

# Designing Reliable, Resilient and Sustainable Surface Water Management Strategies

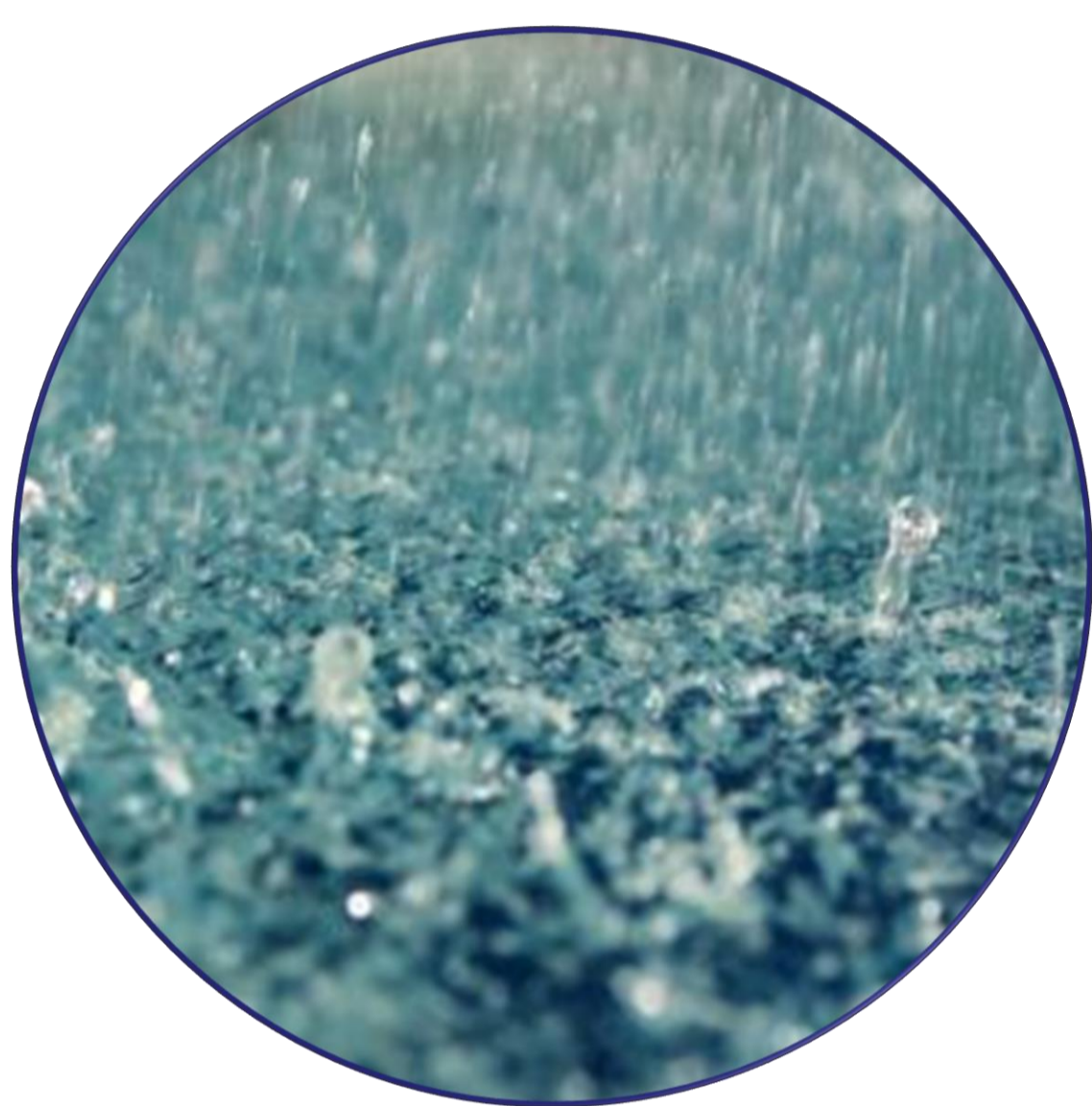
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## The Costs of Surface Water Flooding in the UK

In England flooding currently results in £1.1 Billion annual average damage and places 5.2 million homes (1 in 6 properties) at risk <sup>1</sup>.

It is estimated that 40% of annual flood losses are a result of surface water flooding<sup>2</sup>. Surface water runoff is a major controlling factor for fluvial and sewer flooding. Management of surface water is therefore of crucial importance to protect homes and infrastructure in the UK.

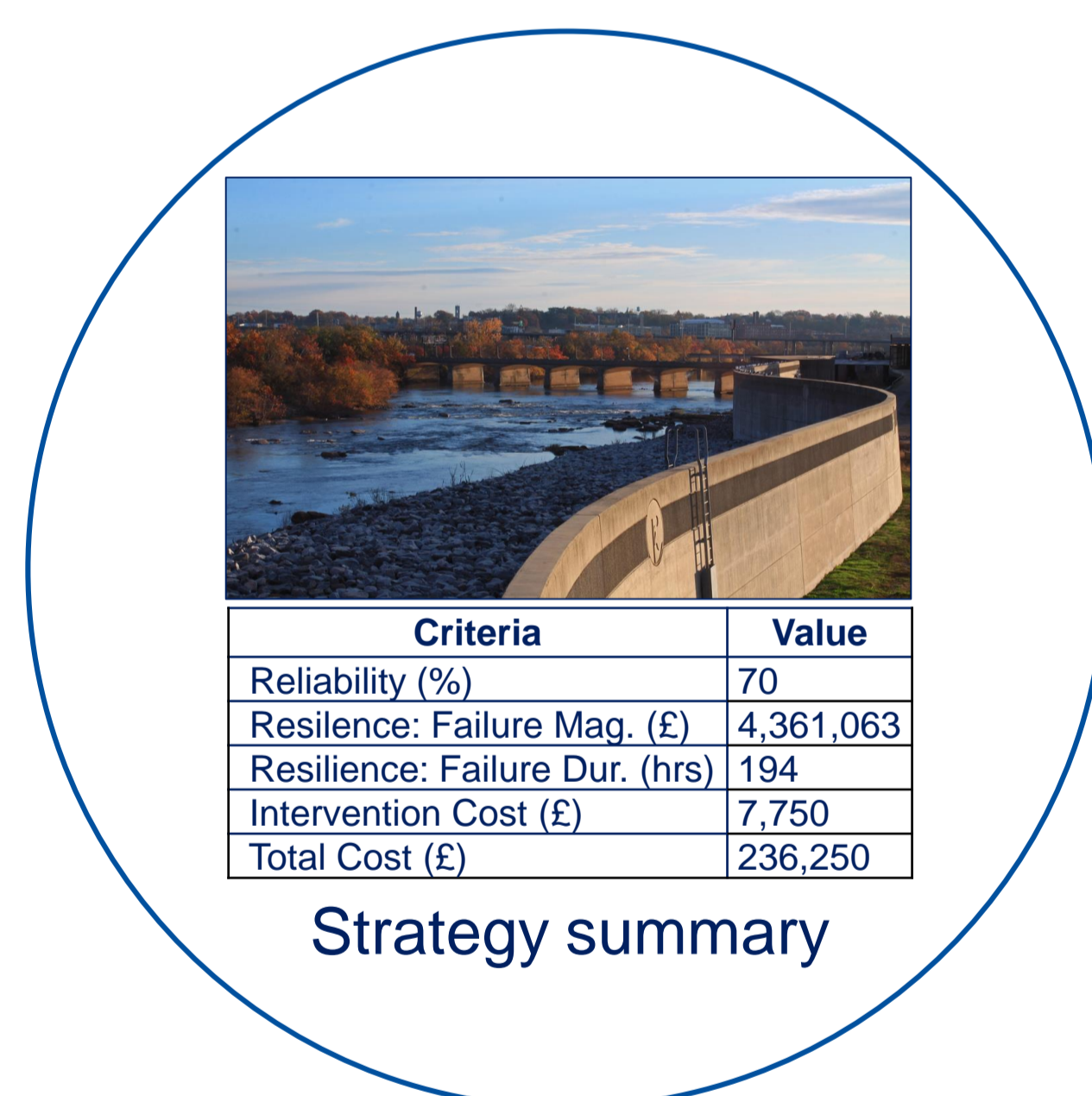
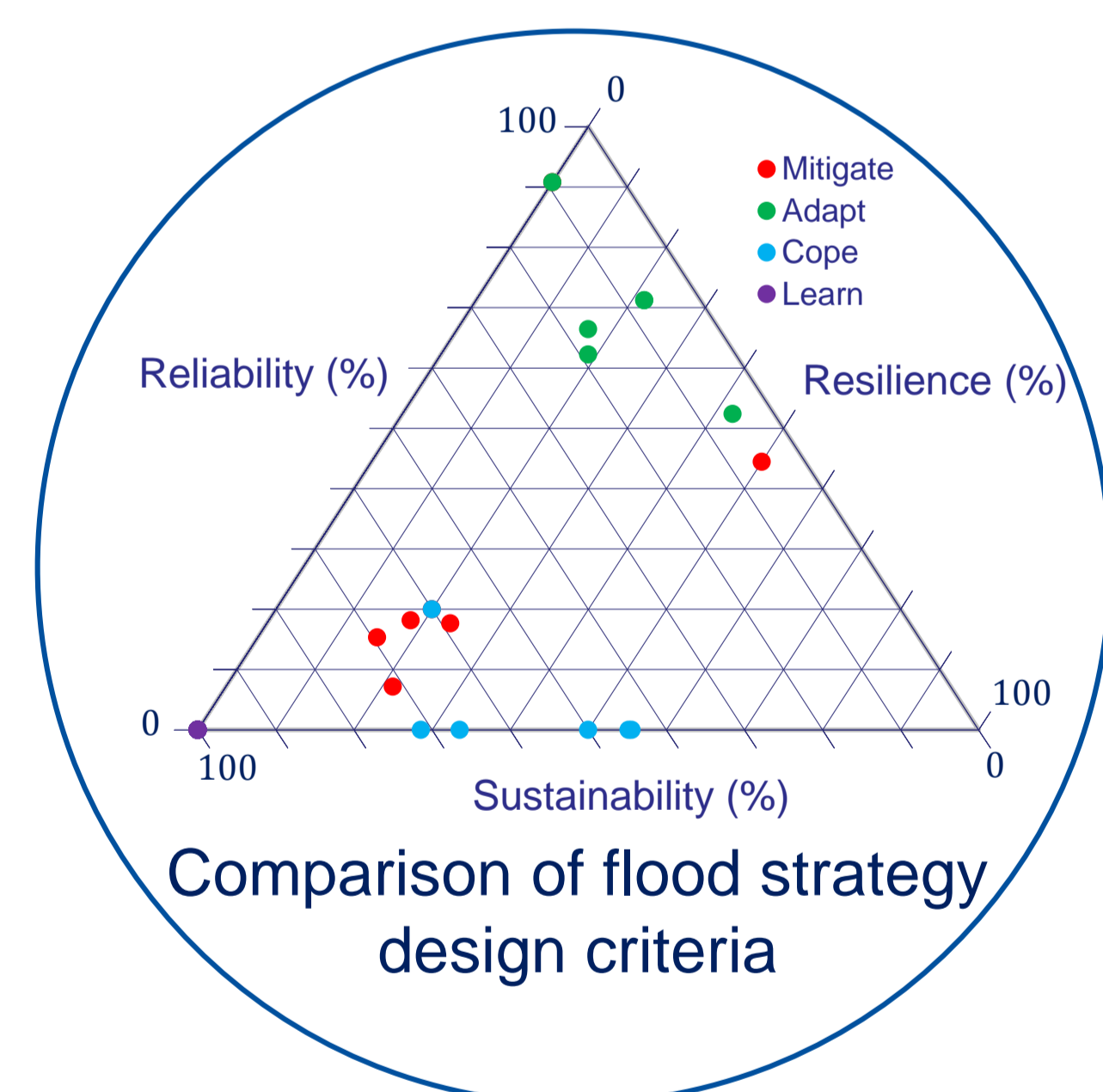
UK Legislation <sup>3,4</sup> emphasises the need to build resilience to flooding, however currently there is only limited understanding of how this can be achieved <sup>5</sup>. The majority of current approaches are dominated by qualitative frameworks unsuitable for practical application.

## New Approaches to Manage Future Flooding are Required

Flooding is a global issue, with future consequences predicted to worsen as a result of climate change, urbanisation, population growth, demographic change and a dependence on aging infrastructure <sup>6</sup>.

Traditional risk management strategies focus on the day to day reliability of defences in relation to managing the probability of failure in predictable 'design standard' events. This approach does not accommodate coping with failure by planning for 'extreme' low probability, high magnitude events<sup>7</sup>.

New resilient flood management approaches need to be developed. A paradigm shift from reducing probability to reducing consequences<sup>8</sup>.



## Research Outputs

### Flood Intervention Comparison Tool

- Suitable for **assessing options at the initial design stage** of flood management.
- Input basic information about a scheme to **evaluate the cost, reliability, resilience and net positive outcomes** from a large range of options.
- Provides evidence for decision makers and direction leading into the detailed design stage.

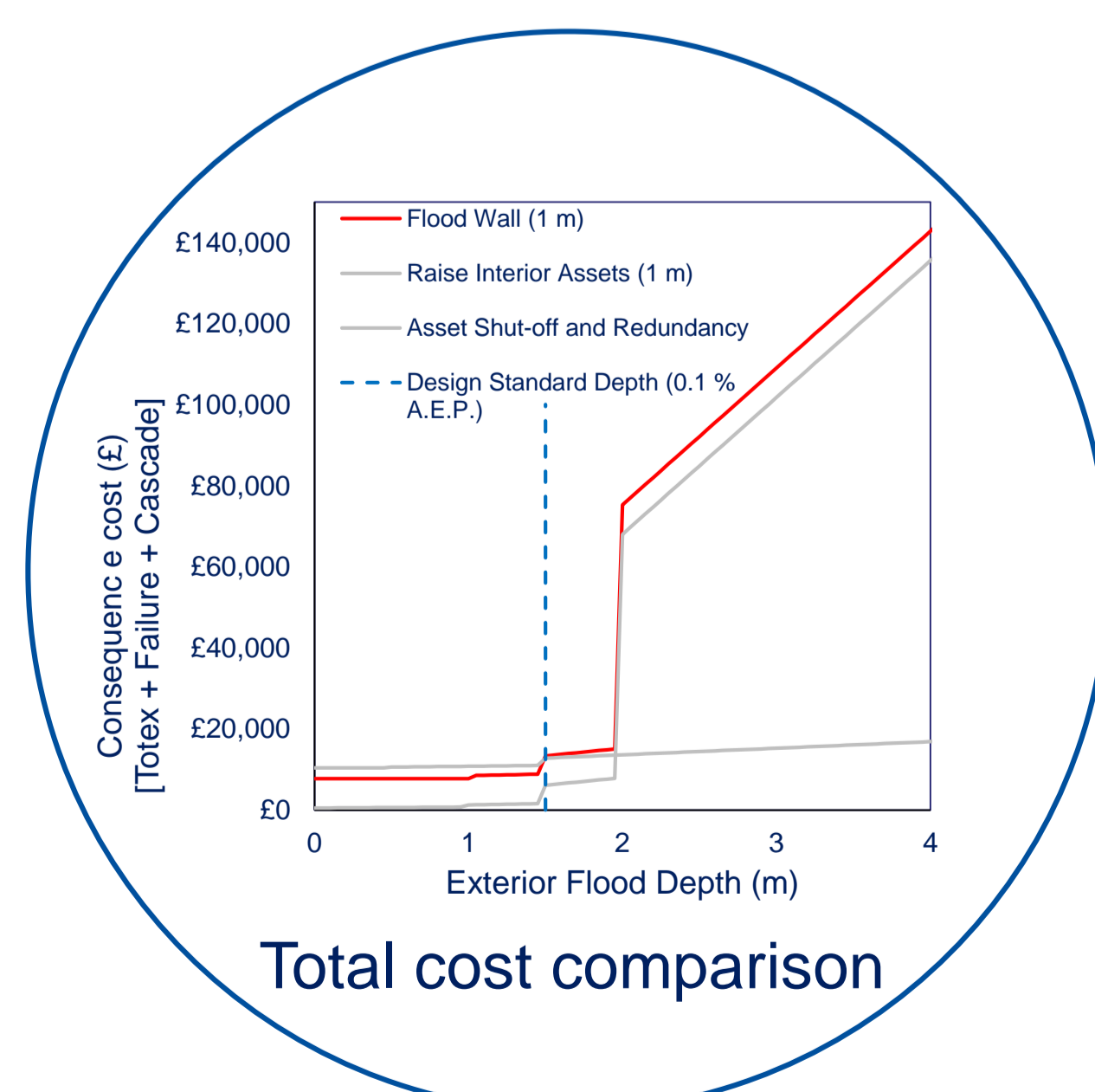
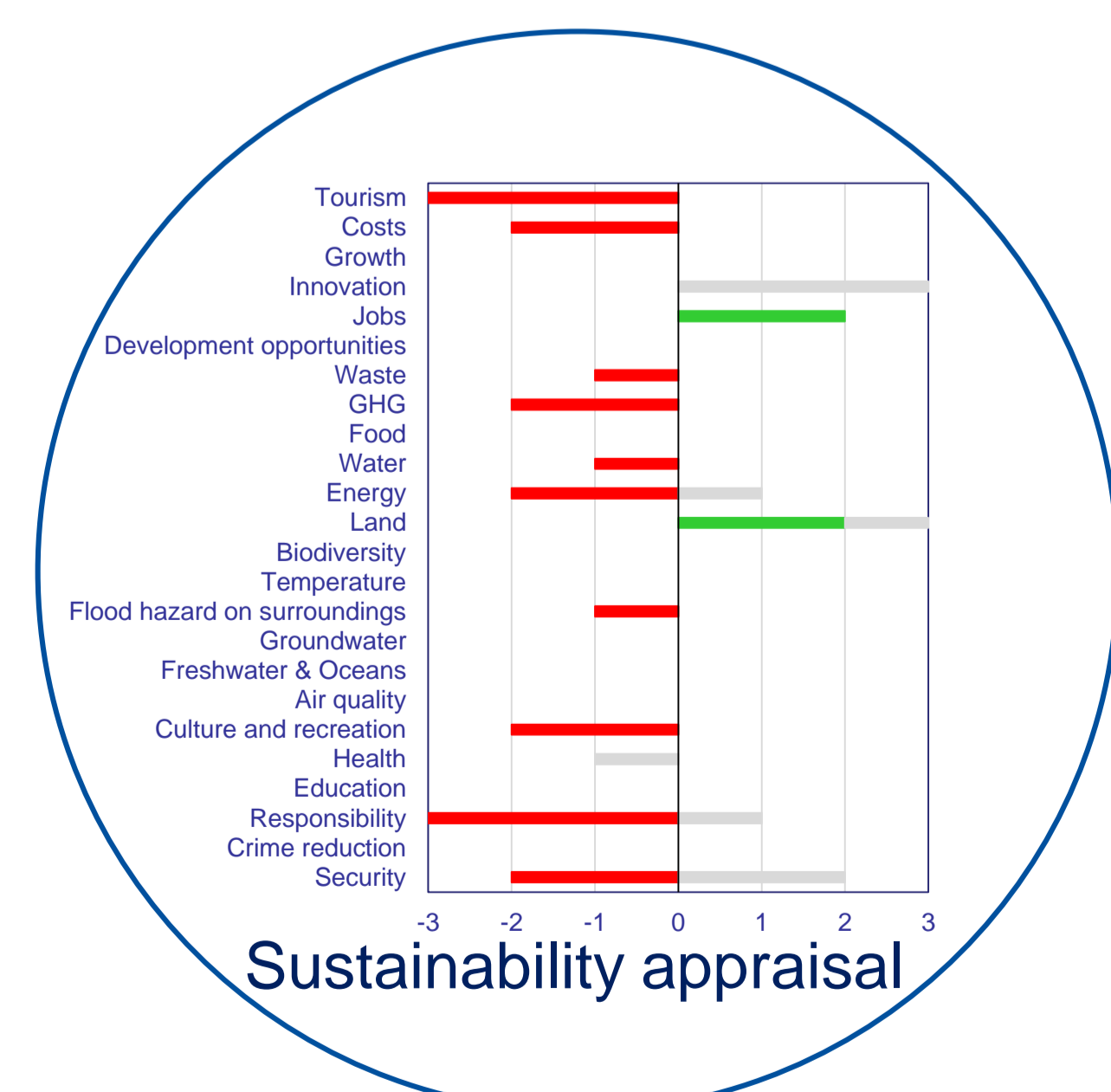
### Visualisation of Trade-Offs in Flood Management

- Identify trade-offs in **cost, reliability, resilience and sustainability**.
- Clear and easy to assimilate statistics and graphics for a rapid initial analysis and **signposting further option development**.

### Measuring Resilience of Interventions

- **Connecting industry standard risk based planning** (suitable for design standard risks) with the **benefits of a resilient approach** (managing extreme events).

**For opportunities to collaborate on Case Studies and Tool Development please contact James Webber ( [jw616@exeter.ac.uk](mailto:jw616@exeter.ac.uk) )**



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