

Module 3: Formulate Robust or Flexible Actions

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JOINTISZA PROJECT

Strengthening cooperation between river basin management planning and flood risk prevention to enhance the status of waters of the Tisza River Basin

WP6 Activity 6.4 Pilot on climate change induced specific water quantity issues

Shared Vision Planning Pilot Methodology and Stakeholders workshop

26-27 October 2017, Szolnok, Hungary



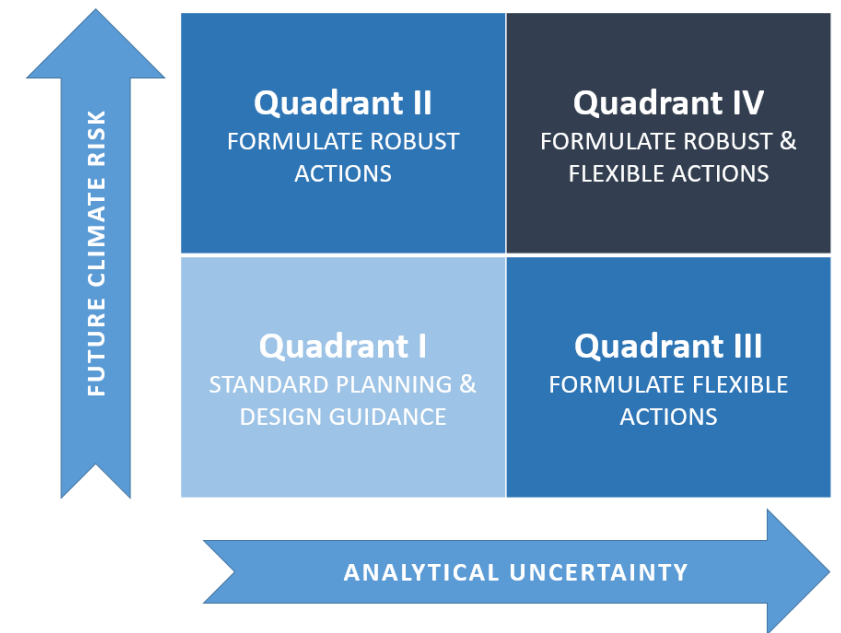
Robust or Flexible?

Risky situations demand **robust** solutions

- We are confident climate change is going to impact our system.
- As a result, we want to build for a more extreme climate than observed.
- Question remains: Which climate? How big do we build?

Uncertain future conditions demand **flexibility**

- We are unsure if the future will be wetter or drier.
- We don't want to risk over-investing now.
- Flexible measures or plans buys us time.



Flexibility and Robustness

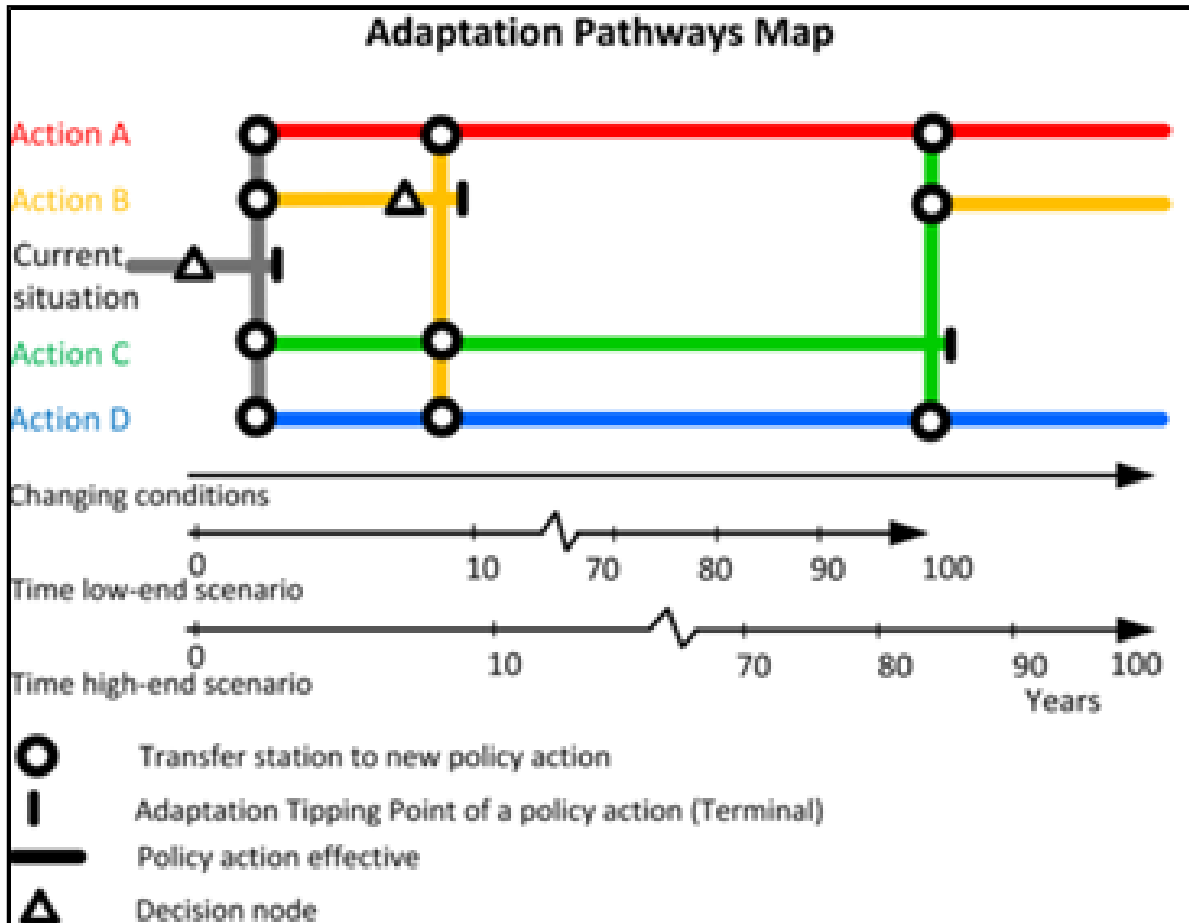
- **Flexibility**: Continued ability to adapt to uncertain future conditions
 - Breadth of the available options
 - Range of potential future conditions that can managed
- **Robustness**: Ability of respond successfully to range of conditions
 - Slack (e.g. excess capacity or performance)
 - Redundancy

Simple Examples of Flexibility and Robustness

A water treatment plant fails to make its targeted deliveries due to frequent power outages. The following plans exist to improve its performance...

	Robust?	Flexible?
• Add treated water storage reservoir	No	No
• Dedicated circuit	Yes	No
• On-site power generation capacity	Yes	Yes

Adaptation Pathways to illustrate flexibility



Developed in the Netherlands

- With limited information, decision makers risk over- or under-designing solutions
- Adaptation pathways illustrate flexible strategies to the decision maker
- Goal: choose initial step that has many transfer points in the future provides a low regret option as the science progresses

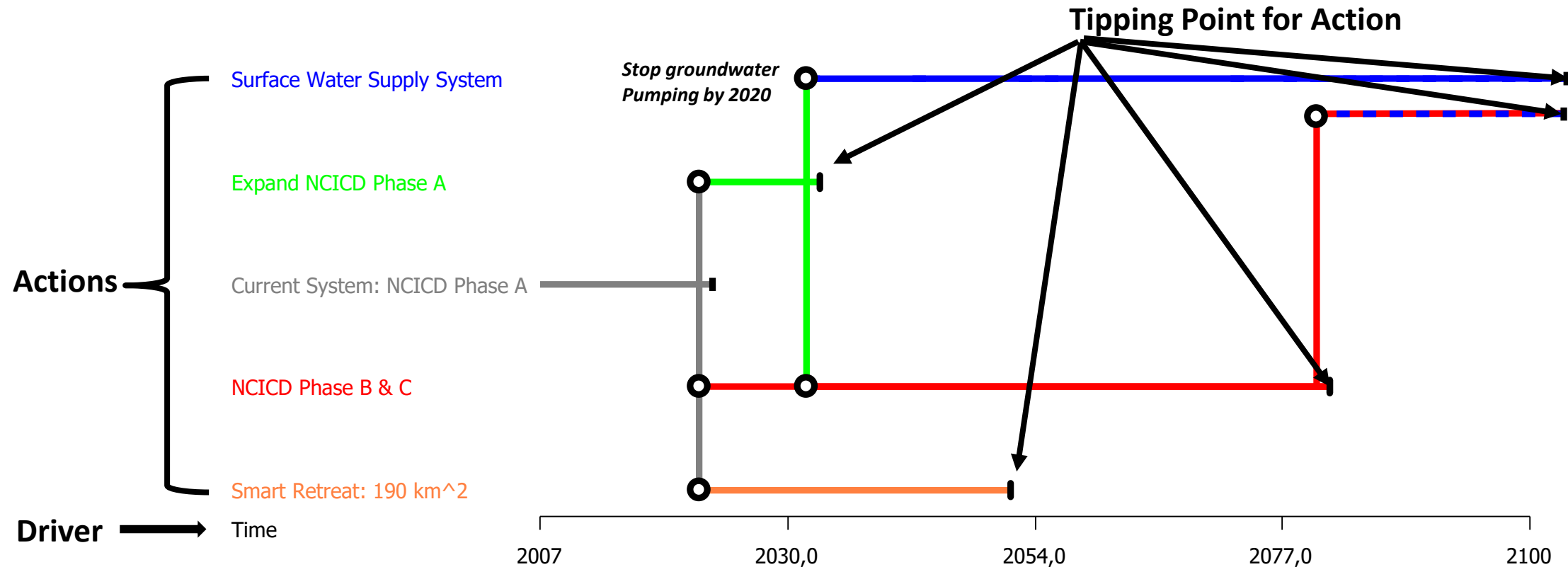
A Few Notes on Flexibility and Robustness

- Flexible plans take advantage of “Real Options”
 - the value of obtaining new information before taking action
 - the value of delaying costs and avoiding reversing actions
- Flexible plans also require more institutional capacity
 - multiple decision points
 - monitoring costs (can trigger points realistically be observed?)
 - reliable consistent course of action (can reliably act fast enough?)
- Robustness is simpler but is often more expensive and can be more rigid

Adaptation Pathways Development

MODULE 3: EXERCISE

Adaptation Pathways Example: Jakarta Coastal Flood Risk Management



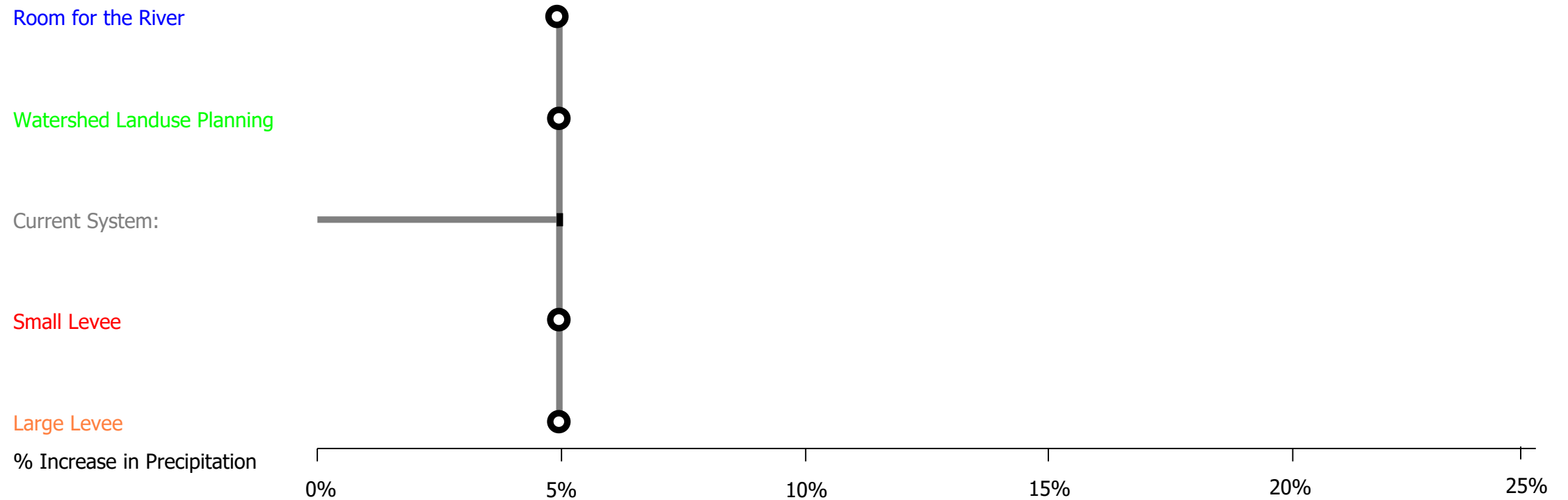
Map generated with Pathways Generator, @2015, Deltares, Carthago Consultancy

Exercise

- Develop flood risk management adaptation pathways for a river basin using the below actions and defined tipping points.
- Note that some actions can be combined, as was shown by the blue and red pathway in the Jakarta example to extend the tipping points.

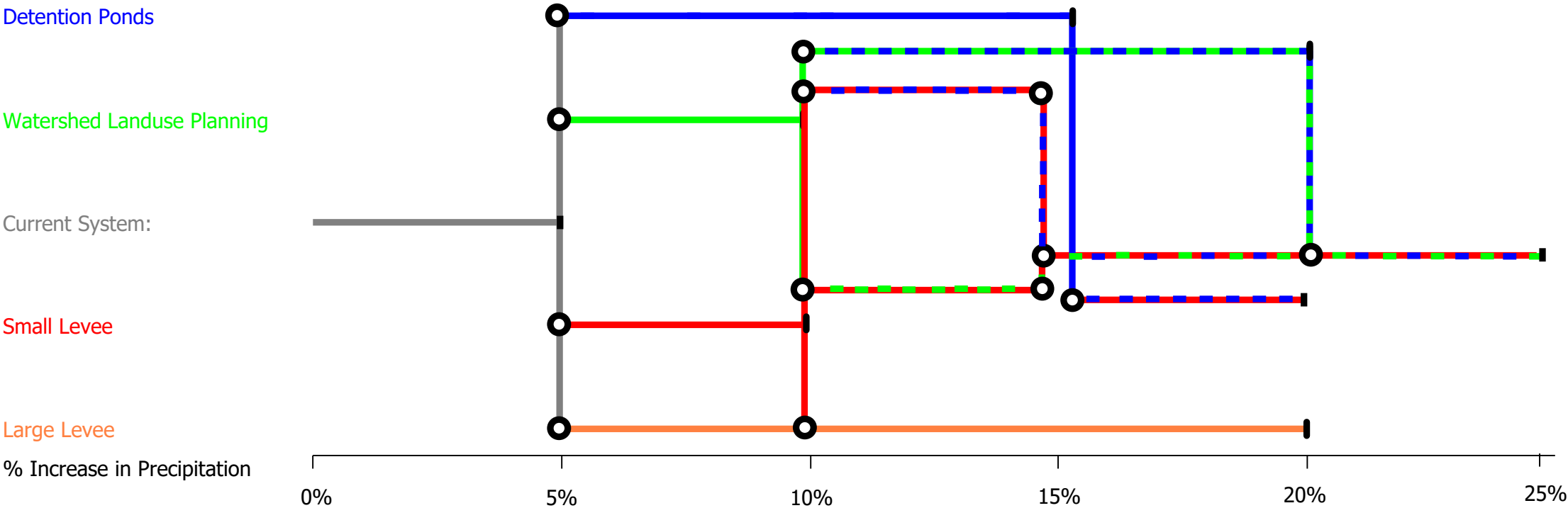
Action and Combined Actions	Tipping Point (% increase in precipitation)
Current System	5
Small Levee	10
Large Levee	20
Detention ponds	15
Watershed landuse planning (i.e., reduce runoff)	10
Detention Pond + Small Levee	20
Watershed landuse planning + Small Levee	20
Watershed landuse planning + Detention Pond	20
Watershed landuse planning + Detention Pond + Small Levee	25

Adaptation Pathways



Map generated with Pathways Generator, @2015, Deltares, Carthago Consultancy

Adaptation Pathways



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