

Funding Flood and Coastal Erosion Risk Management Maintenance: Learning from Existing and Past Practice

Defra

June 2014

Draft Final Report

PB1718



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Document title Funding Flood and Coastal Erosion Risk
Management Maintenance: Learning from
Existing and Past Practice

Document short title

Status Draft Final Report
Date June 2014
Project name FCERM Maintenance Funding Research
Project number PB1718
Client Defra
Reference PB1718/R/303895/PBor

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Date/initials approval ...19/06/14.....FO.....

EXECUTIVE SUMMARY

Royal HaskoningDHV was commissioned by Defra to undertake research to identify and analyse experience of cases where different approaches to funding and undertaking flood and coastal erosion risk management (FCERM) maintenance work have been previously been carried out. The research aims to draw out lessons that could be fed into the future development of policy options to enable increased collaboration in funding of FCERM maintenance work, drawing in funding from non-Government sources where appropriate, and for improved collaboration and partnership working between flood risk management authorities and others with an interest in maintenance activities.

The research utilised a wide range of information sources, including a review of publicly available literature and a targeted survey of staff from key organisations including the Environment Agency, Local Authorities and Internal Drainage Boards. Where appropriate, further details were sought from respondents and other identified key persons.

The identification of existing examples focussed on two areas. Where a body different from the operating authority with the primary maintenance role in a situation had funded or part funded maintenance activity and where such a body has carried out or contributed in kind to a maintenance operation, enabling the existing maintenance budgets to deliver more benefits.

The examples identified have been assessed to establish their relative potential for future application. Each option has been assessed against the following key criteria:

- Scale of applicability
- Cost/effort effectiveness
- Applicability to FCERM operation and maintenance
- Ease of implementation
- Level of capability and professionalism

The appraisal of the identified approaches leads to some overall common findings.

There are no clear examples from abroad that provide readily usable solutions for the UK situation. It appears that the type of alternative approaches that have been identified by this study are more common in the UK than other countries with established flood risk management industries such as elsewhere in western Europe, the U.S.A or Australia.

It is important to recognise the difference between maintenance and capital flood defence works when attracting funding from alternative sources. With capital investments, the contributors are usually funding an improvement that they can actually see such as new flood defences which reduce flood risk. However with maintenance, potential contributors are being asked to fund continuation of something that they may perceive that they already have. It is often not clear where their money is going and therefore communicating the benefits of maintenance activities is a challenge. The need for operating authorities to recognise this challenge and as a result ensure clear communication of the benefits is therefore very important to wider take up.

There is the opportunity through capital schemes to secure on-going operation and maintenance funding or delivery through partnerships and other funding sources. While this has been done successfully in a few cases, there is a lot more scope to take the advantage of the existing partnership funding policy in this regard.

There is a difference between those approaches that strategically gather money for funding maintenance in a general sense (Community Infrastructure Levy, Business Improvement Districts or Local Levy) compared with those where funding is available for a specific local maintenance issue. Although the approaches that gather strategic funds seem to be able to attract far greater amounts of money they are generally not solely for the purpose of FCERM maintenance. The smaller amounts collected to solve specific local issues are usually intended to be used only for FCERM maintenance.

A difference between the delivery approaches is illustrated through the relative level of capacity and professionalism of the persons undertaking the work between large well organised bodies and volunteer groups. The more organised bodies often have a pool of trained and experienced staff with appropriate resources and supervision, safe methods of working, environmental awareness and the safety net provided by insurance cover. Good examples were identified however where some smaller and less formally organised groups have through targeted training and alliancing with other more capable organisations been able to reduce this problem and improve the quality of work undertaken. Such practices need to be shared more widely with other local volunteer groups.

A challenge with many approaches is that maintenance ideally needs a long term commitment from those funding it or delivering the work on the ground. However this type of security is rare with private funders and in some case public bodies where their budgets that they could allocate to FCERM maintenance are not ring-fenced. The use of commuted sums and rolling agreements renewable periodically (say every 5 years) to secure maintenance were identified as workable approaches that could be used more widely.

Funding and delivery approaches developed in one region do not tend to be taken up elsewhere. The reasons for these are not always apparent. Increased publicity and sharing of best practice across the country would be helpful to achieve wider uptake of the opportunities.

A number of approaches to obtaining funding from local beneficiaries are constrained by potential labelling as local taxation or the need for a referendum or similar major activities to put in place. Some easing of these legislative requirements would be helpful.

While this study has looked at approaches individually, combinations could be explored. For example alternative delivery options being combined with an alternative funding source.

Overall there are a wide range of potential approaches but all have their own challenges and there are issues that need to be overcome to ensure their effective implementation. As such there are no easy quick wins to realise a significant funding source or delivery

mechanism. However, by targeting the approaches with higher potential applicability and ease of implementation, addressing some of the legislative, policy or delivery barriers and opportunities, a significant increase in collaborative delivery and funding for maintenance can be achieved.

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1 INTRODUCTION

Royal HaskoningDHV was commissioned by Defra to undertake research into options for increased collaboration in the funding and delivery of flood and coastal erosion risk management (FCERM) maintenance work.

This report documents the findings of this research, and analyses relevant examples from past and current practice to ensure that any lessons learnt can be fed into future policy development.

1.1 Objectives

The objectives of this project are to:

- Gather evidence to support the exploration of future funding policy options for FCERM maintenance
- Explore examples of co-operation in the delivery of maintenance such as payment in kind through work undertaken on the maintenance or operation of assets
- Identify case studies and analyse these to draw out lessons learnt, and the benefits and challenges of the different approaches
- Draw on experience from the UK and internationally
- Consider existing mechanisms and/or powers that can be used to secure contributions towards maintenance

1.2 Approach

This project has been guided by a Project Steering Group (PSG) with representatives from Defra (Lewis Baker, Celia McNally, Carol Tidmarsh, Emma Beckles and Nick Haigh) and the Environment Agency (Ben Lukey and Richard Walker).

A variety of information sources has been considered to investigate and appraise the different approaches available for the funding and delivery of FCERM maintenance. This has included a review of publicly available literature primarily through a desk based internet search. In addition members of the PSG supplied literature relevant to the study and gave suggestions of people to contact regarding other potential examples.

An open request for information from key organisations was also made. This took the form of a short one-page proforma that asked a series of targeted questions and is included as Appendix A. This was issued through key contacts at the Environment Agency, Local Authorities and the Association of Drainage Authorities. This request was also made through the Flownet group on the local government Knowledge Hub website. From this request for information examples were obtained from the Environment Agency, Local Authorities and Internal Drainage Boards.

Following this information collation phase, where appropriate, further details were sought from respondents and key persons. This was undertaken through short structured telephone interviews to explore the potential benefits and issues with certain approaches to funding or delivery of FCERM maintenance.

1.3 Report Structure

Section 2 sets out the context of the research, outlining the scope of maintenance activities that have been considered.

Section 3 then sets out the alternative approaches to the delivery of FCERM maintenance that have been found, considering those that provide funding and then those that facilitate delivery through provision of resources.

Section 4 appraises the potential of the approaches that have been identified and the pros and cons of the approaches, with the detail of the appraisal of individual approaches contained within Appendix B.

Section 5 summarises the outcomes of the research and the key findings.

2 SCOPE AND CONTEXT

FCERM maintenance covers a wide range of activities that includes the inspection and maintenance of assets, operation of mechanical and electrical assets, and deployment of temporary flood defences. The types of maintenance activities that have been considered include:

- Maintaining and operating flood barriers, gates and pumping stations
- Clearing trash screens and grills
- Removing obstructions and sediment from watercourses
- Vegetation management in watercourse channels, culverts, banks and flood embankments
- Inspection and repair of hard FCERM assets such as walls, sluices, culverts and revetments
- Management of natural defences such as beaches and shingle ridges

Maintenance of FCERM assets in England is primarily carried out by the Environment Agency, Internal Drainage Boards, Local Authorities and land owners/occupiers. The powers under which maintenance works are carried out come from the Coast Protection Act 1949, Land Drainage Act 1991 (as amended in 1994), Water Resources Act 1991, Environment Act 1995 and the Flood and Water Management Act 2010.

Typically the powers to undertake maintenance are as follows:

- The Environment Agency has powers for maintenance of FCERM assets on main rivers and for coastal flood defences
- Local Authorities have powers for maintenance of FCERM assets on ordinary watercourses and coastal erosion defences
- Internal Drainage Boards have powers for maintenance of FCERM assets within their internal drainage districts
- Private owners may have responsibility for FCERM assets on land they own or occupy; in addition they have riparian owner responsibilities to maintain conveyance in watercourses adjacent to their property

This review has considered any approach that contributes to FCERM maintenance that involves the use of funds or resources from organisations apart from those with primary powers as outlined above.

3 DIFFERENT APPROACHES TO DELIVERY OF FCERM MAINTENANCE

The following sections outline the different approaches to the delivery of FCERM maintenance that have been identified by this review. The different types of approach have been divided into those that contribute funds to deliver maintenance (Section 3.1) and those that provide resources usually in the form of manpower or where organisations take on the maintenance themselves (Section 3.2). There are also some cases where the approach does both (Section 3.3).

3.1 Alternative Sources of Funding

There is a range of approaches and mechanisms whereby additional funds can be sourced for FCERM maintenance by the asset owner. The approaches have been grouped into the organisation that provides the funding. The three groups are:

- Local Authorities (where maintenance is not their responsibility)
- Local Businesses
- Riparian Owners / Landowners / 3rd Sector Organisations / Communities

3.1.1 Local Authority Funding Arrangements

Local Authorities may choose to fund FCERM maintenance activities through alternative sources where this contributes to their needs and objectives. Although they have local flood risk management powers and responsibilities, funds that they collect or are responsible for may be directed towards maintenance of assets which are the responsibility of others. The following sections describe mechanisms that have been used for this purpose.

Local Levy

The Local Levy is a local income raised by a Regional Flood and Coastal Committee (RFCC) to fund FCERM activities within its region that are a local priority. Lead Local Flood Authorities (LLFAs) contribute to the local levy fund. LLFAs are compensated to some extent by central government grants administered by the Department of Communities and Local Government for their contribution to the Local Levy fund. This is through the Local Services Support Grant, which is not ring-fenced for flood risk management activities.

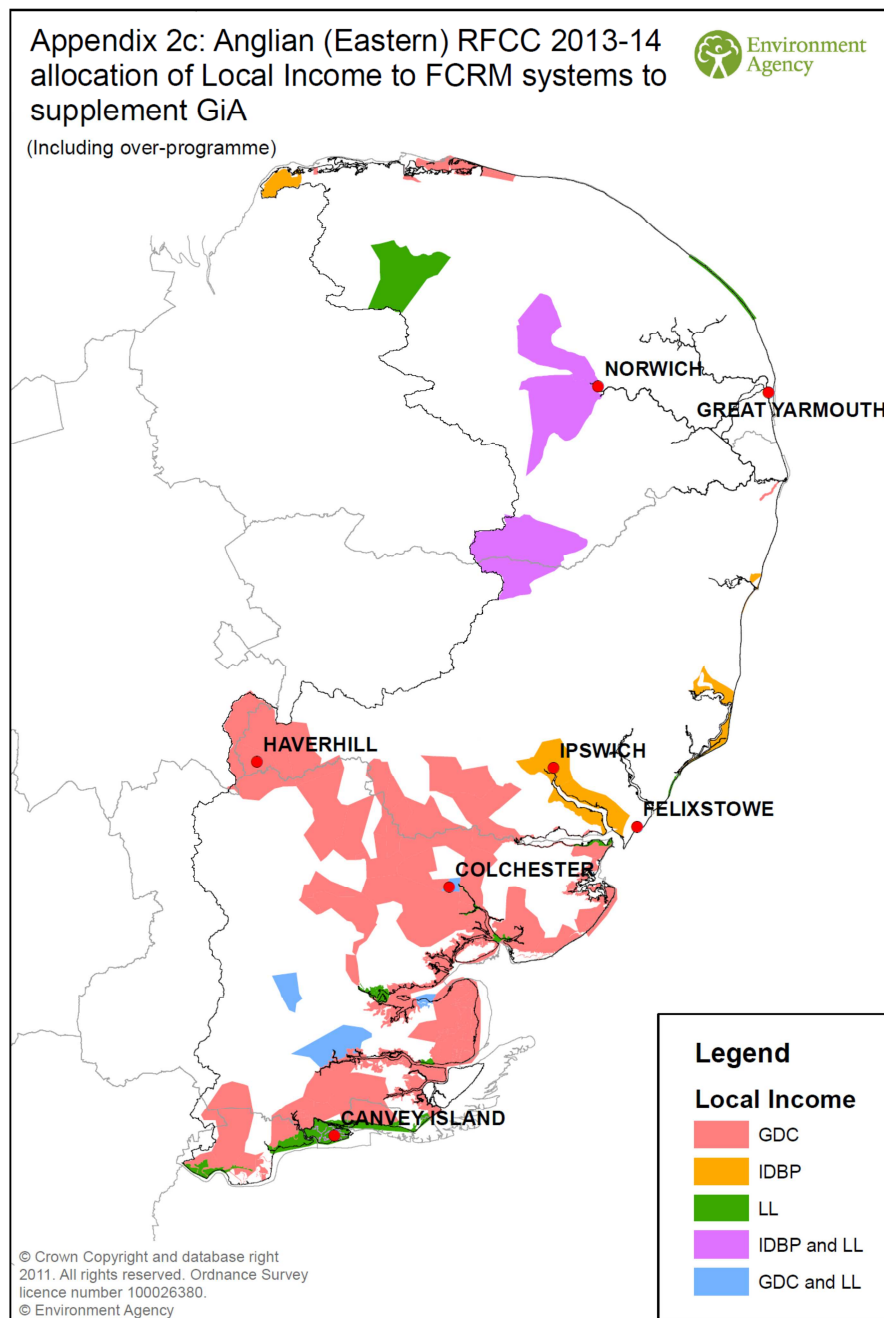
The Local Levy required is discussed by the RFCC annually in January and voted on by Local Authority members only. The total agreed levy needed is raised from all LLFAs within the RFCC boundary and is proportioned across them based on the equivalent number of Band D council tax properties that each LLFA has in the RFCC's area. This means that where Local Authority boundaries cross RFCC boundaries they may pay different rates of levy to different RFCCs. Local Levies do not have to be spent in the year they are raised as balances can be carried forward.

Historically the Local Levy funding had not been used to fund maintenance activities. However in 2013/14 due to the shortfall in available funding from other sources two of the RFCCs in Anglian Region chose to allocate Local Levy funds to the Environment Agency to carry out maintenance. This did reduce the amount of money available to support capital schemes through Local Levy contributions.

The Anglian Central Area RFCC allocated £20,000, while the Anglian Eastern Area RFCC allocated £450,000. These amounts are a relatively small proportion of the total spent on maintenance, representing only 0.5% and 7% of the total maintenance budgets respectively. However using the Environment Agency's prioritisation system this meant that an additional 37 'high consequence' flood risk systems could be fully funded in the Eastern RFCC's area. This contributed to maintenance of conveyance, defences/structures, and providing asset operation/incident response functions. Table 3.1 shows specific uses of the Local Levy funds for maintenance by the Anglian Eastern Area RFCC and Figure 3.1 shows how this has contributed to funding maintenance of FCERM asset systems in this area in 2013/14.

Table 3.1 Maintenance Activities Funded By Local Levy in the Eastern Area of Anglian Region

Location	Description	Local Levy Funding (£k)
River Colne, Colchester	Sluice Gate. East Mill Gates - refurb gates	50
Canvey Island	Tewkes Creek badger sett removal	20
Various	Minor Intermittent Maintenance Projects (<£20k) - Defences/ Structures	101
	Frequent Maintenance on High consequence systems - Conveyance	76
	Frequent Maintenance on High consequence systems - Defences/ Structures	186
	Frequent Maintenance on High consequence systems - Asset Operations/ Incident Response	10
	Frequent Maintenance on High consequence systems - Other	7



(GDC – General Drainage Charge, IDBP – Internal Drainage Board Precept, LL – Local Levy)

Figure 3.1 Allocation of local funds to support maintenance by Anglian Eastern Area RFCC

Section 106 Agreements

Under Section 106 of the Town and Country Planning Act 1990 Local Authorities can set Planning Obligations on developers. They are legally binding obligations that are attached to a piece of land and are registered as local land charges against that piece of land. These obligations enable a Local Authority to secure contributions to services, infrastructure and amenities in order to support and facilitate a proposed development.

Since 2010 there are three legal tests that must be met for obligations to be set:

- a) necessary to make the development acceptable in planning terms
- b) directly related to the development
- c) fairly and reasonably related in scale and kind to the development

In the past this mechanism is known to have been used to gather funds to support delivery of FCERM by several Local Authorities. Known examples include Chichester District Council, Cheltenham Borough Council and the District of Harborough.

However the scope of Section 106 agreements has recently been reduced with the introduction of Community Infrastructure Levies, which are discussed in the following section.

Community Infrastructure Levy (CIL)

CIL was introduced in 2010 to enable Local Authorities to raise funds to provide infrastructure to enable development. Money collected can be used for infrastructure including transport, flood defences and green spaces. The CIL takes over from part of the Section 106 process. It is intended to collect funds to deliver strategic infrastructure that is not specifically related to the development site. When a Local Authority introduces a CIL, Section 106 requirements should be scaled back to those matters that are directly related to a specific site, and are not set out in a regulation 123 list of the CIL; this sets out which types of infrastructure that specific CIL will be used to fund.

Many Local Authorities have set up or are in the process of implementing their CILs. In some cases the regulation 123 list is quite generic while others specify actual projects that will be funded. In general the emphasis seems to be on delivery of new infrastructure and its subsequent maintenance is rarely mentioned.

Portsmouth City Council approved a CIL charging schedule on 24th January 2012; this applies to all development after 1st April 2012. Any future planning applications will have to include information to allow the CIL charge to be calculated. CIL funding will contribute towards specific flood risk management infrastructure projects on Portsea Island and contribute towards implementation of the Portsea Strategy. In Portsmouth, CIL is expected to raise around £41 million over 20 years.

In addition to Portsmouth known examples of Authorities including for FCERM on their '123' lists include Bristol City Council (strategic flood defence measures), Mid Sussex Council (Flood Mitigation), Oxford City Council (flood storage area project), City of London Corporation (flood defence and flood mitigation), Southampton City Council (strategic flood risk), Exeter City Council (strategic flood defences) and Waveney District Council (coastal defence works).

Although this could be a significant source of funds the amount received is not guaranteed. It could not, therefore, be relied upon to deliver routine maintenance work over the long term unless it is specifically built into the way CIL levies are structured to include an allowance for FCERM maintenance over the anticipated life of a development.

Council Tax Precept

A Council Tax precept can be instigated by a Local Authority to address a specific and special expenditure requirement. Implementation of such a levy requires agreement through referendum of the whole authority area where the increase is equal to or greater than the limit set out in the Council Tax referendum principles. For 2014-2105, this limit is set at 2% (Department for Communities and Local Government, 2014). Agreement is determined by the majority of those voting. The levy is then collected with the Council Tax by the billing authority (which is likely to be the borough or district council).

Gloucestershire County Council held a local referendum to allow Council Tax to be increased by 1.1% to raise funds for investment in additional drainage and maintenance work after the 2007 floods. This provides around £2.3 million per year towards FCERM activities in the county.

Parish precept

Parish precepts are typically used for maintenance of playing fields, recreation grounds, village halls, car parks, footpaths, etc. The parish council can also spend money on anything that they consider would be a benefit to the community that is not covered by their specific responsibilities. This could include raising funds for maintenance for flood risk management purposes. Hambledon Parish Council provided incident response and community resilience support role in managing groundwater flooding in 2000/2001 which included establishing a flood warning system, a community communication system, a flood information centre and stockpiling essential equipment (Hampshire Flood Steering Group, 2002).

Unlike Council Tax, the parish precept is not capped, although the Government has considered the potential need for a cap due to parish precepts increasing by an average of 5% in 2013, such that this cannot be excluded in the future. Indeed, a bill was proposed to give effect to Schedule 5 of the Localism Act 2011 to require parish and town councils to conduct local referendums in the event that they chose to increase the precept by 2% or more in the following financial year. However, the Bill failed to complete its passage through Parliament such that it made no further progress (www.parliament.uk, 2014).

3.1.2 Local Business Funding Arrangements

Businesses in some circumstances may be willing to contribute funds to FCERM maintenance where they can see a direct benefit to reducing their flood risk. Examples of approaches which have facilitated this are described in the following sections.

Business Improvement District

Business Improvement Districts (BIDs) are a partnership between businesses and the Local Authority to allow businesses to pay for additional services to improve trading conditions within the boundary of a clearly defined commercial area.

As part of the development of the Lower Don Flood Alleviation Scheme in Sheffield a BID has been set up to pay for part of the capital works and the first five years of channel maintenance. Through using the BID mechanism, the local businesses that benefit from the scheme and maintenance will contribute through a levy on their business rates. This research suggests that this is the first example of this mechanism

being used to fund flood defences and FCERM maintenance, albeit as part of a capital improvement package.

The BID was approved through a ballot of affected businesses in December 2013, and will start in July 2014 subject to receipt of national public funding for the majority of the capital scheme through FDGiA. The BID levy will provide £1.4M, of which £0.55M will completely fund the 5 year river channel maintenance work that has been planned to complement the capital scheme. After 5 years if this is to be continued a new BID must be set up.

Tourist charges

There are examples in other countries where tourist visitors are charged a small amount to help fund the delivery of services. This is typically sourced through an additional charge when a tourist pays for overnight accommodation.

Examples include Rome, Italy where there is an additional charge that must be paid by people staying in the city's hotels and campsites that is used for the maintenance and promotion of the city. City museums contribute to the city's tourist services by adding an extra one euro to every admission ticket for non-residents. In France, a Taxe de Séjour is often collected from tourists, but this varies by location.

In the UK, businesses in Overstrand, North Norfolk considered imposing a similar charge to fund coast protection works; however this has not gone ahead.

Business Rate Supplement

The Business Rates Supplements Act 2009 allows county councils, unitary district councils and the Greater London Authority to levy a supplement on business rates. This supplement can be used to fund additional investment to promote economic development of local areas. This can include investing in physical infrastructure projects. If the revenue from this funding source will be more than a third of the total cost of the project to be funded, the authority must consult affected businesses and hold a ballot. At present there are no known examples of this being applied to fund FCERM activities but it could be used in the right circumstances.

3.1.3 Riparian Owner/Landowner Funding Arrangements

Landowners in some circumstances may be willing to contribute funds to FCERM maintenance where they can see a direct benefit to reducing their flood risk or improving their land drainage. Examples of approaches which have facilitated this are described in the following sections.

Local Group Fundraising

In certain circumstances local interest groups may step in to fund FCERM maintenance where there is no available funding from public bodies. The following section outlines an example of this in the Alde-Ore Estuary in Suffolk.

The Alde and Ore Estuary Partnership has been set up by a group of local landowners and residents with the aim of maintaining and repairing tidal and coastal defences along the Alde and Ore Estuaries in Suffolk. They wish to supplement the available national funding by raising money themselves. Their intention is to raise £5 million through local

landowners donating small parts of their land for property development. All money raised will be donated to a newly formed Charitable Incorporated Organisation which will manage the use of these funds for flood risk management including maintenance works.

In addition, at a smaller scale the Alde and Ore Estuary Partnership are also piloting approaches to encourage the restoration of saltmarsh in front of the existing defences to provide improved toe protection. Volunteers are installing hazel faggots that have been donated by a local landowner and lead member of the partnership.

Somerset Community Foundation is leading efforts to raise money for the Somerset Flood Relief Fund. Although much of the fundraising is intended to assist with recovery after flooding, donations that exceed the short and immediate term need could be used to help increase resilience of communities in the future. The Somerset Community Foundation website notes that this could include an endowment fund for long-term support to communities (Somerset Community Foundation, 2014). This is mainly intended to be for community initiatives related to relief from the impacts of flooding and for recovery rather than ongoing regular FCERM maintenance.

General Drainage Charge

The General Drainage Charge (GDC) was introduced in 1963, and is now raised in line with the regulations set out by the Water Resources Act 1991. It is a statutory levy charged to occupiers of agricultural land that does not fall within an IDB district. It provides a contribution towards certain types of maintenance for flood risk management assets. It is primarily used to ensure conveyance of river systems through actions such as dredging, weed clearance and work to ensure structures remain operable (pumping stations and culverts). The actual rate is linked to the amount of Local Levy raised by the relevant RFCC and the council tax base rate. Land liable for payment of the GDC is not related to its proximity to a river, charges are levied at a uniform rate through the district of the RFCC. Only land greater than 4 hectares in area is subject to the GDC, as it would be uneconomical to collect the charge for smaller areas.

At present it is only raised by the RFCCs in Anglian Region, but there is the legal framework to allow this to be taken up by other regions. In 2013/14 the GDC contributed 22.5% (£4,248,000) of total funding for maintenance by the Environment Agency in the Anglian Region as a whole.

Use of the GDC is aimed at allowing maintenance on systems that are lower priority from a national perspective (fewer properties at risk) that are otherwise unaffordable to maintain. It primarily funds maintenance undertaken by the Environment Agency, but this may include their external contractors as well.

The Anglian Eastern RFCC generated an income from the GDC of £1,953,000 in 2013/14; this constitutes 72% of the local funding for maintenance in their area. The Anglian Eastern RFCC recognised that income from the GDC should fund work to the rural communities from which it is sourced. Therefore they agreed that it should primarily be allocated to conveyance type works with FDGiA and IDB precept allocated on a risk based approach. Table 3.2 details specific uses of the GDC for maintenance in the Anglian Eastern RFCC for 2013/14.

Table 3.2 Contributions to maintenance from the General Drainage Charge by Anglian Eastern RFCC (2013/14)

Location	Description	GDC Funding (£k)
Moverons, Essex	Extension to Moverons Sluice outfall pipe (forward of chamber at front toe) incl new flap	70
River Stour, Suffolk	Repairs to Ely Ouse Gates	68
Point Clear, Essex	Point Clear / grout/Canwedon repairs / NFCDD - intermittent	40
Mundon, Essex	Mundon Hall Sluice New HW and Flap	30
Mayland, Essex	Replace SW HW Pigeon Dock No 1 Sluice	27
Holland, Essex	Rebuild Vehicular Access Ramps 4 no 1 every 25 years	25
Salcott Wells, Essex	Virley Hall Sluice headwall rebuild	20
St Lawrence, Essex	Beacon Hill Revetment Repairs	20
South Woodham, Essex	Repair landslip. Operational Issue 67.	20
Various	Minor Intermittent Maintenance Projects (<£20k) - Defences/ Structures	111
	Frequent Maintenance on High consequence systems - Conveyance	908
	Frequent Maintenance on High consequence systems - Defences/ Structures	380
	Frequent Maintenance on High consequence systems - Asset Operations/ Incident Response	10
	Frequent Maintenance on High consequence systems - Other	1
	Frequent Maintenance on Medium consequence systems - Conveyance	62
	Frequent Maintenance on Medium consequence systems - Defences/ Structures	102
	Frequent Maintenance on Medium consequence systems - Asset Operations/ Incident Response	1
	Frequent Maintenance on Low consequence systems - Conveyance	56
	Frequent Maintenance on Low consequence systems - Defences/ Structures	2

In some areas the Environment Agency has no operational responsibility such as Foulness Island which is owned by the Ministry of Defence. In this location landowners are still required to pay the GDC and £10,000 has been used from the GDC to pilot landowners undertaking their own maintenance. Feedback from Environment Agency staff involved in this pilot indicates that it was successful, with productive liaison between the landowner and Natural England. However it did take a significant amount of staff time to facilitate for a relatively small amount of maintenance work.

Riparian Owners

In some situations Riparian Owners have contributed funds for maintenance of the watercourse.

In Sheffield, the Sheffield Forgemasters, a local business that has riparian ownership responsibilities on the River Don, has funded a three year maintenance contract with the River Stewardship Company (RSC), a social enterprise company. The contract involves invasive species control, vegetation management, and the regular clearance of debris within the channel and riverbank on their stretch of the river. Further information on the

other work of the RSC is discussed in Section 3.2.1. There is also an example of this in southeast England recorded on the Environment Agency's Maintenance Efficiency Register where £650 is contributed each year. It is understood that this register is still developing and the associated data is yet to be validated.

3.1.4 Water Company Funding Arrangements

One example of an alternative approach to funding from Water Companies has been identified in Croatia and is described in the following section.

Croatia Water Charges

In Croatia the State Budget is used for implementation of the National Flood Protection Plan, with the water charges used for investment into the construction of regulation and protective water structures on local waters in accordance with local water management plans. The water charges are also used for maintenance of these structures and, if these funds are not sufficient, then the regional and local self-government units fund the difference (Hrvatske Vode, 2010). Water contribution charges are paid on the principles that (Hrvatske Vode, 2010a):

- Urban developments increase flood risk due to changes in the nature of the landscape and natural watercourses, and because water runs off from urbanised areas more rapidly. This results in larger canals being required and improved maintenance
- The more developed an area is, the higher the risk of pollution and destruction due to flooding
- Increased level of protection against adverse effects leads to an increased value of an area

The water contributions are paid based on the value of location¹, the type of property (business facilities, storage for agricultural products, family houses, other residential buildings for permanent residence, etc.), and special circumstances such as reduced tariffs for veterans of the Homeland war or their family members. Agricultural buildings and structures also receive a reduction. The charge is also based on the surface area of the property.

The funds collected are used for:

- Regular maintenance of watercourses, regulation and protective water structures for international watercourses and torrents (waters of first rank) and waters of second rank
- Construction of regulation and protective water structures whose construction cannot be delayed due to the adverse effects of water
- Preparation and implementation of plans for protection from floods and ice, erosion and torrents, and other planning documents

In addition, the Croatian Act on Water Management Financing (Regulation No. 71-05-03/1-09-2, 17 December 2009) regulates the source of funds for financing of water

¹ Zone A: City of Zagreb and protected coastal zone; Zone B: remaining territory of the Republic of Croatia; and Zone C: areas of special state concern.

management. Although principally focused on water resources and water quality, the Act also includes fees for an amelioration drainage fee. This, along with the irrigation fee, provides the revenue of a regional self-government unit, who are also responsible for collection of the fee (Croatian Parliament, 2009).

The amelioration drainage fee is paid by agricultural land within the territory of the regional self-government units in which drainage facilities have been constructed. The fee is based on the surface area of real estate. The revenues can also be used according to the principles of solidarity and priority (Croatian Parliament, 2009).

The amount to be paid is based on a decision on the calculation of the fee, and this decision can be issued for an indefinite period (Croatian Parliament, 2009). The amount of the charge depends on (Hrvatske Vode, 2010):

- The part of the catchment area on which works are being performed
- The benefit derived from the works
- Potential for collecting the water charge

If an individual wishes to achieve a higher level of safety for their own property, they can use their own funds to finance works in the water system. This can include capital works such as construction of embankments or raising the height of embankments. In all cases, an agreement with Hrvatske Vode is required that includes details on the obligations related to the maintenance of any constructed structure. If the works are carried out, the rights and responsibilities are regulated in a concession contract (Hrvatske Vode, 2010).

3.2 Alternative Resources for Delivery

There is a range of approaches whereby FCERM maintenance can be delivered by organisations other than the asset owner. The approaches have been grouped into the organisation for providing the maintenance. The six groups are:

- Charities / Volunteers
- Parish Councils
- Landowners
- Internal Drainage Boards (where they do not have a remit to undertake maintenance)
- Local Authorities (where they do not have a remit to undertake maintenance)
- Community Payback

3.2.1 Charity/Volunteer Led

Charities and volunteers are often willing to contribute to the delivery of basic FCERM maintenance activities, particularly where either they wish to improve their local environment or they have been subject to recent flooding or erosion events. Usually the scope of maintenance they undertake is relatively basic due to a lack of expertise and equipment. Examples of this type of approach are described in the following sections.

Social Enterprise Companies

Social enterprise companies are generally defined as businesses that help people or communities. There are examples where such organisations have been set up with the aim of improving watercourses which can include basic maintenance activities. An example of this is the River Stewardship Company which is described in the following section.

River Stewardship Company

The River Stewardship Company (RSC) was established by a group of public and third sector partners including Sheffield City Council, Groundwork Sheffield, Sheffield Wildlife Trust, Environment Agency, South Yorkshire Forest, Five Weirs Walk Trust and Upper Don Walk Trust. The RSC is a company limited by guarantee which undertakes riverside management work for riparian owners, and community projects involving local communities and volunteers. They are involved in a number of projects that are described in the following paragraphs.

A current project they are undertaking in partnership with the Environment Agency is the River Friends Project. This is delivering management of the waterways involving riparian owners and local communities at six 'show sites' along the River Don in Sheffield. The focus is on ensuring the river is kept free of debris and litter, and maintaining conveyance. The RSC has developed a standard specification for management of vegetation in the river channel and a standard approach for engaging riparian landowners.

The Young Riverlution Project involved working with the Environment Agency, Sheffield Wildlife Trust, Remedi and the River Stewardship Company. Young people learnt important skills whilst helping to improve local rivers and increasing awareness of flood risk. This four month project worked with 30 young people on several five week programmes; the aim of which was to improve the skills, knowledge and experience of those involved so that they are better placed to find employment or go in to further education or training. The young people took part in surveys to assess the quality of certain water-bodies and then carried out work to address some of these issues. Practical tasks that have been undertaken include removal of trees that are at risk of falling in the water and causing potential blockages, removing barriers to fish passage and providing habitat for important invertebrates.

The Community Riverlution Project used funding from a number of different sources including Environment Agency, Police Crime Commissioner, Shiregreen and Brightside Community First; the project will deliver 48 volunteer days in areas at risk of flooding and on water bodies where mitigation measures have been identified by the Environment Agency to address specific failures under WFD. RSC hosted the volunteer days, whilst Sheffield Wildlife Trust (SWT) will provide a mentoring service for the young people as well as supporting them with progressing towards nationally-recognised AQA or ASDAN accreditations. The Youth Justice Service/Remedi assisted in the referral of young offenders that match the NEET (Not in Education, Employment, or Training) requirements onto the programme and provide supervision and transport.

River Trusts

Rivers trusts are independent charitable organisations working for the public benefit through management of river watercourses. Much of their effort is concentrated on practical management of the river catchment and fisheries, and is often centred around restoration works. Through their activities some trusts do get involved in the delivery of FCERM maintenance. The following sections describe two examples that were identified.

The Eden River Trust

Eden River Trust are undertaking river restoration that will include enabling the river to adjust its course of its own accord as part of a project to assess if this can reduce the cost of river maintenance, while also avoiding causing problems for people. (<http://trust.edenrivertrust.org.uk/eden-rivers-festival-eden-valley-events.html>)

The Tyne Rivers Trust

The Tyne Rivers Trust is rolling out Selective River Maintenance which targets conveyance of floodwaters without causing damage to the environment or landscapes. (<http://tynerivertrust.org/wp-content/uploads/2013/08/Position-statement-River-maintenance.pdf>)

Flood Action Groups

Flood action groups are community-based groups who work on behalf of the wider community in finding ways to reduce flood risk. They typically form in areas following flooding events that act as a catalyst for action. In most cases they act as a voice for their community to work in partnership with relevant agencies and authorities that manage flood risk. However in some cases they have taken it upon themselves to actively maintain their local watercourse through basic activities such as vegetation clearance and debris removal. Examples of where this has been happening are described in the following sections.

Bodenham Flood Protection Group

This local group in Herefordshire formed in 2008 following flood events of 2007 as a sub-committee to the parish council. The group comprises 50 registered volunteers and aims to reduce flood risk in their local area.

The maintenance activities that they carry out include clearance of drains and watercourses of trash and debris, and removal of silt from around flapped outlets. In addition they stockpile sandbags for use in the event of a flood. During the summer months these activities are carried out at fortnightly working party sessions by the volunteer members of the group. Through this regular action they have improved conveyance on their watercourses and reduced flood risk.

They were initially supported with finances from the parish council to buy tools (spades, mattocks, buckets, waders and drainage rods), but through their own fundraising were able to repay the loan. In addition grants from the Bodenham Community Charity have enabled the purchase of pumps, a trailer to transport equipment and metal cages to store prepared sandbags. West Mercia Police Authority also donated high visibility vests, torches and first aid equipment to the group.

Hanneys Flood Group

This local flood group in Oxfordshire was set up following the flooding that occurred in East and West Hanney in 2007. It consists of volunteers who work to reduce the risk of flooding, including undertaking basic maintenance activities on local watercourses including a main river (Letcombe Brook). This has included vegetation removal such as fallen trees, soil removal to increase the capacity of drainage ditches, litter removal from watercourses and rodding of road drains. In the past they have also been assisted by offenders serving community payback sentences (previously known as community service). The potential for the use of community payback offenders is discussed further in Section 3.2.6.

West Felpham Flood Action Assembly

This local flood action group in West Sussex was formed following flooding in June 2012. Through funding from West Sussex County Council's Operation Watershed Active Communities Fund they were able to carry out significant maintenance on an existing drainage ditch. This involved removal of vegetation and 168 tonnes of soil from 230m of the ditch. The £8,500 funding was used for hire of equipment (small excavator) and disposal of the waste material.

Deben Estuary Groups

There are several groups within the Deben Estuary in Suffolk who have taken it upon themselves to undertake FCERM activities including maintenance of the tidal defences.

At Sutton the River Deben Association (RDA) undertook work to restore an area of saltmarsh that protects the toe of the flood embankment. This was achieved through the installation of brushwood groynes to trap sediment and allow the saltmarsh to grow. In 2008 a proposal was submitted for £2,500 from the Sustainable Development Fund, which the RDA undertook to match from its own funds, and a further £200 from the Woodbridge Society. The bid stated that all the labour should be voluntary from RDA membership and friends, and manpower from HMP Hollesley Bay Colony. The work was completed in April 2009.

Since then, at Sutton Hoo, the Deben Estuary Partnership (DEP) has made use of dredged material that was being extracted to maintain navigation to boatyards and marinas at Woodbridge on the other side of the estuary to restore saltmarsh. This dredged material would otherwise have been disposed of as waste by the boatyards and marinas. The DEP funded the transport of dredgings to the site.

More recently at Falkenham, nearer to the mouth of the estuary, the DEP has undertaken work to reduce flows in the channels through the marsh to encourage sediment accretion and reduce erosion over 22 hectares. This was funded by the Touching the Tide project, a Landscape Partnership Scheme for the Suffolk coast funded by the Heritage Lottery Fund.

Kilnsea and Spurn Flood Defence Group

As part of the development of the Humber Estuary Flood Risk Management Strategy it became apparent that the coastal flood defences at Kilnsea could not be sustained into the future as it would not be economically justifiable and erosion was threatening to wash away the existing defences. As a result, a partnership funding scheme was

developed to construct a new earth embankment defence with the condition that the Kilnsea and Spurn Flood Defence Group would take on responsibility for its management. These defences have been set back and are expected to last for 20-30 years until coastal erosion will start to undermine them. A legal agreement was set up between East Riding of Yorkshire Council, the Environment Agency and the Kilnsea and Spurn Flood Defence Group to establish this responsibility (Environment Agency, 2008).

Volunteer Flood Wardens

Although not directly involved in maintenance, the volunteer flood warden schemes across the country are a mechanism by which issues with FCERM assets can be brought to the attention of the Environment Agency. This could be extended to reduce the burden upon Environment Agency staff to inspect certain aspects of the FCERM asset systems.

Other Local Volunteer Arrangements

In addition to the examples already discussed the Environment Agency's Maintenance Efficiency Register recorded two further local examples where volunteers have assisted in delivering the FCERM maintenance programme in southeast England.

- A volunteer from Stanford Hill HMP assisted in delivering maintenance
- A work placement student from an agricultural college assisted in delivering maintenance

Catchment Management Partnerships, Australia

In Australia, catchment management partnerships which operate between public sector, private sector and communities have recently been involved in the delivery of FCERM maintenance. This has grown following the significant flooding that affected parts of Australia in 2010-11.

An example of this type of group is the Condamine Alliance that works to repair and conserve the environment in the Condamine catchment, in Southern Queensland. Examples of their involvement in maintenance related activities include debris and rubbish clearance after flood events. They work with local councils, landholders, community groups and Conservation Volunteers Australia.

3.2.2 Parish Council Led

Parish Councils can act as a local body to co-ordinate the actions of a community to contribute to FCERM maintenance. The following examples outline two cases where this has been set up, in addition many of the flood groups described in Section 3.2.1 are strongly linked to their parish council.

Teignmouth, Devon

Shaldon Parish Council in Devon operates the 10 flood gates that form part of the Shaldon flood defence scheme with 40 volunteer flood wardens providing local ownership and operation of the scheme.

Hawkshead, Cumbria

The village of Hawkshead in Cumbria has recently suffered from flooding due to blockage of trash screens owned and operated by the Environment Agency. The village

is remote and difficult to access during events; as a result local people have started to take it upon themselves to attempt to clear the screens during events, which is not safe.

The Environment Agency has entered into a partnership with the Parish Council to formalise this maintenance assistance. Volunteers have been issued with equipment and received training from the local Environment Agency Team to enable them to safely carry out maintenance. The volunteers are working under the insurance of the Parish Council to ensure there are no liabilities for the Environment Agency. The partnership has only recently been established but initial indications are positive.

3.2.3 Landowner Led

Owners of land adjacent to main rivers (riparian owners) are able to carry out some maintenance work on the watercourse to improve land drainage and reduce the effect of flooding without getting permission from the Environment Agency. These activities are as follows:

- Removal of in-stream debris and rubbish
- Undertaking minor tree works: cutting back trees and other vegetation, and removal of fallen trees
- Trimming grass/vegetation on the banks and in the channel

However other activities require permission to ensure there are no adverse impacts on the environment and they comply with the law. There are several examples of situations where the Environment Agency has worked in partnership with landowners to enable them to carry out maintenance activities while complying with relevant legislation. These are outlined in the following sections:

Environment Agency River Maintenance Pilots

The Environment Agency is currently piloting an arrangement where landowners will be allowed to carry out de-silting work on main river watercourses without the need for flood defence consent. Farmers and landowners will still need a waste exemption. It is available for free and is valid for 3 years. The waste exemption will enable farmers and landowners to spread low risk silt material on their land without the need for further permission.

The Environment Agency has published a Regulatory Position Statement (Environment Agency, 2013d) outlining the arrangement and an accompanying Environmental Good Practice Guide (Environment Agency, 2013a). It specifically relates to de-silting (removal of fine silt and sediment) and not dredging (deepening and widening channels). The trial period began in October 2013 for seven pilot locations across England:

- Alt Crossens, Lancashire
- River Duckow, Shropshire
- River Idle, Northamptonshire
- Bottesford Beck, North Lincolnshire
- River Brue, Somerset
- Upper Thames, Oxfordshire
- Winestead Drain, East Riding of Yorkshire

Each pilot area has an appointed Environment Agency lead person who must be notified by any landowner wishing to undertake work under this arrangement. This is an example of a process which is reducing the regulatory burden on landowners wishing to undertake river channel maintenance to reduce flood risk to their land.

Following a review of the pilots after six months of operation it has been decided to extend them until March 2015, increase the area of the River Idle pilot to cover the whole of the Isle of Axholme and introduce two new pilot areas, the River Eau in Nottingham and East Lytham in Cumbria. In these first six months uptake has been low due to the wet winter when several of the pilot areas were flooded and many landowners have been unable to do any river maintenance work. In total 1.3km of watercourse maintenance has been undertaken by landowners using the new regulatory approach with a number of other landowners considering work in Autumn 2014.

Other Local Arrangements

In addition to the examples already discussed, the Environment Agency's Maintenance Efficiency Register records further local examples of where landowners have delivered FCERM maintenance or assisted the Environment Agency in doing so as outlined below.

- Arrangements made with local farmers to graze land instead of the Environment Agency cutting vegetation in Kent and South London
- Riparian owner agreed to undertake CCTV survey and culvert clearance instead of the Environment Agency's contractor in Sussex
- Handing back the maintenance, ownership and responsibility to riparian owners of trash screens that do not provide any flood defence benefit to properties (15 handed back in Wessex)
- Provision of an alternative access route by a landowner for maintenance where the current access is in poor condition and needs significant work
- Operation of manually operated sluice gates by the landowner to parameters set by the Environment Agency. This is subject to a pending legal agreement

3.2.4 Internal Drainage Board Led

Internal Drainage Boards (IDBs) in some circumstances will undertake maintenance work on watercourses outside their area of responsibility, typically main rivers that are the responsibility of the Environment Agency. This is usually where they feel there is a land drainage benefit in carrying out maintenance in locations that the Environment Agency does not consider a high priority for funding. Examples of where this is known to have happened are described in the following sections.

Moreton's Leam, Whittlesey

Moreton's Leam is a Main River and serves to discharge the flood storage water from the Nene Washes (a major flood storage reservoir on the River Nene) into the tidal River Nene. The 8km² area of the reservoir is part of the North Level District Internal Drainage Board. The IDB would like this channel to be maintained to a higher standard to evacuate the flood water more quickly after flood storage to restore maximum capacity for the next rainfall event, together with restoring important road networks across the Washes. The Environment Agency was unable to secure funding for the channel as it is classified as a low risk system given no property is at significant risk of flooding from the

Washes. The previous maintenance agreement was also more restrictive due to the perceived impact of maintenance on statutory European and National environmental designations. The IDB, the Environment Agency and Natural England have worked together to agree a less restrictive approach.

An agreement was made between both parties whereby the North Level District IDB would be responsible for the maintenance of this Main River for a 10 year period. The Environment Agency agreed to pay 50% of costs in Year 1, 25% in Year 2 and 15% in Year 3. Thereafter, all costs are to be borne by North Level District IDB. The Environment Agency committed to increase monitoring of the watercourse to provide evidence that the altered maintenance regime has not had an ecological impact, which allowed Natural England to grant the assent to complete the works.

Other Local Arrangements

In addition to the example already discussed, the Environment Agency's Maintenance Efficiency Register records two further local examples of where IDBs have delivered FCERM maintenance. These include maintenance, by an IDB, of main river sections downstream of IDB outfalls and joint weed screen clearance.

3.2.5 Local Authority Led Maintenance

In some circumstances a Local Authority may agree to undertake maintenance of certain FCERM assets that are outside their responsibility on a main river or at the coast. An example of this is an agreement for 150m of flood embankment as part of the Grange Crescent Scheme, Halesowen.

3.2.6 Offender Rehabilitation and Employment

There are several examples where current and recently released offenders have been used to provide additional labour for delivering FCERM maintenance as well as providing them with skills and vocational experience in landscape management. These examples are discussed in the following sections.

Community Payback

Community Payback, formerly known as community service, is the process whereby convicted offenders are sentenced to undertake unpaid work for the benefit of the community. This can involve basic maintenance and landscaping work, and there are several examples of where this has been for the purpose of FCERM. In addition, community payback offenders have recently been used to fill sandbags for temporary flood protection in West Mercia, Cambridgeshire and for the Somerset Levels.

As previously outlined in Section 3.2.1, community payback offenders have been used to assist the Hanneys Flood Group in Oxfordshire with vegetation removal from river channels.

In Cornwall, as part of the Defra Community Flood Resilience Pathfinder projects, community payback offenders have been used to clear leaf litter from watercourses and drainage systems. The project led by Climate Vision, a climate change consultancy based in south-west England, removed leaf debris in Par, St Blazey and Lostwithiel.

Offender Rehabilitation and Employment Schemes

There are several examples of organisations that work with offenders who are recently released from prison and who are seeking work and young offenders. These organisations offer employment training to these individuals in basic landscaping and maintenance work. They have partnered with the Environment Agency to provide basic maintenance services and are funded by alternative sources such as local authorities and probation services. Two examples of this are described in the following sections.

Groundwork Trust / Bluesky

In 2009 Groundwork MSSTT (Manchester, Salford, Stockport Tameside and Trafford), an environmental regeneration charity, established Blue Sky in North West England, a franchise of the social enterprise Blue Sky Development and Regeneration. Blue Sky is a landscape management and construction business whose aim is to support people leaving prison by providing them with employment and training. This will hopefully reduce re-offending risk and support ex-offenders in securing sustainable future employment.

A pilot project was set up in 2009 to explore the potential of Blue Sky delivering environmental asset management work for the Environment Agency in Greater Manchester. This has been funded in part by the Environment Agency with match funding provided by the Future Jobs Fund and Manchester City Council's Working Neighbourhood Fund programme. Following the 2009 pilot, the Environment Agency has continued to work with Blue Sky, and between 2009 and 2012 the programme delivered £154k of maintenance work. Of this £57k (38%) of funding has been obtained from third parties (Future Jobs Fund or Manchester City Council's Working Neighbourhoods Fund), with the remainder coming from the Environment Agency.

The main activities that have been undertaken as part of the pilot project have included:

- Installation of fencing and gates
- Improving access to riverbanks and grids through vegetation clearance
- Clearance and tidying of access areas to grids
- Constructing and renewing paths
- Painting

The Skill Mill Ltd

The Skill Mill is a social enterprise that offers employment to young offenders in the Tyne and Wear area of North East England. It has been formed through a partnership between the Newcastle Young Offending Team and the Environment Agency. The scheme is a demonstration project for the Environment Agency's Northern Ambition NEET initiative.

Young offenders have been taking part in basic flood risk management maintenance works on ordinary watercourses such as clearing debris and excavating channels to improve conveyance. This began with a pilot in April 2011, supported by the Northumbria RFCC. Works undertaken included litter and debris removal, building new water channels and improving drainage.

Recently the Skill Mill has been awarded support through the School of Social Entrepreneurs with £4000 funding from Lloyds Banking Group and the Big Lottery Fund. Also involved has been the National Offender Management Service.

3.2.7 Public Private Partnerships (PPP)

Public Private Partnerships (PPPs) are collaborations between public bodies and private companies to deliver services over an extended contract period. The private company is usually expected to deliver the design, construction and commissioning of all assets necessary to provide the service. Once the service is available for use, the contractor is paid an agreed periodic sum that is dependent on the level of service provided. Throughout the contract period the contractor is responsible for the maintenance of the asset. The confidence, security and commitment that is given by PPPs leads to efficiencies, and enables the best resources and skills of both private and public to be brought in to deliver the service, which provides better value for money. In terms of FCERM these agreements can provide certainty in expenditure over the long term, which is very valuable. Two examples of PPPs in operation in the UK that undertake FCERM maintenance are discussed in the following sections.

Pevensey Public Private Partnership

Pevensey Bay in East Sussex comprises a shingle beach and embankment with aging timber groynes. This provides flood defence to 50km² of land with significant number of receptors including over 17,000 properties, roads and railway lines and internationally important wetland environments.

The PPP contract at Pevensey requires a consortium to provide a specified standard of protection (1 in 400 years) to a coastal frontage for 25 years through beach management and groyne maintenance. The consortium comprises Westminster Dredging, Bean & Dyball, Mackley Construction and Mouchel. They formed Pevensey Coastal Defences Limited to deliver the contract which is worth around £30 million over the 25 years at 1999 prices. To ensure the performance of the consortium, they are required to prove that there is a certain volume of shingle on the 9km of beach which is being maintained and that a minimum width to the crest of the shingle bank is maintained.

Alongside providing certainty in expenditure for the Environment Agency, the long-term nature of the contract has allowed the consortium to experiment with approaches to beach maintenance while still meeting the specified performance objectives.

Broadland Public Private Partnership

The 20 year Broadland Flood Alleviation Project, which is a £150m contract that began in 2001, is an example of where a flood alleviation scheme is being successfully delivered using a Public Private Partnership approach. This scheme provides a range of flood defence improvement, maintenance and emergency response services in the Norfolk Broads.

3.3 Alternative approaches to both funding and delivery

There are some approaches that have been found that combine both the funding and delivery of FCERM maintenance. The two examples that this applies to are discussed in the following sections.

3.3.1 Public Sector Cooperation Agreements

A Public Sector Cooperation Agreement (PSCA) allows the Environment Agency and other public sector Risk Management Authorities (Internal Drainage Boards and Local Authorities) to deliver maintenance through a partnership approach. This is an example of the implementation of Section 13 of the Flood and Water Management Act 2013 that relates to co-operation and arrangements between risk management authorities.

This has recently been developed for use with IDBs and there are now several examples of its implementation. There are initial discussions that are ongoing with some local authorities (Leeds City Council and Bradford City Council).

The agreements are set up to cover a five year period and provide the frame work for allowing a range of maintenance activities to be undertaken by either party and on either party's assets. The guidance on setting up a PSCA outlines the full range of maintenance activities that could be undertaken and these are listed below:

- Asset condition inspection
- Operational inspection
- System monitoring
- System operation
- Maintaining structures
- Grass cutting (Hand or mechanical)
- Tree works
- Defence repair
- Work on flood storage reservoir
- Obstruction removal / debris clearance
- Environmental management
- De-silting and dredging
- Pumping operations
- Bank reprofiling/ reinstatement
- Asset improvement works
- Transportation of plant
- Weed control (mechanical and chemical)
- Pest/ vermin control.

Once the PSCA is in place the intention is that on an annual basis the two parties will meet to discuss their respective maintenance needs, available resources and budgets to establish how they can best work together to meet their respective goals for maintenance of their assets.

The agreement specifies that all maintenance activities must be carried out free of charge or at cost (not for profit). As such this should be cheaper for the funding partner in comparison to a standard contractual arrangement where fee rates will include an element of risk and profit. An existing example with the Trent Valley IDB has led to an estimated 10% saving for using the PSCA and IDB cost rates. Initially the IDB had been contracted to undertake £65k of maintenance work on commercial rates, however moving to the PSCA has reduced the cost through removal of risk from the rates. However if the work takes longer than expected the Environment Agency may incur further cost, placing some risk onto them.

Once specific work has been identified a requisition is made that specifies the exact arrangements for that task. This will include how it is funded (solely by one party or in partnership), who is doing the work and which plant assets are to be used. The party doing the work is responsible for preparing relevant health and safety documentation (Risk Assessment's and Method Statements), and for supervision of the work.

A summary of the arrangements that are already in place is shown in Table 3.3 and agreements that have been made in principle are summarised in Table 3.4. There are a number of other IDBs and other organisations where initial discussions are in progress or are planned for the near future. At present the work undertaken/planned is vegetation management, de-silting and incident management. This is primarily due to the agreements being introduced mid-year in 2013 and it is hoped that for the next financial year the scope of work will be extended.

Table 3.3: PSCA Agreements in Place

EA Region	IDB	Details
Anglian	Black Sluice	Works identified for 2013/14 Weed control Screddington Beck Bushing works Screddington Beck Training for IDB to assist Pumping Station operation (tba) Obstruction removal during a flood incident
	WITHAM 1st	Works identified for 2013/14 Weed control Anwick Catchwater Obstruction Removal during a flood incident
	WITHAM 3rd	Works identified for 2013/14 Engine Drain reinstatement works, Fiskerton Obstruction removal during a flood incident
	UPPER WITHAM	Works identified for 2013/14 Weed control, Skellingthorpe Beck and Cardinal Dyke Bushing work , Boutham Catchwater Obstruction removal during a flood
	NORTH LEVEL	Proposed works include Weed control and grass cutting (Jan –May 2014) Counter Drain Weed control works (2014/15) Carr Dyke, River Folley, Padholme Drain and, Brook Drain
Midlands	TRENT VALLEY	Extensive schedule of work to be undertaken in 2013/14, replacing IDB tendered work Includes grass cutting, weed control , tree / bushing works, inspections and obstruction removal (c. £65k)

Table 3.4: PSCA Agreements in Principle

EA Region	IDB	Details
Anglian	LINDSEY MARSH	Works identified for 2013/14 and 2014/15 Partnership working re de- silting River Steeping Obstruction removal during a flood incident
	WITHAM 4TH	Potential work includes support during flood incident and maintenance works subject to further discussion.
	WELLAND AND DEEPINGS	Potential works include Weed control (2014/15) Siphon Drain (Crowland and Cowbit washes) Obstruction removal during a flood incident
	KINGS LYNN IDB	Potential 2014/15 work includes Inspection /clearance of weedcreens, operation of penstocks and gates Heacham, ingol, Babingley outfalls, support during flood incident
	BEDFORD IDB	No details
	CAMS CONSERVANCY (Navigation Authority)	FWMA allows Navigation Authority to undertake work for Flood Risk Management Authority but not vice versa

3.3.2 New Internal Drainage Boards

There are some areas of the country where, for local historical reasons, some rural watercourse reaches with relatively few properties are designated as main rivers and therefore are the responsibility of the Environment Agency. The historical reason may relate to en-maining to enhance delivery of particular improvement works or as part of the bulk en-maining of critical ordinary watercourses. Under current guidance, a main river needs to be continuous, so once a section is en-mained due to a local flood risk issue, the en-maining then continues downstream irrespective of the risk. While this guidance has been provided for sound operational reasons such as to ensure conveyance or flood risk standards, areas of interest are not constrained by downstream capacity or restrictions, in some cases, it has led to a number of main river lengths with low risk and as a result low priority for maintenance by the Environment Agency. As a result funding for maintenance is limited and in three locations in north-west England and at eight locations in south-east England a solution that has been proposed is to establish new IDBs. As part of this process the Association of Drainage Authorities and the Environment Agency produced a guidance document (Environment Agency, 2011) to assist in facilitating this process as the last IDB to be formed was Swavesey IDB in 1981. Key issues with this approach are the financial implications on landowners who would be required to pay drainage rates to any new IDB and the Special Levy that local authorities are required to pay to the IDB for benefits to the wider community.

The following sections outline the three examples where new IDBs have been proposed and the challenges they have faced.

North Cumbria

The Waver and Wampool catchments in northern Cumbria flow northwards into the Solway Firth. They are largely rural and have wide floodplains in their lower reaches. Flood risk and land drainage is managed by channel maintenance, raised embankments and four land drainage pumping stations. Part of these catchments was until the late 1970's part of the Waver and Wampool Internal Drainage District. However this was abolished in 1975 with all maintenance transferring to the North West Water Authority (which subsequently became the National Rivers Authority and then the Environment Agency).

Due to its reprioritisation based on flood risk, the Environment Agency announced that it would no longer be able to operate three of the land drainage pumping stations. This led to investigations to establish how land drainage could be maintained into the future with one option being the formation of a new IDB. A feasibility report (Environment Agency, Association of Drainage Authorities & Waver Wampool Wiza Waterways Group, 2011) was produced to explore the potential for this including consultation with local communities and authorities.

Following further discussions the deadline for ceasing operation of all four pumping stations was extended to December 2015 by the Environment Agency. The intention is still to facilitate a handover of these assets to a new IDB. As of November 2013 the Environment Agency is still undertaking consultation to establish the level of support for a new IDB (Environment Agency, 2013c). This is primarily among landowners who will pay drainage rates and the local authority (Allerdale Borough Council) who will need to

raise the Special Levy to contribute to the new IDB. The National Farmers Union and the Country Landowner and Business Association have consulted the farming landowner community and there is 80% support for the proposals. If there is sufficient support the next step in this process would be to prepare a justification statement to promote the establishment of a new IDB.

South Cumbria

The Lyth Valley in southern Cumbria comprises a pumped drainage and flood defence system with embanked high level watercourses and a low level network of drainage channels with pumping stations to assist drainage. Until the late 1970s, areas of the Winster, Bela, Lyth Valley, Duddon, Newland Moss and Windermoor catchments were within Internal Drainage Districts. In 1975 the River Kent Estuary IDB, River Winster IDB and the Beetham and Arnside IDB were amalgamated to form the River Kent Estuary Internal Drainage District. The North West Water Authority (which subsequently became the National Rivers Authority and then the Environment Agency) took over all maintenance of these systems.

Due to the reductions in funding for maintenance, the Environment Agency announced that it would no longer be able to operate three pumping stations on the Lyth Valley from 31st January 2013 and another from 31st January 2014. This led to investigations to establish how land drainage could be maintained into the future with one option being the formation of a new IDB. A feasibility report (Environment Agency, Association of Drainage Authorities & South Cumbria Water Level Management Group, 2011) was produced to explore the potential for this including consultation with local communities and authorities.

This initial proposal was rejected by local residents as it required many who are not at risk of flooding to contribute. The deadline for cessation of pumping station operation was extended to December 2015 (Environment Agency, 2013b).

More recently in January 2014 a new proposal for a drainage board financed by a local levy has been put forward. This proposal involves a levy on farmers, landowners, households and businesses only. South Lakeland District Council will collect any levy imposed.

Alt Crossens

The Alt Crossens catchment is the drainage area between the Ribble and Mersey Estuaries in Lancashire. The area is primarily drained by pumping stations with two main stations at Altmouth and Crossens providing pumping from the drainage network to the sea, and ten smaller stations within the drainage area. These assets are currently operated by the Environment Agency, however due to reprioritisation of budgets based on flood risk, they wish to reduce their annual revenue spend in the catchment by £1 million.

Through consultation and the work of the Alt Crossens Advisory and Partnership Group it has been decided that the best way forward is to promote two complementary options. These involve creation of a Flood Risk Partnership to manage risk at the catchment scale, and formation of a new IDB to manage drainage of the low-lying land.

The main challenge at present to implementation of this solution is the ability of the local authorities to fund their contribution through the Special Levy. Until recently they were able to reclaim 60-90% of any money paid as Special Levy from the Department of Communities and Local Government (DCLG) in an arrangement known as the Formula Grant. However Local Authorities now receive funds through their annual grant from DCLG to reflect the length of ordinary watercourse within their borough. This is broadly similar to the amount originally received through the Formula Grant but this is not ring-fenced.

In addition the amount of money that local authorities receive from DCLG is fixed until 2020 under the comprehensive spending review settlements. Therefore the affected authorities are not able to seek an increase in their budgets to fund their contribution to a new IDB. In this interim period it would need to be funded through increased council tax or cuts to other local public services.

Finally the possibility of the Environment Agency contributing to the IDB through a partnership funding contribution has been raised. However there are concerns that this may set a national precedent with other IDBs requesting funds in the future.

South-East England

The Environment Agency has acted as the IDB for eight Internal Drainage Districts (IDDs) in south-east England. These are:

- Cuckmere IDD
- Pevensey Levels IDD
- River Adur IDD
- River Arun IDD
- River Ouse IDD
- South West Sussex IDD
- East Gravesend IDD
- West Gravesend IDD

Due to changes in policy it has been decided that this is no longer appropriate and the Environment Agency wishes to stop acting as the IDB. Good practice guidance (from Defra, the Association of Drainage Authorities and the Environment Agency) is that an Internal Drainage Board should represent those who pay for and benefit from its work. The Environment Agency Board does not meet this criterion, so they plan to dissolve all their existing Internal Drainage Boards and help put alternative arrangements in place by April 2015. An option for future management of the assets in the IDBs is to form new independent IDBs. This gives the opportunity for these locations where present funding of maintenance is not a high priority for the Environment Agency to secure a new approach for ongoing maintenance funding and delivery.

4 APPRAISAL OF ALTERNATIVE APPROACHES TO FCERM MAINTENANCE DELIVERY

The options and approaches for the alternative delivery of FCERM maintenance outlined in Section 3 have been assessed to establish their relative potential for future application. Each option has been assessed against the following key criteria:

- Scale of applicability
- Cost/effort effectiveness
- Applicability to FCERM operation and maintenance
- Ease of implementation
- Level of capability and professionalism

The criteria are defined in Section 4.1 along with their specific scoring systems, and the results of the appraisal are discussed in Section 4.2.

4.1 Definition of Criteria and Scoring System

The following sections define the appraisal criteria and how each has been scored. All five options are scored on a simple scale of 1, 2 or 3, with three being best and one being worst. Apart for the Level of Capability and Professionalism criteria, every approach has been assessed against each criterion. The Level of Capability and Professionalism criteria are not applicable to approaches that solely provide funding.

4.1.1 Scale of Applicability

The scale of applicability relates to the extent to which an approach can be applied. In some cases approaches have wide national applicability while others are only suitable for locally specific situations. A definition of how the scoring system has been applied is given below:

1. Approaches with only very local applicability
2. Approaches with potentially widespread applicability, however there are constraints such as the type of FCERM system where they can be used or specific beneficiaries
3. Approaches which are nationally applicable with no constraints

4.1.2 Cost/Effort Effectiveness

This criterion relates to the balance between the cost/effort required from the national FCERM budget to facilitate the approach, and the outcomes in terms of the amount and quality of maintenance delivered. A definition of how the scoring system has been applied is given below:

1. The whole life cost/effort is far more than the amount/quality of maintenance delivered
2. The whole life cost/effort is acceptable for the amount/quality of maintenance delivered
3. The whole life cost/effort is far less than the amount/quality of maintenance delivered

4.1.3 Applicability to FCERM Operation and Maintenance

This criterion relates to how applicable the approach is to enabling the funding and/or delivery of FCERM maintenance. This ranges from approaches which are clearly applicable and where there is clear previous precedent for its use in FCERM maintenance delivery to others where there is a potential connection; however it has not been attempted. A definition of how the scoring system has been applied is given below:

1. There is no clear link or precedent but the approach could be applied in theory
2. There is clear potential for application of the approach but there are very few examples
3. There are well documented examples of using the approach for FCERM maintenance

4.1.4 Ease of Implementation

This criterion relates to whether there are any key issues or barriers that could prevent the application of any approach in the future. A definition of how the scoring system has been applied is given below:

1. Difficult to implement (numerous issues and barriers)
2. There is some effort required for implementation (some issues and barriers)
3. Easy to implement (no obvious barriers)

Examples of such barriers that are covered by this criterion include:

- Perception of the accepted uses for specific sources of funding
- Lack of political acceptability
- Ability of funding sources to contribute over the longer term
- Need for community approval through referendums
- Technical expertise of those wishing to deliver maintenance

4.1.5 Level of Capability and Professionalism

A key concern in approaches that use human resources that are not professional staff from a risk management authority is that there could be issues with lack of expertise, training and proper liability insurance. These could lead to unacceptable health & safety risks, legal or financial exposure, or poor quality maintenance being undertaken. A definition of how the scoring system has been applied is given below:

1. Local groups and volunteers with no formal training or insurance cover (In some circumstances training is provided which may elevate such groups/volunteers to a score of 2)
2. Smaller organisations with some level of training and insurance cover
3. Large, professional organisation with established training procedures, Quality, Safety, Health & Environmental policy and insurances

4.2 Results of Appraisal

The appraisal criteria set out in Section 4.1 have been applied to all of the approaches considered in this review. The full appraisal of the options is included in Appendix B and a summary of the results is shown for approaches to funding in Table 4.1, approaches to delivery in Table 4.2 and approaches to both funding and delivery in Table 4.3. The following sections discuss these results for the three categories.

Table 4.1: Appraisal of Approaches to Funding

Category	Approach	Scale of Applicability	Cost/Effort Effectiveness	Applicability to Operation and Maintenance	Ease of Implementation	Level of Capability and Professionalism
Local Authority Funding	Local Levy	3	3	2	2	N/A
	Section 106 Agreements	3	3	2	2	N/A
	Community Infrastructure Levy	3	3	2	2	N/A
	Council Tax Precept	3	2	2	1	N/A
	Parish Precept	3	2	2	2	N/A
Local Business Funding	Business Improvement District	2	2	2	2	N/A
	Tourist Charges	2	1	1	2	N/A
	Business Rate Supplement	2	1	1	1	N/A
Riparian Owner / Landowner Funding	Local Group Fundraising	1	2	2	1	N/A
	General Drainage Charge	2	2	3	1	N/A
	Riparian Owners	2	2	2	1	N/A
Water Company Funding	Croatia Water Charges	3	2	2	1	N/A

Table 4.2: Appraisal of Approaches to Delivery

Category	Approach	Scale of Applicability	Cost/Effort Effectiveness	Applicability to Operation and Maintenance	Ease of Implementation	Level of Capability and Professionalism
Charity/Volunteer Led	Social Enterprise Companies	3	2	2	3	1
	River Trusts	3	2	2	2	1
	Flood Action Groups	1	2	2	2	1
	Volunteer Flood Wardens	3	2	2	2	1
	Local Volunteer Arrangements	2	2	2	2	1
Parish Council Led	Local Parish Council Arrangements	3	2	2	2	2
Landowner Led	Environment Agency River Maintenance Pilots	3	2	2	2	1
	Local Landowner Arrangements	2	2	2	2	1
IDB Led	Local IDB Arrangements	2	2	3	3	3
Local Authority Led	Local Authority Arrangements	3	2	2	1	3
Offender Rehabilitation and Employment	Local Community Payback Arrangements	3	2	2	2	1
	Offender Rehabilitation and Employment Schemes	3	2	2	2	2
Private Company Led	Public Private Partnerships	3	2	3	2	3

Table 4.3: Appraisal of Approaches to Funding and Delivery

Category	Approach	Scale of Applicability	Cost/Effort Effectiveness	Applicability to Operation and Maintenance	Ease of Implementation	Level of Capability and Professionalism
IDB Led	Public Sector Cooperation Agreements	3	2	3	3	3
	New Internal Drainage Boards	1	2	3	1	3

4.2.1 Funding Approaches

The appraisal of the different approaches to funding FCERM maintenance that have been identified has shown a range of performance against the key criteria. This is summarised below:

- In terms of the scale of applicability, the results reflect the fact that Local Authority funding is widely applicable while businesses and landowners will only provide funds for activities that directly benefit their local area.
- In general the effort required to implement many of the funding approaches is proportional to the effort required to facilitate them. There are exceptions however; both Section 106 Agreements and Community Infrastructure Levies are processes undertaken by local authorities that are not entirely for the purpose of FCERM, therefore the effort to obtain funding from these sources should not be significant. Also the local levy is an established mechanism for funding flood risk management and the switch to funding for maintenance should be relatively simple as well. Conversely tourist charges and business rate supplements are believed to require more effort than would be proportional and application of water charges into the UK system would also be difficult.
- Apart from the General Drainage Charge which is entirely focused on maintenance delivery, the majority of the approaches have clear potential for application but there are few examples. However there are some approaches where the link is more tenuous such as tourist charges and business rate supplements, while local group fundraising is not suited to maintenance funding as it cannot usually sustain an ongoing commitment to maintain assets over an extended period of time.
- All the approaches have some issues and barriers to their implementation. However there are generally more barriers with approaches linked to funding from local businesses and landowners. An exception is the General Drainage Charge, which has been assessed as having significant barriers as its extension to other parts of the country apart from East Anglia has been actively pursued with little success.

4.2.2 Delivery Approaches

The appraisal of the different approaches to delivery of FCERM maintenance that have been identified has shown a range of performance against the key criteria. This is summarised below:

- In terms of the scale of applicability, the results show that most approaches are widely applicable. The exception to this is where the group of individuals undertaking the work has a specific interest either to the local area with community groups and landowners, or to improving the operation of their drainage system with Internal Drainage Boards.
- In general the effort required to implement many of the funding approaches is proportional to the effort required to facilitate them. The only exception is flood

wardens, where in the context of FCERM maintenance there is little they can actually achieve. Their purpose is far more concerned with supporting the Environment Agency in educating communities and during flood events.

- The majority of the approaches have clear potential for application but there are few examples. The exceptions are IDB agreements and Public Private Partnerships that have very clear examples of their application.
- All of the approaches have varying scales of opportunities. Challenges also exist to their implementation, with the exception of flood wardens and local IDB arrangements. Local Authority arrangements have the uniquely significant barrier that it is challenging for them to fund themselves undertaking maintenance in the short term as their budgets are limited at present.
- The level of capability and professionalism shows a clear split in the approaches. For charities, volunteers and landowners this is generally limited, while professional organisations such as local authorities and Internal Drainage Boards score highly. Less formally organised bodies such as Parish Councils and Social Enterprise Companies, as well as the offender rehabilitation organisations have some level of capability and professionalism but not to the same level as others.

4.2.3 Funding and Delivery Approaches

The two approaches in this category perform similarly under some criteria, but very differently with others.

- While Public Sector Cooperation Agreements are nationally applicable, new IDBs are only applicable in very specific circumstances.
- With both approaches the effort to facilitate them is considered proportionate to the outcomes delivered.
- Both approaches are highly applicable to FCERM maintenance with clear examples.
- While Public Sector Cooperation Agreements have some barriers, these are clearly being overcome with many agreements being signed. However new IDBs have not yet been successfully implemented with several barriers proving difficult to overcome, in particular securing a funding source to enable local authorities to contribute to their operation through the Special Levy.
- In both approaches the level of capability and professionalism is high with work being undertaken by the Environment Agency, Internal Drainage Boards or local authorities.

5 SUMMARY AND FINDINGS

The appraisal of the range of different approaches that are potentially available for the funding and/or delivery of FCERM maintenance leads to some common findings. This section discusses these findings and gives an overall summary of the report.

There are no clear examples from abroad that provide readily usable solutions for the UK situation. It appears that the type of alternative approaches that have been identified by this study are more common in the UK than other countries with established flood risk management industries such as elsewhere in western Europe, the U.S.A or Australia.

It is important to recognise the difference between maintenance and capital flood defence works when it comes to attracting funding from alternative sources. With capital investments, the contributors are usually funding an improvement that they can actually see such as new flood defences which reduce flood risk. However with maintenance, potential contributors are being asked to fund something that they may perceive that they already have. It is often not clear where their money is going and therefore communicating the benefits of maintenance activities is a challenge. However there is the opportunity through capital schemes to secure on-going operation and maintenance funding or delivery through partnerships and other funding sources.

Another dimension to the funding approaches is the difference between those that strategically gather money for funding maintenance in a general sense (CIL, BIDs or Local Levy) compared with those where funding is available for a specific local maintenance issue. Although the approaches that gather strategic funds seem to be able to attract far greater amounts of money, they are generally not solely for the purpose of FCERM maintenance. In contrast, the smaller amounts collected to solve specific local issues are intended to be used only for FCERM maintenance.

A difference between the delivery approaches is illustrated through the relative level of capability and professionalism of the persons undertaking the work between large well organised bodies and volunteer groups. The more organised bodies often have a pool of trained and experienced staff with appropriate resources and supervision, safe methods of working, environmental awareness and the safety net provided by insurance cover. Good examples were identified however where some smaller and less formally organised groups have through targeted training and alliancing with other more capable organisations been able to reduce this problem and improve the quality of work undertaken. Such practices need to be shared more widely with other local volunteer groups.

A challenge with many approaches is that maintenance ideally needs a long term commitment from those funding it or delivering the work on the ground. However this type of security is rare with private funders and in some cases public bodies where budgets that they may allocate to FCERM maintenance are not ring-fenced. The use of commuted sums and rolling agreements renewable periodically (say every 5 years) to secure maintenance were identified as workable approaches that could be used more widely.

Another aspect to consider is that approaches developed in one region do not tend to be taken up elsewhere. The examples obtained for one approach often are concentrated in

one region and the reasons for this are not always apparent. Increased publicity and sharing of best practice across the country would be helpful to achieve wider uptake of the opportunities.

A number of approaches to obtaining funding from local beneficiaries are constrained by potential labelling as local taxation or the need for a referendum or similar major activities to put in place. Some easing of these legislative requirements would be helpful.

While this study has looked at approaches individually, combinations could be explored. For example alternative delivery options being combined with an alternative funding source.

Overall there is a wide range of potential approaches but all have their own challenges and there are issues that need to be overcome to ensure their effective implementation. As such there are no easy quick wins to realise a significant funding source or delivery mechanism. However, by targeting the approaches with higher potential applicability and ease of implementation, addressing some of the legislative, policy or delivery barriers and opportunities, a significant increase in collaborative delivery and funding for maintenance can be achieved.

6 REFERENCES

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Appendix A Consultation Pro-forma

FD2678 - FCERM Maintenance Funding Research

Case Study Record Sheet

Name/Title	
Location	
Contact Person (Tel / Email)	
FCERM Asset Types	
Type of Collaboration (please choose)	External funding of maintenance Yes / No External provision of resources / delivery of maintenance Yes / No Both external funding and resourcing/delivery of maintenance Yes / No
Describe the challenge or opportunity that led to the collaborative approach	
Describe the innovation and/or partnership approach to maintenance	
Lessons learnt, how well did the approach work?	

Please return to Richard Stevens (richard.stevens@rhdhv.com, 02380382986)

Appendix B

Appraisal of Approaches

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach

Approach Type	Sub-category	Approach
Funding	Local Authority Funding	Local Levy
		Community Infrastructure Levy
		Section 106 Agreements
		Council Tax Precept
	Local Business Funding	Business Improvement District
		Business Rate Supplement
	Riparian Owner/Landowner Funding	Local Group Fundraising
		General Drainage Charge
		Riparian Owners
	Water Company Funding	Croatia Water Charges
Delivery	Charity/Volunteer Led	Social Enterprise Companies
		Flood Action Groups
		Volunteer Flood Wardens
		Local Volunteer Arrangements
	Parish Council Led	Local Parish Council Arrangements
	Landowner Led	Environment Agency River Maintenance Pilots
		Local Landowner Arrangements
	Internal Drainage Board Led	Local IDB Arrangements
	Local Authority Led	Local Authority Arrangements
	Offender Rehabilitation and Employment	Local Community Payback Arrangements
Offender Rehabilitation and Employment Schemes		
	Public Private Partnerships	
Funding & Delivery		Public Sector Cooperation Agreements
		Offender Rehabilitation and Employment Schemes
		New Internal Drainage Boards

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Local income raised by the Regional Flood and Coastal Committee (RFCC) to fund FCERM activities within their region that are a local priority. This has been used to fund maintenance recently in Anglian Region by the Eastern Area RFCC.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Authority Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	There is some effort required by government organisations as the RFCCs are staffed by people from these organisations. However the RFCCs already meet on a regular basis and it would not require much additional effort from their members to direct funds towards FCERM maintenance.	3
Applicability to Operation and Maintenance	Has been used in some locations to fund FCERM maintenance activities in areas where national funding has been lacking. Therefore there is precedent for its use previously, however this is not typically what these funds have been used for in the past, with the majority of the money going to capital schemes.	2
Ease of Implementation	There is a perception that local levy funds are used to support capital investment where there are local priorities that national funding will not support. Moving to a situation where it is regularly used to fund maintenance will need a shift in mind-set, however this can be overcome.	2
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Under Section 106 of the Town and Country Planning Act 1990 local authorities can set Planning Obligations on developers. These obligations enable a local authority to secure contributions towards infrastructure in order to support and facilitate the proposed development.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Authority Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	This does not require any significant effort or expenditure from the national FCERM budget as this is an established process undertaken by local authority planning teams. May require input from Environment Agency staff to define nature of contributions to FCERM maintenance activities.	3
Applicability to Operation and Maintenance	There are known examples of Section 106 agreements being applied to deliver FCERM however there is a bias towards capital investments. Historically this has been a source of income in certain locations, and the priority for its use for FCERM has depended on the priorities of the relevant local authority.	2
Ease of Implementation	Recently the scope of work that can be funded by Section 106 agreements has been reduced as Community Infrastructure Levies have been implemented. Now Section 106 can only fund infrastructure on the development site itself.	2
Level of Professionalism		N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Enables local authorities to raise funds from new build developments. Money collected can be used for strategic infrastructure including transport, flood defences and green spaces.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Authority Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Potentially large amount of money could be collected by a CIL in areas of significant redevelopment. This will require effort from local authorities to set up and manage the process but a large amount of funding could be gained through this mechanism. However this effort will not come from the national FCERM budget, as local authorities will set up the CIL to deliver a range of infrastructure needs. Therefore the effort is considered less than the value of the outcomes.	3
Applicability to Operation and Maintenance	No precedent for its use to fund FCERM operation and maintenance, at present the focus of established CILs is to support capital infrastructure improvements. However if local authorities can use the CIL to gather funds for FCERM maintenance there is significant potential.	2
Ease of Implementation	The total amount of funds collected by a CIL is not guaranteed as it relies on the level of development in a local authority's area. However local authorities could include for FCERM maintenance funding in the CIL levy as it is a valid part of delivering infrastructure upon which the new development will rely.	2
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Can be instigated by a local authority to address a specific and special expenditure requirement. Implementation of such a levy requires agreement through referendum of the whole local authority area.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Authority Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	If successfully implemented this can give a significant amount of funding so the effort required to undertake the preparatory work, referendum and management of the fund by the local authority would be justified. Gloucestershire County Council held a local referendum to allow council tax to be increased to raise funds for additional drainage and maintenance work after the 2007 floods. This provided £2.3 million per year towards FCERM activities in the county.	2
Applicability to Operation and Maintenance	There is a precedent in Gloucestershire for its use to fund FCERM activities. But this does not focus completely on maintenance and therefore is not entirely applicable.	2
Ease of Implementation	This does require the agreement of the residents of the whole local authority area, even those who are not at risk of flooding and would not significantly benefit from the funds raised. This is significant barrier to implementation.	1
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Parish precepts are typically used for maintenance of playing fields, recreation grounds, village halls, car parks, footpaths, etc. They can also be used to fund anything that is considered a benefit to the community that is not covered by Parish Council's specific responsibilities. This could include raising funds for FCERM maintenance.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Authority Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	It is likely that effort will be required by government bodies such as the Environment Agency to assist a Parish Council in determining the need for a precept and setting this up through demonstrating how the money would be spent. However this is likely to be proportional to the funding received.	2
Applicability to Operation and Maintenance	No known history of its application for FCERM maintenance, however if there is a clear benefit to the local community this is an available mechanism for a Parish Council to raise funding.	2
Ease of Implementation	Established process for gathering funds through a Parish Council. This source of funding is not capped therefore offers better opportunity than Council Tax	2
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	A partnership between businesses and the local authority to allow businesses to pay for additional services to improve trading conditions within a clearly defined commercial area. These services can include reduced flood or coastal erosion risk.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Business Funding
Scope of Maintenance Activities	Any

Appraisal		
Category	Description	Score
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Potential source of significant funding for FCERM maintenance, however requires significant effort to educate business community and gain their support for its implementation. This work would be led by the local authority who also are required to administer the BID.	2
Applicability to Operation and Maintenance	There is a precedent for its use in the Lower Don FAS, however, there are few other examples of use of BID for maintenance purposes.	2
Ease of Implementation	There can be issues in convincing the business community to contribute and this must be confirmed through a ballot. Each BID only lasts for 5 years and therefore cannot guarantee long term maintenance funding.	2
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	There are examples in other countries where tourist visitors are charged a small amount to help fund the delivery of services. This is typically sourced through an additional charge when tourists pay for overnight accommodation.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Business Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Uncertain what this would be as there are no examples. Likely to require significant effort to get consistency in uptake across the tourist accommodation industry.	1
Applicability to Operation and Maintenance	No precedent of this, this could be used to gain funding for costal defences in resort towns but would require change in thinking.	1
Ease of Implementation	Would need wide scale support from business to implement for a whole area with the aim of maintaining tourist income. Uptake is likely to be inconsistent unless there is a legal obligation to implement the charge. This would make it a tax, which would then require Treasury approval and is unlikely to be obtained. It will raise the cost of accommodation making the area potentially less competitive.	2
Level of Professionalism		N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	The Business Rates Supplements Act 2009 allows county councils, unitary district councils and the Greater London Authority to levy a supplement on business rates. This supplement can be used to fund additional investment to promote economic development of local areas.
Approach Type	Alternative Source of Funding
Approach Sub-type	Local Business Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Would require significant consultation as there are no known precedents. Establishing who pays what, probably based on their level of risk would require effort to communicate. Therefore likely to require far more effort than the benefits it would give.	1
Applicability to Operation and Maintenance	No known examples, would need acceptance that this approach could be used to fund FCERM maintenance.	1
Ease of Implementation	Lack of precedent would lead to significant barriers through resistance to this approach from the business community. It is likely to be seen a further tax on business for a service that many view as the responsibility of government to provide.	1
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Local interest groups may step in to fund FCERM maintenance where there is no available funding from public bodies and there is a clear local need.
Approach Type	Alternative Source of Funding
Approach Sub-type	Riparian Owner/Landowner Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	There is usually some requirement for government agencies to consult, guide and monitor the activities of such groups to ensure that their activities do not have any unforeseen negative consequences. However this is usually proportional with the results achieved and the additional benefits of active engagement with the local community on FCERM issues.	2
Applicability to Operation and Maintenance	There is potential for funding from this source but there are very few examples.	2
Ease of Implementation	Small scale and inconsistent contributions that do not lend themselves to long term maintenance activities. These groups usually can only contribute once and therefore tend to fund a capital investment. These groups often lack the technical expertise to collect funds and contribute to maintenance, so may need significant assistance.	1
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	The General Drainage Charge was introduced in 1963, and is now raised in line with the regulations set out by the Water Resources Act 1991. It is a statutory levy charged to occupiers of agricultural land that does not fall within an IDB district. It provides a contribution towards certain types of maintenance for flood risk management assets.
Approach Type	Alternative Source of Funding
Approach Sub-type	Riparian Owner/Landowner Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Effort in administering the charge is proportional to the benefits it provides through significant funding. An effective approach to raising funds for maintenance in Anglian Region. In 2013/14 the GDC contributed 22.5% (£4,248,000) of total funding for maintenance by the Environment Agency in the Anglian Region. But the administrative burden is also significant.	2
Applicability to Operation and Maintenance	Specifically aimed to fund maintenance, with long standing precedent in Anglian Region since 1963. It targets areas where national funding for maintenance is limited as they are considered low priority systems due to the lack of properties.	3
Ease of Implementation	Well established system in Anglian Region that could be replicated in other areas of the country. However attempts to do so in the past elsewhere have been unsuccessful. This is due to the administrative burden to implement and manage the charge, the perception of the charge as a new tax on agricultural landowners and it being politically unpopular.	1
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	In some situations Riparian Owners have contributed funds for maintenance of the watercourse. This is usually where they see the benefit of maintaining the watercourse for aesthetic reasons or to control flood risk to their property.
Approach Type	Alternative Source of Funding
Approach Sub-type	Riparian Owner/Landowner Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed following flooding so in practice sporadic local opportunities.	1
Cost/Effort Effectiveness	Effort for government authorities is in engaging landowners and agreeing funding arrangements. Limited funds generally available, so generally will only be undertaken where effort is proportionate to the funding received.	2
Applicability to Operation and Maintenance	One known example of funding provision but unlikely to be widely repeated. Funds available likely to be limited and will only be possible on an opportunistic basis.	2
Ease of Implementation	Will require significant effort to convince riparian owners they should contribute to FCERM maintenance and in general they are likely to very reluctant to provide funds. Far more likely to do some maintenance themselves.	1
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Water charges are used in Croatia to fund delivery of local water management plans. This includes maintenance of 'protective water structures'. These charges support the state budget that is used for implementation of their National Flood Protection Plan.
Approach Type	Alternative Source of Funding
Approach Sub-type	Water Company Funding
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Will require significant initial effort to bring in an additional charge that would be included within water bills. Likely that this would require legislation from government. But it may be a significant source of funding once established. However over time the funds received would start to balance out the upfront effort.	2
Applicability to Operation and Maintenance	There is precedent in Croatia for its use in FCERM maintenance, however this is under a different regulatory system and application to the system in the UK would be complicated.	2
Ease of Implementation	Likely to be significant barriers to implementation including public acceptance of the charge, lack of political will to implement the charge and cost to the water companies to change their charging system. It would need to be applied dependent upon the level of risk and communicating this to the bill payers would be problematic.	1
Level of Professionalism	N/A	N/A

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Social enterprise companies are generally defined as businesses that help people or communities. There are examples where such organisations have been set up with the aim of improving watercourses and their activities can include basic FCERM maintenance.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Charity/Volunteer Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	There is usually some requirement for government agencies to consult, guide and monitor the activities of such organisations to ensure that their activities do not have any unforeseen negative consequences. However this is usually proportional with the results achieved and the benefits of active engagement with the local community on FCERM issues.	2
Applicability to Operation and Maintenance	There is an example of this with the River Stewardship Company (RSC) in Sheffield. They undertake riverside management work for riparian owners, and community projects involving local communities and volunteers. However they are only able to undertake basic maintenance work.	2
Ease of Implementation	No significant barriers to implementation beyond the need for a group of individuals to be willing to set up the organisation and run it.	3
Level of Professionalism	Some degree of organisation, however they do use volunteers to deliver maintenance and therefore quality of work will be lower. The RSC have developed their own specification for in-channel vegetation management to improve the quality of their work. But new organisations are likely to lack expertise.	1

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Rivers trusts are independent charitable organisations working for the public benefit through management of river watercourses. Through their activities some trusts do get involved in the delivery of FCERM maintenance.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Charity/Volunteer Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	There is usually some requirement for government agencies to consult, guide and monitor the activities of such organisations to ensure that their activities do not have any unforeseen negative consequences. However this is usually proportional with the results achieved and the benefits of active engagement with the local community on FCERM issues.	2
Applicability to Operation and Maintenance	As part of their work it is natural that River Trust will undertake some work that constitutes FCERM maintenance. There are some examples of this but this may increase over time. However as they primarily use volunteers for delivery the scope of activities that can be undertaken will be limited. It is typically focused on river restoration.	2
Ease of Implementation	Need for a group of individuals to be willing to set up the organisation and run it. In addition may need assistance and education to help them understand the role they can play in FCERM maintenance, beyond their general aims of river restoration.	2
Level of Professionalism	Some degree of organisation, however they do use volunteers to deliver maintenance and therefore quality of work will be low. Lack of awareness of guidance in techniques for delivery of FCERM maintenance.	1

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Flood action groups are community-based groups who work on behalf of the wider community to find ways to reduce flood risk. In some cases they have taken it upon themselves to actively maintain their watercourse through basic activities such as vegetation clearance and debris removal.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Charity/Volunteer Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed following flooding so in practice sporadic local opportunities.	1
Cost/Effort Effectiveness	There is usually some requirement for government agencies to consult, guide and monitor the activities of such organisations to ensure that their activities do not have any unforeseen negative consequences. However this is usually proportional with the results achieved and the benefits of active engagement with the local community on FCERM issues.	2
Applicability to Operation and Maintenance	Clear precedent of some maintenance activities being undertaken by such groups. Limited to activities that can be undertaken through manual labour with limited tools and expertise. There are a wide range of maintenance activities that are too complex for these types of groups to undertake. May be effective in increasing conveyance along watercourses at a local scale but groups are generally only concerned with actions that affect risk to their community.	2
Ease of Implementation	Limited resources to undertake maintenance, it is generally done by volunteers and therefore the amount undertaken can vary due to attendance at working party sessions. Generally these groups aim to obtain funding from government to reduce their risk, but in some cases are willing and able to take action where possible.	2
Level of Professionalism	Limited level of organisation as all volunteers, lack of expertise and training in maintenance delivery, issues with quality of maintenance undertaken, concerns over Health & Safety and liability insurance.	1

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Although not directly involved in maintenance, the volunteer flood warden schemes across the country are a mechanism by which issues with FCERM assets can be brought to the attention of the Environment Agency.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Charity/Volunteer Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	The flood wardens are primarily co-ordinated by the Environment Agency. They have limited impact on delivery of maintenance as their main role is communication with the local community and assistance during events. Therefore the benefit gained in terms of maintenance is a bonus to their primary role.	2
Applicability to Operation and Maintenance	Limited examples, but there is clear potential for flood wardens to reduce the burden upon Environment Agency staff to inspect certain aspects of the FCERM asset systems.	2
Ease of Implementation	A well established group of volunteers but training them to carry out additional tasks to assist the FCERM maintenance programme would require effort for the Environment Agency. Existing wardens may be unwilling to take on additional responsibilities.	2
Level of Professionalism	Although supported by the Environment Agency they are volunteers and therefore this is low. They may gain some training from the Environment Agency but their level of skill and expertise is low.	1

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	On a local basis volunteers may assist the Environment Agency in delivering maintenance. These have included a volunteer from a prison and a work placement student from an agricultural college.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Charity/Volunteer Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed following flooding so in practice sporadic local opportunities.	1
Cost/Effort Effectiveness	Can reduce burden on Environment Agency staff by providing additional free labour. However there will be effort required from Environment Agency staff to train and supervise any volunteers who work with them to deliver maintenance.	2
Applicability to Operation and Maintenance	This does occur sporadically and there are some examples but there is potential for wider application.	2
Ease of Implementation	Actively attempting to find volunteers to assist in the delivery of FCERM maintenance would be difficult. This is generally only possible on an opportunistic basis. Scope of work volunteers can undertake will be limited by their skills and requirement for proper training to comply with Health and Safety regulations.	2

FCERM Maintenance Funding Research - Appraisal of Approaches

Level of Professionalism	Although supported by the Environment Agency they are volunteers and therefore this is low. They may gain some training from the Environment Agency but their level of skill and expertise is low.	1
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FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Parish Councils can act a local body to co-ordinate the actions of a community to contribute to FCERM maintenance. Examples of this have been found in Teignmouth, Devon and Hawkshead, Cumbria.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Parish Council Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	There is usually some requirement for government agencies to consult, guide and monitor the activities of parish councils to ensure that their activities do not have any unforeseen negative consequences. However this is usually proportional with the results achieved and the benefits of active engagement with the local community of FCERM issues.	2
Applicability to Operation and Maintenance	Can take responsibility for some maintenance away from the Environment Agency. In Hawkshead, Cumbria volunteers are working under the Parish Council's liability insurance to remove any liabilities from the Environment Agency	2
Ease of Implementation	Limited scope and resources to undertake meaningful maintenance work. Requires drive from the Parish Council for this to occur and it is not easily replicable. Sporadic in uptake as it generally requires a local issue to be implemented.	2
Level of Professionalism	Parish councils can provide co-ordination function for a community and are more organised than local community groups in general. There is an example of a parish council having liability insurance for volunteers undertaking maintenance work.	2

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	The Environment Agency are currently piloting an arrangement where landowners will be allowed to carry out de-silting work on main river watercourses without the need for flood defence consent.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Landowner Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	The process is currently being managed by the Environment Agency to ensure that work undertaken does not have unforeseen negative impacts. But encourages landowners to undertake their own maintenance and relieves some pressure from the Environment Agency. Overall effort is balanced with outcomes.	2
Applicability to Operation and Maintenance	<p>Aimed directly at maintenance, but applicable to de-silting only. Landowners are already allowed to undertake the following without permission:</p> <ul style="list-style-type: none"> • Removal of in-stream debris and rubbish • Undertaking minor tree works- cutting back trees and other vegetation, and removal of fallen trees • Trimming grass/vegetation on the banks and in the channel 	2
Ease of Implementation	No significant barriers, however will need to convince landowners that it will be beneficial to them in reducing flood risk.	2
Level of Professionalism	Landowners generally have no formal training although they are likely to be experienced in vegetation management techniques in rural locations. Lack of Health & Safety consideration and insurance. Needs good oversight to ensure negative impacts are avoided.	1

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Local arrangements where landowners have delivered FCERM maintenance or assisted the Environment Agency in doing so.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Landowner Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed following flooding so in practice sporadic local opportunities.	1
Cost/Effort Effectiveness	Will require effort from the risk management authority to formally agree with the landowner that they will undertake certain activities and do so in the correct manner. There will be a need to ensure there are no negative impacts on the environment and changes to flood risk elsewhere. Overall effort is considered to balance with the outcomes delivered by this approach.	2
Applicability to Operation and Maintenance	Potential for application but may be limited to specific areas, with few examples of this currently available.	2
Ease of Implementation	Landowners are willing to maintain watercourses to control flood risk on their land. In addition scope of activities they are willing to undertake is usually limited and will vary. Maintenance of a watercourse by one landowner may improve conveyance passing a problem onto other landowners downstream. Sporadic nature of opportunities and landowner must realise there is an issue that they can contribute to solving.	2

FCERM Maintenance Funding Research - Appraisal of Approaches

Level of Professionalism	Landowners generally have no formal training although they are likely to be experienced in vegetation management techniques in rural locations. Lack of Health & Safety consideration and insurance. Needs good oversight to ensure negative impacts are avoided.	1
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FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Internal drainage boards (IDBs) in some circumstances will undertake maintenance work on watercourses outside their area of responsibility, typically main rivers that are normally managed by the Environment Agency.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Internal Drainage Board Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Will require effort from the Environment Agency to formally agree with the IDB that they will undertake certain activities. However IDBs are experienced in this type of work and the effort will be proportional.	2
Applicability to Operation and Maintenance	Several documented examples of this, and it is specifically concerned with delivering FCERM maintenance. However this approach is now being delivered under Public Sector Cooperation Agreements.	3
Ease of Implementation	None, they are set up to undertake this maintenance.	3
Level of Professionalism	IDBs are experienced in carrying out watercourse maintenance, and have the skills and expertise required. Therefore they are the most suitable organisation to undertake this type of work apart from the Environment Agency and its contractors. High level of professionalism with experienced and skilled workforces, formal QSHE policies and corporate insurances.	3

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	In some circumstances the local authority may agree to undertake maintenance of certain FCERM assets that are outside their responsibility on a main river or at the coast.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Local Authority Led
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Effort from other risk management authorities to establish agreements for local authorities to undertake FCERM maintenance likely to be proportional to benefits of these arrangements.	2
Applicability to Operation and Maintenance	Some examples and clear potential for application elsewhere when a local authority sees the need to do so.	2
Ease of Implementation	Lack of available funds for local authorities to allocate to FCERM maintenance a fundamental barrier to them undertaking maintenance delivery. Some local authorities have staff experienced in this type of work, however for many expertise in FCERM maintenance will have been lost due to only recently being given responsibility for local flood risk management. Coastal local authorities generally have greater expertise due to responsibility for coastal defence.	1
Level of Professionalism	High level of professionalism with skilled workforces, formal QSHE polices and corporate insurances.	3

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Community Payback, formerly known as community service, is the process whereby convicted offenders are sentenced to undertake unpaid work for the benefit of the community. This can involve basic maintenance and landscaping work, and there are several examples of where this has been for the purpose of FCERM.
Approach Type	Alternative Approach to Delivery
Approach Sub-type	Offender Rehabilitation and Employment
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Can provide a effective free source of labour to assist with basic vegetation control maintenance activities. There will be a need for the relevant authority such as the Environment Agency to guide and supervise the work undertaken.	2
Applicability to Operation and Maintenance	Has been used in some instances to assist community led FCERM maintenance activities such as watercourse vegetation clearance, and removal of leaf litter from drainage systems. However more complex activities are beyond this approach.	2
Ease of Implementation	Competition for this resource from other community projects will reduce the level of resources available to undertake FCERM maintenance related projects. This is likely to make it more likely to be locally applicable, where flood risk is higher priority	2
Level of Professionalism	There is formal supervision of the offenders, however the level of experience in this type of work will be low and so too will be the quality of the work undertaken.	1

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	There are several examples of organisations that work with offenders who are recently released from prison and who are seeking work and young offenders. They have partnered with the Environment Agency to provide basic maintenance services and are funded by alternative sources such as local authorities and probation services.
Approach Type	Alternative Approach to Funding & Delivery
Approach Sub-type	Offender Rehabilitation and Employment
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	There is effort required by the Environment Agency to guide what these organisations are doing to ensure it fits into the overall FCERM maintenance programme. But this is proportional to the outcomes delivered by this type of approach.	2
Applicability to Operation and Maintenance	Established examples of maintenance being delivered through this mechanism, however the scope of services provided is limited.	2
Ease of Implementation	Limited scope of maintenance activities undertaken. The number of recent offenders who may take up such an opportunity is probably low, limiting the amount of work this approach can deliver. Also setting up similar organisations elsewhere will require effort and may be challenging.	2
Level of Professionalism	Offenders do receive formal training and are supervised by experienced staff. However their overall level of experience in this type of work will be relatively low.	2

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	Public Private Partnerships (PPPs) are any collaboration between public bodies and private companies. Their benefits are drawn from the belief that private companies are often more efficient and better run than more bureaucratic public bodies. In terms of FCERM these agreements can provide certainty in expenditure over the long term.
Approach Type	Alternative Approach to Funding & Delivery
Approach Sub-type	N/A
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	These agreements require effort from the Environment Agency to procure and administer. In addition funding is from the national FDGiA budget. However overall it is an efficient way to deliver maintenance over long time periods.	2
Applicability to Operation and Maintenance	These agreements can provide certainty in expenditure over the long term for the Environment Agency. Two substantial examples in the UK, Pevensey Bay in East Sussex where 9km of shingle beach/embankment is being managed for 25 years, and Broadland Flood Alleviation Project which manages the Norfolk Broads including maintenance of flood defences over 20 years.	3
Ease of Implementation	Significant commitment for the Environment Agency to fund such a project. Replicating this elsewhere in the current funding climate will be challenging.	2
Level of Professionalism	Work is delivered by experienced FCERM contractors. They have appropriately experience and trained staff, the necessary corporate insurances and QSHE procedures.	3

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	A Public Sector Cooperation Agreement (PSCA) allows the Environment Agency and other public sector Risk Management Authorities (Internal Drainage Boards and Local Authorities) to deliver maintenance through a partnership approach.
Approach Type	Alternative Approach to Funding & Delivery
Approach Sub-type	N/A
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed follow	1
Cost/Effort Effectiveness	Effort is required to set up and administer the agreement from the Environment Agency. However there is the potential for significant improvements in delivery and funding of FCERM activities, therefore the effort is considered justified.	2
Applicability to Operation and Maintenance	The agreements are set up to cover a five year period and provide the framework for allowing a wide range of maintenance activities to be undertaken by either party and on ether party's assets. This has recently been developed for use with IDBs and there are now several examples of its implementation. There are initial discussions that are ongoing with some local authorities (Leeds City Council and Bradford City Council).	3
Ease of Implementation	At present uptake is limited primarily to IDBs, as Local Authorities do not have the capacity to carry out this type of work in many cases. Scope and amount of work to be undertaken will depend upon budget available form both parties. However there is a system in place to facilitate these agreements that has been shown to be sucessful, and further implementation by willing partners should require minimal effort	3
Level of Professionalism	High level of professionalism with experienced and skilled workforces, formal QSHE polices and corporate insurances.	3

FCERM Maintenance Funding Research - Appraisal of Approaches

Approach	Tourist Charges
Description	There are some areas of the country where catchments that are typically managed by Internal Drainage Boards (IDBs) for local historical reasons are managed by the Environment Agency. Funding for maintenance is limited and in several locations a solution that has been proposed is to establish a new IDB.
Approach Type	Alternative Approach to Funding & Delivery
Approach Sub-type	N/A
Scope of Maintenance Activities	Any

Appraisal		
<i>Category</i>	<i>Description</i>	<i>Score</i>
Scale of Applicability	Could be set up anywhere but generally are only formed following flooding so in practice sporadic local opportunities.	1
Cost/Effort Effectiveness	If achieved this will significantly reduce the obligations of the Environment Agency for FCERM maintenance, making money available for other locations. A new IDB would be able to undertake maintenance effectively, funded by drainage rates and the Local Authority Special Levy.	2
Applicability to Operation and Maintenance	Direct transfer of maintenance obligations to a new Risk Management Authority. This has been proposed in three locations in north-west England and 8 locations in south-east England. As part of this process the Association of Drainage Authorities and the Environment agency produced a guidance document to assist in facilitating this process as the last IDB to be formed was Swavesey IDB in 1981.	3
Ease of Implementation	Financial implications on landowners who would be required to pay drainage rates to any new IDB. Special Levy that Local Authorities are required to pay to the IDB for benefits to the wider community. Until recently they were able to reclaim 60-90% of any money paid as Special Levy from DCLG. However Local Authorities now receive funds to reflect the length of ordinary watercourses which is not ring-fenced. In addition the money that local authorities receive from DCLG is fixed until 2020 under the comprehensive spending review.	1
Level of Professionalism	High level of professionalism with experienced and skilled workforces, formal QSHE policies and corporate insurances.	3