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# Integrated Coastal Resilience Planning Framework for SEA

**Wang Shanshan | Singapore Water Business Lead**

5 October 2023

This random image was suggested what ChatGPT suggested when prompted –

*Find me a good image for a strong opening for my presentation on coastal adaptation in Southeast Asia*

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# Acknowledge our ignorance
# Be brave to explore

Photo by Jeremy Bishop on Unsplash

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# Arup Worldwide

**From more than 89 offices in over 33 countries, over 17,000 planners, designers, engineers and consultant deliver innovative projects across the world with creativity and passion.**

v1

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# Arup in Southeast Asia

**50+ yrs** of city-shaping history

**1,000+** SEA-based staff

**10** offices

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# What is coastal resilience?

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# Definition

**Climate change induced**

**Socio-economic factors**

**Bounce back better**

# What are disintegrated?

Photo by Dexter Fernandes on Unsplash

# Disintegrated

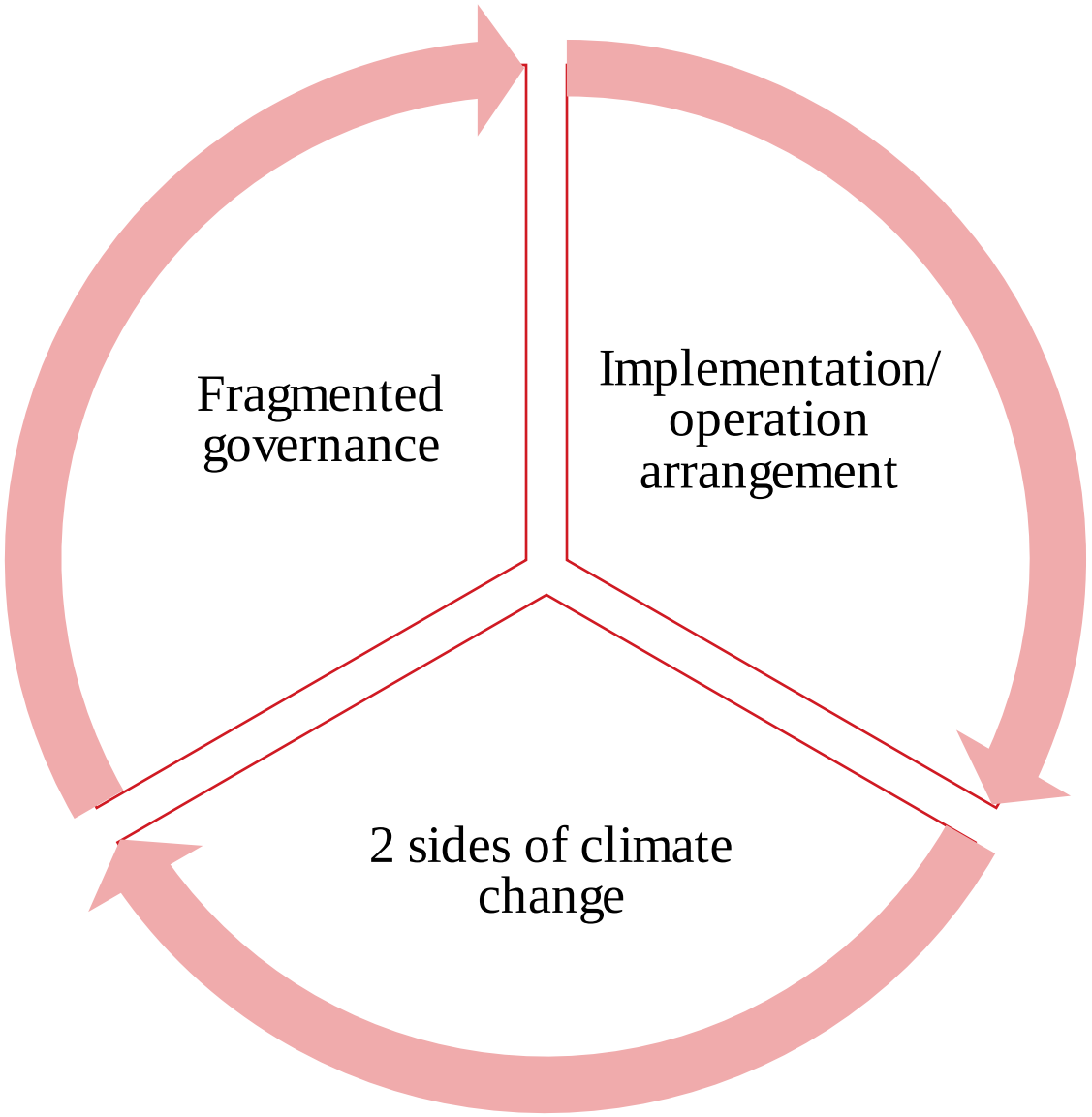

Photo by Dexter Fernandes on Unsplash

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# Teaser –
# What to ask to plan for coastal resilience for a city?

Photo by Alvaro Reyes on Unsplash

# What to ask to plan for coastal resilience for a city?

Maybe -

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# What to ask to plan for coastal resilience for a city?

And we have -

**Smart city**

**Nature based solutions**

**Circular economy**

**Active mobility**

# BUT

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# BUT
# Who will construct/maintain my NbS?

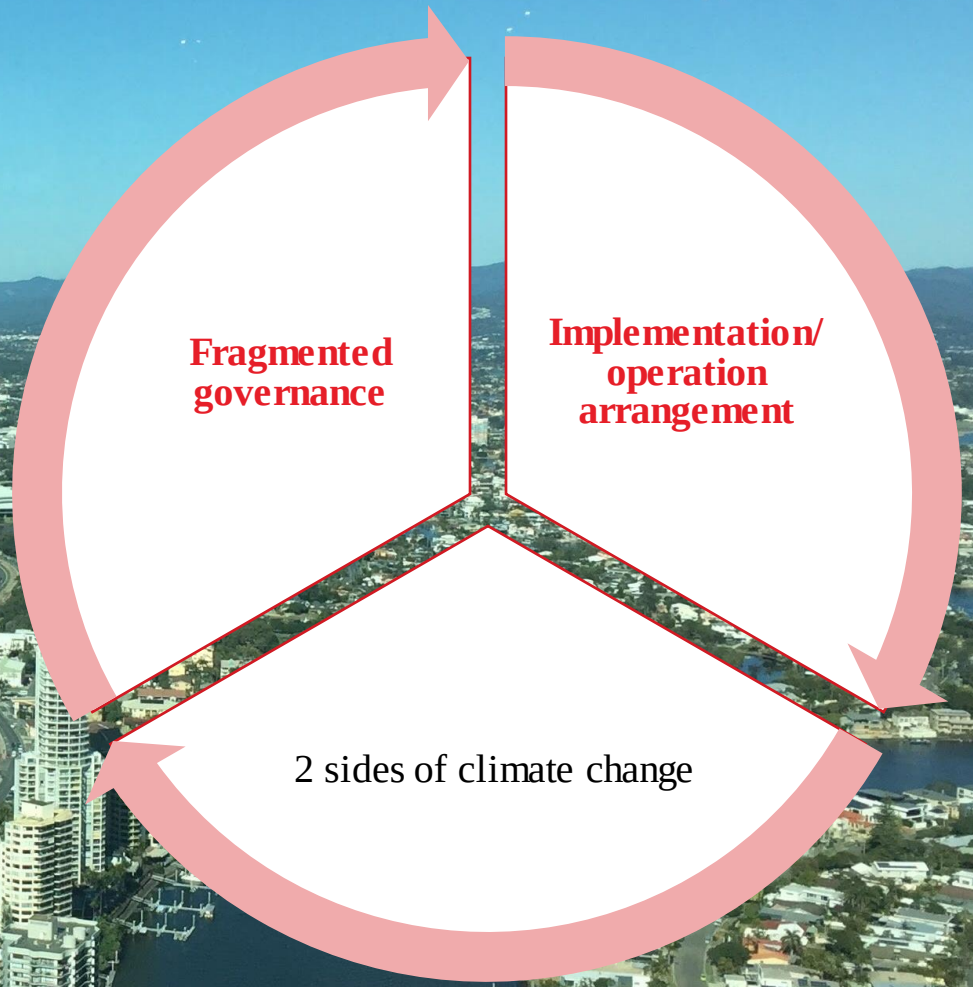


Photo by [illegible]

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**BUT**

Who will maintain my smart sensors and analyse data for continuous improvement?

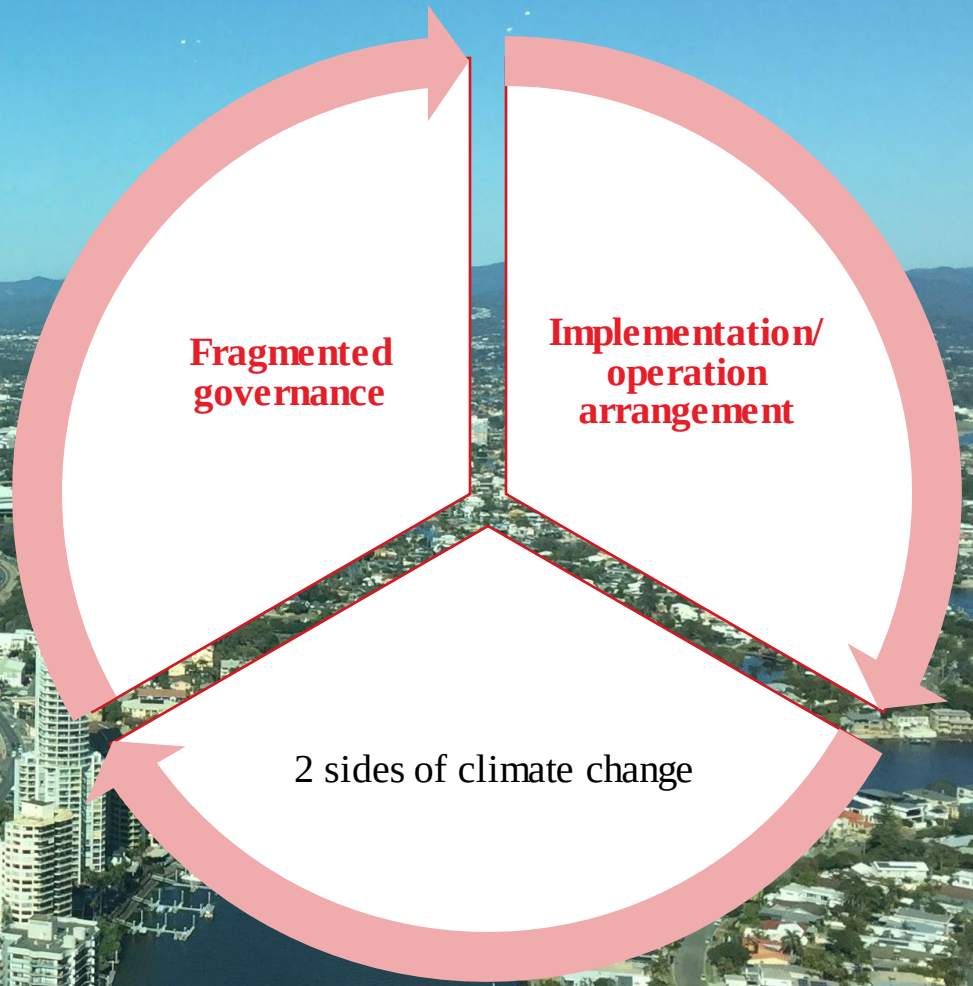


Photo by [illegible]

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**BUT**

Who will coordinate with private development to avoid over-build?

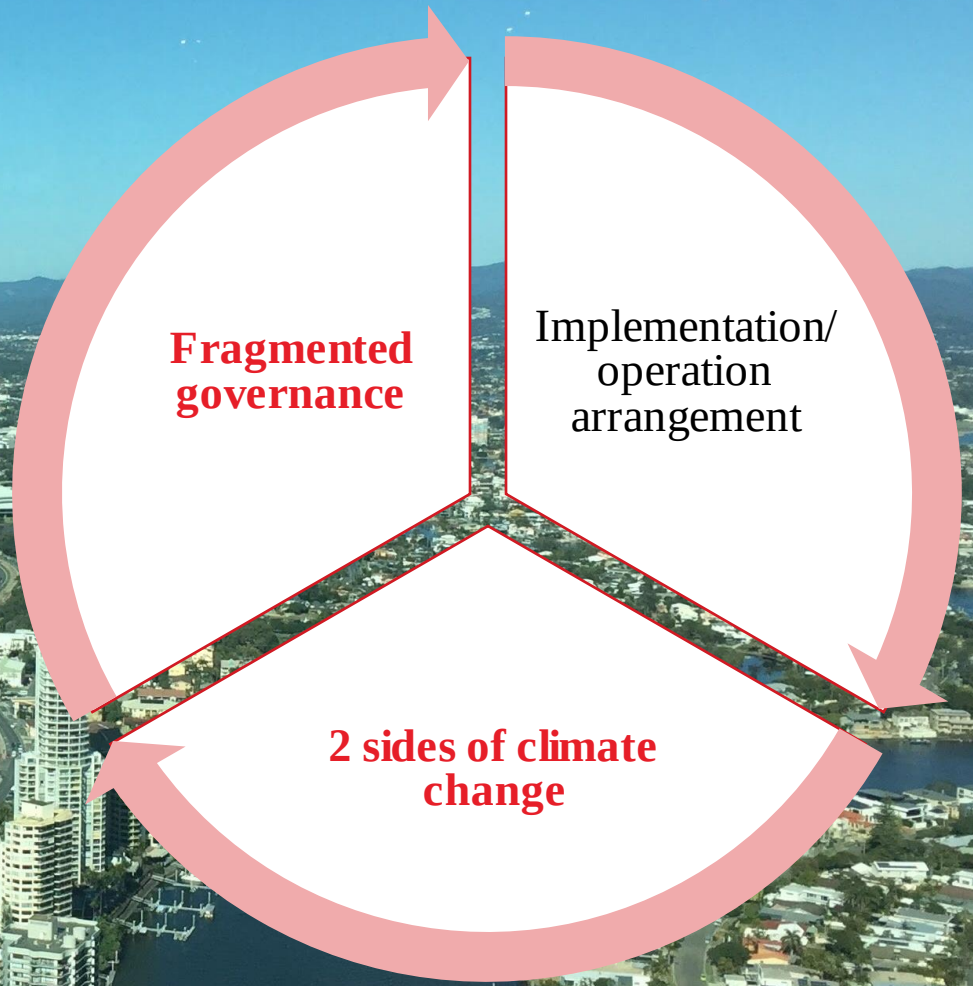


Photo by [illegible] on Unsplash

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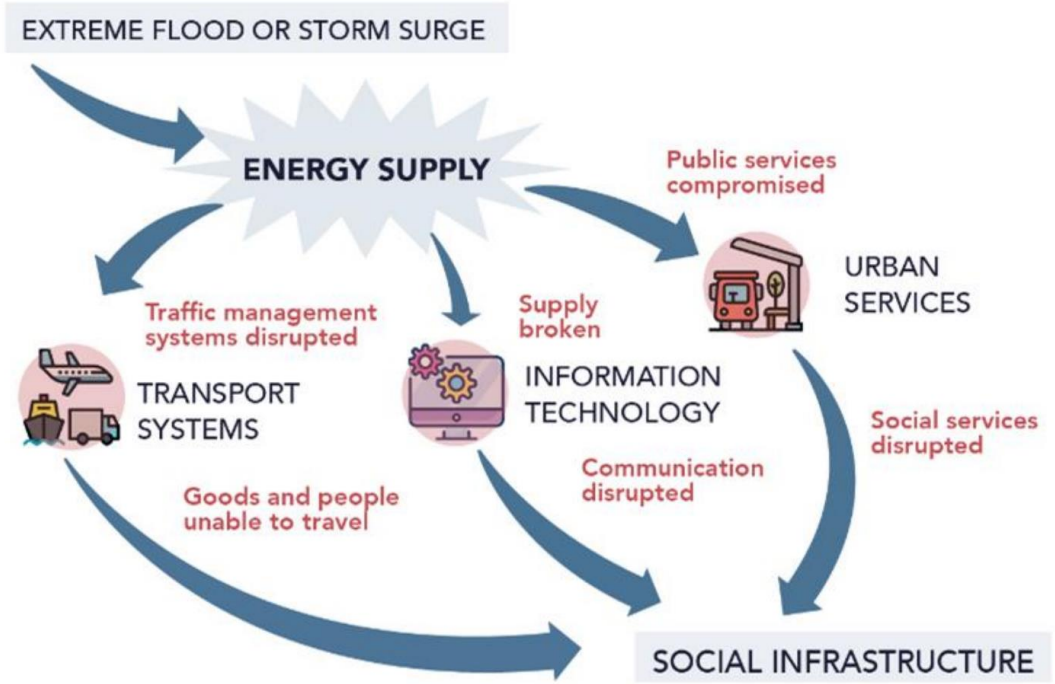
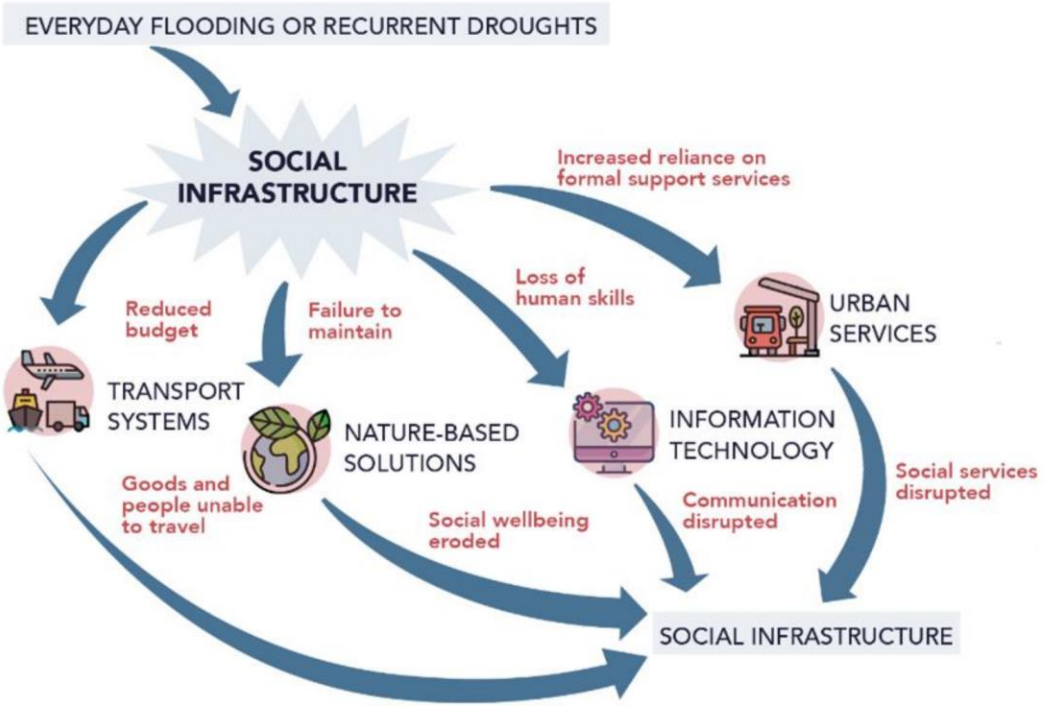
# Cascading and compounding impacts from climate change require mindset and practice shift



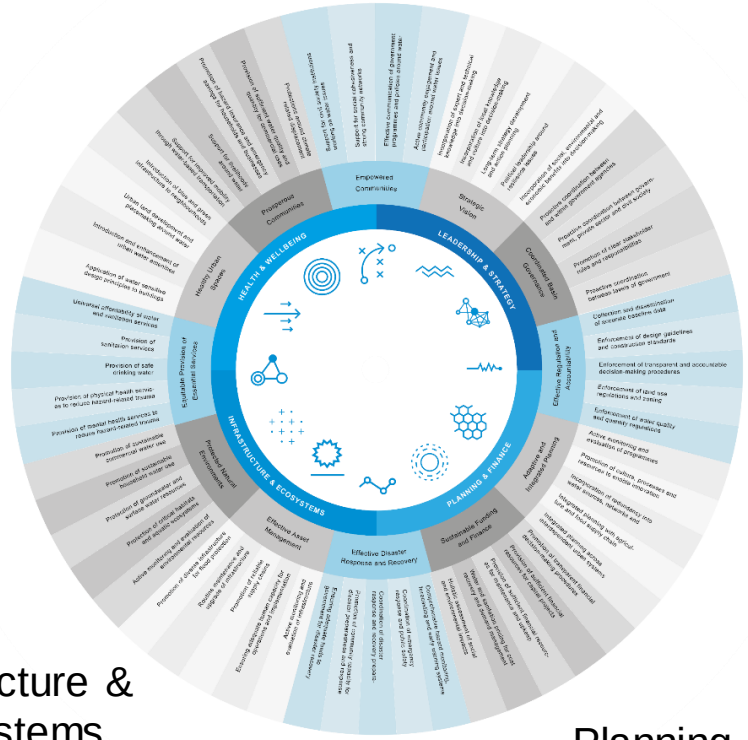

Adapted from IPCC AR6 WGII by Summary for Urban Policy Makers

# City water resilience framework & approach

**Improve water governance structures with clearly defined roles and responsibilities**

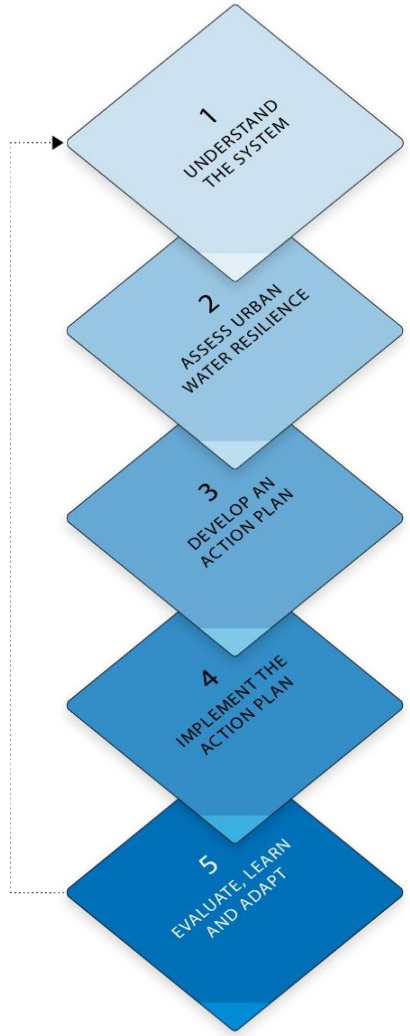
Health & Wellbeing

Leadership & Strategy




Infrastructure & Ecosystems

Planning & Finance



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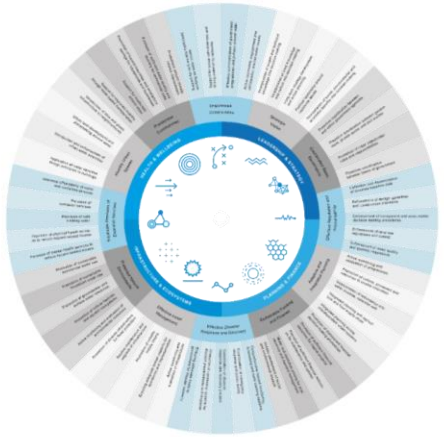
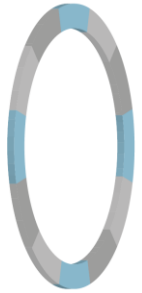
# City water resilience framework

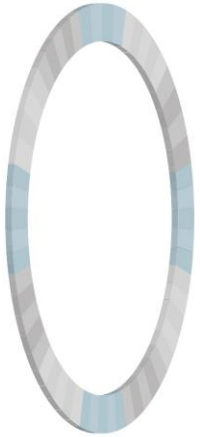
**Improve water governance structures with clearly defined roles and responsibilities**



**4** dimensions



**12** goals



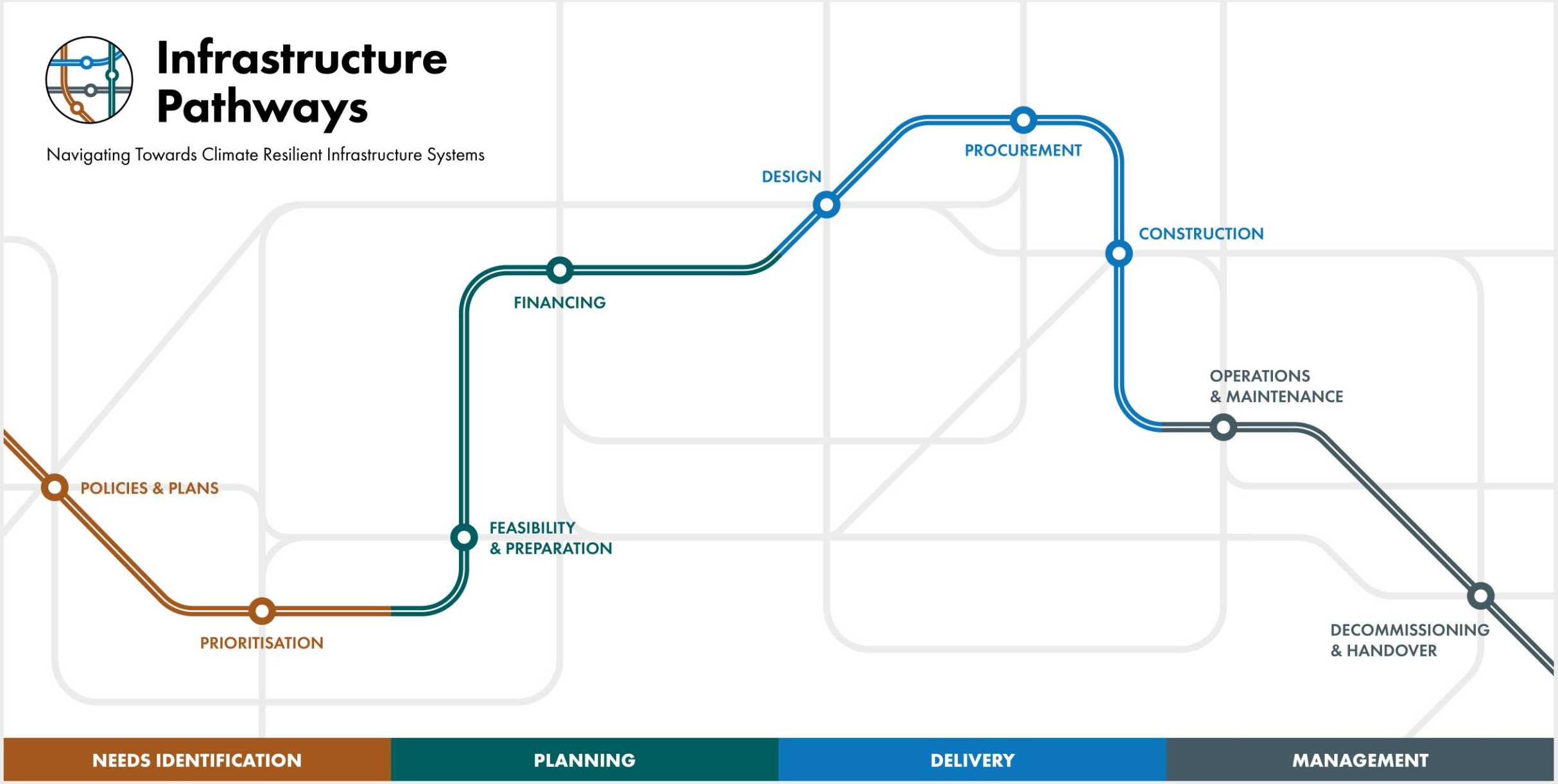
**53** Sub-goals

**4** dimensions

| **12** goals | **Leadership & Strategy** | **Planning & Finance** | **Infrastructure & Ecosystems** | **Health & Wellbeing** |
|---|---|---|---|---|
| | Empowered communities | Sustainable funding and finance | Effective disaster response and recovery | Equitable provision of essential services |
| | Strategic vision | Adaptive and integrated planning | Effective asset management | Healthy urban spaces |
| | Coordinated basin governance | Effective regulation and accountability | Protected natural environment | Prosperous communities |

# Infrastructure Pathways

Navigating Towards Climate Resilient Infrastructure Systems



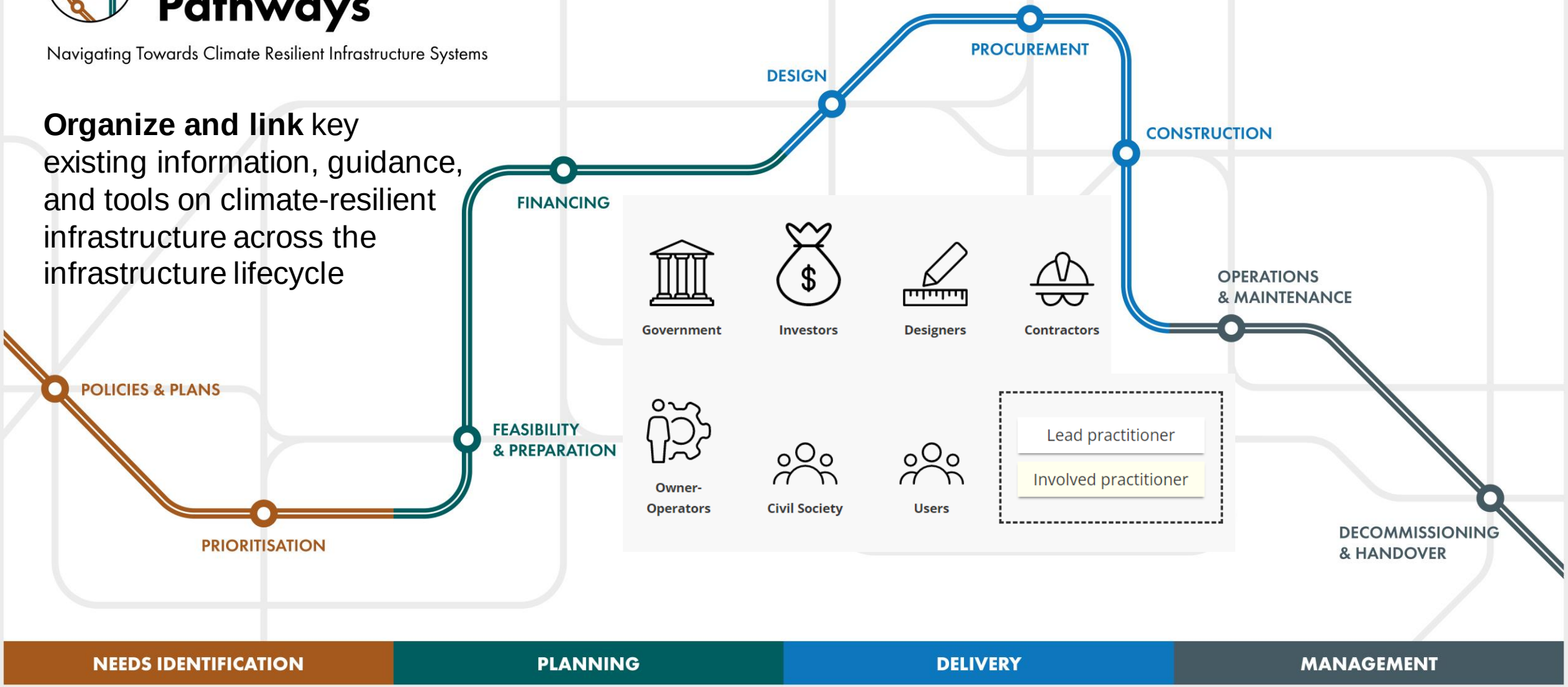

THE RESILIENCE SHIFT

in partnership with ICSI International Coalition for Sustainable Infrastructure ARUP

# Infrastructure Pathways

Navigating Towards Climate Resilient Infrastructure Systems

**Organize and link** key existing information, guidance, and tools on climate-resilient infrastructure across the infrastructure lifecycle



# Integrated guidance

Lifecycle Phase

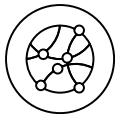
Themes

Each theme is linked to climate change **mitigation** and **equity** considerations.

Essential Actions

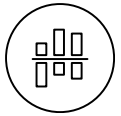
Guidance, Tools, Case Studies

Process tags:



Systems Thinking

Reflection and Iteration



Evidence-based Decision-making

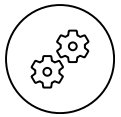
Future-oriented Planning

Inclusive Engagement

Outcomes tags:

Environmental Co-Benefits

Equity and Social Co-Benefits

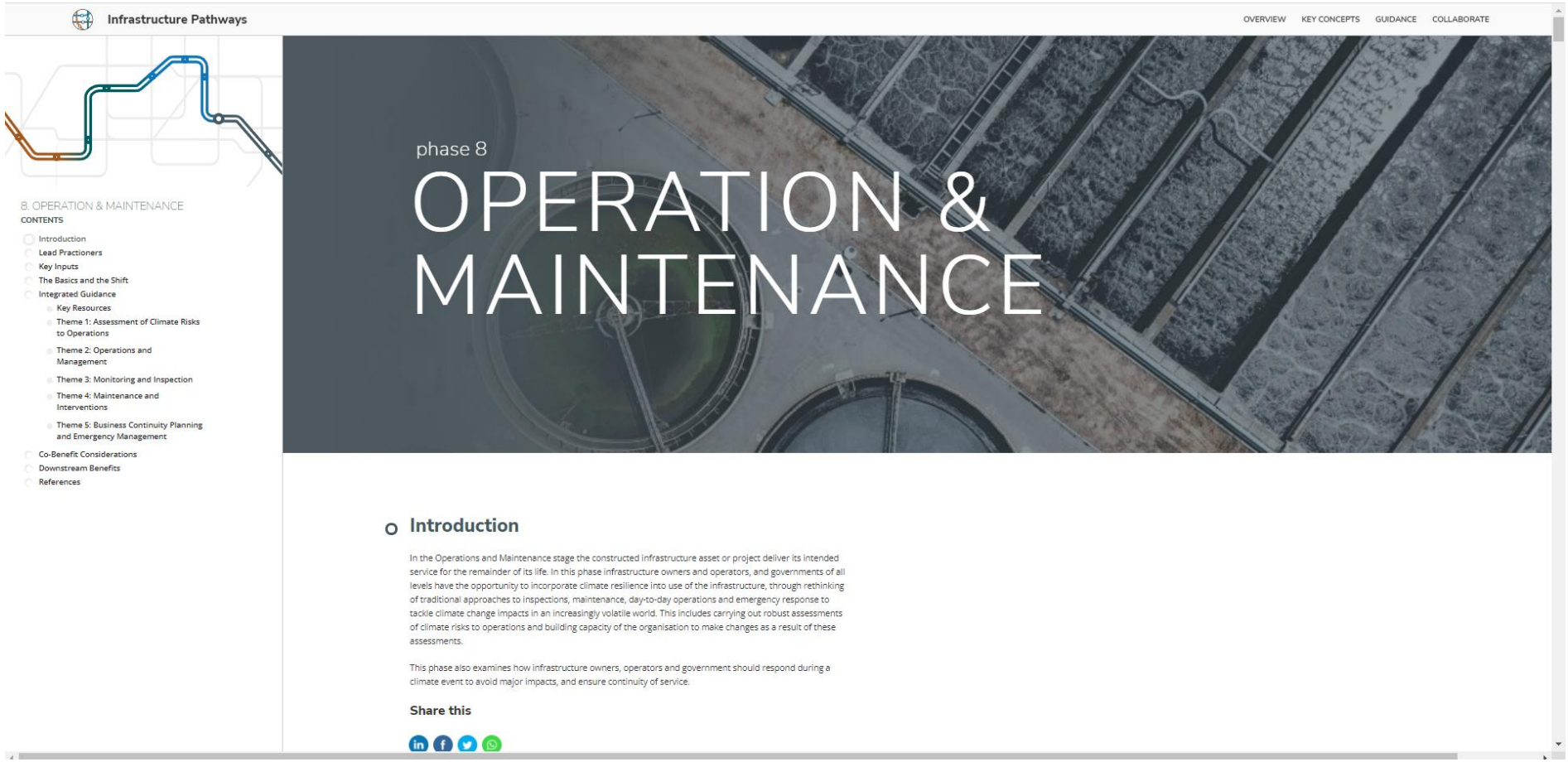


Service Continuity

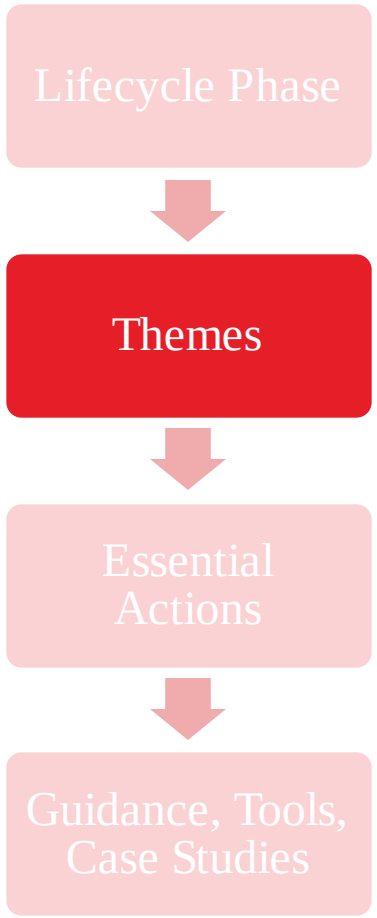
Capacity Building

# Example – O&M

- Lifecycle Phase
- Themes
- Essential Actions
- Guidance, Tools, Case Studies



# Example – O&M




8.1 Assessment of Climate Risks to Operations

8.2 Operations and Management

8.3 Monitoring and Inspection

8.4 Maintenance and Interventions

8.5 Business Continuity Planning and Emergency Management

# Example – O&M

Lifecycle Phase

Themes

Essential Actions

Guidance, Tools, Case Studies

ACTION 8.5.3

## *Adopt a multi-hazard, multi-sector approach to enhance emergency response and prevent cascading failures*

SYSTEMS THINKING

Infrastructure asset management in one sector should no longer be seen as operating in isolation from other infrastructure but rather be considered as evolving within 'a system of systems'[77]. The failure of one asset could lead to serious disruptions in others through cascading impacts.

Systems Thinking

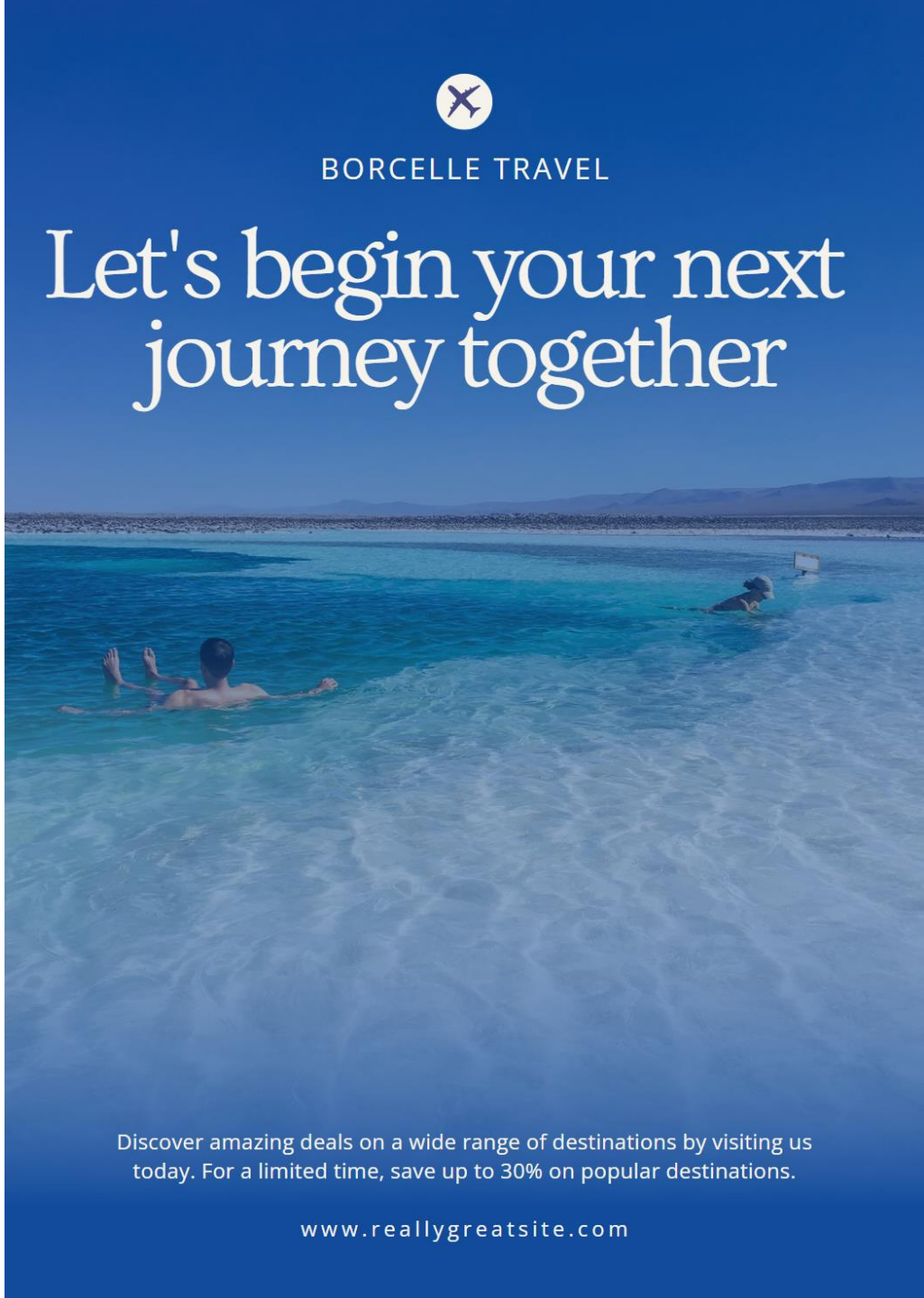
As part of this process, operators should consider the following procedures:

- Coordination with national and local disaster risk reduction strategies. Including regular **stress testing** of the strategies to ensure that all infrastructure is operating as expected and update the standards and strategies, when necessary.
- Developing improved understanding of inter-dependencies and connections between infrastructure systems. UNDRR suggests that the infrastructure operators could generate indicators to promote a systemic approach when assessing the complexity and interdependencies of the overall infrastructure dynamics.
- Improve coordination at different levels and among all relevant parties. Ideally this would be facilitated by a specific government agency from the local to national level.
- Data sharing is again a vital element of this process.

# Again…

Let’s see what ChatGPT suggests -

*Find me a good image for a strong ending to reinforce the point about resilience being a journey for continous learning*



# Thank you!

**Shanshan Wang**, Singapore Water Business Lead | Arup
(Email: shan-shan.wang@arup.com)

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*About Infrastructure Pathway:*