Mykolaiv Water Hub

Water Leaders Course

National University of Water and Environmental Engineering

Newcastle University

University of Maryland

FUNDED BY

European Bank
for Reconstruction and Development

Module 7: Management

Video 2: Resilience in Crisis

Every decision in water management has consequences for the people who depend on safe water, the infrastructure you are responsible for, and the long-term recovery of your city and country. In a reconstruction context, these responsibilities are even greater. This video explores how to make effective decisions under pressure and build an organisation capable of responding to uncertainty, complexity and rapid change.

- Understand the external pressures shaping modern water management.
- Explore resilience across four practical dimensions.
- Use scenario modelling and analytical tools
- Understand the importance of monitoring and organisational culture.
- Develop the capacity to make better management decisions

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Decision Making

Decision-making in utility management is increasingly complex. Water managers must respond to multiple pressures at the same time. This includes:

- Climate change
- Extreme weather
- Donor and financing
- EU regulations
- Demographic changes
- Ongoing security threats

In Ukraine, these challenges often exceed the resources available to address them, making effective prioritisation essential.

- **Robustness**: Systems should be designed to withstand disruption and continue functioning under pressure rather than failing at the first point of stress.
- **Redundancy and networking**: Multiple interconnected sources and systems should ensure that the failure of one component does not disrupt the entire water supply.
- **Recovery**: Plans should ensure that essential water and sanitation services can be restored as quickly as possible following a disaster, attack, or infrastructure failure.
- **Adaptive capacity**: Organisations must have the technical, institutional, and human capacity to learn, adjust, and improve as conditions change.

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Decision Making

These four dimensions are not abstract principles.

They are practical planning commitments that should inform every capital investment, every operational decision, and every staffing allocation you make as you lead reconstruction.

The management culture we discussed previously will determine whether your organisation has the capacity to take these seriously.

Resilience planning is not a separate exercise; it must be embedded in everything.



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Decision Making

Sound processes, trained staff, and reliable data are all essential foundations but not enough.

The most consequential decisions will require critical thinking, professional judgement and ability to move forward with incomplete evidence.

Many decisions will be judgement calls. The quality of those judgements depends on having the right people, the right data and the right analytical tools in the room

Examples of questions without clean answers:

How much risk of failure is acceptable for ageing infrastructure?

How much should be invested now in climate adaptation and sustainability?

What level of tariffs and charges can customers bear given the external pressures?

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Decision Making Tools

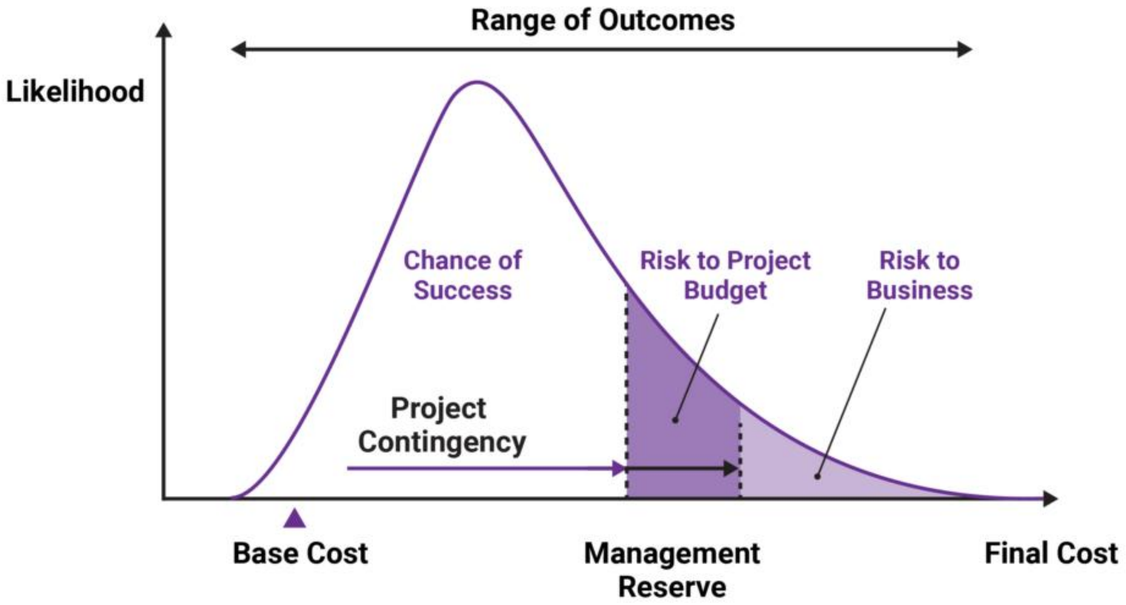
One of the most valuable tools for making decisions that involve large capital investments or high-consequence risks is the **Monte Carlo simulation,** which runs possible scenarios and presents a distribution of likely outcomes, rather than a single estimate. This is useful for:

Estimating the range of costs and timelines for infrastructure rehabilitation under conflict, funding, and supply chains

Modelling the probability of water supply failure under different combinations of drought severity and damaged network capacity

Assessing financial risk when committing to large capital projects with uncertain donor funding streams

Planning resource allocation when multiple systems are degraded simultaneously, and trade-offs between them



(Project Management Academy)

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Additional Note: Monitoring as a strategic priority

Analytical tools are only as good as the data that feeds them.

For reconstruction, this means building robust monitoring systems must be treated as a primary development goal, not an afterthought.

Without reliable monitoring, you lose visibility of what is failing, where, and why.

You cannot prioritise what you cannot see.

Monitoring systems provide early warnings, but only if the staff are well equipped to read them,

Investment in monitoring infrastructure must therefore be matched by investment in the people who operate it.



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Building organisational foundations

The speed and quality of decision-making under pressure depend on organisational culture and structure. Three basic principles must be embedded in the workforce from the outset:

Clear, timely, and honest information sharing across teams and levels of the organisation. In a crisis, poor communication wastes time that does not exist.

Communication



Every person must understand their role, their mandate, and how their work connects to the wider mission. Ambiguity in a crisis leads to paralysis.

Team structures and purpose



A workforce that trusts one another, raises problems openly, and supports collective problem-solving is fundamental when facing unplanned conditions

Positive team dynamics



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Building organisational foundations

Asset management: Effective investment and maintenance decisions by understanding the asset network.

Asset knowledge: Water networks contain thousands of components, including pipes, pumps, treatment plants, reservoirs, valves, and meters, each with different lifespans, failure risks, and levels of criticality

Evidence-based decisions: A clear understanding of the asset base prevents investment decisions from being made without reliable information

Condition-based maintenance: Maintaining assets according to their actual condition can extend infrastructure lifespan and reduce unexpected failures.



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Building organisational foundations

Risk-based prioritisation: Limited resources should be directed towards assets based on the likelihood of failure and the consequences that failure would create.

Critical infrastructure: Assets with the greatest potential impact on public health, safety, and service continuity should receive the highest priority.

Investment and accountability: A prioritised risk register provides clear, evidence-based justification for reconstruction decisions and investment needs.



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Summary

Together, asset management and risk-based management form the **analytical backbone** of good utility decision-making.

They do not replace judgement, but they ensure that **judgement is informed, consistent, and justifiable**.

Building on the planning foundations established in **Video 1**, you should now understand how strategy turns into action and be able to examine how water managers make sound decisions under pressure and uncertainty.

By mapping the external drivers complicating utility management, you should **understand the need** for decision-making tools for **asset management** and **risk-based prioritisation**, as well as **probabilistic modelling**.

This information should provide the tools to work towards establishing a culture within the water sector that ensures reconstruction is sustainable and affordable.

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2026