



# *Framework for* **Increasing Resilience to Climate Change in Water & Health**

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April 4, 2019



# Framework for Increasing Resilience

1. Rationale
2. CRIDA
3. Way forward



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# 1. Rationale



## Climate resilience

- When faced with increased variability
  - Urgent: floods & droughts
  - Longer term trends
- Infrastructure remains functional
- Services continue
  - Recover quickly when confronted with hazards
- Health risks do not increase

# 1. Rationale



- Water and sanitation
  - Sustainable water supply
  - Safe sanitation
  - Water-borne diseases
- Health infrastructure
  - Safety
  - Power, water, sanitation
  - Access, supplies
- Other impacts...

# Other impacts



## Vector-borne diseases, e.g.

- Mosquitoes: WNF, dengue
- Rats: leptospirosis



## Climate change:

- longevity, transmission potential
- Need for water storage

## Non-infectious diseases

## Microbiological & chemical pollution

- Water-borne diseases
- Cyanobacteria
- AMR
- Fungi

## Climate change

- Runoff, overflows
- Increased exposure



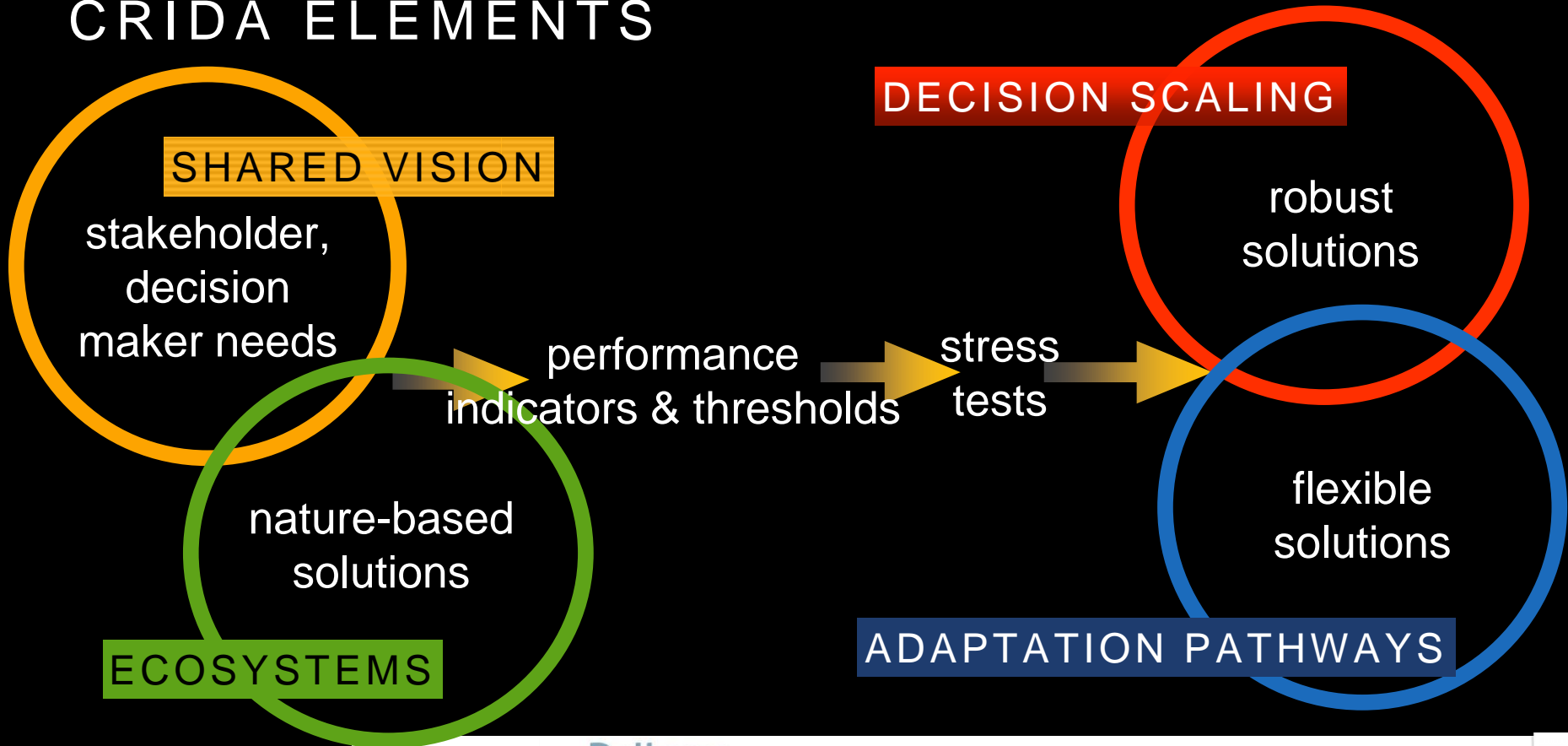
## 2. CRIDA



### Climate Risk Informed Decision Analysis

- To support decision making under uncertainties
- Structured stepwise planning approach
- Start from tolerance levels for failure and ask:
  - At what level of change will it start to hurt?
  - How plausible is this situation in the future?
  - Build resilience to avoid this situation
- Involve stakeholders from an early stage

# CRIDA ELEMENTS

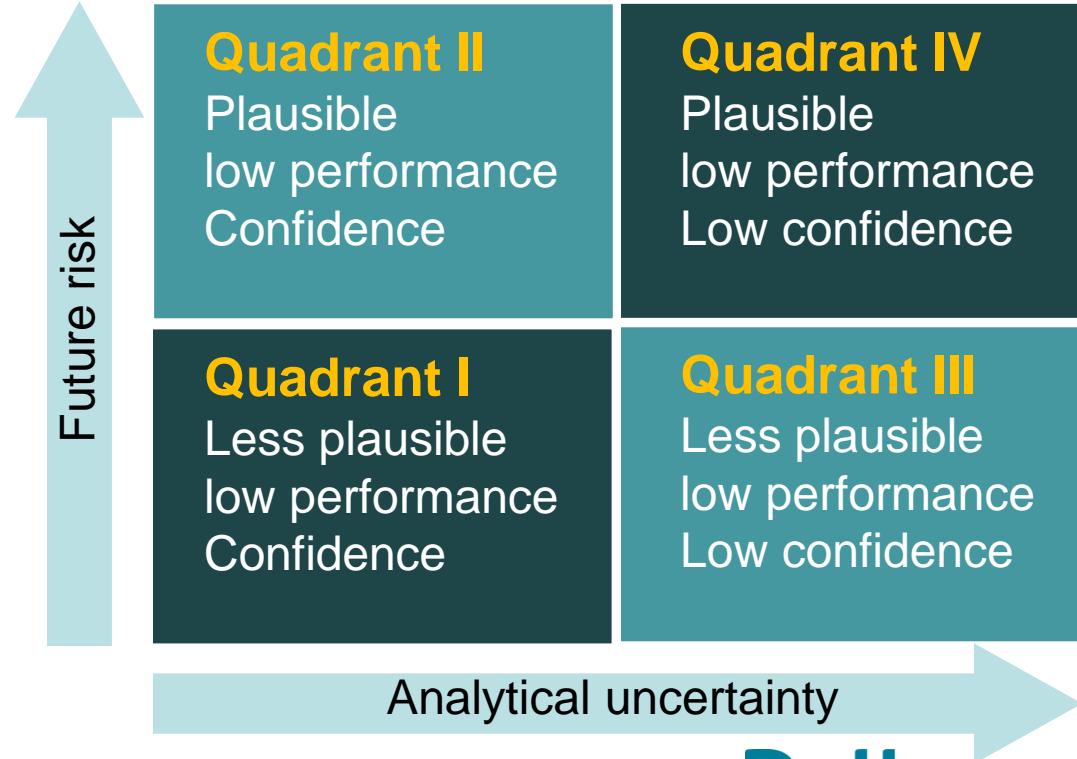


## 2. CRIDA



### Selecting a strategy

1. Assess level of risk of **chronic** unacceptable performance
2. Assess level of uncertainty



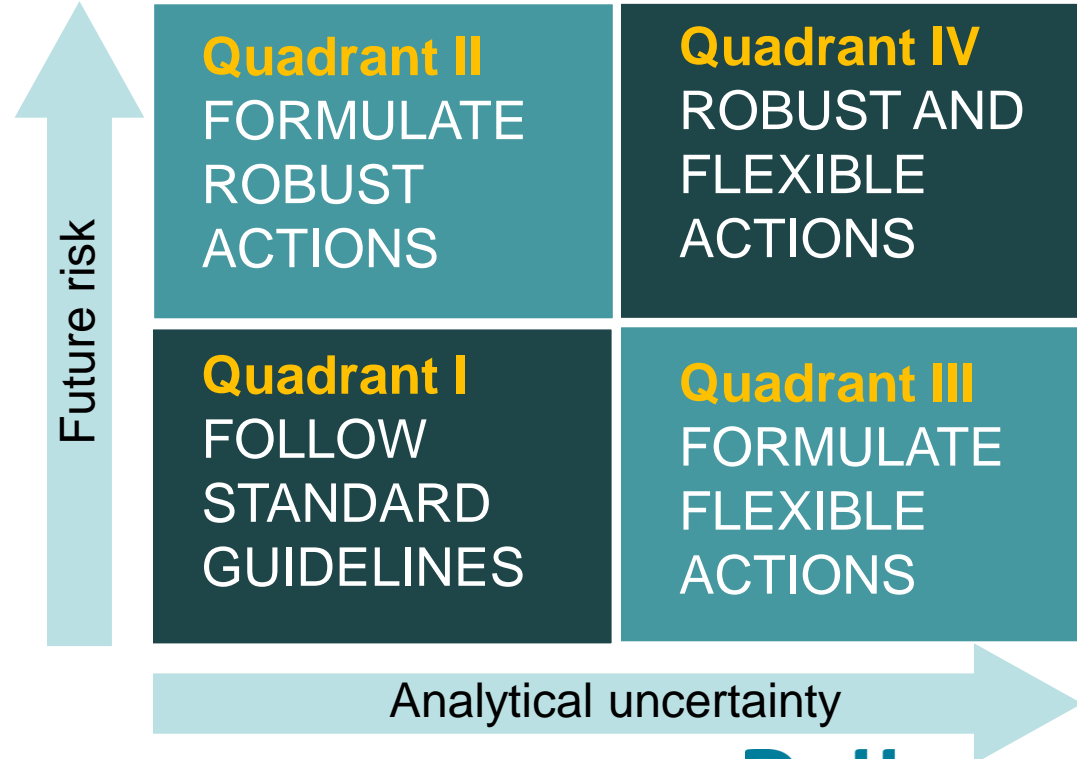


## 2. CRIDA



### Selecting a strategy

3. Appropriate action for each situation



# CRIDA ELEMENTS

SHARED VISION

stakeholder,  
decision  
maker needs

nature-based  
solutions

ECOSYSTEMS

performance  
indicators & thresholds

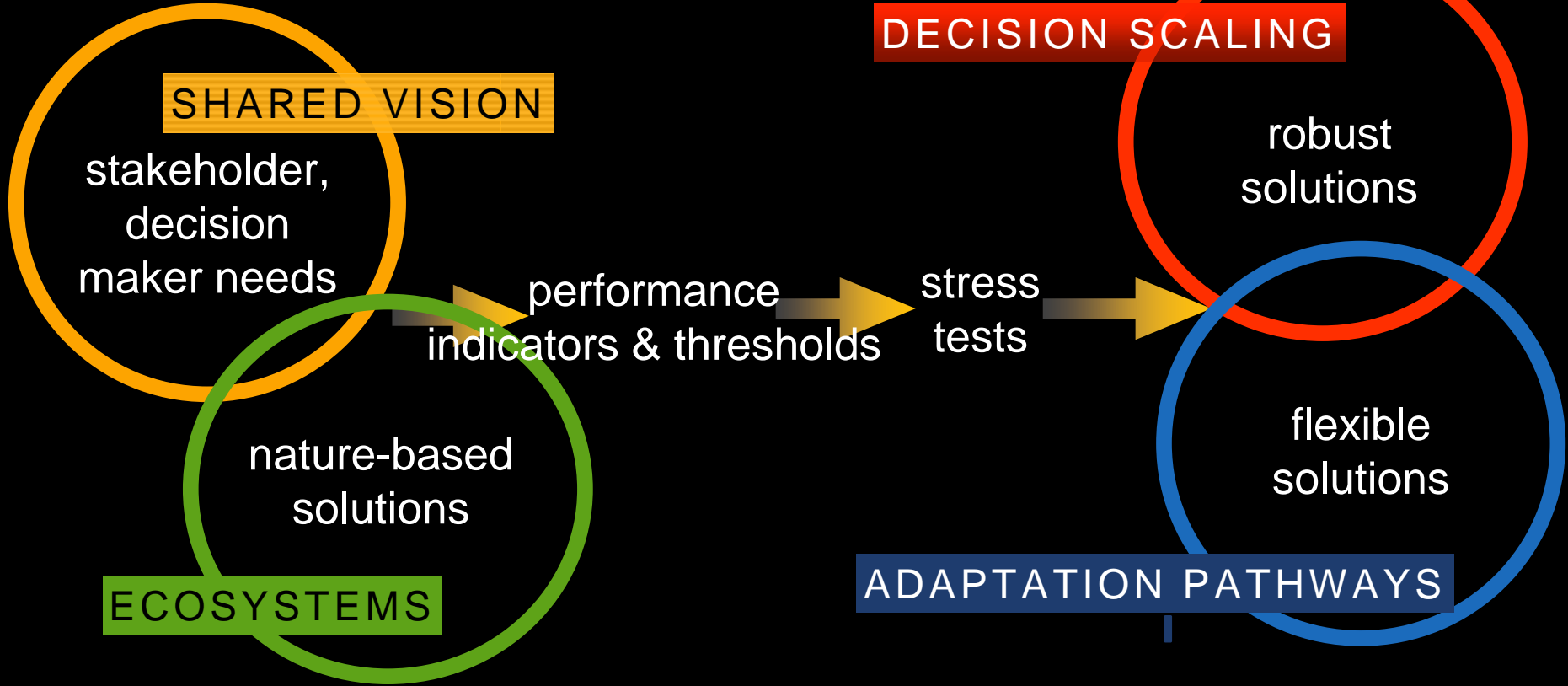
stress  
tests

DECISION SCALING

robust  
solutions

flexible  
solutions

ADAPTATION PATHWAYS

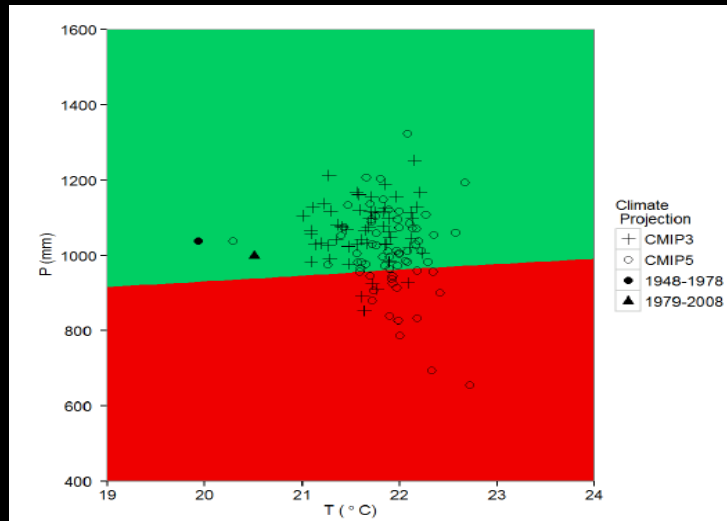


## 2. CRIDA – TWO KEY ELEMENTS



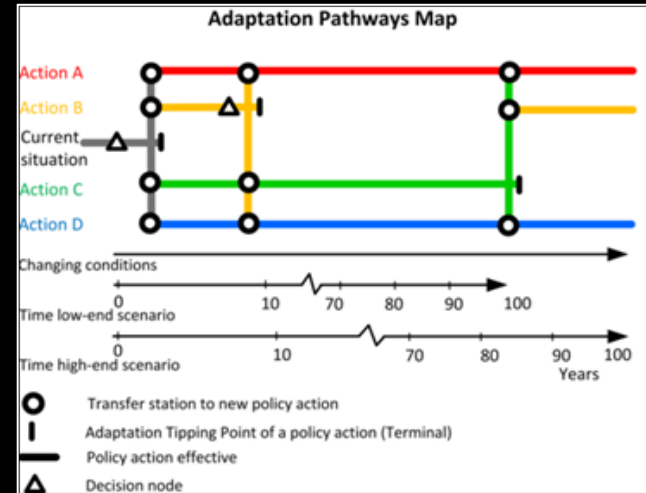
### Decision scaling stress test

- Uncertain climate data
- Allow stakeholders to define system failure



### Adaptation pathways

- Show flexibility
- Many transfer points in future: low regret options



# Example of adaptation pathway



Stage 1: define actions and shelf life indicator

Dike: Large

Dike: Small

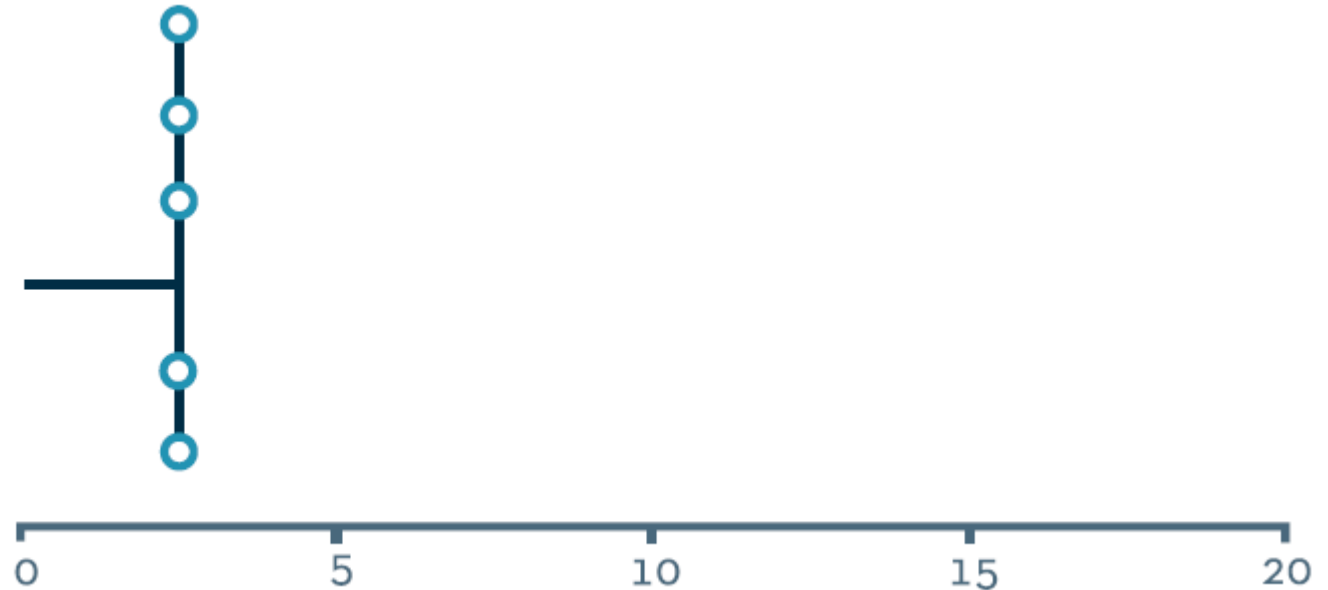
Floodproof Urban Areas

Current Situation

Room for River: Small

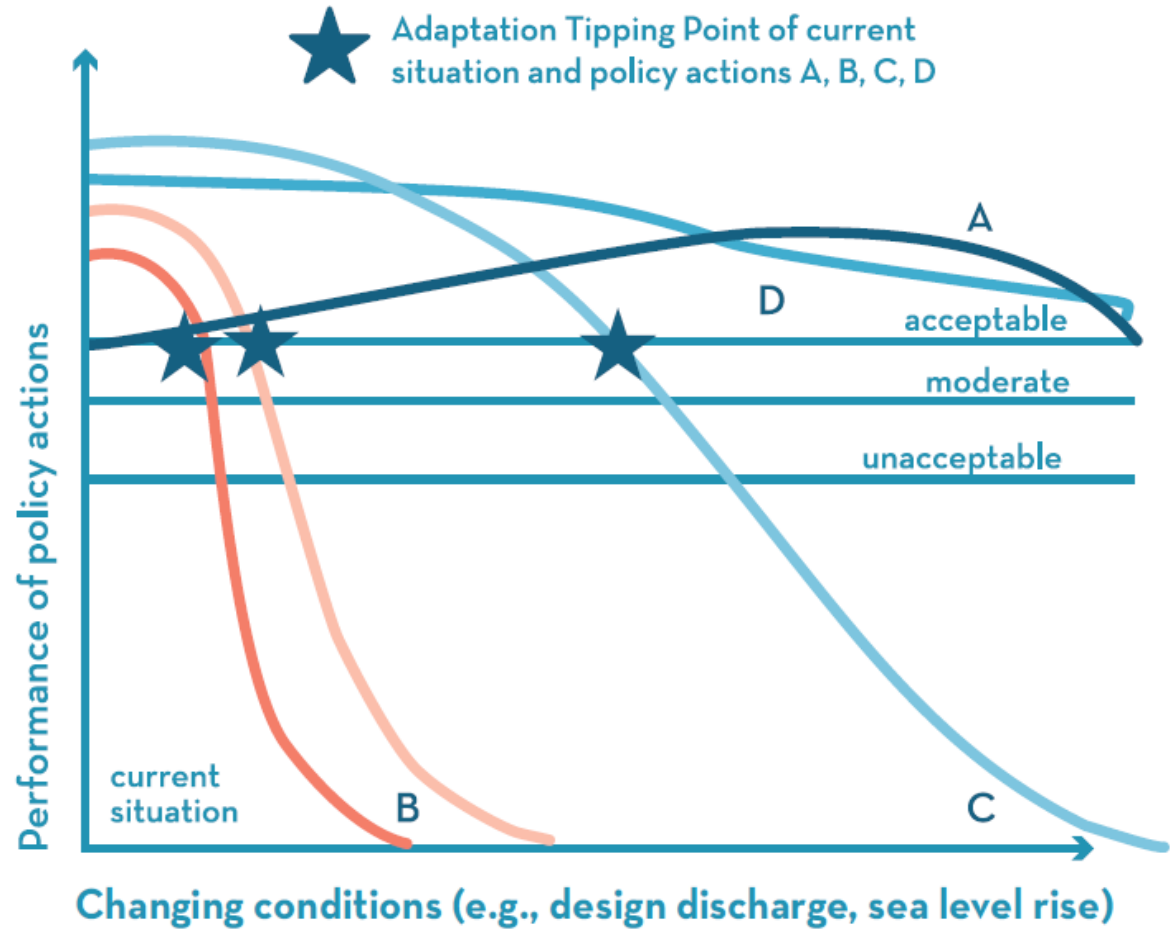
Room for River: Large

Inflow Change (%)



# Example of

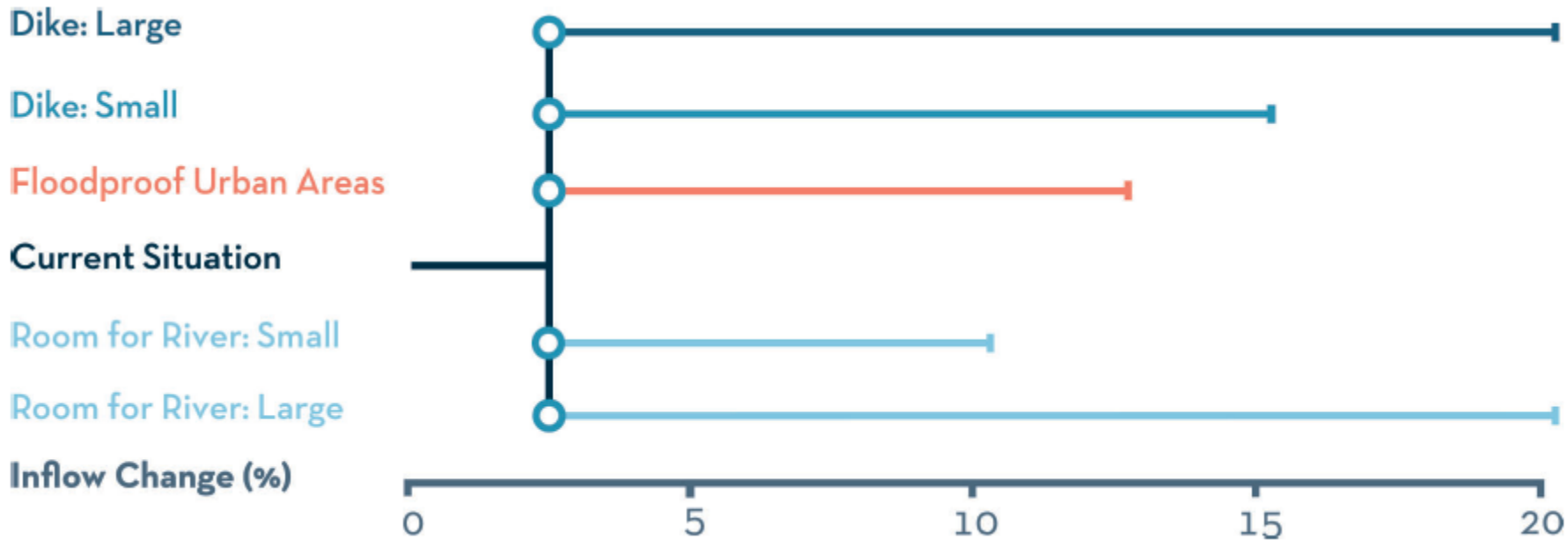
Stage 2: determine adaptation tipping points



# Example of adaptation pathway



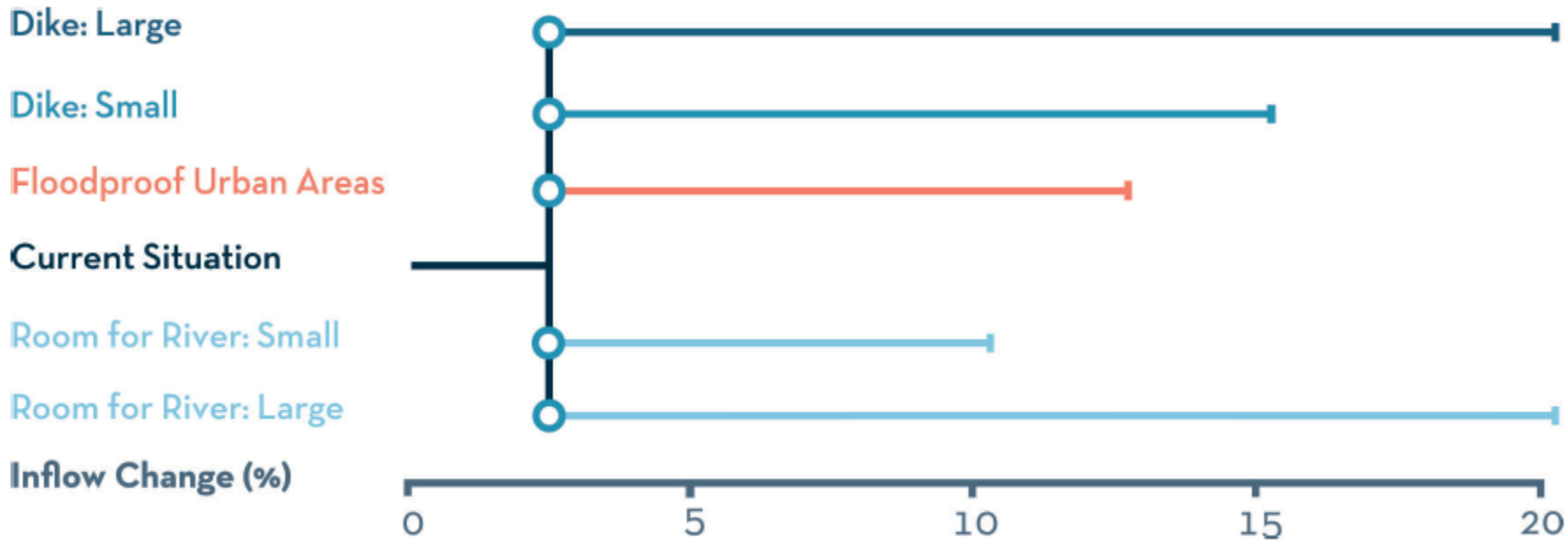
Stage 2: assign tipping points to pathways



# Example of adaptation pathway



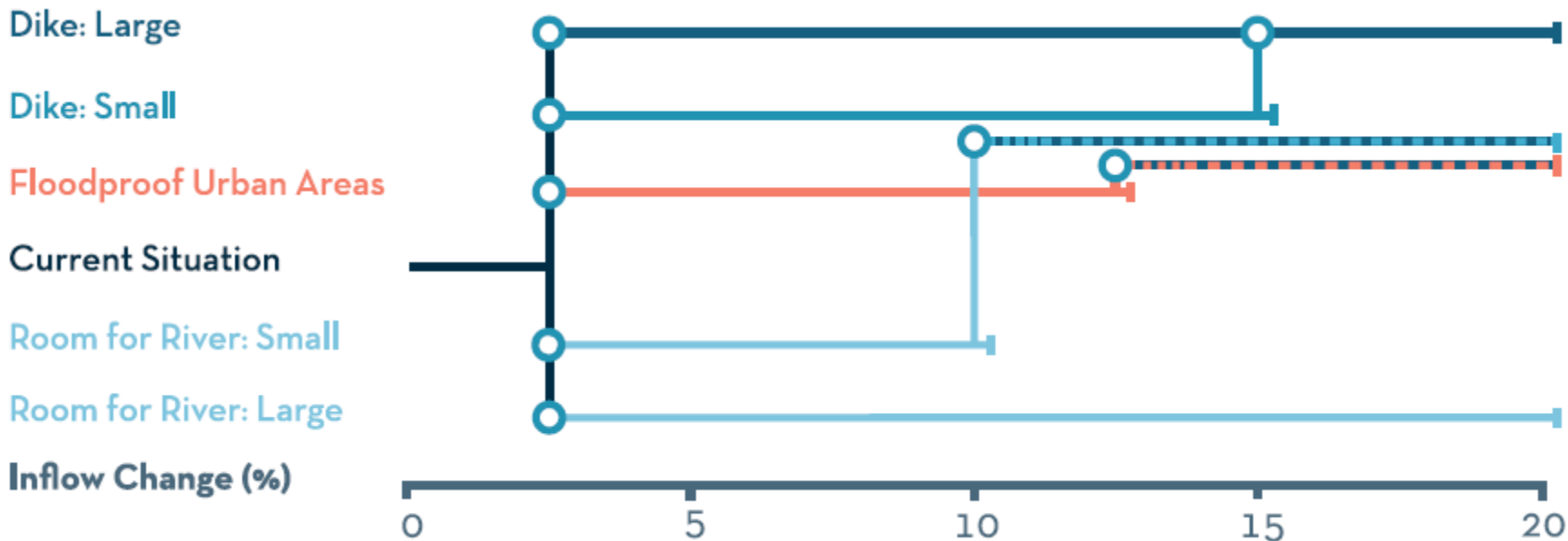
Stage 2: assign tipping points to pathways



# Example of adaptation pathway



## Stage 3: identify pathway transfer points

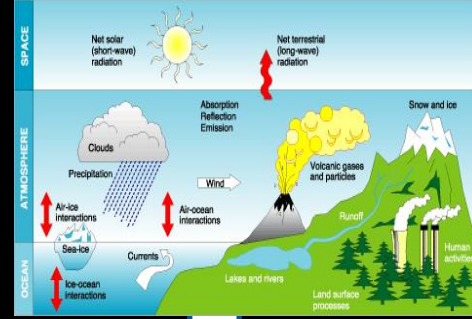




# STAKEHOLDERS



# CRIDA IN A NUTSHELL



Driver

# ROBUST SOLUTIONS



# FLEXIBLE IMPLEMENTATION

'ANALYST'



Performance

METRICS THAT MATTER

VULNERABILITY



STRESS TEST



DECISION MAKER

# 3. Way Forward



- CRIDA could be applied to Water & Health
- Supporting climate-resilience of
  - Drinking water supply
  - Sanitation
  - Health facilities
- Feedback from Water & Health working group to UNFCCC

<https://agwaguide.org/about/CRIDA/>

**Thank you!**

**More information in the book**

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Climate Risk Informed  
Decision Analysis (CRIDA)

Collaborative Water Resources  
Planning for an Uncertain Future



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