



Joint Defra/EA FCERM R&D programme - project FD2662

Flood and coastal erosion risk management
and the local economy

TOOLKIT: Non-technical summary

March 2014

Preface by Defra

- This “toolkit” is the key output of research project FD 2662 “Flood and coastal erosion risk management and the wider economy” commissioned from Frontier Economics as part of the Joint Defra and Environment Agency R&D programme.
- We commissioned this work as a step towards making the existing economic appraisal system for FCERM projects more useful for local partners such as Local Authorities, Internal Drainage Boards, Local Enterprise Partnerships, business groups and other beneficiaries of flood and coastal management and land drainage. The rise of partnership working and funding in FCERM and land drainage means that the emphasis of appraisal is shifting from a centralised option-selection tool for Risk Management Authorities spending national Grant in Aid, to a more holistic assessment of impacts on a range of partners, including those assessing the local case for contributing their own funding to supplement Grant in Aid.
- As such, this “toolkit” focuses on methods to explore the local economic benefits of FCERM and land drainage, moving beyond the usual estimation of “avoided damages” to consider wider impacts on local income or Gross Value Added, which are potentially of at least equal interest to local stakeholders. We hope the “toolkit” and forthcoming case study and other materials (to follow soon) are useful within the context of local debates on funding, but we recognise this research constitutes a first step. We would be very interested to receive feedback (to the email address below) on how the approach is working and how it might be improved.
- The toolkit is entirely voluntary and is not meant to displace any existing appraisal methods which partners may already be using to explore the local benefits of FCERM. For example, established methods borrowed from mainstream regeneration and economic development practice, particularly for assessing the benefits of enabled inward investment. Again, comments on how the methods in this toolkit compare with those approaches and whether there are useful developments we could make, would be welcome.
- The methods in this toolkit are not suitable for estimating national-level GVA or economic growth impacts and as such should be used for local assessment only, rather than populating national-level cost-benefit analysis used for FCERM Grant in Aid allocation. Displacement of GVA impacts between local areas is likely to be a key issue at the national level. Whilst Frontier have conducted a preliminary assessment of situations in which national-level impacts may arise in their “national note” published as part of the research outputs, further work will be required to consider whether this has workable implications for economic appraisal.

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About this “toolkit”

Introduction

This document provides a “toolkit” for practitioners of approaches to assess the costs and benefits to a **local** economy of flood and coastal erosion risk management (FCERM) and land drainage.

These impacts are not currently assessed within the Defra/Environment Agency FCERM appraisal process, in which impacts are considered from the national perspective. This national perspective informs Flood Defence Grant in Aid (FDGiA) funding from the Exchequer, but ignores locally important benefits for which other funding streams may be available.

This toolkit therefore complements, rather than replaces, standard FCERM appraisal approaches. It is aimed at Local Authority practitioners and other local economic interests such as Local Enterprise Partnerships who may be considering non-FDGiA funding contributions for FCERM under the Partnership Funding system. The toolkit is intended to inform local debate about funding FCERM to provide local benefit.

The purpose of the toolkit is to provide an understanding of:

- The ways in which FCERM leads to potential benefits for businesses and their employees, both in terms of first-round impacts (avoided damage to commercial property, agricultural output, inventories etc); and, dynamic impacts which occur in the economy over time as businesses respond to the lower level of flood, or coastal erosion, risk, or drainage regime.
- Methods to estimate the scale of potential impacts on the

local economy

- How to interpret results for the purposes of informing funding decisions.

In this report references to **flooding** also implicitly include adverse water levels as influenced by **land drainage**, to which similar thinking can be applied. However it is fully recognised that **coastal erosion** raises inherently different implications for businesses than flood risk or suboptimal drainage. Therefore, dedicated advice on the assessment of the GVA impacts of FCERM where it addresses coastal erosion is provided in Annex 6 of the main toolkit report.

This toolkit is structured in two parts:

- **Part 1: non-technical summary (this report).** This sets out in non-technical terms who the toolkit is for; how the assessments can help local communities and those co-ordinating Partnership Funding (which comprises FDGiA from central government alongside contributions from local partners); what we mean by the ‘local economy’; the ways in which FCERM benefits the local economy; how this toolkit relates to standard FCERM appraisal guidance; and, how to get started.
- **Part 2: technical material (see main toolkit report).** This section is split into two sub-sections.
 - (i) The framework – this presents the underlying rationale for the approaches suggested. In particular, the channels through which FCERM impacts on the local economy.
 - (ii) A step-by-step approach for how to assess the impacts on the local economy, with worked examples.

Non-technical summary: the toolkit and how it can help local partners

Who is this toolkit for?

This toolkit is intended for local bodies (principally Local Authorities) who are considering, or would like to encourage others to consider, contributing partnership or other funding for FCERM. This is in recognition of the local economic benefits of FCERM and to complement funding which may be available through Flood Defence Grant in Aid.

What do we mean by the local economy?

Businesses and their employees located in the geographical area that is of interest to the local practitioner. For example, this could be the Local Authority boundary or a much smaller scale, such as the area protected by the particular FCERM intervention under consideration (which is recommended). The unit of impact considered here is a monetary measure of the value added by businesses to the local economy, called Gross Value Added (GVA).¹

How can this toolkit help local authorities or project leads?

This toolkit, and associated evidence it informs, are likely to be useful for local partners in several ways. These include:

- **Supporting the case for action:** by assessing the costs and benefits to a local economy of managing flood or coastal erosion risk, it could help local authorities make informed decisions about the relative returns from investing in different policy areas.
- **Engagement tool:** evidence on the costs and benefits of action to manage flood or coastal erosion risk can be a valuable tool to engage local partners – including local businesses, Local Enterprise Partnerships, community groups etc – on the need to invest in FCERM options.

This is particularly true if the detailed approach proposed in this toolkit is used.

- **Pragmatic and proportionate effort involved:** recognising the likely constraints on resources, this toolkit offers practitioners with two approaches for undertaking the analysis. The first is ‘light touch’ which estimates the likely orders of magnitude of impacts using publically available reports and data, along with suggested assumptions (based on evidence). **Results can therefore be generated relatively swiftly.** The second is the more ‘detailed’ approach which involves investing in primary research to understand business perceptions and likely responses to FCERM. Practitioners therefore have the choice to use the approach which best meets their needs.
- **The process of undertaking the detailed approach could be a valuable mechanism to generate local business buy-in to the need for action and the proposed intervention.** The detailed approach involves extensive stakeholder engagement – such communication can play an important role in building required relationships for effective partnership working.
- **Understanding how impacts on the local economy can occur and their potential scale provides the opportunity to design interventions to maximise local economic gains.** Involving businesses or other local partners early enough in the process i.e. scheme design stage or before, can help generate buy-in to the intervention, maximise economic gains and encourage local contributions.

¹ GVA is an established measure of local economic activity. The focus in this toolkit is business responses and how they can impact GVA – it is recognised that a holistic assessment of the impacts on the local economy would consider the wider community (including public infrastructure). Evidence is however currently constrained on such effects so this will be kept under review.

Non-technical summary – understanding the impacts on the local economy

What are the potential impacts on the local economy?

The size of an economy is typically measured by the value created by businesses and their employees. This depends not only on the total amount of goods and services produced, but also how efficiently they are produced. Business efficiency can take three forms:

- **Productive efficiency:** producing goods and services to a high quality and at least cost;
- **Allocative efficiency:** allocating resources to the most productive uses; and,
- **Dynamic efficiency:** encouraging and embracing innovation to improve what is offered over time and how, along with offering new products or services.

FCERM can alleviate the adverse impacts of flood risk on each of these, and therefore deliver benefits for the economy.

Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG) already estimates the scale of **‘first-round impacts’** on the local economy. These assume no change in the composition of businesses or their behaviour over time and include reductions in:

- Expected damage to commercial properties (premises, inventories, machinery etc.);
- Damage to public infrastructure (utilities, for example);
- Business travel disruption;
- Loss of agricultural output and yield.

These sit alongside other impacts assessed in FCERM-AG.

Measurement

FCERM-AG estimates impacts for different flood return periods based on evidence from past flood events. First round impacts for this toolkit are entirely based on the sum of relevant components of the FCERM-AG project appraisals.

Building on FCERM-AG, additional impacts on the local economy may, however, arise. This is because changes in flood risk could alter business decisions and behaviour over time. We refer to these as **‘dynamic impacts’**.

Such business decisions are assumed to be driven by two key factors: adaptive capacity and location dependence:

- **Adaptive capacity:** The degree to which a business is able to prepare, respond and recover appropriately given its size, resources (financial and knowledge, experience or information), and nature of activity.
- **Location dependence:** The degree to which a business is likely to consider moving to another area with lower flood risk. This would be influenced by its dependence on factors in the local area (or ‘location dependence’).

On the basis of a business’s adaptive capacity and location dependence, a business may decide to stay in its current location and do nothing (stay + do nothing); stay where it is but invest in adaptation (stay + adapt); move away from the flood risk to another area (move) or cease trading (shutdown).

Dynamic impacts in this toolkit assess the outcomes of business behaviour change when FCERM is implemented, compared to the case in which it is not.

Non-technical summary – understanding impacts on workers and businesses

‘Dynamic impacts’ of FCERM are assessed in terms of:

- **Business continuity and sector composition:** FCERM lessens the extent to which businesses are disrupted by flooding. In addition, it could also provide the incentive for a business to stay in its current location and carry on trading whereas it otherwise may have moved away, or even shut down, without the FCERM.

Measurement

These impacts can be assessed by considering the value of economic activity of businesses. This uses data on the business sector, number of employees and region, along with annual earnings data. This is used to estimate the value of avoided disruption and the value of retained businesses.

- **Unlocked investment:** it is possible that FCERM can lower flood risk to the extent that planning approval for new site developments is granted, whereas without FCERM it would not have been. Those developments may also be more viable as a lower level of investment is needed to meet property-level standards of flood protection. Foreign Direct Investment may also be attracted to the areas that would otherwise not have been viable because of the flood risk.

Measurement

Site development can be valued in terms of the economic activity i.e. earnings generated (assuming less or even none would have been there otherwise).

- **Spillover impacts:** These include:

- Agglomeration:** clusters of businesses can be more productive because of the ability to share ideas, knowledge, skills etc across businesses. Where FCERM facilitates businesses to remain in clusters, productivity gains are likely (relatively to what otherwise would have happened without FCERM).
- Infrastructure interdependencies:** businesses rely on infrastructure to enhance their efficiency. FCERM which better protects that infrastructure benefits businesses.
- Costs of insurance:** FCERM could lower insurance premia which means more businesses can afford to purchase insurance. This could in turn provide the business with greater access to finance (flooding insurance is often a pre-condition of loans).
- Incentives to invest in the growth of the business:** lowering the risk of flooding could enhance business confidence and lower operational uncertainty. This could lead to greater investment.
- Land values:** land values may rise in areas better protected by flooding (care is needed to avoid double counting when assessing this impact).

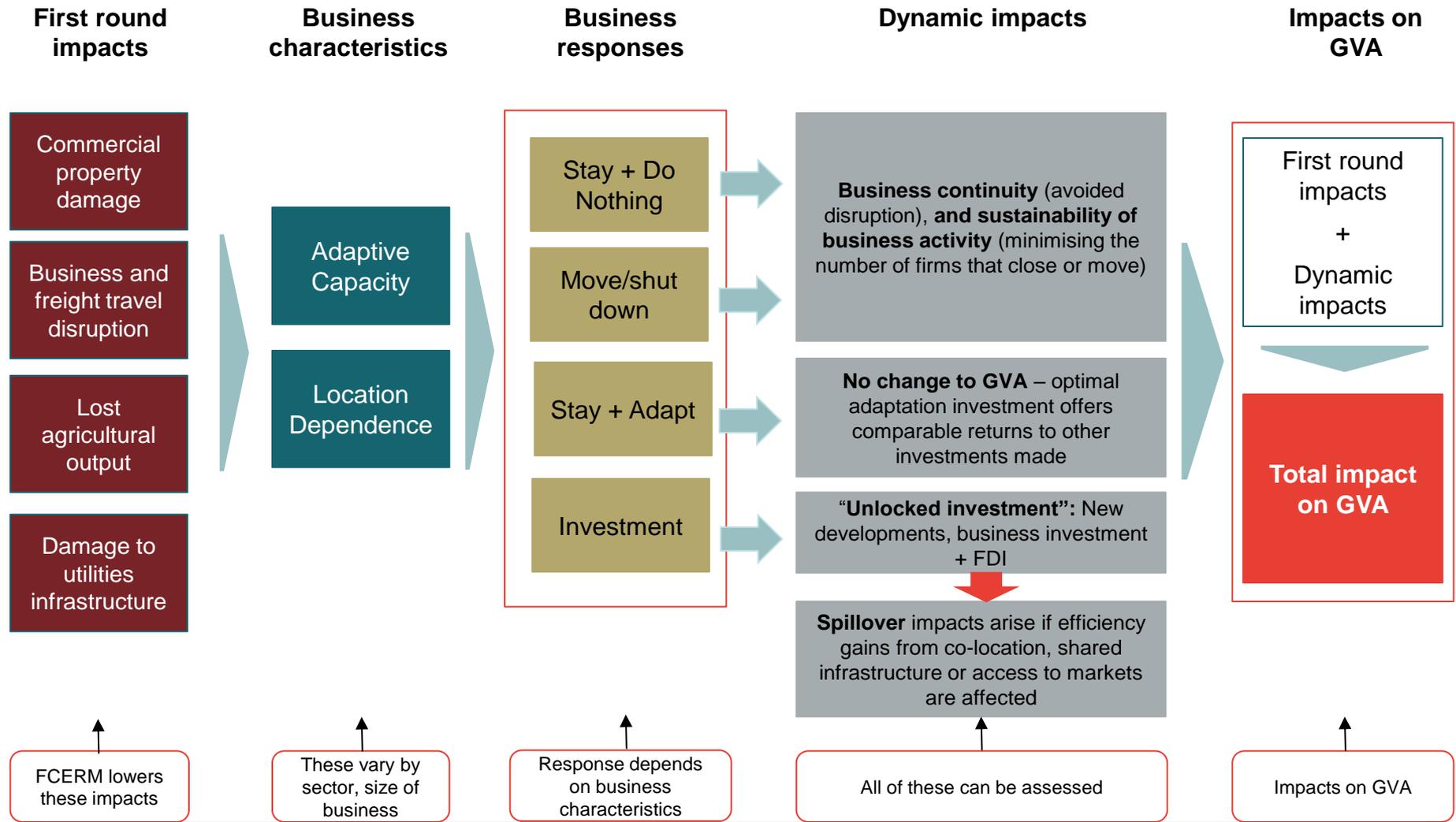
Measurement

These impacts are very location-specific and can be considered quantitatively and qualitatively (with stakeholder evidence)

The Figure on page 10 shows how impacts of FCERM on the local economy are likely to occur.

How FCERM can impact on local economic activity: the 'transmission mechanism'

The 'transmission mechanism' shows how lowering the risk of flooding can feed through into impacts on the local economy. The benefits of FCERM are assessed by comparing the case with the intervention (the 'do something') with the case without the intervention (the 'do nothing').



Non-technical summary – how do I use the toolkit?

What does the toolkit add to the existing FCERM appraisal guidance?

The Environment Agency currently has detailed guidance for assessing the benefits and costs of FCERM interventions. That guidance develops the evidence to inform decisions about where and how much resource is worthwhile investing in FCERM activities.

The advice in the toolkit (see main document) does not replace any of the FCERM appraisal guidance. It adds to it. It provides a richer understanding of the impacts of flood risk on the local economy that can arise over time.

The toolkit is the first of its kind. It offers new approaches to assessing a different range of benefits and costs of FCERM to the local economy. These approaches are expected to evolve as information and experience in these assessments build over time. This toolkit should therefore be developed over time as the evidence base on businesses and their responses to flood risk increases.

Some of the information needed to implement the approaches suggested in the toolkit will be generated as part of the standard FCERM appraisal. Where additional data or information is needed, this is highlighted in green boxes such as the following.

Data needed

Boxes like this offer suggestions for appropriate sources of published data

How to get started: some basics about the toolkit

The toolkit is intended to be user-friendly, yet rigorous and robust. Some important points to note when using the toolkit are now discussed.

(i) Proportionality

As with all appraisals, it is important to make the assessment proportionate. To help with this, alternative approaches are suggested to estimate the size and nature of particular impacts. These are:

- **A detailed approach:** this sets out how primary data collection could be undertaken to estimate impacts specific to the local area under consideration. This may be appropriate for larger-scale schemes for which more in-depth analysis would be justified; and,
- **A lighter touch approach:** this recognises that primary data collection is resource-intensive and may not be justified for some smaller-scale FCERM appraisals. Where this is the case, a lighter touch approach may be more appropriate. Credible secondary data sources are therefore suggested, along with more simple approaches to undertaking the assessment.

Non-technical summary – how do I use the toolkit?

(ii) User tips

Throughout the main toolkit document, you will therefore see suggested user tips.

User Tip

Boxes like this provide helpful suggestions to save you time or to help you with a particular calculation or its interpretation.

(iii) Unit of measurement

Appraisals should ideally account for all costs and benefits of an intervention. The unit of measurement is money where possible, though this is often complemented with qualitative assessments. These monetary measures typically reflect the value (based on evidence) that society is willing to pay to see a particular outcome achieved (whether an increase in something seen as ‘good’, such as a new product, or a reduction in something seen as ‘adverse’, such as flood damage to property). Economists often refer to the aspects society values as components of society’s ‘welfare’.

As noted earlier, analysis in this toolkit uses an alternative monetary measure to capture impacts on the local economy. The unit is **Gross Value Added (or GVA)**. It measures the value added to the economy of each additional hour worked by a worker (measured by the projected earnings for that hour), or the value-added by a business when it puts together different inputs to create a product or service that is worth more than the inputs used (i.e. the profit).

This toolkit is focused on impacts on the local economy and

it uses an **input** based measure (earnings per employee), rather than an output metric. This is because there is good local data on earnings and GVA.

(iv) Focusing only on the benefits or costs generated by the particular intervention

This toolkit uses a standard approach for identifying the impacts of an FCERM intervention. The benefits and costs of the intervention are assessed by outlining what is expected to be achieved with the intervention in place, and comparing this with a credible (stakeholder-tested) view of what would have been likely to happen without the intervention (called ‘the counterfactual’). The difference between the two cases provides an estimate of the impact only of the intervention. This is not always easy, given uncertainties. Therefore, sensitivity tests using different assumptions, or scenarios reflecting a range of flood return periods, are recommended.

(iv) Appropriate interpretation of results

It is important to bear in mind that there is always a level of uncertainty about the impacts of flooding on businesses. This is particularly true when exploring the potential impacts on business decisions and responses over time. Results must therefore be read in that context, and all key results should be subject to ‘stress tests’ using alternative assumptions, and results presented as possible ranges.

We hope this provides you with a basic understanding of this document. For more detail on the framework and technical step-by-step advice see the main toolkit report.