Understanding risk
Risk identification
Solutions

Integration and Flood Risk Management for development

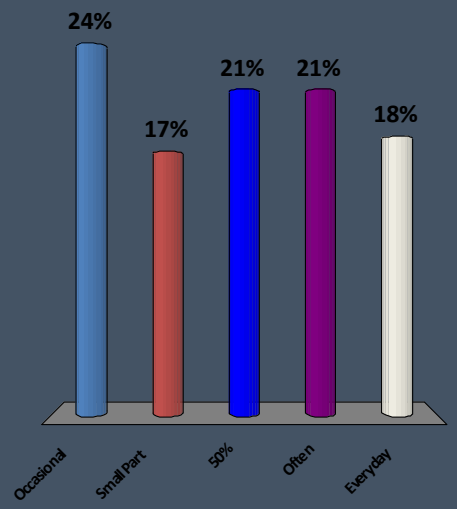
Anthony Green
IFRM Specialist

TA 9634-REG: Strengthening Integrated Flood Risk Management

Consultation Question

In your job you may have many responsibilities. How important is ‘Flood Risk’ for **your** work? Choose A to E.

A. Occasional
B. Small Part
C. 50%
D. Often
E. Everyday



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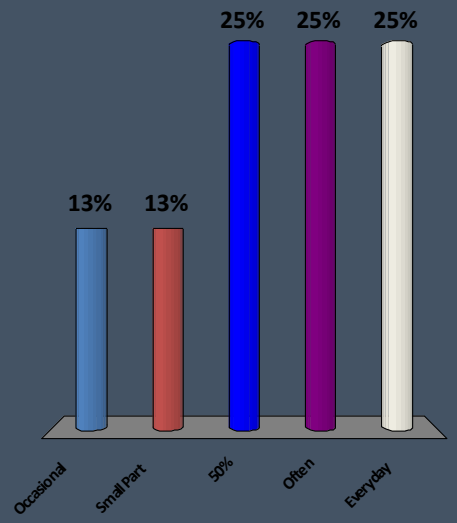
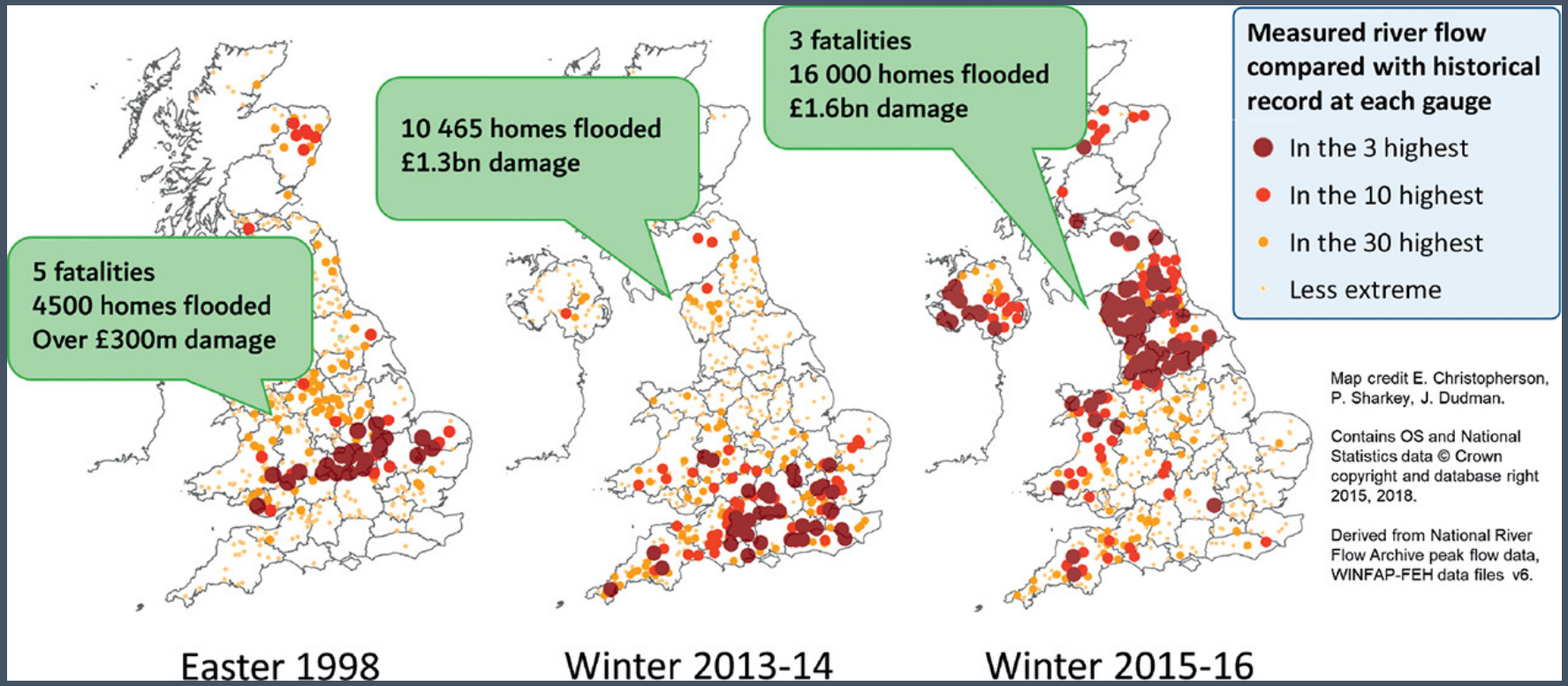
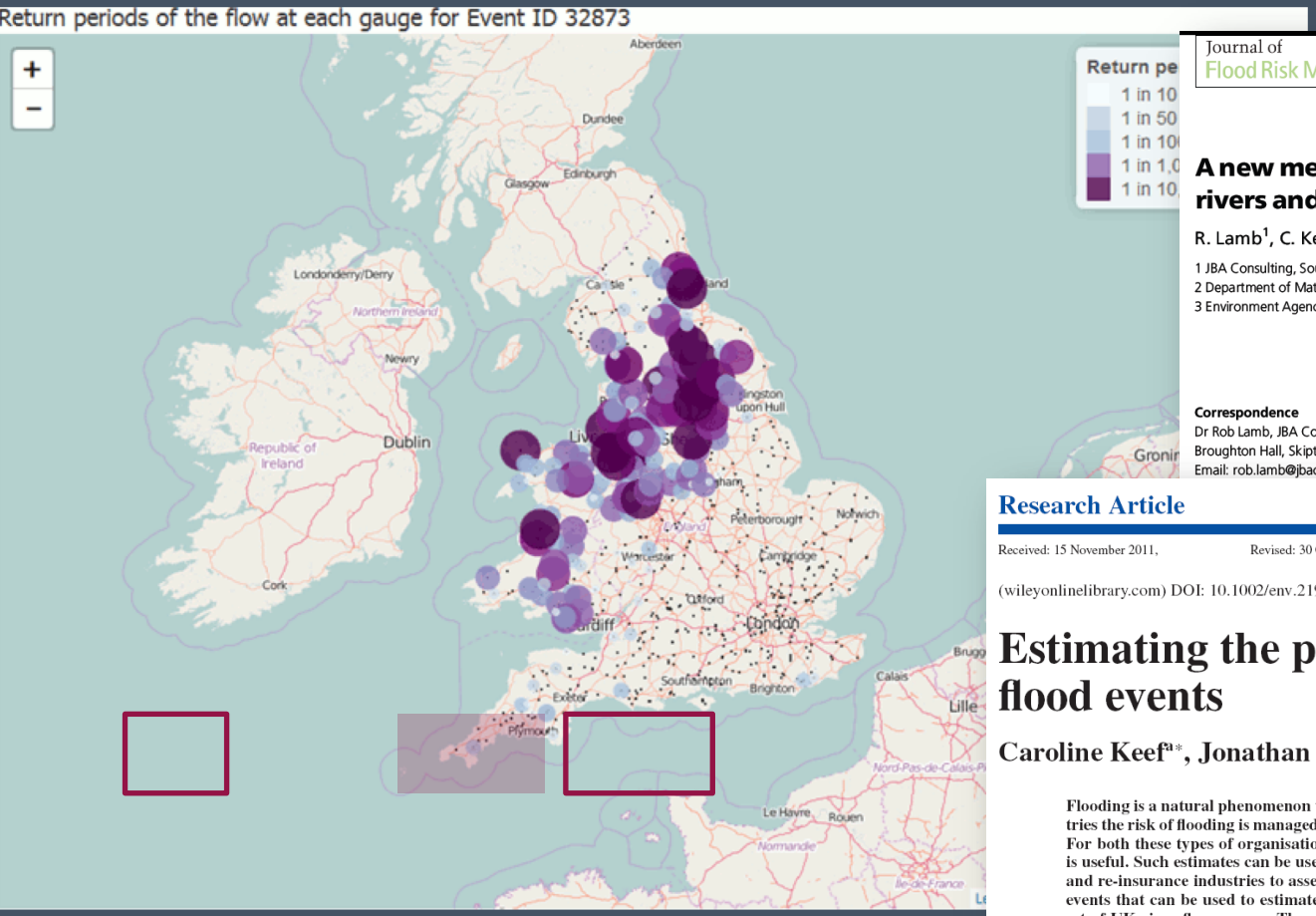


How rare is an extreme flood?



If you are responsible for a large area – very likely at some locations – 80%/year in UK

Spatial extreme flows model



Journal of
Flood Risk Management

A new method to assess the risk of local and widespread f rivers and coasts

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Abstract

To date, national- and regional-scale flood risk assessments ha information about the annual expected consequences of fl

Research Article Environmetr

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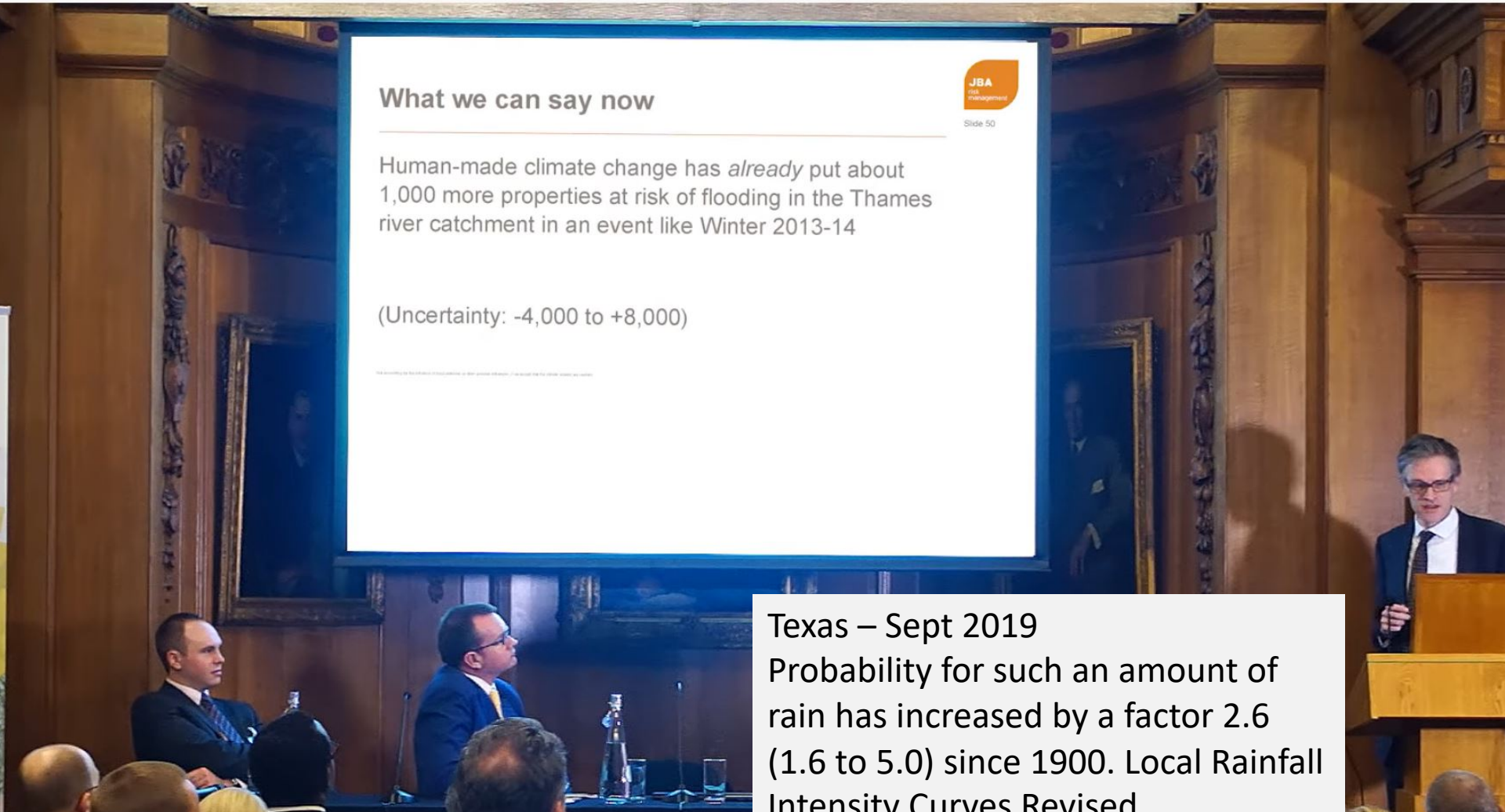
(wileyonlinelibrary.com) DOI: 10.1002/env.2190

Estimating the probability of widespread flood events

Caroline Keef[a]*, Jonathan A. Tawn[b] and Rob Lamb[c]

Flooding is a natural phenomenon that regularly causes financial and human devastation around the world. In many co tries the risk of flooding is managed by society through a combination of governmental agencies and the insurance indus For both these types of organisation an estimate of the largest, or most widespread, events that can be expected to oc is useful. Such estimates can be used to help in preparing or co-ordinating flood mitigation activities and by the insura and re-insurance industries to assess financial risk. In this paper we develop a method to simulate a set of synthetic fl events that can be used to estimate the probability of widespread floods. We demonstrate this method using data fro set of UK river flow gauges. The model used in this simulation process is based on the conditional exceedance mode Heffernan and Tawn, extended to incorporate features typically found in the data for extreme river floods. We also pre

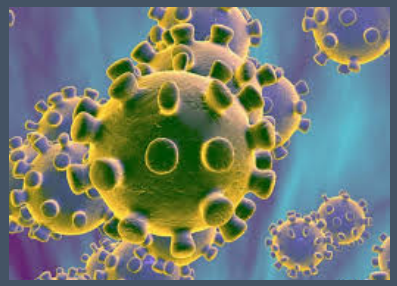
Is Climate Change detectable already?



Texas – Sept 2019
Probability for such an amount of rain has increased by a factor 2.6 (1.6 to 5.0) since 1900. Local Rainfall Intensity Curves Revised

Understanding risk

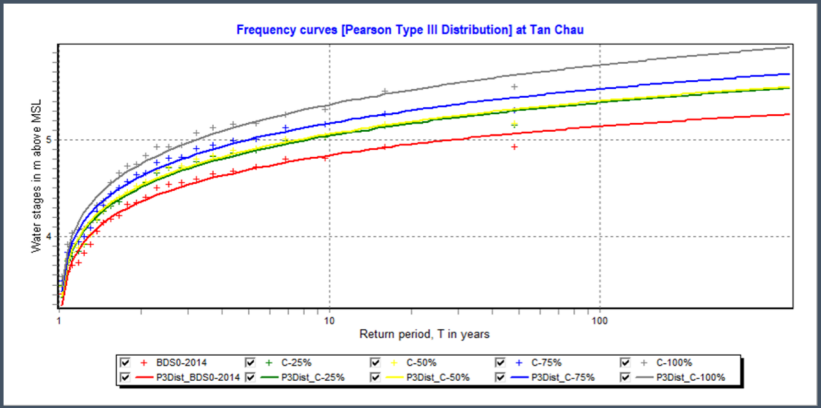
- Likelihood

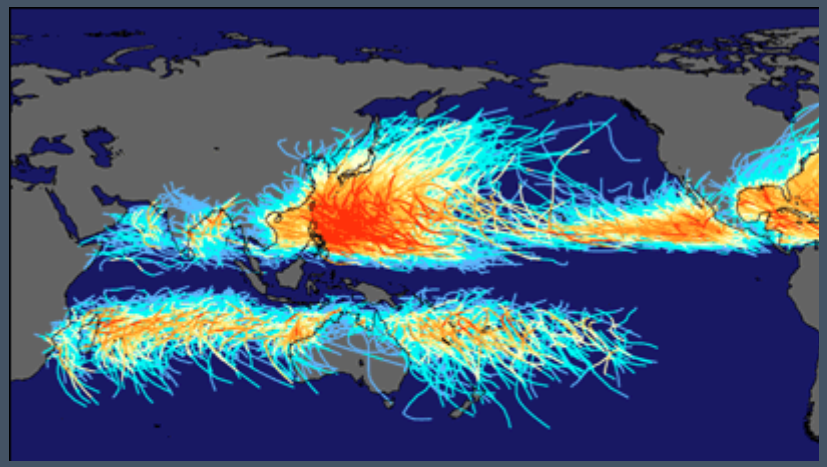


- Consequence

Understanding flood risk

- Likelihood

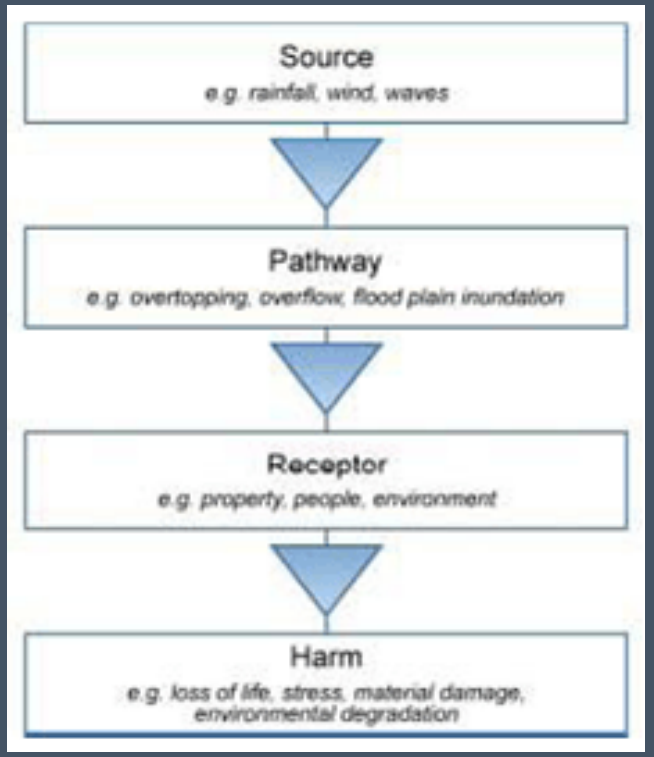




- Consequence

Understanding Flood Risk Analysis

Risk = Fn { Hazard, Exposure, Vulnerability}



Understanding Flood Risk Analysis - **HAZARD**

A **hazard** is any agent that can cause harm or damage to humans, property, or the environment.

Note:

a.Hazard to life as a product of depth and velocity of a flood is also sometimes assessed.

b)Exposure may be different at different times or after warning

Understanding flood risk - Hazard

Rain

Snow/Ice melt

Localised Storm

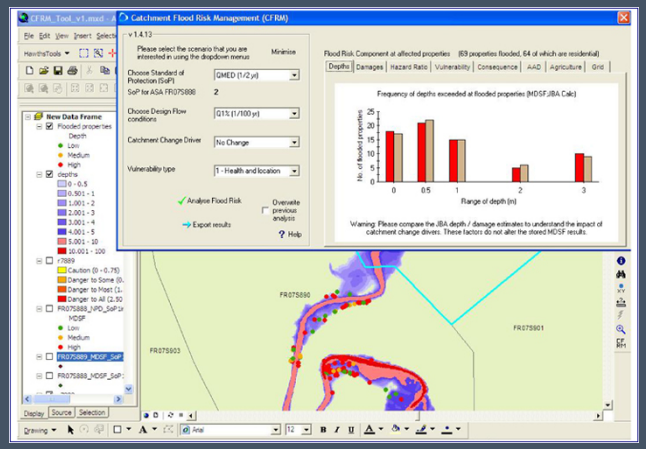
Sea

- Fluvial:
  - Large Rivers - Long
  - Flash Floods Local Catchments
- Surface Water/Drainage
- Groundwater
- Tides
- Storm surge
- Wave

Failures

- Dams
- Banks/Dykes
- Bridges
- Pipes
- Pumps
- Valves
- Subsidence
- Siltation

Exposure



- People – Disaggregated to Vulnerable groups
- Property – Differing standards. Structure and contents
- Agriculture crops and livestock
- Business
- Infrastructure
- Ecology/Environment
- Transport
- Secondary Impacts

Flood Risk – Social Impact for the most Vulnerable

Vulnerability

- Poor People Suffer More
- Impact on Poor People Underestimated

Issues for Resilience

Issues for Cost Benefit

Consequence

- Flooding keeps people in poverty

Action

- Protect/compensate assets of poor people
- Build back better

Flood Events – How have these shaped IFRM?

What Happened?

What lessons were learnt?

What changes were made subsequently? (or not due to certain constraints)

UK 1998 Easter Floods

Context – Progressive Flood Defence improvements in response to events

4200 Properties flooded

5 Fatalities

Independent Inquiry

National Flood Mapping (Floodplain, defended areas)

Incorporation into Land Use Planning Legislation

Emergency Planning

Understanding flood risk – Hazard Sources

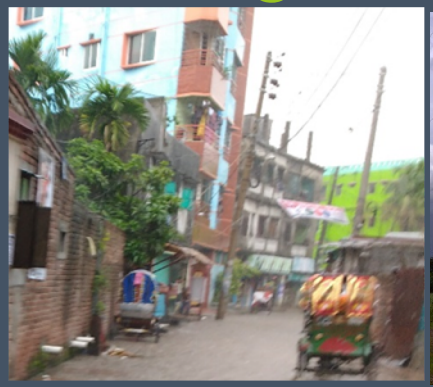
Minister promised flood mapping to be openly available for whole country within 2 years

UK Floods – Risk Management and **Integration (1 of 3)**

With National Flood Mapping and a motivation for Institutional change:

1. **Legislation – Regional and Local Government MUST take account of flood risk (Planning Guidance PPS25 – presumption to develop areas at low risk and exceptions had to be justified and could be challenged)**
2. **Each development needed a Flood Risk Assessment for planning**
3. **Catchment based flood plans were prepared including SEA**

Flood Management **Change (2 of 3)**



4. Flood Responsible Agency became part of same ministry as farming/Land Management.
5. National Exercise Civil Contingency preparedness
6. Closer linkage with Conservation (English Nature) legislation and support for bank setbacks and river restoration.
7. Linkage with land management payments for farmers (catchment management)

UK Floods – Risk Management and **Integration (3 of 3)**

7. **Agreement to increase expenditure on defences with Insurers to maintain household coverage**
8. **Other Flood Risk also quantified/mapped – surface water and dam break**
9. **Climate Change Guidance Issued for all developments**

Summary Changes:

Approach, Communication, Institutions, Funding

Floods still occur in a risk management but

People and Politics may still intervene eg following an embankment failure in 2019

Residents have demanded answers about what happened and solutions to stop flooding happening again. Mr Warman, MP for Boston and Skegness, said

Government exists to try and protect people who are vulnerable and I want to admit, first off, that it is a failure that we are in this position. "So that is a flat-out 'sorry'."

MP Warman said that he had approached Environment Secretary Michael Gove "who had agreed funding would be made available" to **improve flood defences** in the area. There will also be an independent review, some residents demanding the river is not made into a nature park but must be dredged.

Learning Lessons Flood Events

Consider A Significant Flood Event in Your Country

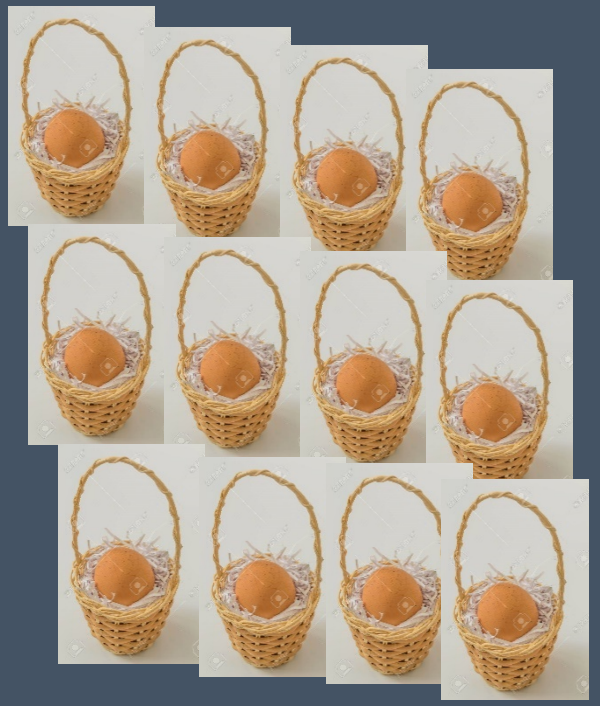
Describe how that has influenced Flood Management and changes that occurred after.

What were the main issues?

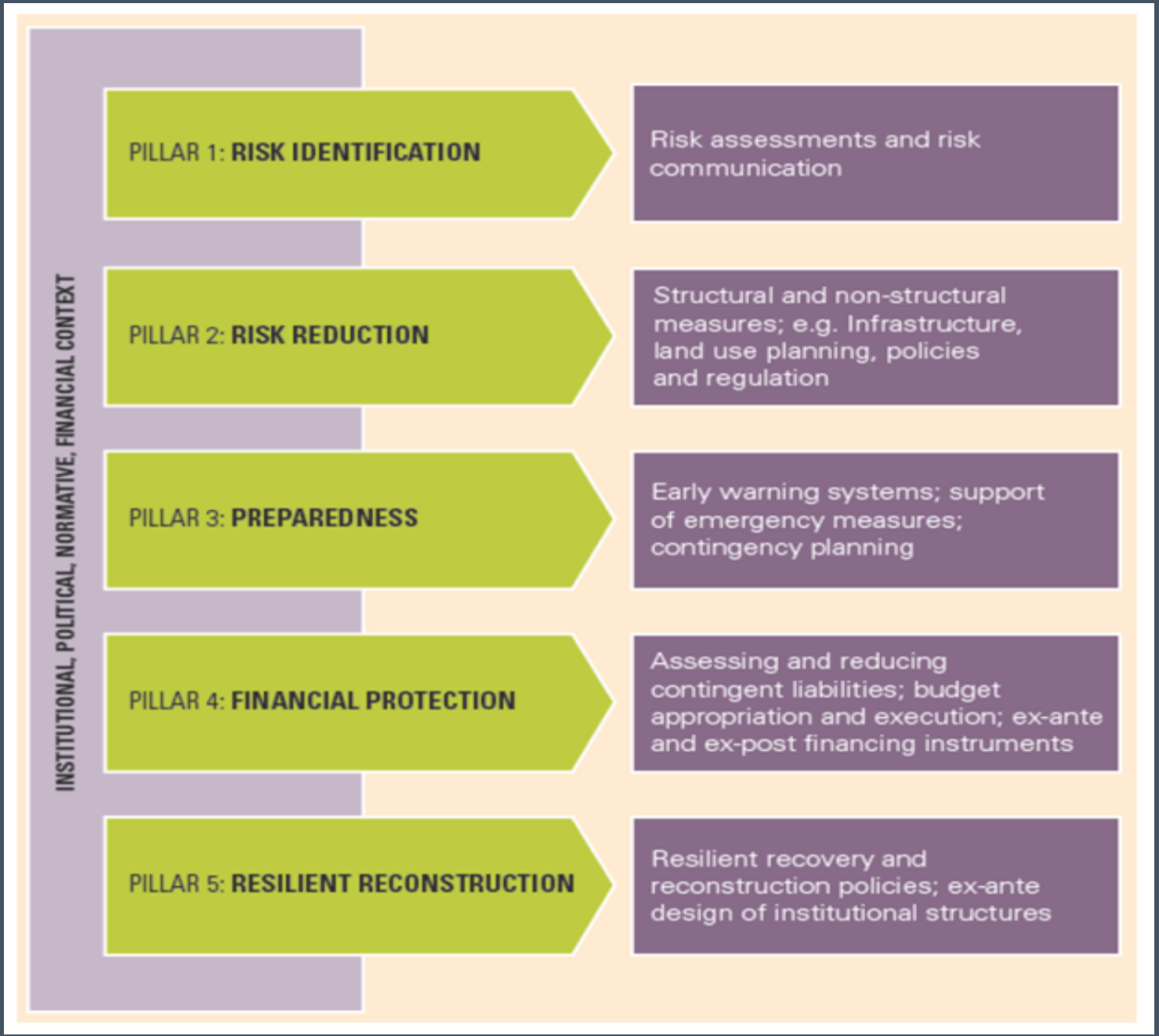
How would a similar flood occurring now be different?

Introducing ‘Solutions’

Eggs and Baskets



‘Pillars’ of Sendai DRR



Consultation Pillar A Risk Reduction

How would you rank the Sendai Framework pillars for the current situation in your country 1=most critical 5=least?

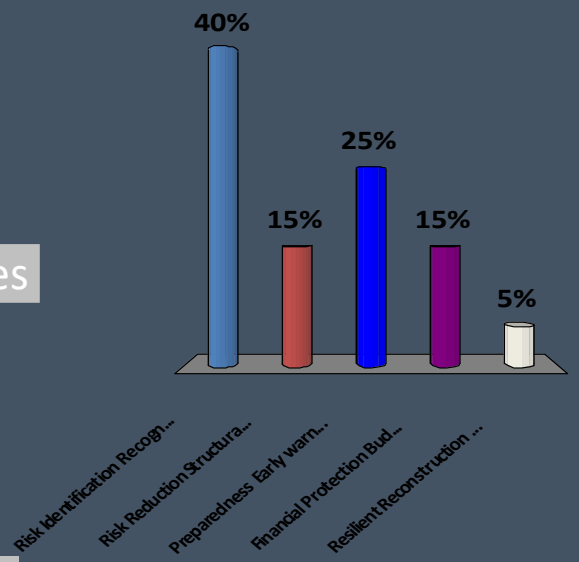
A. Risk Identification Recognizing, Assessing and Understanding the Risk from flood and drought.

B. Risk Reduction Structural and non-structural Measures, For Example; Infrastructures, lane use Planning, policies and regulations.

C. Preparedness Early warning system; support of emergency measures; contingency planning.

D. Financial Protection Budget planning and financial protection of existing infrastructure and assets-Finance and Insurance.

E. Resilient Reconstruction Resilient recovery and reconstruction policies.



Pillar B Risk Reduction

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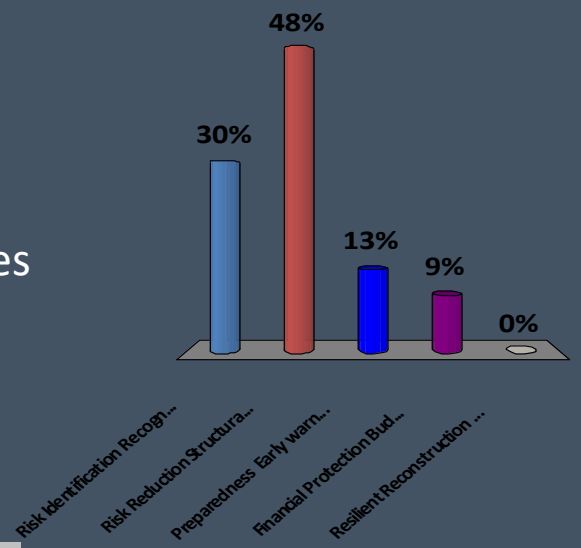

Pillar C Preparedness

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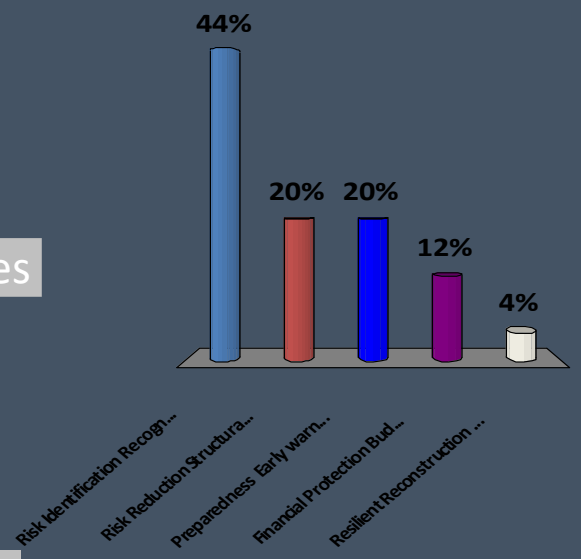

Pillar D – Financial Protection

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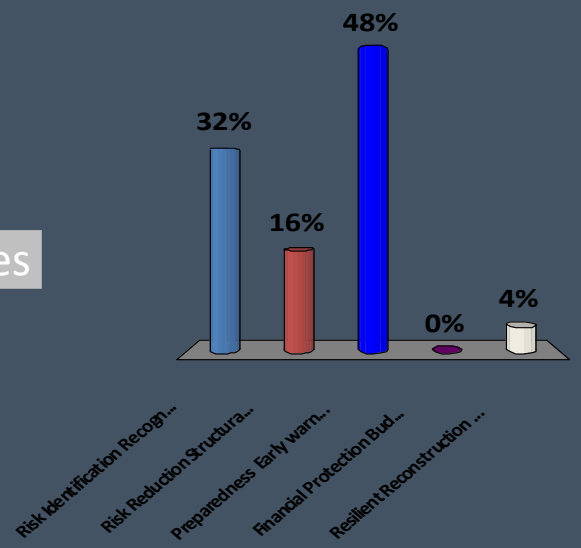

Pillar E Resilient Reconstruction

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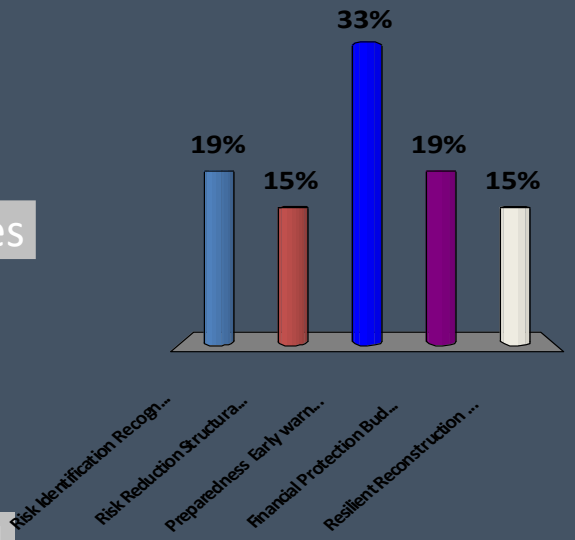
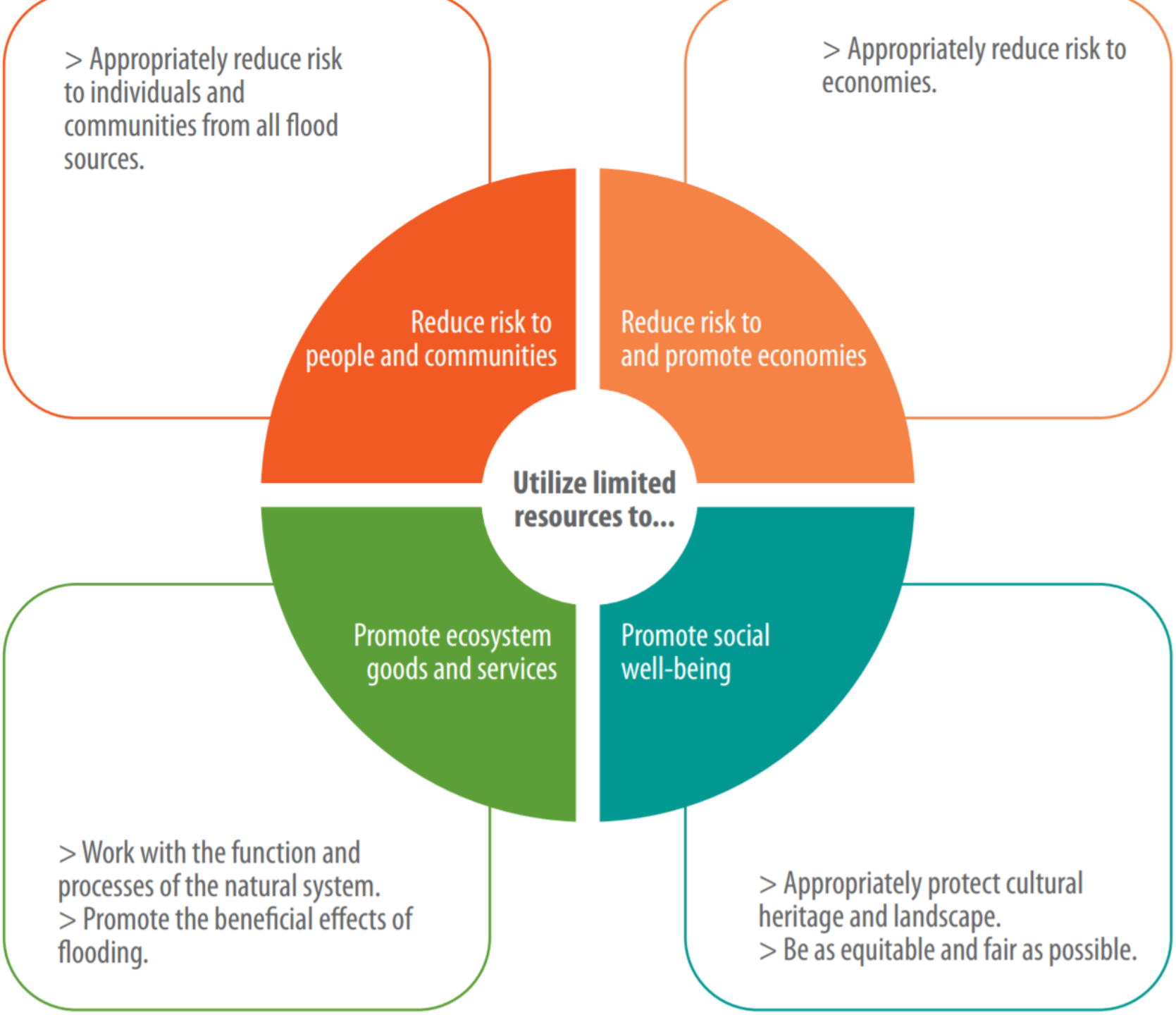


Objective	Country 1
Risk Identification Recognizing, assessing, and understanding risks from flood and drought.	?
Risk Reduction Structural and non-structural measures. For example; Infrastructure, lane use planning, policies and regulation.	?
Preparedness Early warning systems; support of emergency measures; contingency planning	?
Financial Protection Budget planning and financial protection of existing infrastructure and assets – finance and insurance.	?
Resilient Reconstruction Resilient recovery and reconstruction policies.	?


> Appropriately reduce risk to individuals and communities from all flood sources.
> Appropriately reduce risk to economies.
Reduce risk to people and communities
Reduce risk to and promote economies
Utilize limited resources to...
Promote ecosystem goods and services
Promote social well-being
> Work with the function and processes of the natural system.
> Promote the beneficial effects of flooding.
> Appropriately protect cultural heritage and landscape.
> Be as equitable and fair as possible.

Identifying **Solutions** – IFRM Process

Planning

National Strategies

Catchment Planning

Identification of a Range of Hard/Soft Options

Feasibility

Detailed

Community

Involvement

Funding

Responsive

Flood/Disaster Occurs

Learning Lessons

Monitoring

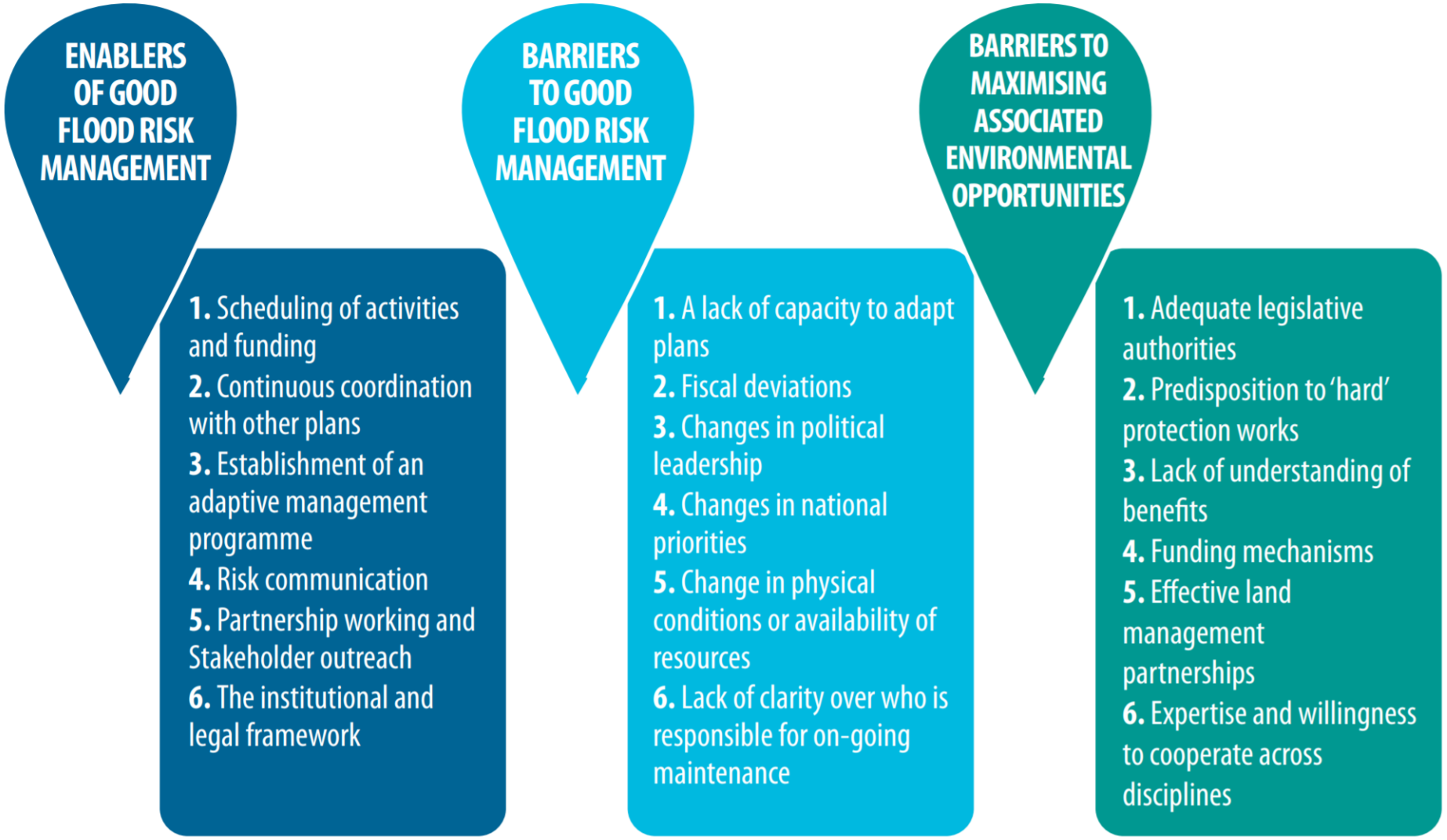
Adapting

Preparedness

Increasing Resilience

Institutional Change and Legislation

From ADB/GWP Flood Risk Management 'A Strategic Approach'




Thank you