Adapting infrastructure assets in practice - Facing up to future challenges

Presented by Paul Sayers, Sayers and Partners
on behalf of the FAIR consortium partners
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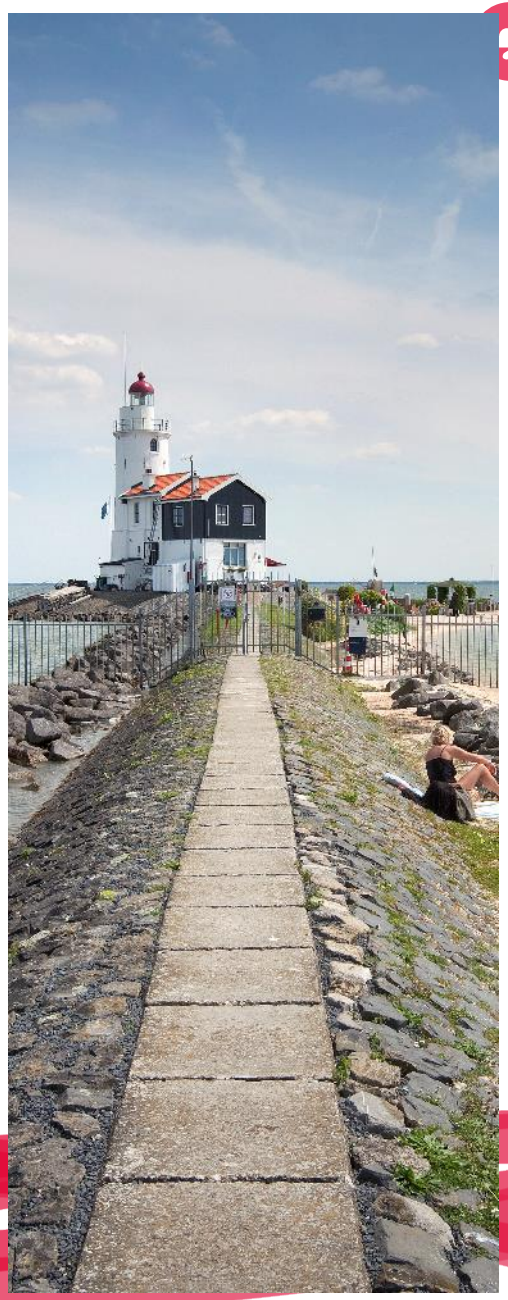
Flood and Coast, 2019 Telford, UK

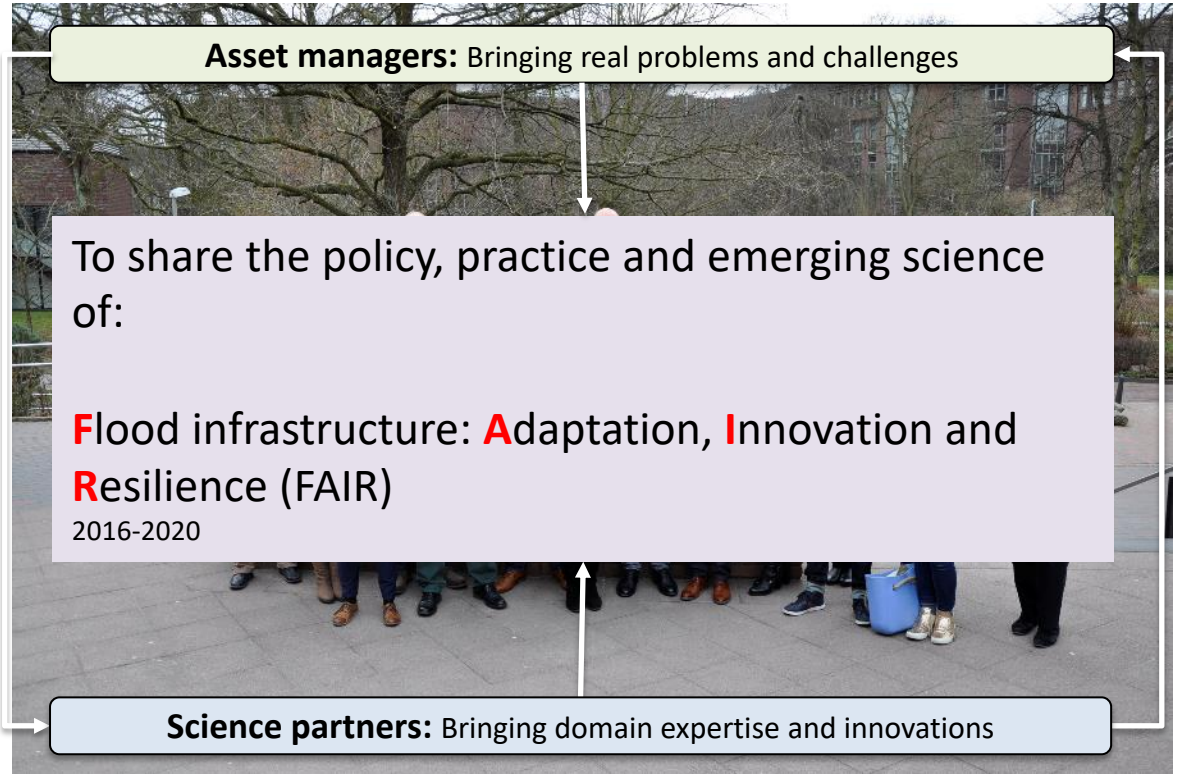
Context

Collectively EU Member States invest an average of **€3 billion per year** on flood protection infrastructure

Given future change, asset managers across Europe are now **questioning the appropriateness of existing approaches**.



So how does FAIR help?



Asset managers: Bringing real problems and challenges

To share the policy, practice and emerging science of:

Flood infrastructure: **A**daptation, **I**nnovation and **R**esilience (FAIR)

2016-2020

Science partners: Bringing domain expertise and innovations

Recommendation 1: Break free of the silo

Common challenge: Institutional context for asset management is often fragmented

+ Many complex and interacting planning processes and actors influence asset management (often with centralised processes delivered by dispersed, localised operators).

"We're holding you responsible..."

Recommendation 1: Break free of the silo

Response: Align multiple planning processes within and beyond flood management

+ A coherent strategy is needed to link flood management within broader planning objectives. Without this, flood management can be undermined by uncoordinated local development choices (from railways to homes).

Illustrative examples: **England:** Strategic oversight and lead local authorities; **Sweden:** A leading role for local authorities enabling integrated planning to be developed (Helsingborg)

Recommendation 2: Mind the gap

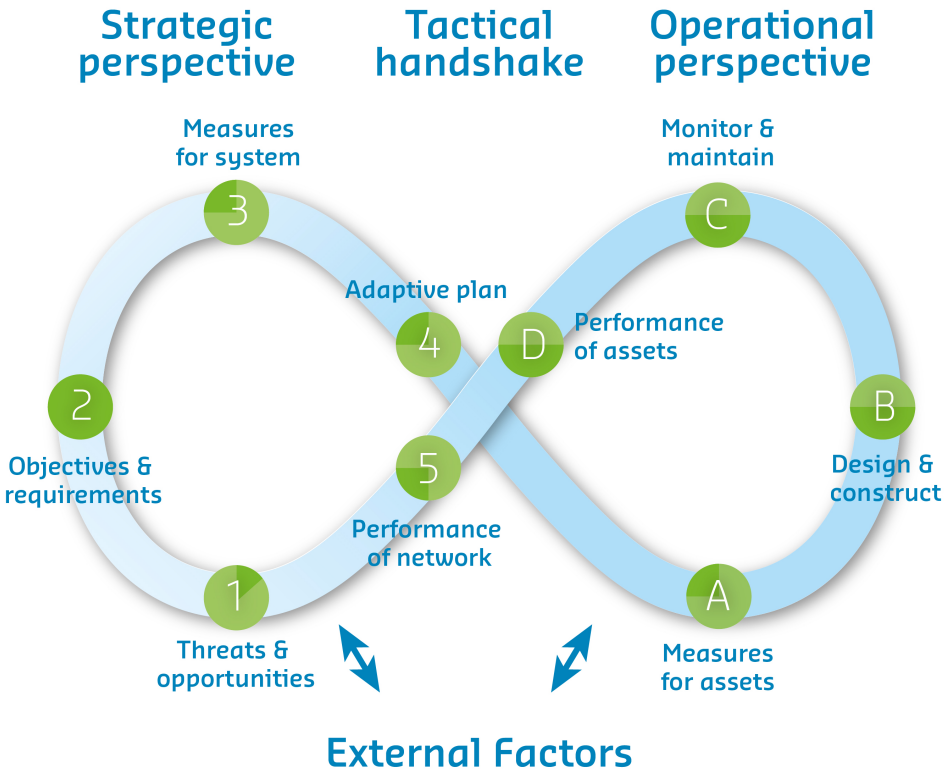
Common challenge: Strategic planning and operational processes are often misaligned

+ Responsibilities tend to be divided between strategic and operational activities. This mismatch can lead to poor targeting of investment and inappropriate design and maintenance choices.

Recommendation 2: Mind the gap

Response: Link strategic planning and operational processes through a tactical handshake

+ A ‘tactical handshake’ between strategy and operation is needed. ‘Progressive’ performance analysis; ‘total expenditure’ whole life approaches; valuing multiple outcomes all aid this
+ *Illustrative examples:* **Netherlands**, reducing life-cycle costs in the delivery of statutory protection standards; **Germany**, reliability standards and deterioration assessment support the management of ‘on demand’ assets



Consistent standards: Alternative views

The approach in England (in a nutshell)

National assessment: Based on an assessment of risk reduction v investment; this enables flood management to compete with other public funds on a rational basis. *Outcome:* a block grant

Locals strategies

Alternative strategies assessed using risk v investment and other criteria determine the preferred strategy.

The incremental BCR test ratios funds to provide a minimum standard for more, rather than a higher standard for a few.

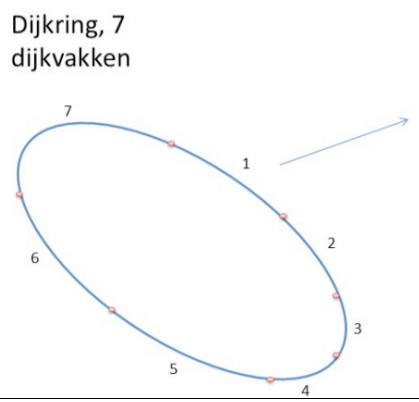
The preferred strategy competes for national funding based on a simplified priority score that:

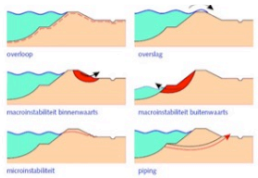
- Allows private funding contributions to increase the priority for national funds
- Preferentially weights protecting households in deprived areas etc

Outcome: A variable standard of protection reflecting benefits and costs (in a broad sense, at least in principle)

Consistent standards: Alternative views

The approach in Netherlands (in a nutshell)



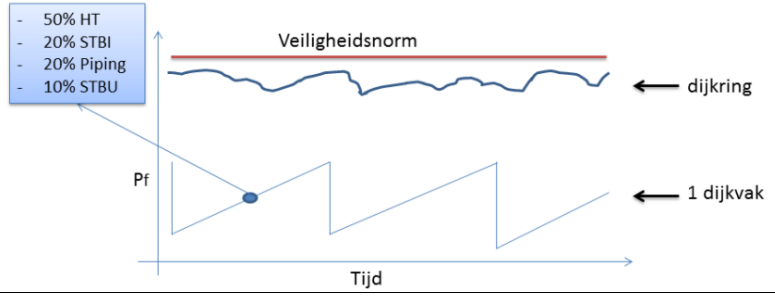


Variatie I:
faalkansbegroting voor verschillende faalmechanismen

Variatie II:
Faalkansverdeling tussen dijkvakken

Variabele III:
Programmering van versterking van verschillende traces in de tijd

Optimalisering → Voldoen aan de veiligheidsnorm & minimalisatie kosten



National assessment

Based on risk (BCR>1) and the principle of solidarity (acceptable chance of death/serious injury, 10^{-5})

Outcome: Top down definition of **Safety Standards** for each polder

National prioritization of actions

Based on funding constraints and matters of safety, risk reduction

Outcome: National **schedule of investments**

System level optimisation

Least whole life cost approach to delivering the standard

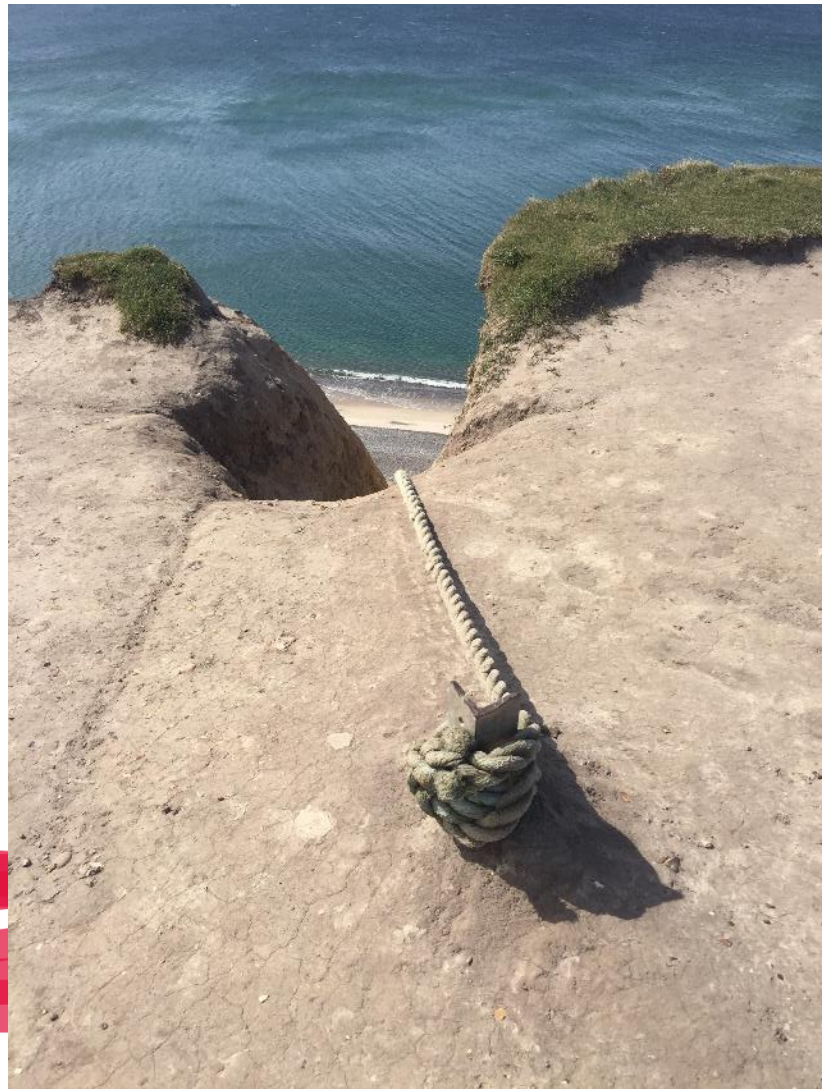
Opportunity for locally funded enhancements

Outcome: Local plan of action

Recommendation 3: Prepare for change

The challenge: The future is uncertain and decisions taken today have long-term implications

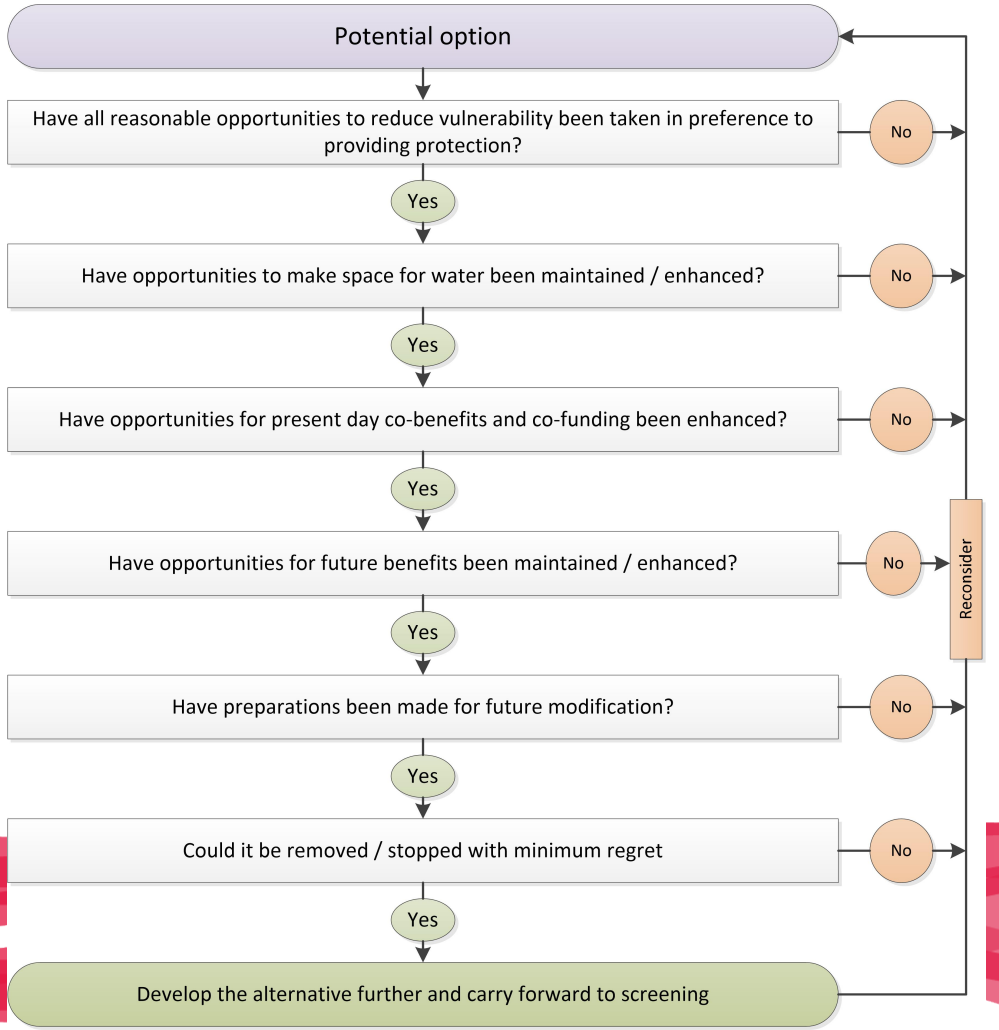
+ How much should be invested today in strengthening and raising assets? Should we delay investment? Should we abandon existing defences?



Recommendation 3: Prepare for change

Response: Develop strategies that are flexible and assets that can be modified

+ Developing the capacity for future flexibility is not simply ‘wait and see’, but a process of purposeful preparation.
+ *Illustrative examples:* The **Netherlands** and **England**, visualising and valuing adaptive pathways



Recommendation 4: Make space for innovation

The challenge: Innovation is not consistently embedded in standard practice

+ to be successful, a society must learn to manage risk and not simply seek to avoid it; but we struggle to promote and deliver more innovative solutions that challenge accepted norms.

Recommendation 4: Make space for innovation

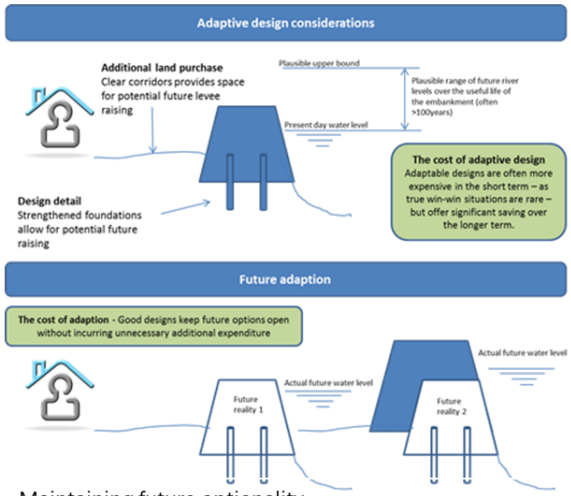
Response: Accept innovative solutions attract risk

+ to be successful, a society must learn to manage risk and not simply seek to avoid it; but we struggle to promote and deliver more innovative solutions that challenge accepted norms.

Multifunctional flood defences, Netherlands

Space of water and healthy ecosystems, UK

Improving understanding



Maintaining future optionality

Summary

+ FAIR brings together Asset Owners, engineers and researchers to share experience and insights into flood protection assets.
+ Comparisons have been made on planning, funding, inspection, design and maintenance approaches.
+ Four policy recommendations have resulted:
    1. **Break-free of the silo**: Align multiple planning processes within, and beyond, flood management;
    2. **Mind the gap:** Link strategic planning and operational processes through a tactical handshake;
    3. **Prepare for change**: Develop flexible strategies and asset designs that can be adapted to meet changing requirements in future;
    4. **Make space for innovation:** Embrace and manage risk to support the development of innovative solutions.

Acknowledgements and more detail

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Further reading

More detail, including factsheets relating to each illustrative example, can be found on the FAIR project website: **https://northsearegion.eu/fair/**

The Policy Brief can be found here:
http://www.sayersandpartners.co.uk/uploads/6/2/0/9/6209349/2019_fair_interreg_policy_brief_a4_web.pdf