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| **Task 3.1a Asset Management: Questionnaire Response England** |
| **WP3 Investment Planning and Asset Management** |
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| **Owen Tarrant, Paul Sayers and Jessie Fieth….** |
| **May 2016** |

# Report information

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**Report Title:** Task 3.1 Asset management tools and approaches within the North Sea Region

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**Contributing science partners:** Sayers and Partners, UK,

Contributing asset owners: list….

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# Summary

FAIR (Flood infrastructure: Asset management and Investment in Resilience, adaptation and maintenance), is funded by the EU INTERREG North Sea Region (NSR) Programme and led by the Rijkswaterstaat, FAIR focuses on providing improved, more resilient, more multi-functional and adaptive approaches to providing flood infrastructure. Asset owners and academic colleagues from the Netherlands, Sweden, Germany, Belgium, UK and Denmark will be comparing approaches to asset management and investment planning to share good practice and support new developments.

This report is provided under Work Package 3 (WP3 Investment Planning and Asset Management) and sets out a questionnaire to be completed by the asset owners and science partners within the FAIR consortium. The aim of the template is to guide the Asset Owners in identifying the challenges, barriers and gaps they face in developing more adaptive Asset Management. The science team will then summarise the findings and incorporate elements in international practice and tools.

**Glossary of terms**

|  |  |
| --- | --- |
| Asset | Item, thing or entity that has potential or actual value to an *organization*[[1]](#footnote-1)*.* In the context of flood management this is generally a physical asset (e.g. a gate), but it can also be the data that is used to manage the gate (i.e. if the data is gone, the performance will drop). |
| Asset function | Function related to an organizational objective that the asset fulfills, an asset can fulfill multiple functions. E.g. a sluice will contribute to shipping (a function), but also to flood risk reduction (a different function). |
| Asset management | Enables an organization to realize value from assets in the achievement of its  organizational objectives1. Asset management can be done on different levels, strategic, tactical and operational are the generally distinguished levels. An example of strategic asset management is that safety standards of flood defences are changed due to new societal developments (e.g. economic growth), an example of asset management on a tactical level is the planning of reinforcement of dikes over a longer period of time, an example of a decision on an operational level is how often a dike should be inspected in order to ensure its reliability meets the standard. |
| Asset performance | Measurable result1 Measure for the extent to which the asset performs, to be compared with the required performance. E.g. the reliability of a dike or the availability of a sluice. |
| Availability | Ability of a system to be kept in a functioning state[[2]](#footnote-2). E.g. the percentage of time that a pump is functioning. |
| Consequence | Represents an impact such as economic, social or environmental damage or improvement, and may be expressed quantitatively (e.g. monetary value), by category (e.g. High, Medium, Low) or descriptively.[[3]](#footnote-3) For instance the casualties and damage in a flood. |
| Cost | **Capital**: Initial investment required to provide a significant change to the performance of an asset or provide a new asset (e.g. reinforcement costs, cost of building a sluice)  **Revenue**: On-going investment needed to maintain the performance of asset / asset system  **Operating**: costs for keeping an asset (e.g. the sluice) operational (i.e. satisfying the performance criterion). For instance, cost for energy, maintenance, painting the doors.  Whole life: see life-cycle cost |
| Life-cycle cost (LCC) | Or: Whole Life-cycle Cost or: Total Cost of Ownership (TCO). The total of all costs and revenues over the life cycle. Enables comparison of e.g. construction, maintenance and removal costs. Generally expressed as Present Value, where all future investments are expressed in current day value using discounting. |
| Probability | Measure of our strength of belief that an event will occur. 2 For more details on different interpretations and views on the concept of probability see2. |
| Reliability | Ability to perform a certain defined task, often expressed as probability of failure. E.g. the reliability of a flood defence is its ability to prevent a flood. Generally expressed in terms of probability |
| Resilience | Ability of a system to react and recover from a damaging hazard2 |
| Risk | Function of hazard, exposure and vulnerability2  For a flood that would be:  Hazard: the probability that a flood occurs (to given depth, velocity, duration) at a given location.  Exposure: the people, businesses, infrastructure, habitats etc that may experience harm if a given flood occurs.  Vulnerability: the degree of harm (loss of well-being) suffered by those exposed to a given flood.  Please note: This definition supports the more general definition of risk as a function of probability and consequences; where consequences are described by exposure and vulnerability. |
| Risk attribution | Decomposition of risk to individual assets/objects |
| Safety | The requirement not to harm people, the environment, or any other assets during a system's life cycle[[4]](#footnote-4) |
| Scenario | A plausible description of a situation, based on a coherent and internally consistent set of  assumptions.2 For instance a description of the development of climate or economic growth in the next decades. |
| Standard | Of protection:  Performance    Safety  Ultimate limit state  Serviceability limit state |
| (Investment) strategy | A strategy is a combination of long-term goals, aims, specific targets, technical measures, policy instruments, and process which are continuously aligned with the societal context. 2 |
| Performance criteria | Required: Levels that performance indicators need to meet. E.g. safety standards defined by law.  Desired: Levels of performance indicators that might be met, if benefits for organizational objectives (broadly) outweigh costs. E.g. if an organization has as objective to generate more economic activity on and around a dike, they can make it multifunctional, if it is not too expensive. |

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# 1 Introduction

This template sets outs the questions to be reviewed and completed by the Asset Owners. The responses will then form the basis of a comparison of methods across the North Sea Region and, importantly, common challenges identified and best practice shared. The results from the questionnaire will be taken forward in WP3 and WP5.

The questionnaire is structured in two main parts. This first part of the questionnaire explores the context within which asset management policy is made, strategies development and plans delivered. The aim is to provide a rich understanding of the approaches in each partner country that forms the background to the case studies. The second part of the questionnaire focuses on the specific challenges and approaches at the case study site. By including these two strands an in-depth understanding of the reasons why different approaches are used will be developed and, in doing so, enable best practice to be shared in the most meaningful way.

**Note:** The responses to the questionnaire should be provided as a standalone report and set out using the question headings given here.

# 2. Part A National context - Netherlands

## Question 2.1: Context within which asset management takes place

### 2.1a – Roles and responsibilities

We would like to understand the organizations with an interest in AM, their role and responsibilities for delivering AM (funding, programming and permitting etc). This includes both private and public sector organizations, as well as the role of communities and NGOs. We would also like to explore how third party assets treated/managed.

|  |  |  |  |
| --- | --- | --- | --- |
| **Organization** | **Interest** | **Role** | **Responsibility** |
| **National government** |  |  |  |
| Department of the Environment Food and Rural Affairs (Defra)  Environment Agency | To ensure funding is directed, equitably to highest risk areas and great benefits for investment are realised  To reduce the risks of flood and erosion to people and property whilst enhancing the environment | *To develop and set policy, liaise with treasury.*  *The Environment Agency’s is to set the direction for managing the risks through strategic plans; providing evidence and advice to inform Government policy and support others.*  *The Environment Agency also has operational role for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea, as well as being a coastal erosion risk management authority* | *Defra has overall national responsibility for policy on flood and coastal erosion risk management, and provides funding for flood risk management authorities through grants to the Environment Agency and local authorities.*  *The* [*Environment Agency*](https://www.gov.uk/government/organisations/environment-agency) *is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion.*  It is the responsibility of the Environment Agency toe enable authorities/businesses and communities to manage the risk they face by:   * ensuring a clear understanding of the risks of flooding * setting out clear and consistent plans for risk management * ensure that emergency plans and responses to flood incidents are effective * help communities to recover more quickly |
| **Regional government** |  |  |  |
| Eleven Regional Flood and Coastal Committees have been established in England | Ensure national funding is appropriate prioritized toward local needs | RFCC’s role is to provide a link between flood risk management authorities and other relevant bodies to develop mutual understanding of flood and coastal erosion risks in their areas. | RFCC’s are responsible for ensuring coherent plans are in place for identifying, communicating and managing flood and coastal erosion risks across catchments and shorelines and for promoting efficient, targeted investment in flood and coastal erosion risk management. |
| **Local government** |  |  |  |
| Lead Local Flood Authorities (unitary authorities or county councils) are  District Councils  . | Local integrated development | They have lead role to manage the risk of flooding from surface water, groundwater and ordinary watercourses.  Take decision on suitability of development on risk areas. District and unitary councils in coastal areas also act as coastal erosion risk management authorities. | Responsible for developing, maintaining and applying a strategy for local flood risk management in their areas and for maintaining a register of flood risk assets.  District Councils are key partners in planning local flood risk management and can carry out flood risk management works on minor watercourses, working with Lead Local Flood Authorities |
| **Operating authorities** |  |  |  |
| Internal Drainage Boards , which are | Ensure optimum water level within district to maximize productivity of land, safety for the community and environment outcomes. | Permissive powers to manage water levels within their respective drainage districts. | Independent public bodies responsible for water level management in low lying areas, also play an important role in the areas they cover (approximately 10% of England at present), working in partnership with other authorities to actively manage and reduce the risk of flooding. They undertake works to reduce flood risk to people and property and manage water levels to meet local needs. |
| **Private owners** |  |  |  |
| Third party assets owners | various | various | Responsible for managing or controlling the structure or feature. Note: 3rd party assets are a significant proportion of the national asset portfolio (perhaps as much as 1/3) |
| **NGOs** |  |  |  |
| N/A | N/A | N/A | N/A |

### 2.1b - Relevant policy, plans and codes

Discuss the policies, plans and codes that specifically influence the delivery of asset management. These should include both flood related and non-flood related (for example, broader development plans). This should be provided as a table as below with supporting text below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Policy or plan** | **Level (international;/European/National)** | **Description** | **Influence on asset management** |
| **Policies** |  |  |  |
| Floods Directive | European |  | The requirement for a national understanding of areas at significant risk and develop Flood Risk Management Plans for those areas |
| Floods and Water Management Act (2010) | National | An Act to make provision about water, including provision about the management of risks in connection with flooding and coastal erosion. Provides for better, more comprehensive management of flood risk for people, homes and businesses. | Requires both national and local flood risk management strategies be developed which guide the level of asset management required. |
| **Plans** |  |  |  |
| System asset management plan |  | A plan focused at a system of assets which describes how the Environment Agency will manage and maintain flood risk assets | Plan outlines an agreed the programme of investments required to manage the assets in a particular system. The plan and supporting tools help to identify and record the scale and timing of investments in our asset base. |
| Protocol for the maintenance of assets |  | Detail the process of maintaining our assets and when and how we might stop maintaining | Guides all asset maintenance activities |
| **Codes** |  |  |  |
| Eurocodes | European | Technical annexes: e.g. geotechnical codes, reliability analysis | Use for the design of all UK flood defences |
|  |  |  |  |
| **Influential Guides and guidance** |  |  |  |
| Environment Agency |  | Examples to add  Engineering standards and guidance (various)[[5]](#footnote-5) | The Environment Agency jointly with Defra provide guidance and practical research. See… |
| CIRIA |  | Examples to add  [www.ciria.org](http://www.ciria.org) | Provide authorities industry focused guidance. |
| International Levee Safety Partnership |  | Examples to add | Formed after the writing of the international levee handbook |
|  |  |  |  |

### 2.1c Planning timescales of interest

Discuss the timescale over which asset management activities are assessed and planned and how each influences AM decisions. Consider the multiple timescales within which assessments takes place (national policy cycles, regional planning cycles, maintenance cycles, others).

|  |  |  |  |
| --- | --- | --- | --- |
| **Time scale** | **Associated time horizon (in years)** | **What AM decisions take place over this timescale?** | **Who leads these decisions?** |
| **Long term planning** |  |  |  |
| Shoreline management plans and catchment flood management plans  Large estuary strategies e.g., Humber & Thames Estuary 2100  Long-term investment plan | A 100 years from date of plans  100 years from date of plan  50 years from date of plan within the context of a 1:100 year horizon | Policy level decisions about whether or not to hold the line/advance the line or retreat the line as well as statement of intent e.g., no active intervention.  Timing of major investment  Sets out a statement of investment needs | Plans are delivered in consultation by the relevant local authorities or the Environment Agency |
| **Medium term planning** |  |  |  |
| Investment programme and pipeline (programme cover 6year funding settlement) pipeline looks out 15 years. | In **development** (currently funding source unclear but likely to go ahead quickly when funding secured)  15 years (**pipeline**)  6 year (**programme**) | Identification investment needs and potential funding partners along with costs/benefits | Environment Agency have overview role  (see R+D on consistent standards) |
| **Short term plans** |  |  |  |
| System asset management plans (SAMPS)  Winter preparedness/incident plans | Review yearly  Current under development likely to be review yearly. |  | Environment Agency in conjunction with its partners  This will include a particular activity to improve the condition of assets or prepare for the deployment of temporary barriers |

**2.1d - Requirements of performance**

Discuss what kind of performance requirements have to be met, who defines these and how these are determined.

**Condition of existing assets**

Process of identifying

* **Minimum needs** - the lowest unavoidable cost to maintain statutory compliance and continue operation for a system accepting that the Standard of Service may decline as a result.
* **Identified needs** - the lowest whole-life cost to provide the required Standard of Service usually defined by target condition. The cost will reflect the best balance of maintenance and replacement over the assets whole-life period, and where best practice is adopted to comply with health, safety and environmental requirements.

A national scale agreement between EA/central government on the funding to support the minimum and identified needs for the next 6 years.

**Investment in new assets or improved standards**

A more rigorous appraisal process to development a business case by each individual scheme.

* **Required criteria (i.e.** What criteria must be met regardless of cost)

Legislation, H+S (construction and operation – but not the standard of protection provided), WFD etc

* **Desired criteria?** What criteria might be met? If (broad) benefits outweigh (broad) costs

The process of consistent decision making, including iBCR is set out in the Appraisal Guidance and includes a decision process[[6]](#footnote-6). This includes a progress BCR. Outcome measures (see below) are then linked to funding and funding sources (partnership funding – see below)

### 2.1e Governance and other aspects

#### Funding

* Who pays, the asset management plan to be developed, for maintenance, capital investment and how secure is this funding stream into the future?

The Environment Agency is responsible for the prioritisation of investment in flood and coastal risk management works according to Government policy and in line with Treasury guidance on economic appraisal. We design our investment criteria to implement Government policy such that public money is spent on the works that provide the greatest benefits to society, is spent efficiently and effectively and reflects a partnership approach.

We prioritise and allocate funding to FCERM schemes using the partnership funding approach. Schemes are eligible for FCERM GIA according to the benefits they bring. Funding contributions from other sources such as local levy raised by the Regional Flood and Coastal Committees, private or public organisations make up any remaining funding required or may fund a scheme completely. The partnership funding approach allows more FCERM schemes to happen than would be affordable relying on government funding alone. All schemes with a partnership funding score of 100 per cent or over will receive all or some of the funding requested. GIA funding allocations to schemes are subject to required funding contributions being secured. All projects supported by partnership funding need to meet the set criteria and as a minimum in every case, demonstrate that in present value terms the expected whole-life benefits exceed the whole-life costs of the scheme.

When the government is deciding whether the level of funding for a particular project they look for are range of outcomes which they will fund at specific payment rates as per table:



A funding settlement is agreed between the Government and the Environment Agency for a 6 year programme. This 6 year agreement is relative new, previously funding was agreed on a yearly basis. The new 6 year agreement allows schemes allocations to start in both the current year and future years, and provides greater visibility of the programme of work to suppliers and potential funding partners.

Maintenance funding is part of the wider FCERM Revenue budget. In line with capital expenditure the government has also recently agreed to settling the budget over a 6 year timeframe. The latest settlement will mean that the Environment Agency can both maintain their assets to minimum needs level and identified needs.

These 6 year programmes are in line first six years of our Long Term Investment Scenarios (LTIS). The LTIS show how future risks from flooding and coastal erosion could change due to different investment scenarios and estimate the level of investment that would maximise benefits under different circumstances.

The study takes into account:

•climate change

•how development in flood plains is managed

•changes in future costs to manage flooding and coastal erosion

LTIS takes account of the FCERM investment programme 2015 to 2021 and finds that the proposed levels of spending are consistent with investment levels from the LTIS analysis that would maximize benefits over the long term

## 

## Question 2.2: Challenges and barriers to be overcome

Questions 2.2a to 2.2d seek to tease out the issues in our understanding of asset performance over time and the availability of supporting data.

### 2.2a Barriers in the understanding of the current system

#### Physical understanding

*Sources*

* Extreme storms and river discharges (what are of return period storms do you consider, how do you include joint probability issues)

Full range of return periods considered (from frequent, <1:1 to rare, around 1:200 - 1000 ). Nationally consistent extreme levels are provided at the coast. Joint probability is routinely analysis on the coast and within estuaries using industry standard joint probability methods e.g., JOINSEA. Recently analysis full analysis of multivariate extremes has been completed for the coastal under our national risk mapping programme – State of the nation.

*Pathways*

* Accuracy of the floodplain topography data (what level of accuracy is typical and is this good enough?)

Environment Agency’s Geometrics team lead the way in the UK for the capture of the UK’s floodplains with LIDAR. All of our floodplains have 2m horizontal resolution LIDAR data with a vertical accuracy of better than +/- 25cm.

* Accuracy of information on asset location, geometry and construction (what is known and where are the key gaps in knowledge)

All asset data is captured on our AIMS (Asset Information and Management System) line level and geometry information is captured, however significant effort and resource is still required to complete this national dataset. The concept the Continuous Defence Line (CDL) has also been promoted in recent years provides a continuous understand from source to sea or the boundary between the river/sea and the land.

Socio-economic understanding

*Receptors*

* Accuracy of information on floodplain usage (residential properties, people, businesses etc)

The Mutli-coloured manual Penning Rowsell et al 2013) presents techniques and provides supporting data for calculating the economic flood and erosion impacts on residential and commercial housing, agricultural land as well as other flood losses such as road disruption and emergency costs, recreational gains and losses and other environmental losses. Cascading and escalating impacts remain difficult to estimate and significant research is being devoted to this.

### 2.2b Future change

We would like to understand how future change is accounted for. In particular:

#### In climate

What guidance is provided on climate change, including: (change to a table)

* Sea level rise allowances – what estimates of SLR are used for 2025,2050,2080

The EA provide guidance on how to make an allowance for climate change flood risk assessment to minimize vulnerability and provide resilience to flooding and coastal change in the future.

The climate change allowances are predictions of anticipated change for:

•peak river flow by river basin district

•peak rainfall intensity

•sea level rise

•offshore wind speed and extreme wave height

They are based on climate change projections and different scenarios of carbon dioxide (CO2) emissions to the atmosphere. There are different allowances for different epochs or periods of time over the next century.

All details of the allowances can be found in the out guide - Adapting to Climate Change:

Advice for Flood and Coastal Erosion Risk Management Authorities which can be downloaded [here](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/544982/LIT_5707.pdf)

**Sea level rise assumptions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Change to relative mean sea level** | **Sea level rise mm/yr up to 2025** | **Sea level rise mm/yr 2026 to**  **2050** | **Sea level rise mm/yr 2051 to**  **2080** | **Sea level rise mm/yr 2081**  **to 2115** |
| H++ scenario | 6 | 12.5 | 24 | 33 |
| Upper end estimate | 4 | 7 | 11 | 15 |
| Change factor | Use UKCP09 relative sea level rise medium emission 95% projection for the project location available from the user interface. | | | |
| Lower end estimate | Use UKCP09 relative sea level rise low emission 50% projection for the project location available from the user interface. | | | |

Is any consideration given to the influence of the following climate change related issues on asset management decisions:

* Temperature – Yes/no – if yes how? No, not directly
* Storm sequencing – Yes/no – if yes how? No- currently an area of research interest
* Spatial coherence – Yes/no – if yes how? Yes, in extreme sea level estimates, but not allowance made for any future change in coherence).

#### In socio-economics

* Population growth – Yes/no – If yes, what assumptions are made about population growth (% increase, by 2025, 2050, 2080)

No not routinely used.

* Economic development – Yes/no – If yes, what assumptions are made about growth (% increase, in GDP by 2025, 2050, 2080)

Excluded from scheme specific appraisal – making the assumption that development may or may not happen – but in national planning scenarios of developed are included to support robust policy choices. This is currently being cascaded to scheme decisions too. All BCR analysis includes discounting and hence an implicit assessment of GDP.

*In land levels*

Localised settlement of the levees – If yes, what assumptions are made

Yes generally an allowance for settlement is made as part of the design

Regional soil subsidence (i.e groundwater management related consolidation) – If yes, what assumptions are made

Yes, depends on location. Has limited impact on AM on national level.

Isostatic rebound – If yes, what assumptions are made

Yes incorporated in advice – see hyperlink above

### 2.2c Funding barriers

Everyone has a finite pot of money – but is the structure of funding or payment a barrier to optimal / best asset management (compensation for example).

Previously the year to year settlement between the EA and national government for maintenance was a significant barrier to programming work. Recently this has moved to a 6 year funding agreement for maintenance is a significant step forward for the EA

The need to secure third partner funding is also a barrier.

Funding remains split between revenue and capital expenditure – this artificial split makes true whole life costing and appraisal difficult. We are trying to move towards a total expenditure approach – but not yet there

### 2.2d How successful is asset management

Is it known whether the asset management is being delivered successfully?

Consider issues of delivering:

* The required process – assets been managed through the process set out
* The performance criteria (see Question 2.1d) – have required and desired performance been met.
* The efficiency of achieving these – minimizing whole life costs for the outcomes achieved

If so, how is it measured? (e.g. required and desired performance requirement (if present) is met?

Recently the Environment Agency completed a health check on our progress toward ISO55000 compliance. Currently assessed as a ‘high 2’ and we will continue to strive for full ISO55000 compliance.

We have a range of key Performance Indicators implemented or under development from which we monitor our asset management performance these include:

* KPI 962 (assets at required condition)
* KPI 965 Conveyance
* KPI 965 (flood risk associated with asset condition)
* KPI 970 – time until repair becomes critical.

Flood incident reviews – all failing assets are reviewed and reported on (a lessons learnt review). All available online.

## Question 2.3: Overview of tools and data used (where this is known)

### 2.3a Reliability

#### Overview

* What approaches do you typically use to support policy analysis and design?

*Loading conditions:* Probabilistic assessment across a range of loads

*Strength:* typically, deterministic

*Response (equations of failure)* typically assumed to be deterministic

*Appraisal:* Fragility curves are used to characteristic reliability. The development the fragility curves either generic or, for limited number of assets, based asset specific analysis (using tools like RELAIBLE, Floodsite with other bespoke analysis). This remains an areas of activity research to improve the site specific understanding.

*Design:* Typically based on deterministic / semi-probabilistic process.

The fragility curves capture the likely performance of the pathway term in our national flood risk assessment. Spatial data derived from the national risk assessment can be downloaded at <http://environment.data.gov.uk/ds/catalogue/index.jsp#/catalogue> . More on the scientific and practical basis for the fragility curves can be found in following research outputs which can be downloaded from <http://evidence.environment-agency.gov.uk/FCERM/en/Default/FCRM/Project.aspx?ProjectID=919FEFC3-B8E3-4616-A2F4-927E20E68345&PageId=a0fe6dfc-506a-452c-9bff-a7ec06b4e6b0>

* Do you have data to support these methods? If so, who collects it, who collates it and can access it and is it t openly available, if so where? Is uncertainty in the data considered?

Data is increasing available for key attributes (CL, condition etc) but more de

ailed data is often not available without specific survey.

#### Specific challenges and gaps in understanding

What are you particularly grappling with

Improved characteristics of reliability to be more locally specific, transition, composite structures etc. Improved data inputs to the reliability assessment

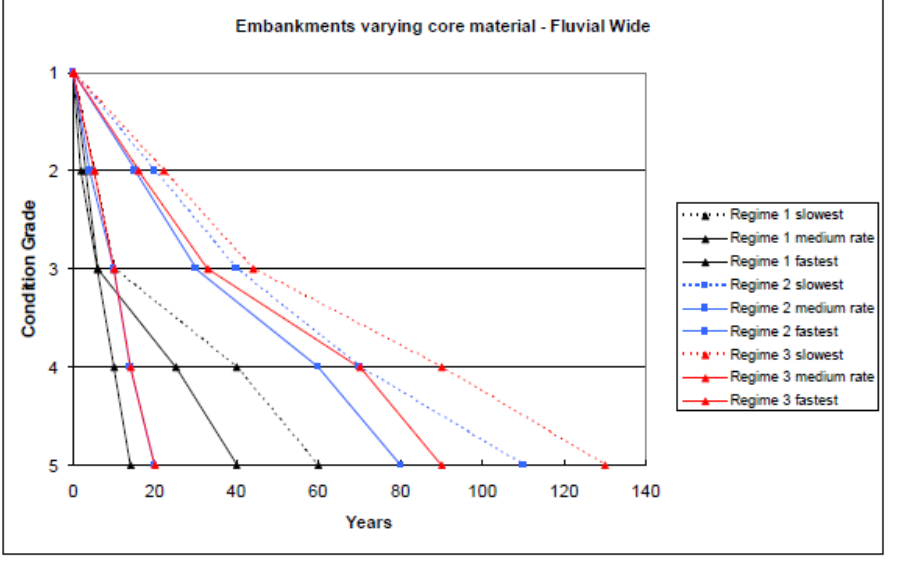
The relationship between overflow/overtopping and failure

Understanding of scour – particularly at bridges and structure toe (rear and front face)

### 2.3b Deterioration

With and without management….

National generic deterioration curves across asset types are assumed – based on no management, low and high maintenance. These are associated with cost curves for moving from one condition grade to another.

Example deterioration curves

More can be found on the research supporting the derivation of these curves at <http://evidence.environment-agency.gov.uk/FCERM/en/Default/FCRM/Project.aspx?ProjectID=48961F27-F4B6-4234-865B-EF60FB701020&PageId=a0fe6dfc-506a-452c-9bff-a7ec06b4e6b0>

This is a priority for future research – particularly as a stochastic time dependent process.

## Question 2.4: Decision process

The following question explore the aspects that shape the choices made.

### 2.4a Investment planning and prioritization

*Expenditure type*

*Appraisal:* Is based on whole life costs and whole life benefits.

*Funding settlement:* Currently however the funding settlement is separately agreed for capital and revenue.

*Prioritisations*

Priority for national funding (Flood Defence Grant in Aid) is determined through a priority scoring process. Guidance support this flood risk management project appraisal process can be found at <https://www.gov.uk/government/publications/flood-and-coastal-erosion-risk-management-appraisal-guidance>

Use of this guidance is a requirement for all publicly funded Flood and Coastal Erosion Risk Management strategies and projects developed by operating authorities. The role of this guidance is to provide the user with the information needed (or links to that information) to complete a FCERM appraisal in line with government policy. The guidance aims to help users undertake efficient appraisals and encourages experience and knowledge to be applied at all stages. It has been designed based on the following key principles and to help practitioners to:

* undertake appraisals that reduce the threat to people and their property and deliver the greatest environmental, social and economic benefits in line with the Government’s sustainable development principles;
* engage through an open and transparent process with those affected by flooding, erosion or their management activities to enable full account to be taken of social, environmental and economic issues and to build trust with local communities;
* identify what level of information and effort is needed. The guidance recognises that proportionality is needed in the effort expended on addressing uncertainty within appraisals;
* identify and assess solutions that could provide benefits wider than just those associated with managing the risk of flooding or erosion;
* identify who benefits and who loses from a particular solution and where contributions could fund delivery;
* promote approaches which reflect both national and local priorities;
* identify and assess sustainable, adaptable and flexible solutions that work with natural processes;
* understand how change (including climate change) could affect future flood and erosion risk and how to identify and appraise options that enable adaptation to changing risk; and
* promote partnership working to deliver wider benefits.

The national grant, is then calculated using the Grant-in-Aid payment rates of the outcomes delivered by a project (see table above)

*Opportunities for enhancing the return on investment*

Private sector funding can be used to increase the apparent BCR of a scheme. Private funding reduces the ‘costs’ within the BCR calculation enabling private sector contributions to enhance the wider benefits of a scheme to be used to ensure the scheme continues to attract national fundings. This process, in theory at least, promotes the concept of multiple funding sources being pooled to deliver multiple functional schemes.

### 2.4b Social justice

How are the three principles of justice considered:

* Equality – Are all citizens treated equally in the FRM process? If no, why not? If so, how is this ensured?

No attempt is made to give all citizens an equal standard of protection. Equality is ensured through a consistent decision process (i.e. a procedural rather than outcome equality). This recognizes the to provide a uniform standard of protection would be inefficient and prevent public resources being used elsewhere to better effect (e.g. hospitals, roads etc)

* Are the most vulnerable members of society prioritized? If no, why not? If so, how is this ensured?

The Grant-in-Aid formula prioritizes deprived households by providing a higher level of central government funding to schemes that protect houses in the most deprived areas. This implies that a lower private contribution to a project is needed in these areas to make it viable.

* Utility – Is it a required to ensure the best return for each euro spent? If no, why not? If so, how is this ensured?

This is the basis of the approach set out in the England – largely based on BCR.

# 3. Part B Case study – No UK case study

It may be possible to include the Humber at a later date.

1. ISO55000 [↑](#footnote-ref-1)
2. http://www.ntnu.edu/c/document\_library/get\_file?uuid=ae1f2570-1191-4d7c-b4c3-9686aaeccaf8&groupId=151572 [↑](#footnote-ref-2)
3. FLOODsite: The Language of Risk [↑](#footnote-ref-3)
4. http://www.ntnu.edu/c/document\_library/get\_file?uuid=ae1f2570-1191-4d7c-b4c3-9686aaeccaf8&groupId=151572 [↑](#footnote-ref-4)
5. http://evidence.environment-agency.gov.uk/FCERM/en/Default/FCRM.aspx [↑](#footnote-ref-5)
6. https://www.gov.uk/government/uploads/system/uploads/attachment\_data/file/481768/LIT\_4909.pdf [↑](#footnote-ref-6)