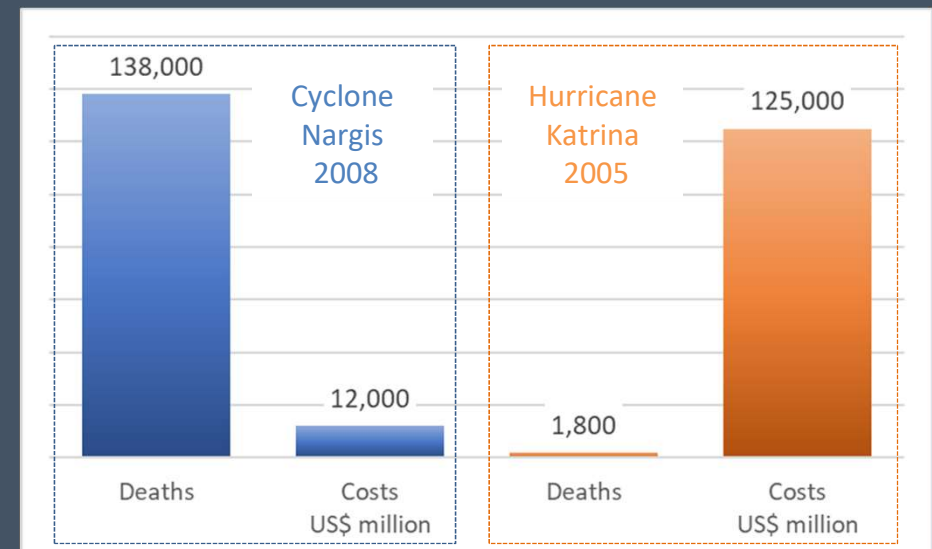
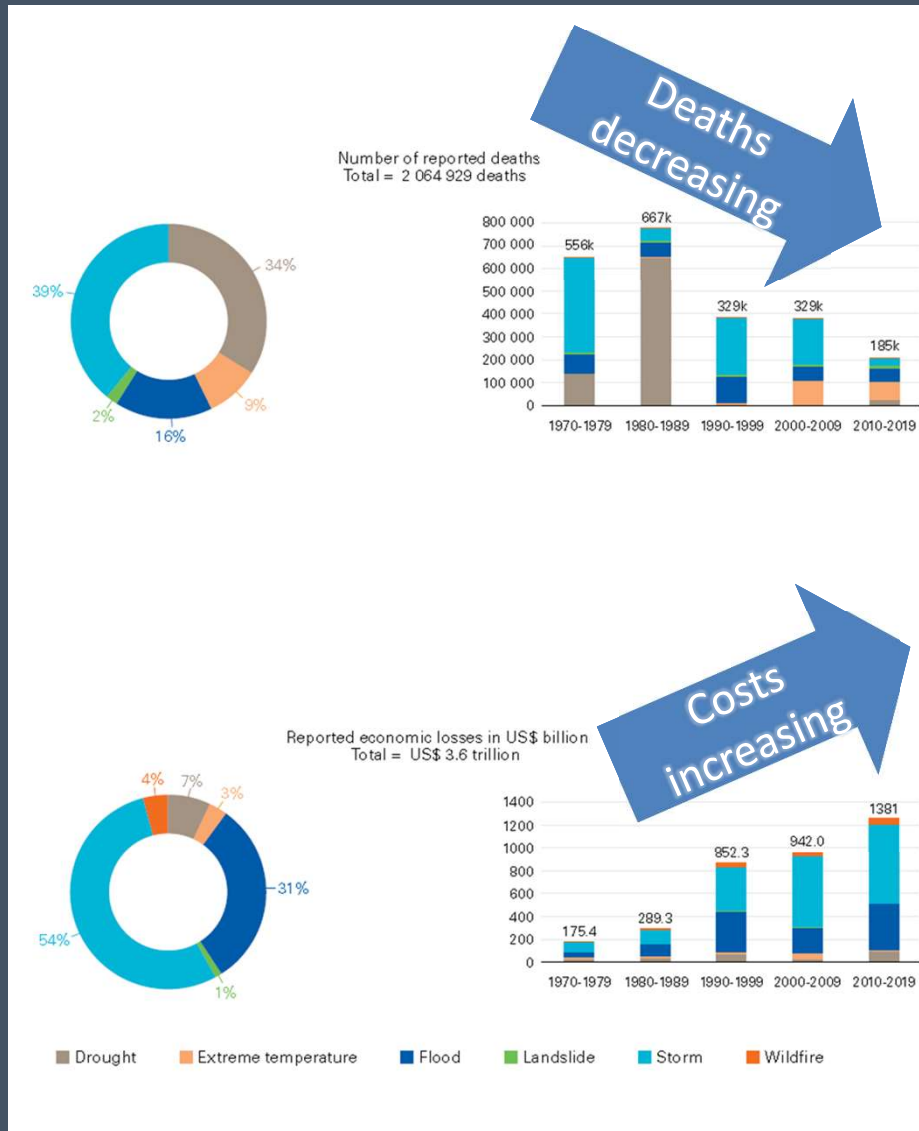
- Poor and vulnerable households will be impacted disproportionately
 - Disease and other health issues
 - Loss of livelihood
 - Disruption to employment
 - Rural households already stressed
 - Agriculture losses vs household losses
- Gender issues:
 - Women often responsible for children and elderly relatives
 - Women can be left to look after the household during the emergency
 - Special needs for evacuation centers
 - Risk of gender-based violence



3. Economic costs

Clear trend for increasing costs in recent years

- Impact of economic development
- Compare coastal flood events in Myanmar and USA



Poll Question 3

What prevents land use and urban planning systems operating efficiently?

Integrated urban planning as a cornerstone for sustainable and resilient urban development

Four knotty challenges typical in the DMCs:

- **Architecture of planning systems**
- **Planning governance**
- **Planning practice**
- **Capacity to run and manage the planning system**

“Urban planning. Cities have the authority to prepare their own development plans. Challenges however include **lack of effective urban planning**, pro-poor and pro-environment land-use management, and coordination between agencies and programs. City development **plans often lack an integrated long term investment strategy** and may also be influenced by short-term political considerations. These problems lead to conflicts of interest, inefficient use of resources, and poor environmental conditions that affect urban services and quality of life.”

(ADB Concept Note, May 2021)

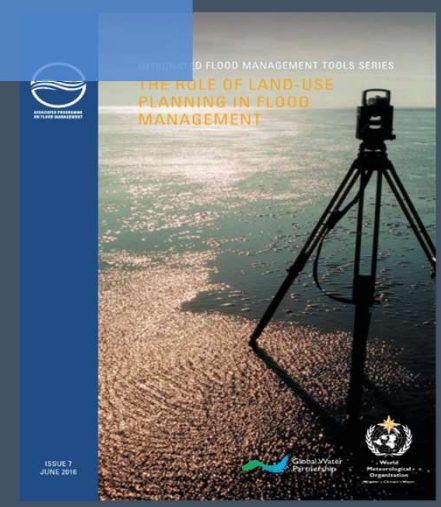
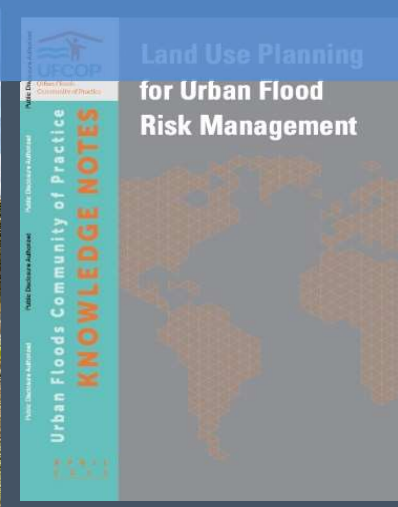
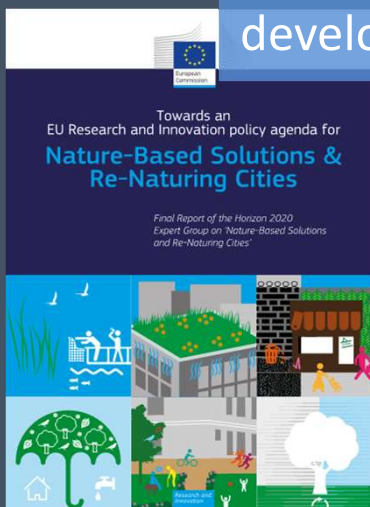
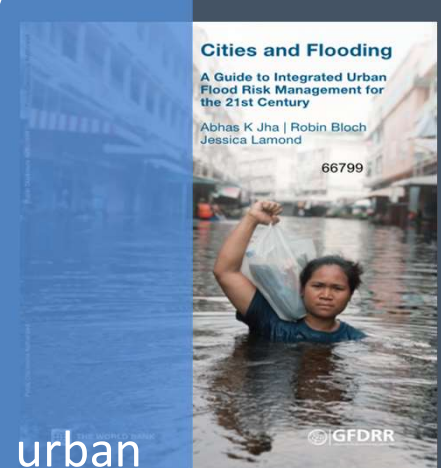
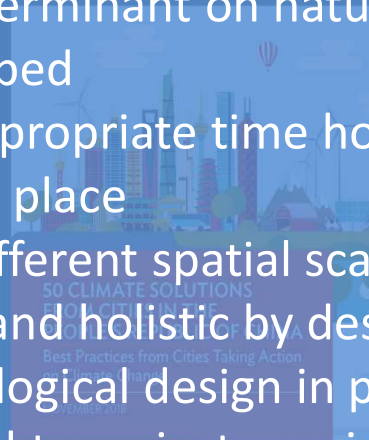
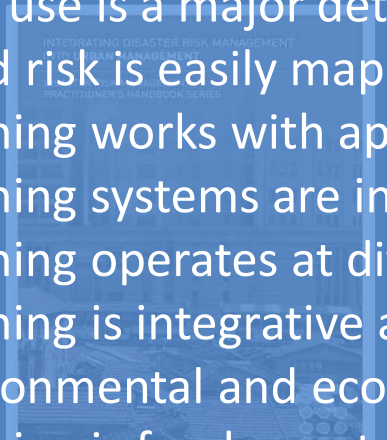
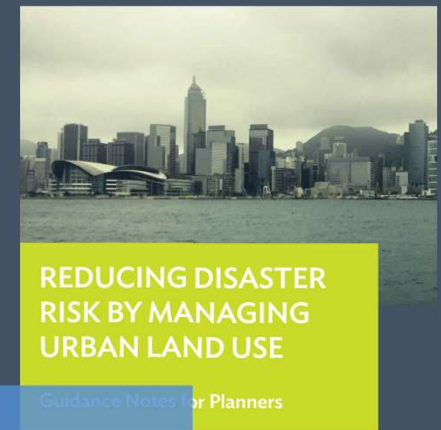
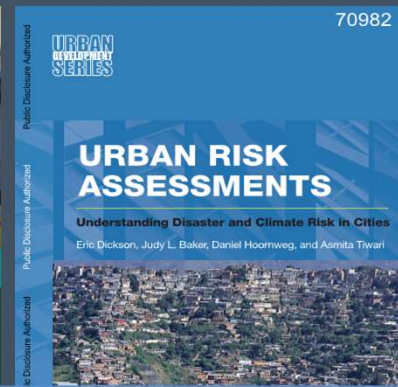
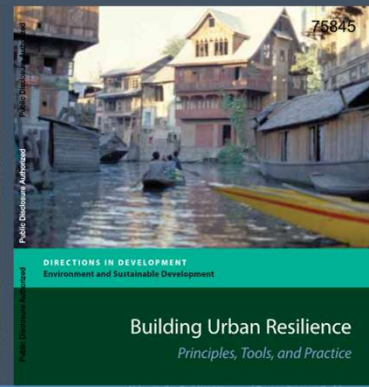
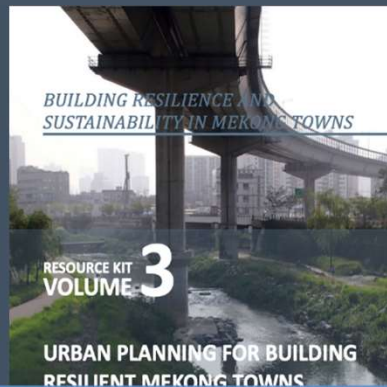
“Major Lessons

Reforms in the spatial planning and development control processes are required for GMS towns to respond effectively and systematically to climate change by mainstreaming resilience and adaptation approaches in their urban planning and infrastructure development. Reforms range from the process of preparation and review of master plans, local area adaptation planning and the design and management of infrastructure. Green infrastructure approaches with an emphasis on rehabilitating and expanding natural systems in towns are an essential foundation for building urban resilience.”

(ADB Completion Report GMS Climate Resilience in Cities, 2016)

Nine reasons to take urban and land use planning seriously:

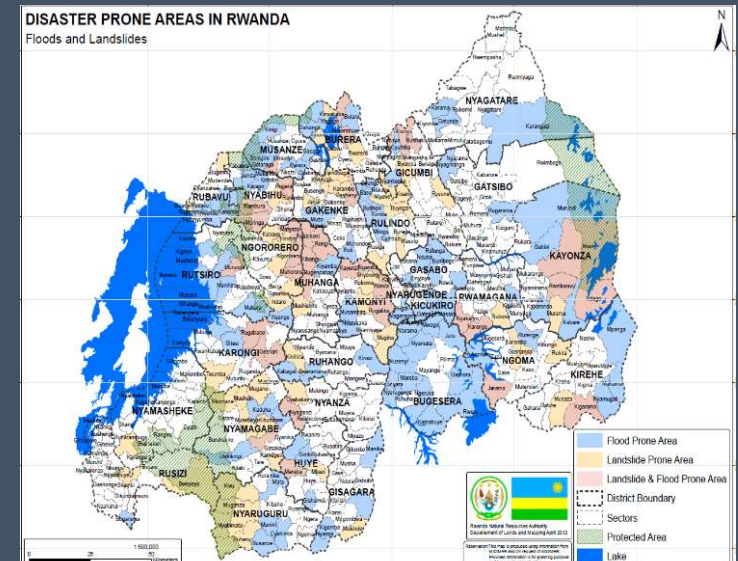
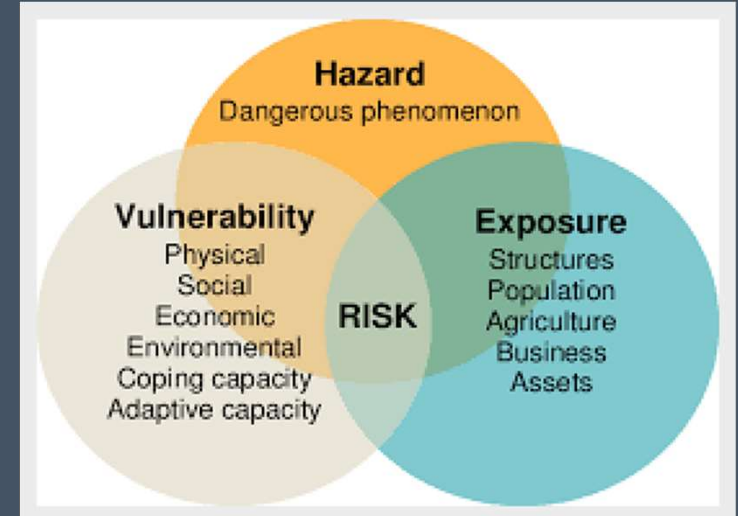
1. Everything goes somewhere
2. Land use is a major determinant on natural drainage capacity
3. Flood risk is easily mapped
4. Planning works with appropriate time horizons
5. Planning systems are in place
6. Planning operates at different spatial scales
7. Planning is integrative and holistic by design
8. Environmental and ecological design in planning's DNA
9. Planning is fundamental to mainstreaming CC/DRR/DRM into urban development



Five takeaways



1. Flood risk sensitive plans
2. Flood risk sensitive plans need flood risk based assessments
3. Zoning is critical and most easily understood
4. The capability to implement and enforce
5. But planning means more than plans



Governance

Institutional ‘rules of the game’ solutions

Policy, law, regulation, planning and plans (policy, zoning, standards, easements), licenses, permits, controls, enforcement, design and building codes, formal and customary

Organisational ‘players of the game’ solutions

Organisation and individual capacity solutions, leadership, community participation, awareness-raising, information and education, IT, logistics, critical mass, nudging (behavioral economics), crowdfunding, community ownership and custodianship, tactical urbanism

**Integrated
Flood Risk
Management
for more
livable cities**

Financial and economic solutions

Taxes, fees, permits, fines, penalties, charges, incentives / disincentives, public investment, leveraging assets, land value uplift and capture, infrastructure levies, capital investment planning, land-based financing, conditional insurance

Structural (building hard and natural) solutions

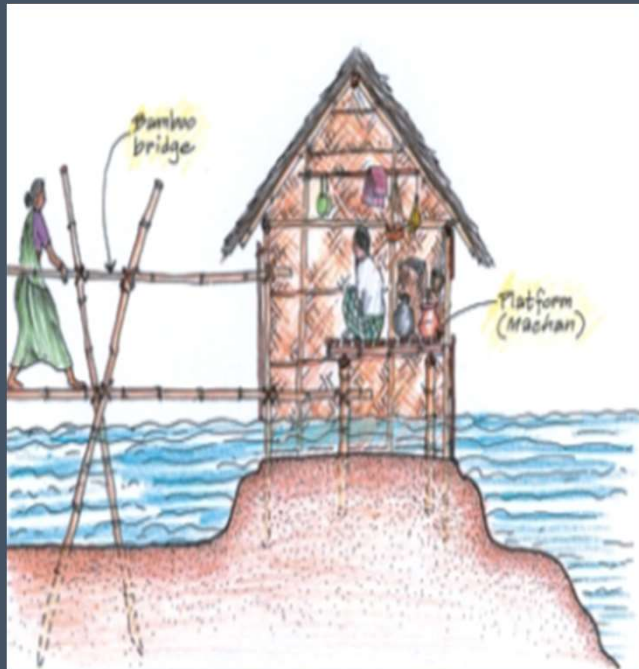
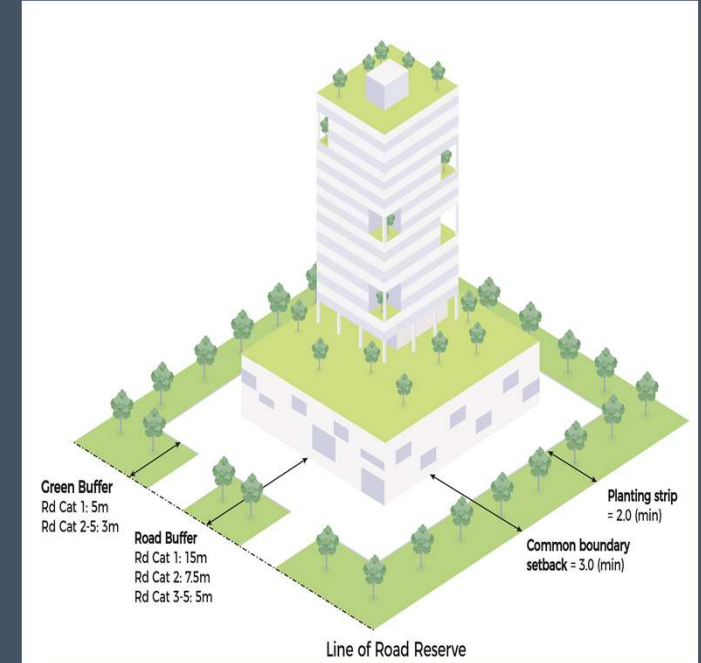
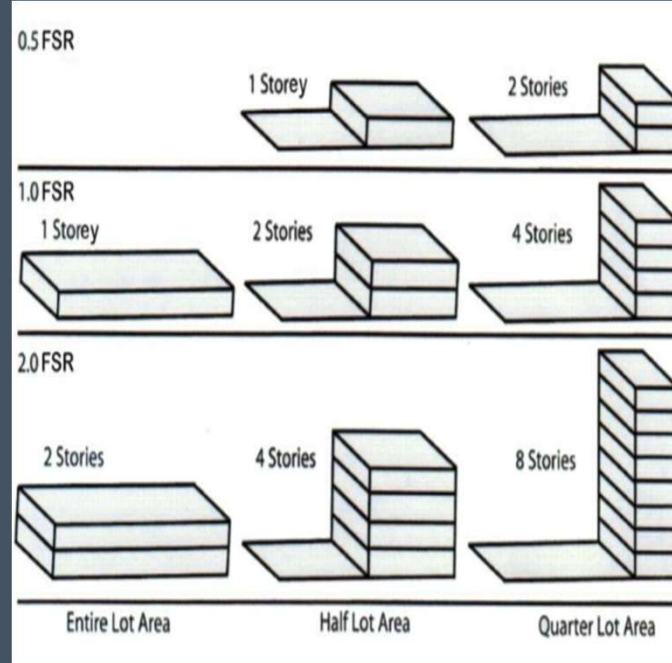
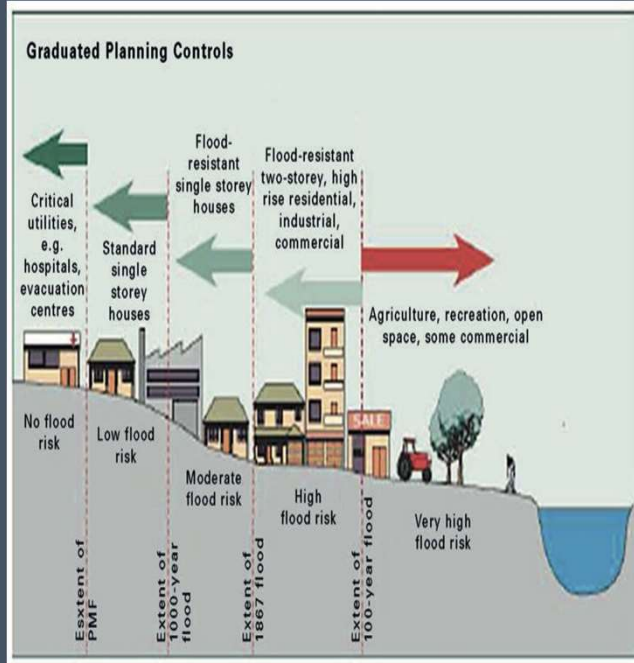
Conventional grey engineering; nature-based solutions and green infrastructure; high-cost/tech, low-cost/tech; design briefs, urban design; land readjustment, pooling, reallocation, and regularization

Governance

Governance

Governance

Plan and Control: shaping flood resilient development with regulations and standards



Design: Urban design and re-imagining cities as sponges

High Tech



Medium Tech



Low Tech



Small Scale

Medium Scale

Large Scale

4. Forecasting and Warning

More than just monitoring equipment and computer screens...

- Impact-based Forecasting and Warning
 - ✓ Weather forecasts (hazard only)
 - ✓ Impact-based forecasts and warnings (hazard + exposure + vulnerability)
 - ✓ Understandable communication

E.g. Heavy rainfall expected in the next 3 hours will cause flash flooding along city streets causing dangerous conditions for all traffic



5. Preparedness and response

Local knowledge + warning + common sense



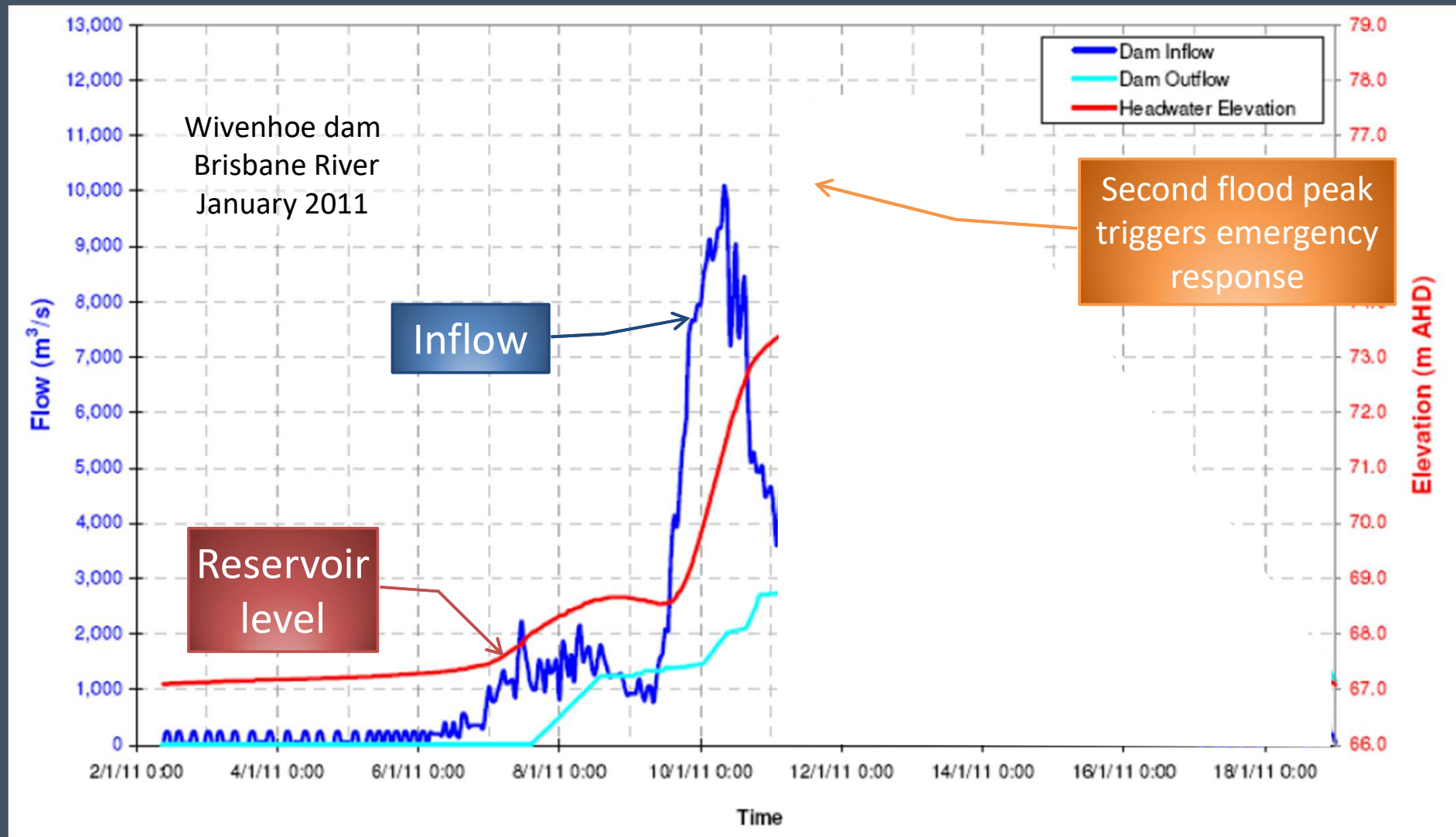




Messaging needs to be...
understandable, adaptable, practical



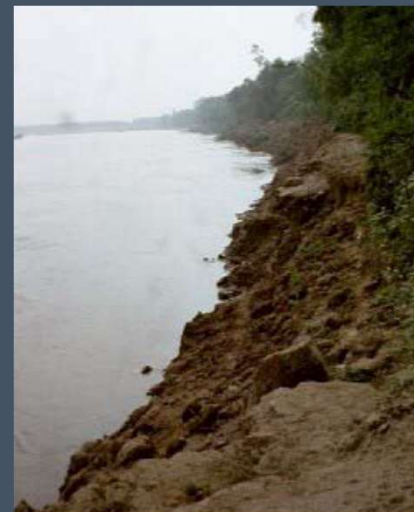
6. Flood operations need to be... well-resourced, well-trained, well-rehearsed



Maintenance of flood defenses

$$\left(\begin{array}{c} \text{increased} \\ \text{defenses} \end{array} \right) + \left(\begin{array}{c} \text{increased} \\ \text{maintenance} \end{array} \right) = (\text{increased security})$$

$$\left(\begin{array}{c} \text{increased} \\ \text{defenses} \end{array} \right) + \left(\begin{array}{c} \text{lack of} \\ \text{maintenance} \end{array} \right) = (\text{decreased security})$$

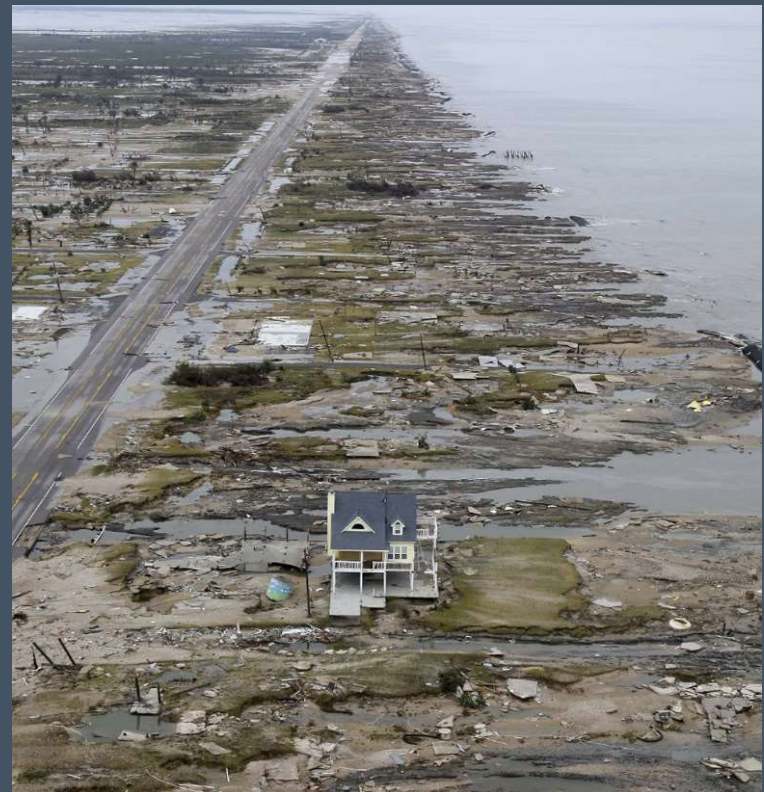


7. Recovery and reconstruction

Build back better



Strategic retreat



What is

Integrated Flood Risk Management?

What is Integrated Flood Risk Management?

Integrated



Climate change
Human impacts
Economic losses
Urban planning
Forecasting & warning
Preparedness & response
Recovery & reconstruction
O&M
Environment
NBS

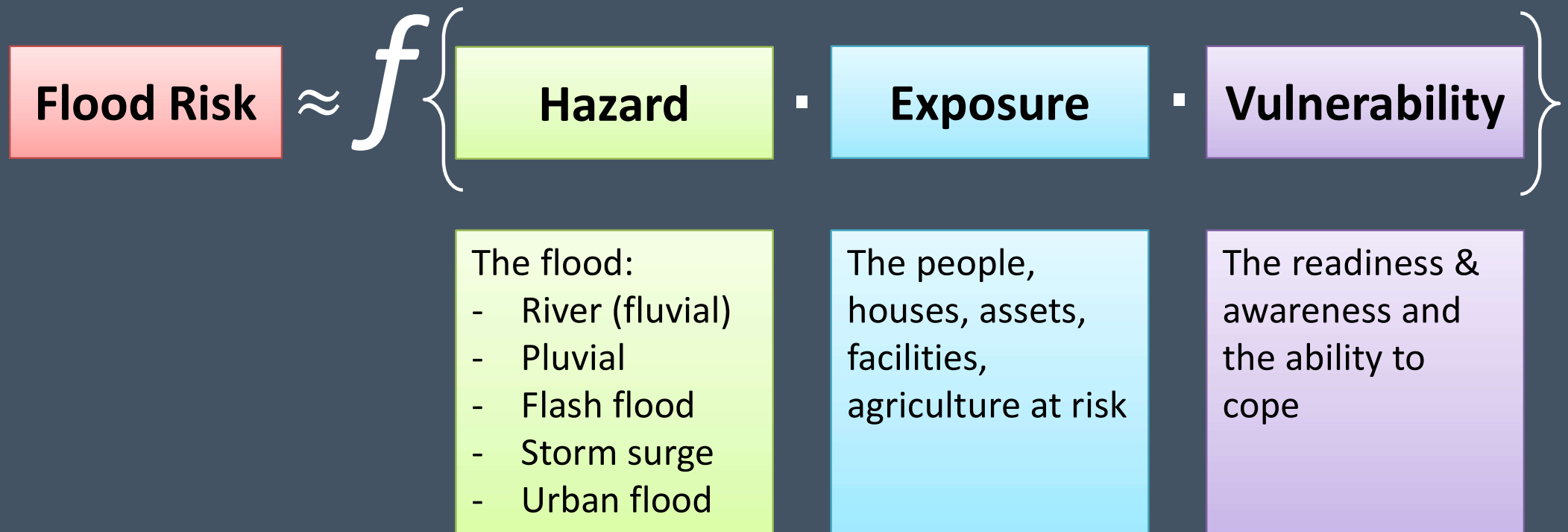
What is Integrated Flood Risk Management?

Flooding

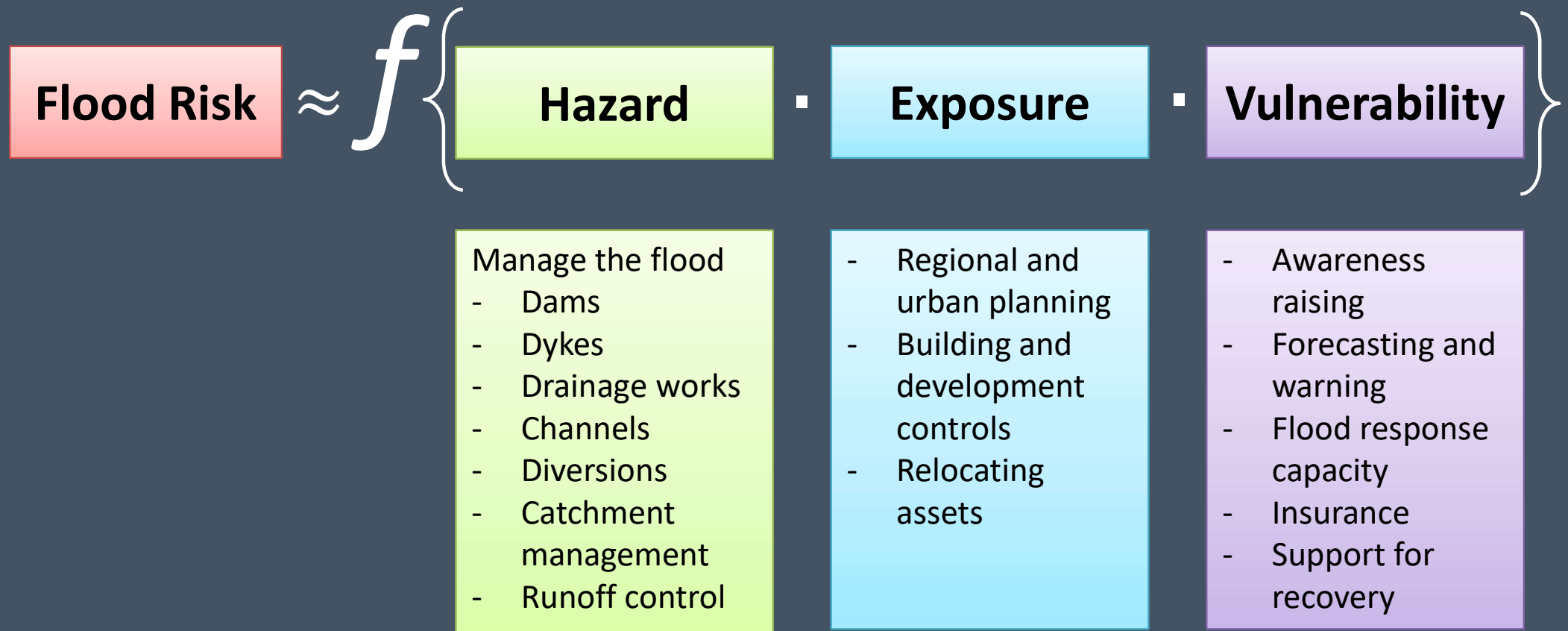


- River flood
- Pluvial flood
- Coastal flood
- Urban flood
- Flash flood
- Water logging
- Dam break
- GLOF

What is Flood Risk?



What is Flood Risk Management?



Issues for developing an IFRM Project with ADB

- ADB Strategy 2030
 - ↳ Prosperous, Inclusive, Resilient, Sustainable
- How much complexity is enough?
 - ↳ Institutional home, stakeholder buy-in, implementable
- Avoid the siloed thinking that define many public institutions
 - ↳ Is the problem just flooding?
- Safeguards: Environmental and Social
 - ↳ Are we “doing things right” rather than “doing the right things“?

What is Resilience?

Resilient infrastructure...

- is planned, designed, built, operated, and maintained for changing climate conditions.
- withstands or recovers quickly from disruptions caused by climate conditions
- For example, culverts in a road project designed for increased rainfall intensity

Infrastructure for resilience...

- increases the resilience of community or asset by increasing the adaptive capacity
- For example, a flood channel that diverts excess river flows away from an urban area

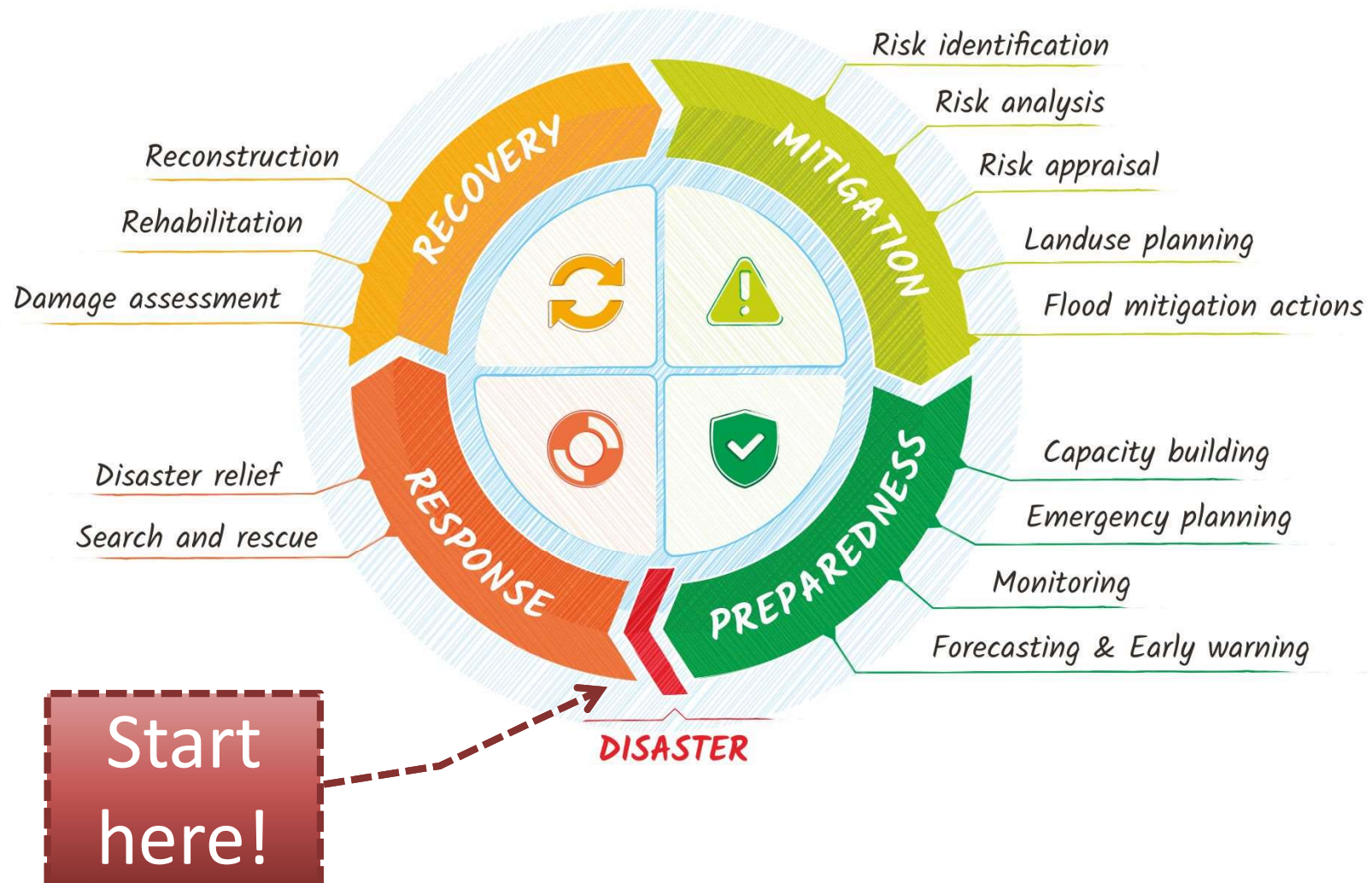
Global Center on Adaptation, 2021. "Climate-Resilient Infrastructure Officer Handbook". Knowledge Module on Public-Private Partnerships (PPPs) for Climate-Resilient Infrastructure. Supported by Ministry of Infrastructure and Water Management, Netherlands



Questions to consider...

- Floods are knowable, so why are flood disasters among the most damaging and frequent?
- Are increased economic losses inevitable?
- Can we get to zero loss of life from floods?
- What will be most useful for us to address IFRM challenges in the future?
 - Is it an issue of knowledge, capacity, funds, institutional constraints?

Final messages



Thank you



Discussion questions

1. In general, can it be said that flood risk management projects in your country are fully integrated?
2. What are the main issues or constraints for balancing land use demands for urban development and the increasing level of flood risk?
3. Are nature-based solutions (NBS) the answer to enhancing resilience? What are the practical issues for designing a flood project with NBS?

SESSION 3

MAR 22
2022 Tuesday

Coastal Flood Risk Assessment

Lessons from coastal flood risk analysis in Philippines and Pakistan.

16:00

Manila
time

90 minutes



Fay Luxford

Flood and Hazard
Modelling Specialist
JBA Consulting



Blair Spendelow

Flood Technology
Specialist
JBA Consulting

See you next week!

For recordings and any follow up questions, please access the event site at the ADB Knowledge Events in Development Asia
<https://events.development.asia/learning-events/challenges-lessons-and-innovations-strengthening-integrated-flood-risk-management>