Calculate Grant in Aid funding for flood and coastal erosion risk management projects

Guidance for risk management authorities

Version 1 updated February 2014

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What's this document about?

This document explains the definitions and calculation methods for the Outcome Measures Defra set for the Flood and coastal erosion risk Management (FCRM) capital programme. Outcome Measures for FCRM are used by Defra to ensure that public money is effective at delivering the benefits expected. It explains how to use these to calculate the potential FCRM Grant in Aid (GiA) contributions for projects in accordance with the Defra policy for flood and coastal resilience partnership funding.

Who's it for and when should it be used?

This document is for the following groups. It should be used from the earliest stages of appraising options, through any project development to grant application and subsequent reporting of outcomes. It is intended to be used to help complete and use the Partnership Funding calculator.

- FCRM Risk Management Authorities
- FCRM project and programme managers
- FCRM project consultants

Related documents

Flood and coastal resilience partnership funding, Defra policy statement on an outcome-focused, partnership approach to funding flood and coastal erosion risk management

Defra flood and coastal resilience partnership funding – an introductory guide

Principles for implementing flood and coastal resilience funding partnerships

The Partnership funding calculator (a spreadsheet tool)

More information relating to FCRM funding and grant applications is available at www.gov.uk

Contents

1. Outcome Measures: definitions

OM1 Economic benefits	**Definition** The average benefit cost ratio across the capital programme based upon the present value whole life costs and benefits of projects delivering in the Government spending review period. Individual projects will need to estimate and report Present Value Benefits and Present Value Costs.
OM2 Households at flood risk	**Definition** The number of households moved out of any flood probability category to a lower category. (Section 4 below shows the flood probability categories).
OM2b	**Definition** The number of households for which the probability of flooding is reduced from the very significant or significant category to the moderate or low category.
OM2c	**Definition** The number of households in the 20% most deprived areas moved from the very significant or significant flood probability category to the moderate or low category.
OM3 Households at erosion risk	**Definition** The number of households better protected from coastal erosion. (Section 4 below shows the coastal erosion risk categories).
OM3b	**Definition** The number of households protected against loss from coastal erosion in a 20-year period.
OM3c	**Definition** Number of households in the 20% most deprived areas protected against loss from coastal erosion in a 20-year period.
OM4a Water dependent habitat	**Definition** Area (in hectares) of water-dependent habitat created or improved to help meet the objectives of the Water Framework Directive, Section 28 of the Wildlife & Countryside Act 1981, and the England Biodiversity Strategy.
OM4b Intertidal habitat	**Definition** Area (in hectares) of intertidal habitat created to help meet the objectives of the EU Habitats/Birds Directives, Section 28 of the Wildlife & Countryside Act 1981, and the England Biodiversity Strategy.
OM4c Protected rivers	**Definition** Length (in kilometres) of rivers protected under the EU Habitat Directive, EU Birds Directive or Section 28 of the Wildlife and Countryside Act 1981 improved to meet the objectives of the Water Framework Directive.

2. Projects that should apply the Partnership Funding calculator and report Outcome Measures

Qualifying projects

The Partnership Funding calculator applies to projects that propose to use Flood and Coastal Erosion Risk Management Grant in Aid (FCRM) in part or full. These projects will:

- provide a step reduction in probability of flood and coastal erosion risk through new or improved defences (known as improved defence projects and given a code “DEF” in the FCRM Medium Term Plan),
- avoid a significant increase in flood or coastal erosion risk probability by replacing or refurbishing existing assets (known as capital maintenance projects and given a code “CM” in the FCRM Medium Term Plan)
- achieve statutory environmental goals described by OM4a, b or c (projects may be given codes “WFD”, “HAB”, “SSSI” or “FISH”)
- achieve other statutory, legal or contractual requirements including health & safety requirements or abstraction agreements

3. Key definitions and approaches

Risk bands

The risk band definitions for OM2 and OM3 are given in the table below.

Flood Risk Management		Coastal Erosion Risk Management	
Very significant	>=5%		
Significant	<5% but >1.33%	Medium term loss	<=20 years
Moderate	<=1.33% but >0.5%	Longer term loss	>20 years
Low	<=0.5%		

Duration of benefits (Flooding)

The period, in years, over which the project will deliver benefit. ie the useful life of the asset or time until the next major capital investment in the defence - whichever is sooner. ‘Major investment’ here means an investment over 20% of the investment being considered now.

Duration of benefits (Erosion)

By delaying the process of erosion, properties can be occupied for longer. The duration of benefits is the additional number of years of potential occupancy. Normally this is the useful life of the coastal defence being built or upgraded or the time until the next major investment, whichever is sooner.

Whole life cost or benefit

For OM contributions and the funding calculation the whole life costs and benefits are calculated over the ‘duration of benefits’ period, as above.

This is not to be confused with the usually longer project appraisal period which typically relates to the life of the longest-lived assets, or 100 years, whichever is shorter in accordance with HM Treasury Green Book.

This sets the next investment in the context of the longer term outlook for managing flood risk to support the business case. In all cases, whole-life costs refers to all costs (capital and revenue) needed to deliver the FCRM-related benefits of a project over the duration of the benefits period claimed.

When applying for Grant in Aid, the estimate of whole life costs used should not include a contingency allowance. However an appropriate contingency should be identified in business cases and discussed with funding partners so that funding agreements accommodate a suitable allowance.

Timing of outcomes

Contributions to an OM, and benefits from an investment, are considered to have been delivered on completion of the works when the flood or erosion risk is reduced. In some instances this may be prior to overall completion of the whole project, ie before completion of surface finishes or compensation matters.

Before and after risk bands and climate change

The 'Before' risk band is the one prior to the capital investment, ie before the works to improve the asset or reinstate structural integrity. The 'After' risk band is the one the households are expected to be in at the *end* of the claimed duration of benefits period. This will include the expected impacts of climate change increasing risk over time, less any mitigation that is included in the scheme design and proposed investment.

Assessing 'Before' risk band for 'Capital Maintenance' projects

The rationale for replacing worn out components or specific sections of existing FCRM assets is that the asset has deteriorated such that it falls short of its design Standard of Service and, as a result, the risk in the defended area has significantly increased.

Where a detailed assessment of risk associate with deteriorating asset condition is not available, practitioners may prefer a simple approach. Here, it's assumed that the 'Before' risk band is *one* band below that inferred from the design standard of the asset once capital maintenance is completed (ie the 'Before' risk band is taken as Moderate if the 'After' risk band is Low). The 'Before' risk band cannot be lower than the undefended risk band.

Household

A permanent residential dwelling. See Definition of General Housing Terms for the definition of a permanent dwelling.

Identifying deprived areas

A simple map showing the 20% and 21-40% most deprived areas in England is available in the Partnership Funding calculator. This may be sufficient to identify whether a FCRM scheme is likely to fall within a deprived area or not, to inform an Outcome Measure assessment. For an accurate assessment, the deprivation ranking for a location can be found using a post code and data provided by the Office for National Statistics. Select 'Lower Super Output Area' and chose the 'Indices of Deprivation and Classification' dataset to find the 'Index of Multiple Deprivation Rank' that is relevant to the project benefit area.

4. Qualifying benefits

OM 1

All economic benefits associated with existing property, infrastructure and business can be counted under OM1. However, when calculating the potential FCRM Grant-in-A for a scheme, payments made for contributions under OMs 2-4 are automatically deducted in the Partnership Funding calculator to avoid paying twice.

The assessment of benefits should be proportionate to the investment being considered but may include residential property, non-residential property (buildings, contents and disruption), civic property (buildings/contents and disruption to hospitals, schools and local government), agricultural property (land, buildings, plant, production and drainage), communications (roads, rail and telecoms), utilities (gas, electricity, water) public health (including fatalities, distress and impact on education). Guidance is available separately for the valuation of such benefits, including Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG) and Multi-Coloured Manual.

OM 2 and 3

Households counted must be permanent dwellings built or converted before January 2012. Temporary or seasonal accommodation, including mobile or static caravans, does not qualify. Households qualify only if they directly benefit from a scheme. This means that, for flood risk, households are only counted if a scheme reduces the probability of flood waters crossing their threshold. For coastal erosion, qualifying households are those where a scheme prevents occupancy from becoming unsafe.

Households indirectly benefiting, through for example loss of services or access, or where flood water isn't expected to enter the dwelling (such as in the upper floors of a building), may not contribute towards OMs 2 and 3. However, economic impacts can be assessed and contribute towards OM1.

OM 4a

The following can count towards OM4a:

- Works that contribute to the restoration of non-river SSSIs to favourable condition, and/or to maintain them at that condition, where the remedies to site condition and threats have been agreed with Natural England and included in a site management plan.
- Works that create or improve any non-intertidal priority wetland habitat as defined under Section 41 of the Natural Environment and Rural Communities Act 2006.

OM 4b

Works that create intertidal priority habitats as defined under Section 41 of the Natural Environment and Rural Communities Act 2006.

OM 4c

The following can count towards OM4c:

- Works that contribute towards the implementation of protected area measures in the current River Basin Management Plans, preventing deterioration and/or leading to an improvement in the condition of water bodies.
- Works that contribute to the restoration of river SSSIs to favourable condition, and/or to maintain them at that condition, where the remedies to site condition and threats have been agreed with Natural England and included in a site management plan.

Avoidance of double counting

Benefits and households cannot be double counted between separate investments. Once benefits or households have been used to justify and gain funding for an investment they may not be used again within the duration of benefits period for investment.

If 2 or more investments are needed to protect a specific benefit area, the investments should either be combined or an appropriate approach taken to apportion any available FCRM Grant in Aid and reported contributions to OMs between the separate investments. Unless this is done, the maximum grant rate will be capped at 45% in accordance with Defra funding policy.

Possible approach to apportionment

The ideal approach to apportioning benefits, and therefore funding, for FCRM projects is to fully model the pathways and receptors and all sources of flooding to understand their combined effects. This will allow a full economic assessment of options, costs and benefits, inform decision-making, and ensure a fair funding outcome across any national or local funding sources to all Risk Management Authorities involved.

This may be appropriate and proportionate in complex locations with significant flood risk and overlapping interests. However, simpler approaches are likely to be sufficient in most locations.

Principles for apportionment

Any approach to apportioning the benefits of FCRM projects should:

- be agreed by all RMAs involved, as it will affect their opportunities to apply for FCRM Grant in Aid, and help their collective efforts to raise any additional funding
- align with the needs of the economic assessment used in options choice and decision-making, so the right risk management options are chosen
- ensure that individual works in an area can make a fair FCRM Grant in Aid claim commensurate with the impact of the works, with no or minimal impacts on works elsewhere
- lead to reporting of Outcomes proportionate to the scale of works and/or the benefits delivered

Simple geographical approach

Flood risk areas can be mapped for each of the known sources. If areas do not overlap then double-counting isn't an issue.

Where overlaps do exist, judgment can be used to assign the benefit areas / households affected to a primary source. A simple benefits map results with a number of single source areas and no double counting. When assessing options in the FCRM appraisal, sensitivity analysis can be used to quickly 'test' the robustness of options choice to changes in the area boundaries. This method is most appropriate where a single source of flood risk dominates and other sources are few and discrete within the overall area.

Simple annual average damage approach

Where it is not possible to readily separate areas affected by different sources or responsibilities for flood risk, then separate economic assessments of the effects of flooding from each source can be carried out. This can be done with the benefits and outcomes of proposed works apportioned to the different sources or Risk Management Authorities using the ratio of annual average avoided damage from one source, to the rest. This approach is useful in areas of widespread multi-source flooding.

Combined approach

In any overall study area both of the above approaches could be used.

Information gaps

These approaches work best when information about the different sources of flood risk is available simultaneously. This may not always be the case and delays while information gaps are addressed could leave communities exposed to unacceptable risk levels. In such cases an allowance can be made that reflects the collective judgment of the missing information in terms of either its geographical extent or potential annual average damages. The Risk Management Authorities involved should share responsibility for any allowances made to ensure all authorities and funders are treated fairly.

Help and advice

Help with avoiding double counting is available from your local Environment Agency Area Partnerships and Strategic Overview Teams, local NCPMS team or the National FCRM Investment and Programme Team. Contact them via our national customer contact centre on 03708 506 506.

5. How to determine duration of benefits for different types of project and construction delivery

Investment in asset systems

An asset system is where a group of assets work together to manage the risk of flooding or coastal erosion for a given coastal cell or flood compartment. Different assets will often be present within the system (for example walls, banks, groynes and outfalls) with different investment needs based upon asset type, construction materials, residual life and current condition.

The Outcomes Measures and FCRM Grant in Aid funding arrangements will apply where any of the works in the system are improved defences (DEF) or capital maintenance (CM). This section explains how the duration of benefits can be determined for these different types of projects, recognising that delivery may involve different works contracts or perhaps packaged contracts over a period of years.

Duration of benefits for "DEF" projects

New or improved defences (DEF) projects will typically provide new assets or improve existing assets across the whole of the coastal cell or flood compartment and usually be delivered in one go. The improved protection level is not delivered until the last component is complete.

The duration of benefits will relate to how long the asset(s) providing the defence are expected to last before the next capital investment that exceeds 20% of this projects cost is required.

Worked example

Example A

A new parapet wall is to be constructed along the top of an existing quayside reducing the risk of sea flooding from 10% exceedance to 1% exceedance in a given year. The new wall has at least a 50 year design life and will cost around £2m. It's anticipated that significant works to the main quay wall (also owned by the risk management authority) will require works in some 20 years time, and cost an estimated £3m.

The duration of benefits for the parapet wall and therefore the current investment is 20 years, limited by the future £3m quay wall work.

Duration of benefits for (CM) projects

Refurbishment and replacement (CM) projects may be needed at various times in a typical system, reflecting a variety of asset types and their condition (for example walls, banks, sluices and groynes), their different residual lives, and also the need for asset components, such as revetments, gates and electrical equipment.

Variations in the timing of different works, their scale and the possibility of ongoing or annual programmes of capital works need to be considered when determining the appropriate benefits duration for calculating OM contributions and FCRM Grant in Aid funding. Some common scenarios follow.

Worked example

Example B

A single flood compartment is protected by a system of assets consisting of different walls (steel pile, concrete and some older stone walls), a length of earth embankment and a tidal sluice.

Scenario 1

The steel pile wall is heavily corroded, is at the end of its useful life and is to be replaced in a single 2-year contract costing £2.6m. The residual life of the remaining assets and their components was shown in the project appraisal to vary up to 80 years with the next major investment not being needed for 20 years.

This scenario requires a discrete investment in a single phase following which benefits will be realised for 18 years until a decision on the next major investment(s) is/are needed, for example 20 years to next major investment, less 2 years – the time taken to deliver the contract and outcomes from the first investment.

Worked example

Scenario 2

The appraisal confirmed the immediate need for steel sheet piling work and that major investment was needed to refurbish the sluice by year 7, as shown below. With the latter complete, further works would not be required for 25 years.

Work contracts & spend profile (£m)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Steel pile wall	1.1	1.5							
Sluice refurb'					0.3	0.8	0.8	0.2	

This scenario requires a discrete investment in a single phase following which benefits will be realised for 5 years, for example the length of time between delivering the outcomes from the first phase in year 2 and the need to deliver outcomes from the next major investment on the sluice in year 7.

Justifying the piling works with a 5-year duration of benefits may be deliverable. However, if funding is required from partners they may be looking for a longer period of secured outcome. One option would be to consider a scheme and associated funding agreement that included the sluice works.

With such an agreement in place it may be reasonable to assume that the duration of benefits could extend to 30-years. Both permutations are worth assessing to inform a decision on a preferred option.

Worked example

Scenario 3

The appraisal confirmed that a number of assets require capital maintenance over the next 5 years. Based on current asset condition and construction lead time, the spend profile in the table below has been determined. The residual life of the remaining assets and their components was shown in the project appraisal to vary up to 80 years with the next major investment not being needed for 25 years.

Work contracts & spend profile (£m)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-10	Year 11-15	Year 16-20	Year 21-25
Steel pile wall	1.1	1.5							
Sluice refurb'		0.3	0.8	0.8	0.2				
Embankment revetment				0.3	1.0	0.2			
Yr 25 Stone Wall refurb'									1.8

In this scenario the 5-years of capital maintenance are considered a single phase as they overlap. It's assumed that funding provision for the whole phase is secured prior to commencement, making it likely that outcomes would be realised from completion of the first works package. This means that the duration of benefits is 23 years, ie 25 years to next major investment, less 2 years – the time taken to deliver the first contract and associated outcomes.

Assessing different scenarios

Example B above shows that it may sometimes be necessary to consider different scenarios for undertaking works that could influence the length of any funding agreement secured and the balance of contributions from funders. While longer agreements may have higher costs it could be that a greater proportion of cost is covered by FCRM Grant in Aid derived from the longer duration of benefits offered. Different scenarios can be easily tested using the Partnership Funding Calculator.

6. Use the partnership funding calculator to assess FCRM Grant in Aid contributions

Funding scenarios to better understand risk

The partnership funding calculator will show what FCRM Grant in Aid may be available for a project and whether any other contributions or costs savings may be necessary for the project to succeed.

It's important to understand that the funding is based upon the project scenario data fed into the calculator, including anticipated costs, benefits, OM contributions and risk reduction. It's usually necessary to enter several scenarios to cover a realistic range of possible combinations, perhaps:

- upper and lower estimated costs to deliver the anticipated outcomes to reflect cost uncertainty and risk, or
- different outcomes in terms of risk management (varying numbers of properties in After and Before risks bands) reflecting uncertainties at early stages of development and anticipated risk reduction to understand the implications for funding.

For planning purposes a realistic scenario needs to be established but the implications of uncertainty and risk should not be forgotten.

Managing expectations

It's important to share the funding and calculator scenarios with key stakeholders in order to manage expectations and avoid future surprises that could undermine success. The calculator can be used at the earliest inception stage of a project to 'test' the funding prospects of different options for managing flood or erosion risks which can prove valuable in setting the initial scope and gaining early support.

Calculator key outputs

The Partnership Funding Calculator is a downloadable spreadsheet. It's a spreadsheet tool providing a useful summary of information for your project, help with calculating present values and a map for identifying areas of deprivation. The outputs from the calculator are::

- FCRM Grant in Aid contribution
- raw OM score
- cost saving or external contribution required
- adjusted OM score

Calculator key inputs

The inputs to the calculator are:

- present value benefits
- present value costs of appraisal, construction and total (including maintenance and allowances for reasonably-foreseeable risks)
- duration of benefits
- funding contributions (if appropriate)
- number of households in different flood risk bands Before and After the investment, split by 3 levels of deprivation
- number of households in different erosion risk bands Before and After the investment, split by 3 levels of deprivation
- area (in hectares) of water-dependent habitat being created or improved
- area (in hectares) of new intertidal habitat created
- length (in kilometres) of protected river improved

Sensitivity testing

It's important to recognise that some calculator inputs may change as the project progresses and more accurate information is produced. Such changes could have significant implications for a project's funding arrangements and project teams should keep stakeholders informed.

Establishing how sensitive a project's funding arrangements are to changes in calculator inputs can help manage expectations leading to successful delivery of the flood or erosion risk management works.

The calculator contains 3 simple sensitivity tests that show the implications on Raw OM Score and FCRM Grant in Aid contribution from changes in the:

- PV whole life cost
- distribution of houses in the Before flood risk bands
- distribution of houses in the Before erosion risk bands

Thinking about uncertainties

While typical of the sort of change that could occur, these are provided for illustrative purposes only and to stimulate consideration of the effects of uncertainties in the project input data. This is particularly relevant when little or no formal project appraisal has been undertaken.

Those using the calculator should consider whether the tests are appropriate to their project, what other test may be appropriate and how best to use the information to manage the needs and expectations of all those involved.

Building confidence in contributions and grant allocation

Where the total FCRM Grant in Aid contributions for projects proposed in a year is greater than total grant available, the Environment Agency (EA) will use Partnership Funding scores to help prioritise projects. For this reason, promoting Risk Management Authorities will be able to increase confidence in FCRM Grant in Aid allocation if they can increase the partnership funding score for a project above 100%. This can be achieved through reducing costs or securing additional contributions.

Increasing evidence

The EA expects increasingly robust evidence of funding contributions as projects develop. The table below shows the nature of evidence it will consider when building the national FCRM capital programme at different project stages. The project stages referred to are described in 'Principles for Implementing Flood and Coastal Resilience Partnership Funding'. The principles the EA applies to the capital programme construction recognise that increasing confidence in funding contributions will result in increasing confidence in grant allocation.

Evidence of contribution			
Project stage	**Gateway**	**Typical years to delivery**	**Evidence of contribution expected**
First Stage Business Case	**0**	**4/5**	**Principal contributors identified and indicated willingness to participate**
Detailed Business Case	1	2/3	heads of terms or other clear written evidence of funding contributions expected
Design and Planning	**2**	**2/1**	**records of advanced stage of negotiations available**
Delivery and Operation	3	1/0	payment in advance or signed legal commitment to contributions

Ongoing dialogue

Timescales will vary between projects and circumstances and may be significantly compressed. An ongoing dialogue with the EA about contributions and FCRM Grant in Aid allocations will help to reduced uncertainty in the programme and build confidence for both funding partners and lead Risk Management Authorities.

7. Responsibilities for assessing and Reporting OMs

All Risk Management Authorities

Risk management Authorities must submit forecasts of OM contributions and timings for each projects as part of the Medium Term Planning exercise. Updated OM forecasts must be submitted as part of regular Grant in Aid financial monitoring. Confirmation of OMs achieved are required as part of project completion documentation.

Prior to the completion of a full appraisal (PAR or Strategy) practitioners should use their best available information to forecast the data needed for OMs. Once the project appraisal stage is complete it should generally be the case that data reported for the Outcome Measures, and used in the grant allocation and programme management processes, links back to the projects Project Appraisal Report (PAR) or Strategy.

If changes occur during subsequent project design and construction then an audit trail should be kept by the project that explains any variance against the original forecast.

Significant changes may require a project to submit a Variation Report (non Environment Agency projects) or Form G (Environment Agency projects). If this is necessary, a revised FCRM Grant in Aid calculator should be produced to determine any changes in grant eligibility.

8. Calculating contributions

Potential FCRM Grant contribution

The introductory guide to Flood and Coastal Risk Management Partnership Funding outlines how the calculation of potential FCRM Grant in Aid available for a project is made. The Partnership Funding calculator uses detailed formulae defined by Defra. Defra's policy statement explains the payment rates used.

Partnership Funding score

The Partnership Funding Calculator converts the potential FCRM Grant in Aid available into a "raw" Partnership Funding Score, which describes the proportion (%) of costs that can be justified against national budgets.

Funding contributions from other sources can be used to adjust and boost the Partnership Funding score. The adjusted Partnership Funding score must exceed 100% before FCRM Grant in Aid is allocated and a project can proceed.

Impact of future costs including maintenance

The Partnership Funding Score calculation will differ slightly if ongoing maintenance costs are to be met by parties other than the Environment Agency (EA), if costs relate to scheme development only, or where costs for approval exceed the present value of expected whole-life costs.

The EA is eligible to claim FCRM Grant in Aid towards both the upfront costs and any future costs including maintenance. This means that contributions to EA projects will need to help fund ongoing costs, otherwise national budgets would be left with an unfunded maintenance legacy. Other Risk Management Authorities are eligible to claim the appropriate share of FCRM Grant in Aid towards the upfront costs only, the "Cost for Approval", so future costs will need to be met at the expense of others. This means that contributions towards future costs will only increase the adjusted Partnership Funding score for projects on assets that will be managed by the EA.

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