



Urban Flood Risk Management schemes: Case study examples of schemes with multiple funders, multiple objectives and partnership working

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Purpose

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Executive Summary

This report presents a study on Urban Flood Risk Management schemes (FRM) carried out in conjunction with the Coastal Schemes with Multiple Objectives and Funders research study (FD2635). The main aim of the project was to draw together a selection of examples of urban and regeneration based investments in FRM where multiple funding had been involved and multiple objectives have been achieved. The clients for this project were Defra and the Environment Agency.

The final outputs will support the clients in promoting best practice to other urban regeneration flood risk projects. Through the investigation of case studies demonstrating good practice examples and lessons learnt guidance which can be shared with flood risk practitioners and other key stakeholders across England and Wales.

To realise the objectives a range of approaches were used. Initially a number of urban FRM schemes were identified, these schemes were then screened against a set of agreed criteria and four case study examples were identified. The case study examples of Afon Adda, Carlisle, Pershore and Rotherham were completed. Research for these case studies was largely gained through interviews and secondary research.

Analysis of the case studies presented interesting findings related to partnership working and external funding. The findings were then compared against the limited academic research in the field.

The key finding of this research is that partnership working is an effective approach to assist FRM schemes in achieving success. However, there are no definitive rules regarding what a partnership should look like or how it should be governed or which organisation should take the lead. The project suggests that due to the complex nature of urban flood risk it is important for all parties to be flexible; when seeking sources of funding or developing the objectives and scope of a FRM scheme. However, the findings of this project are anecdotal in nature due to the lack of empirical research, therefore they should only be considered as a guide for FRM practitioners not specific rules or principles.

The case study evidence presents a number of 'good practice' and 'high-risk' approaches that should be considered by practitioners. Managing complex FRM schemes with the added issue of multi-funding, multi- partnership and multi-objectives can be very challenging indeed. In all cases, the schemes mentioned support and reinforce the underlying principles of the Environment Agency's contributions approach.

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Abbreviations

BIFFA	Waste Management Company
CCC	Carlisle City Council
CCCH	Cumbria County Council Highways
CLA	Country Land and Business association
CWFAS	Community Wide Flood Alleviation Scheme
Defra	Department for Environment Food and Rural affairs
EA	Environment Agency
EU	European Union
FDGiA	Flood Defence Grant in Aid
FR	Flood risk
GAT	Gwynedd Archaeological Trust
GC	Gwynedd Council
FCERM	Flood and Coastal Erosion Risk Management
FRM	Flood risk management
Interreg	European Commission interregional cooperation programme
LA	Local Authorities
LEP	Local Enterprise Partnerships
MoU	Memorandum of Understanding
NE	Natural England
NFU	National Farmer Union
PPS25	Planning Policy Statement 25
PTC	Pershore Town Council
RDA	Regional Development Agency
RMBC	Rotherham Metropolitan Borough Council
SITA	Waste Management Company
SRWT	Sheffield and Rotherham Wildlife trust
SSSI	Site of Special Scientific Interest
STW	Severn Trent Water
UK	United Kingdom
UU	United Utilities
WAG	Welsh Assembly Government
WCC	Worcestershire County Council
WDC	Wychaven District Council
WRAP	Waste Recycling Action Programme
WWT	Worcestershire Wildlife Trust

1. Introduction

1.1 Maslen Environmental

This project, entitled 'Flood Risk Management in Urban Regeneration Settings', was a research study undertaken as part of a 12 week placement with Maslen Environmental (part of the JBA group), the UK's leading specialists in flood risk and environmental management (Maslen Environmental 2010). The project was supervised by the External Funding and Partnership team, who regularly work with public bodies to deliver and secure funding for a range of environmental and regeneration projects.

The project is being delivered on behalf of the Department for Environment, Food and Rural Affairs (Defra) and the Environment Agency (EA) and is part of a larger research project entitled 'Coastal Schemes with Multiple Funders and Objectives – Case Studies' (FD2635). This one year research project will address how Defra and the Environment Agency funds coastal management. The research aims to provide evidence that will support approaches to coastal flood and erosion risk management (CFERM) that make the most of alternative sources of funding and develop management strategies that serve diverse objectives. It was following the commencement of this project that the MSc study onto 'Flood Risk Management in Urban Regeneration Settings' was conceived.

1.2 The Project

The team at Maslen conceived the project outline and basic methodology prior to project initiation, using the process from the wider project.

The main aim of the project was to draw together a selection of examples of urban and regeneration based investments in flood risk management (FRM), where multiple funding had been involved and multiple objectives have been achieved. The clients for this project were Defra and the Environment Agency. Their primary requirement for this project was to help inform the debate regarding approaches to supplement and more efficiently use existing Government funding for managing flood risk (FR), known as Flood Defence Grant in Aid (FDGiA). In addition, it will also support the implementation and ongoing development of the Environment Agency's approach to securing contributions towards flood and coastal risk..

The final outputs from the project will support the clients in promoting best practice to other urban regeneration FR projects. Through the investigation of case studies demonstrating good practice examples, lessons learnt and guidance can be shared with FR practitioners and other key stakeholders across England and Wales.

1.3 Aims and Objectives

The overall aim of this project is to provide evidence that will support approaches to urban FRM that makes the most of alternative sources of funding and develops management strategies that serve diverse objectives.

The objectives are as follows;

1. To determine the key issues facing projects delivering flood risk management in an urban setting.
2. To research and identify schemes that have successfully delivered urban flood risk management solutions.
3. To develop case study information that can be used to facilitate the development of future flood risk schemes that make use of alternative sources of funding.
4. To communicate the findings of the project to the relevant stakeholders so that it can influence policy and guidance in the future.

The following section will present the background context, which will begin with a brief definition of the key concepts. Next will be a brief explanation of the political and policy context and the key stakeholders involved in FRM. The section will conclude by outlining the

issues relating to FRM partnership working and funding, achieving objective one of the project.

Following the examination of available literature the project methodology will be discussed. A six stage process outlines the main approaches used to achieve the project objectives and discusses the potential limitations of the adopted methodological approach.

Next the findings of the project will be presented in the form of case studies to add to the current evidence relating to FRM. Findings will also be presented as a selection of lessons learnt. All of the research will then be drawn together to provide practical guidance to FRM practitioners.

Finally the report will compare the case study findings and lessons learnt to the relevant literature, to establish how this research compares with academic theory. This section will conclude with a reflection on the project process and will identify areas of future research.

2. Case Studies

The results for this project are presented in the form of four case studies. The case studies follow the basic structure of background information, objectives, partnership working, funding mechanisms and lessons learnt from each scheme. Information for the case studies was gained from personnel communication with project managers and key partners, internal documents and grey literature associated with the scheme.

Key project information has been summarised in figure 5.1 to help improve the cross comparability of case study information. Following this is a condensed version of each of the case studies, full versions are available in appendix D

Figure 2.1 Case study summaries



Source; Morrison (2010), Battersby et al. (2010), Rees (2010), Smith (2010)

2.1 Afon Adda Flood Scheme

2.1.1 Introduction

The Afon Adda flood scheme took place in the city of Bangor, situated in Gwynedd, North Wales. The Afon Adda is a culverted river which flows through the city centre. The scheme runs through the city of Bangor and protects approximately 422 residential and 75 commercial properties. The scheme provides a 1 in 100 annual chance, standard of protection and consists of, a flood storage area (that doubles as a wetland habitat), main culvert improvements (replacement, relining, repairing and enlargement of key sections) and blockage reduction measures (instalment of debris screens and silt traps).

Running through the city centre, the scheme faced many issues such as disruption to roads, utility services and a general inconvenience to the city's inhabitants. The engineers faced a number of difficulties to design and implement this scheme, for example sections of culverts disappeared under buildings, sewage pipes discharged into the culverts and the working conditions were extremely high risk due to the unknown state of repair of the whole culvert system.

2.1.2 Objectives

The main drivers for this scheme were the floods in 2000 and 2001. This flooding prompted the Environment Agency Wales (EAW) to undertake a scheme to protect the residents and the infrastructure of Bangor.

The main incentive for the Environment Agency Wales and the WAG to be involved in this scheme was the ability to protect over 450 homes and businesses from flooding. This scheme helped fulfil the WAG flood risk strategy that aims to minimise the impact of flooding to communities across Wales.

The main driver for GC to be involved in this scheme was the ability to protect numerous residents and properties in the city of Bangor. Additionally the scheme allowed the council to protect many council owned properties from the risk of flooding.

The incentive for the European Commission Objective One funds was that by funding flood infrastructure this would act as a driver for inward investment in Bangor. The main aim of objective one funding is to remove the disparities of wealth across Europe through the regeneration and development of less prosperous regions, one of which is Gwynedd.

The GAT was involved in the scheme to ensure that the development did not damage any important archaeological artefacts.

The main aim for this scheme is to provide a flood defence that protects the city of Bangor to a 1 in 100 year standard. The secondary objective was to enhance the environment in particular biodiversity. The objectives for the scheme were set internally by the Environment Agency Wales, with some consultation with the key partners.

The main objectives for this scheme were as follows;

- To provide a 1 in 100 annual chance level of protection to the city of Bangor
- To complete the scheme with minimal disruption to local residents
- To provide a resource that improves the biodiversity in the area.

The objectives for the scheme were set internally by the EAW, with some consultation with the key partners.

2.1.3 Partnership

The main partners and funders in this £8.3 million flood alleviation scheme were the EAW, the Welsh Assembly Government (WAG), the European Commission, Gwynedd Council (GC), and Gwynedd Archaeological Trust (GAT). EAW's project manager carried out a scoping process to identify potential partners of this scheme then approached them individually. A business case was presented to each, to demonstrate the benefits of supporting the scheme to the partners.

As the scheme was being constructed in a heavily built-up area it was important that the local community were kept informed at every stage. All communication activity was facilitated by an EAW appointed Liaison Officer such as public information boards with an 'open door' policy for the public to discuss issues face to face with the agency. Once construction had begun the 'open-door' policy allowed the public to speak to the contractors face-to-face. To keep disruption to a minimum the agency carried out 'letter drops' in specific areas of the community affected by the scheme to inform local residents of the impending works. The Liaison Officer built up a number of important relationships with partners and the community that lasted throughout this project and into future schemes.

The lead partner for this scheme was the EAW, with a close working relationship with GC. In order to manage this relationship a memorandum of understanding (MoU) was put in place. The MoU contained key information regarding partner contributions, communications and working practices, formalising the relationship between these two organisations and building an even stronger level of support for the scheme within GC.

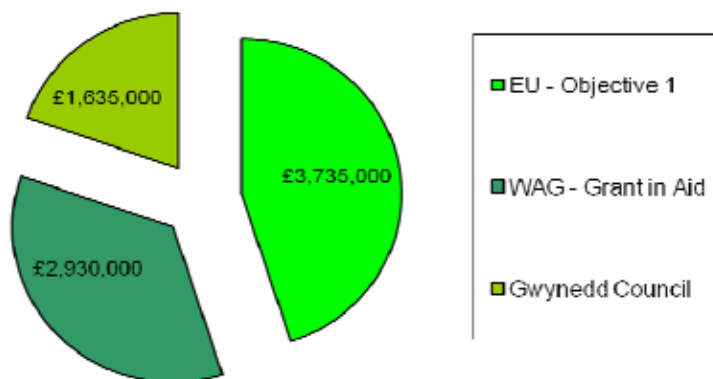
The project team met regularly at quarterly progress meetings, and when required ad-hoc teleconferences were scheduled to ensure project delays were addressed and the project was running on time and to budget. To mitigate against budget risk the project contractors were placed on incentivised contracts. Meaning that if savings were made the contractors received a proportion of the savings.

Once the scheme was completed the Environment Agency Wales took responsibility for all of the flood risk assets including the two rural inflows that had previously been maintained by GC.

2.1.4 Funding

The funders for this scheme were WAG and the EAW who administered the FDGiA money; the EC who provide Objective One Structural Funds and GC. The relative contributions can be seen in figure 5.2.

Figure 2.2 Afon Adda funding package £8.3 million



Although the scheme scored high on the flood defence grant-in-aid (FDGiA) criteria and was eligible to be fully funded, the sheer cost of the scheme meant it would have taken the entire flood defence budget for Wales that year. Meaning if 100% funding was provided other important schemes in Wales would have not gone ahead, it was this that incentivised the search for external contributions.

During the project appraisal and development stage, organisations were approached to help provide finance, through the professional experience of the project manager. The funding from GC was managed by the project manager under the MoU agreement. Objective One funding was managed by a member of EAW staff with expertise in European funding. The criteria of Objective One funding in the period 2000-2006 aimed to help reduce differences in social and economic conditions within the European Union, where prosperity, measured in Gross Domestic Product (GDP), was 75% or less of the European average. In Wales, Objective One covered West Wales and the Valleys (i.e. 15 local authority areas) and

represented an opportunity to the project team to meet both flood risk and regeneration objectives..

All of the partners except the GAT offered a financial contribution to the Environment Agency Wales to support the scheme (see section 5 for more details). In addition GC provided a significant amount of staff time to the scheme from a range of teams including recreation, tourism and highways. The council also provided EAW with a large amount of information related to local residents and local services which saved a huge amount of time. With strong support from GC the project manager was able to make informed decisions quickly and keep the project running on schedule.

Utilising internal expertise helped the project gain additional funding and ensured project success. No private sector organisations were approached for funding as external funding had already been obtained and the project manager felt that engaging with additional funders would have been a lengthy process that could have delayed the scheme.

2.1.5 Lessons learnt

- Project managers must balance the amount of funding required for a scheme with the time available to build relationships with funders.
- Large scale projects require a dedicated Liaison Officer to manage the communications strategy both with project partners and the local community.
- Having a Liaison Officer and Site Supervisor means that the Project Manager can focus on strategic management of the project rather than dealing with the day to day issues.
- Through a MoU effective partner cooperation and support can be established.
- Communication with the wider public is critical to the success of the scheme. By keeping the local community informed about work timetables, etc. It helps to reduce any negative feelings towards the scheme, and in the case of this scheme targeted letter drops worked extremely well.
- It is important for the whole project team to use contacts and lessons learnt from other schemes and works.
- As much communication and negotiation should be done as early as possible; this means engaging with key stakeholders and obtaining partner agreements upfront.
- Within the Agency it is important to prime internal departments when work needs to be completed in tight deadlines.
- When applying for European funding such as objective one, it is helpful to have one person in the team who is an expert in this source of funding.

Source; EA (2009), EU (2008), Morrison (2010)

2.2 Carlisle Flood Alleviation scheme

2.2.1 Introduction

The city of Carlisle is located in the county of Cumbria. Carlisle is located on the confluence of three rivers, the Eden, the Caldew and the Peteril. In early 2002 the Environment Agency began working up designs for a 1 in 100 annual chance standard scheme for the city but gained little interest from the local community, however this all changed following the devastating 1 in 180 year floods in 2005. These floods resulted in a high level of political, media and public interest in the scheme and put the spotlight firmly on the Environment Agency to deliver an enhanced 1 in 200 annual chance level of flood protection.

The £38 million Carlisle Flood Alleviation scheme comprised of two phases. Phase one the Eden and Pettrill scheme cost approximately £12.5 million and protected the Warrick Road area through a series of new flood embankments. Phase two the Caldew and Carlisle City scheme came in at approximately £23.5 million and protected Carlisle City Centre. An additional £2 million was spent on smaller scale locally led FR projects. Works over both phases included flood walls, raised embankments, flood gates, new pumping stations, replacing footbridges, removing old railway bridges and providing a new cycle path.

Due to the political and time pressures on the FRM team to get the scheme underway, there were several underestimations of the cost of the scheme at the approvals stage, this resulted in a £4 million budget shortfall. The was scheme led by the Environment Agency in collaboration with a range of public and private sector organisations including Carlisle City Council (CCC), Cumbria County Council Highways (CCCH), Natural England (NE), United Utilities (UU), National Farmers Union (NFU), Country Land & Business association (CLA) and Defra to provide a joined-up solution to the flood risk problems of the city. In addition the Environment Agency successfully gained contributions from non-delivery partners Tesco, Sustrans and Toby Inns.

2.2.2 Objectives

The initial driver for the Carlisle Flood scheme was the Lower Eden strategy that identified the need for a scheme in the area. However the 2005 floods were the catalyst that promoted the new redesigned £38 million 1 in 200 annual chance scheme. The 2005 floods and subsequent aftermath provided political, media and local community pressure that forced the Environment Agency to design and implement a flood alleviation scheme for Carlisle.

Another driver was the complex nature of the floods that affected the city in 2005 that included a mixture of surface water, rivers flooding and flooding from the sewage system. The Environment Agency recognised that due to the complex nature of the floods it was important that all flood risk was reduced not just the risk from the rivers, therefore a joined up system of FRM was needed in partnership with UU and CCCH. It was these two drivers along with the £4 million budget deficit that meant the scheme became a collaborative venture with a range of public and private sector organisations contributing funding and expertise.

In summary the main objectives for this scheme were as follows;

- To provide a 1 in 200 annual chance level of protection.
- To involve the community in key design decisions.
- To provide a joined up solution to flood risk.

2.2.3 Partnership

The partners involved were the Environment Agency, CCC, CCCH, NE, UU, NFU, CLA and Defra. The agency opened up informal discussions with potential partners before the 2005 floods; however the partnership was formalised after this event and lead by CCC and the Environment Agency. Following the flood events there were a series of public meetings where many of the partners were heavily criticised through political and community means, for their failure to protect the city. The organisations realised at this point that a stakeholder board was required so a joint approach to FRM could be delivered.

The stakeholder group was made up of senior representatives within each organisation. This strategic level stakeholder board meant that the process of decision making was reasonably quick. It also had the added benefit that the senior-level partner representatives could resolve major issues almost immediately, reducing project delays. For example gaining planning permission to build flood defences along a river that is a SSSI site would typically take many weeks but through contacts within this group it was possible to get the permission granted in under a month. It was this proactive decision making and flexibility of this group that was one of the main reasons the scheme was completed one year ahead of schedule.

The stakeholder board was chaired and lead by the Environment Agency however it was largely an informal group. With no rigid rules or requirements it meant that the partnership had the ability to grow, adapt and develop as necessary. The stakeholder board was largely made up of public organisations and wherever possible tried to reduce public impact and concern. By addressing the concerns of the community early, the stakeholder board were able to turn the negative public perception post floods into strong support for the scheme which was a tremendous asset. The board had a joint media team and communication plan to provide a united message which all of the organisations were working to. In addition the board addressed community concerns by taking part in a number of public events and neighbourhood groups. The stakeholder board actively involved the community in different aspects of the scheme, for example involving the local schools in designing murals related to the scheme.

Below the high level stakeholder board was a sub-group of engineers from the relevant organisations, titled the 'making space for water' group. These engineers worked with each other to plot their assets onto one map, which provided the fullest picture of flood risks in Carlisle.

At the end of the scheme the responsibility for the assets remained with the Environment Agency except for flood works that were completed in a city centre park and became the responsibility of CCC.

One of the critical success factors for the Carlisle Flood Alleviation scheme was the partnership working. The stakeholder board met quarterly and provided a good opportunity for the partners to deal with any issues that threatened to delay the scheme. Partners also communicated through informal channels as their relationships grew. The stakeholder board was chaired and lead by the Environment Agency, however it was largely an informal group. The informal structure had no rigid rules or requirements which meant that the partnership had the ability to grow, adapt and develop as necessary.

2.2.4 Funding

A key driver in the funding of this scheme was the £4 million shortfall in project budget. There were two options, request additional funding from Defra and delay the scheme, or carry on and make savings and lever external contributions. Due to the politically sensitive nature and pressure the latter option was chosen, with the plan to provide 'value engineering' solutions, together with external contributions from beneficiaries and partners to reduce costs. The funding for the whole scheme (Phase 1 Eden & Petrill and Phase 2 Daldew & Carlisle) predominantly came from Defra flood defence grant-in-aid (FDGiA) accounting for over 97% of the total cost of the scheme, the remaining 3% came from external contributions.

Several organisations contributed to different aspects of the whole scheme, the current list of financial contributions negotiated in the design and construction phases is as follows:

Phase 1 - Eden & Petrill

On the Eden and Petrill scheme there was limited opportunity to negotiate financial contributions, the scheme was fast tracked after the floods of 2005. However Toby Inns who owned a development site provided £160,000 to pay for defences across their site. This stretch of defence was an integral part of the scheme that also benefited homes on Warwick Road.

External Contributions = £160,000

The Environment Agency through FDGiA = £12,340,000

Phase 1 total scheme cost = £12,500,000

Phase 2 - Caldew & Carlisle Scheme

The longer lead in time of the second phase made it possible for many more contributions to be obtained, this highlights the importance of identifying and approaching potential funders as early as possible in the appraisal stage. CCCH provided £30,000 of its maintenance budget for footbridge renewal and £37,000 to pay for the replacement of footpaths, this was passed to the Environment Agency. In addition the Carlisle Northern Development Route a partnership led by CCCH contributed £86,000 to temporarily protection highway construction works from flooding.

UU contributed £60,000 to protect a pylon threatened by scour.

Tesco contributed £150,000 for the construction of a defence across a site they wished to develop.

Sustrans provided £304,000 to incorporate a cycleway into the design of the defences.

With the exception of Sustrans contribution (which was non defence critical), the other costs based on current FDGiA criteria if not borne by the organisations mentioned, would be paid by the Environment Agency. The Sustrans contribution was non flood defence critical however provided recreational benefits and clearly time and cost efficiencies whilst the scheme was being constructed.

Although CCC did not make any direct investment, there were elements of in-kind contributions saving approximately £500,000, for example there was provision made for the free use of city centre car parks for the Environment Agency to use as site offices and material storage.

External Contributions = £1,167,000 (see breakdown in figure 5.3)

The Environment Agency through FDGiA = £22,428,000

Phase 2 total scheme cost = £23,595,000

Combined scheme cost (phases 1 and 2) = £38,095,000 (see full breakdown in figure 5.4)

Figure 2.3 Phase 2: Caldew & Carlisle scheme - external contributions £1,167,000

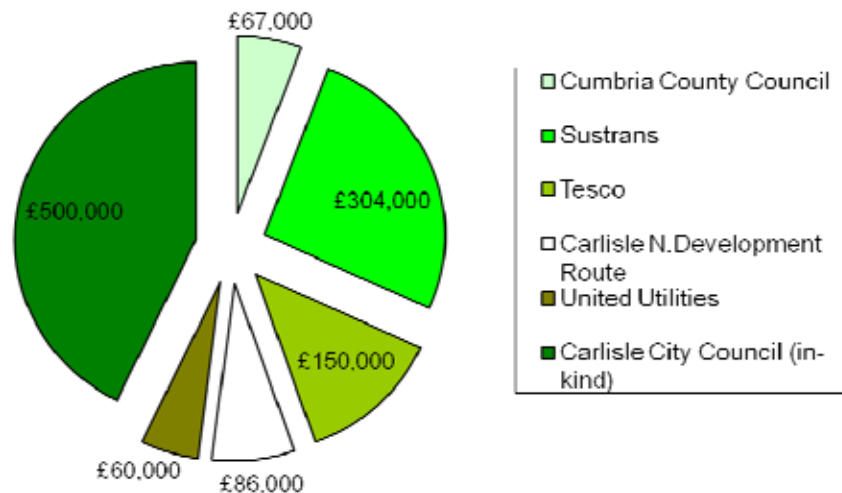
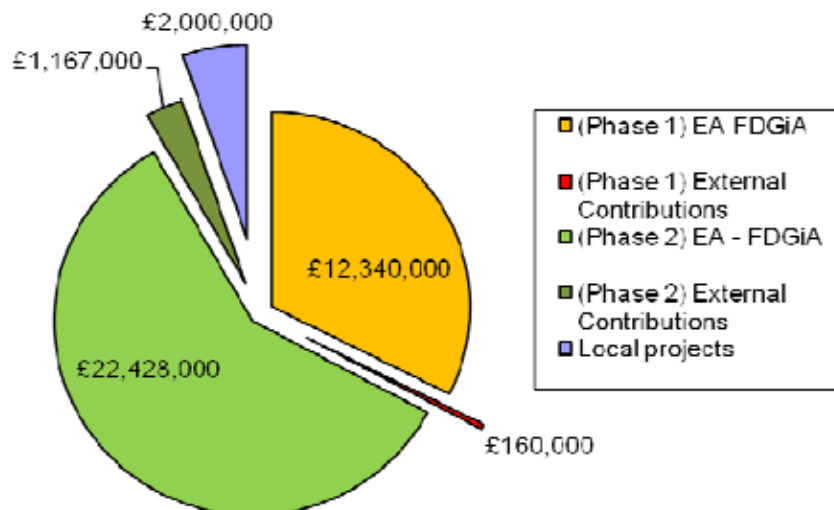


Figure 2.4 Total funding package for phases 1 and 2 - £38,095,000



Contributions were largely gained through the persistence and negotiation skills of the project manager who pursued the line that the “Environment Agency should not be paying compensation to organisations for the privilege of protecting them from flooding”. This meant that contributions were sought from businesses looking to develop along the rivers such as Tesco and Toby Inns and from organisations whose infrastructure was being protected such as UU. Members of the project team were also empowered to seek contributions from organisations which meant a greater number of opportunities for external funding. For

example it was an engineer that negotiated the contribution from UU as the Carlisle scheme was protecting some of their electricity infrastructure.

2.2.5 Lessons learnt

- This partnership scheme worked well as it had individuals from the right organisations at the right level of seniority with a shared purpose and goal.
- When setting a stakeholder board it is important to get the right individuals around the table. Partners need to have the knowledge and seniority to be able to make decisions but need to have the time available to commit to the scheme.
- It is important that the stakeholder board is of an appropriate size for the scheme and time frame. i.e. it was appropriate to the scale and type of scheme. (In this instance a large board was necessary due to the range of issues that needed to be addressed. To stop the board becoming too large the size of the board was limited for example Tesco and other organisations that funded the scheme were not included.)
- If possible a stakeholder board should include representatives with a wide range of skills and expertise. Such a balance of perspectives helps to deliver better solutions and encourages joined up thinking.
- It is important to address the concerns of the general public. (This was done particularly well in the Carlisle scheme where the partners came together at public meetings and provided a united message about the works being completed.)
- It is important to engage with the local community so that they support the scheme and feel a sense of ownership, particularly when balancing their expectations.
- Contributions are more easily obtained in the project appraisal phase and it is important to target owners of property and land who's value will be enhanced as a result of improved flood defences.
- When trying to gain funding it is important to be flexible, contributions in-kind can be just as beneficial to the scheme as direct finance (e.g. CCC allowing the Agency to use their car parks for free, thus saving an estimated £0.5 million.)
- All members of the team should be empowered to seek contributions. In the example of the Carlisle scheme all partners had a part to play in gaining external contributions. However it is important that this approach is coordinated by the project manager.
- There were successful outcomes in-terms of the project meeting its allotted budget through cost savings and external contributions, however if this was to be carried out again a more structured approach, more clearly focused on benefits and more closely managed in terms of negotiation plans, may have resulted in contributions significantly greater than 3%. In addition it was a risky approach to take reliant on the judgement and experience of key partners particularly the Environment Agency's project manager.

Source; BBC (2005), Battersby et al. (2010), Roddy (2010), Met office (2008)

2.3 Pershore Flood Alleviation scheme

2.3.1 Introduction

The town of Pershore is located in the county of Worcestershire between the cities of Worcester and Tewkesbury and is affected by flooding from the River Avon. The key driver to undertake work in Pershore followed the 2007 floods where over 100 properties in the town were flooded. Following this the Environment Agency began to work up detailed plans for creating a scheme in the area, however these plans were stalled when a suitable source of clay could not be found. This problem was solved when the agency saw an opportunity for environmental enhancement and in partnership with Worcestershire Wildlife Trust (WWT), decided to create a wetland habitat which provided a source of clay for the flood defences and improved biodiversity along the river.

The scheme now completed defends 61 of the 100 properties that were flooded in 2007 and provides a 1 in 100 annual chance standard of protection from fluvial flooding. The scheme is being carried out in two phases, phase one was completed in May 2010 and involved the flood proofing of several buildings. The second phase of the scheme is currently under construction and will provide 1.2km of raised flood defences consisting of a mixture of floodwalls and embankments. Interestingly, this scheme is using barges to transport the clay from the wetland to the flood defence site, which whilst being slightly more expensive, dramatically reduces the disruption and environmental impacts of the scheme

The main partners and funders for this scheme are the Environment Agency, WWT, Worcestershire County Council (WCC), Severn Trent Water (STW), Pershore Town Council (PTC), and local landowners.

2.3.2 Objectives

The initial driver for this scheme was the floods in 2007 which badly affected the town of Pershore. Once initial feasibility work had been completed the project manager sought to identify a source of clay as key raw material, important to successfully implement the flood defence option. However due to the economic 'down-turn' there were none of the usual sources of clay available as much building work was put on hold. Worcestershire Wildlife Trust (WWT) were approached to undertake a project that would provide a biodiversity habitat and a source of clay for the flood defence works. It was these drivers which resulted in the Pershore Flood Alleviation scheme becoming a multiple partner project.

The incentive for WWT to be involved was the benefit of receiving 15 hectares of 'biodiversity action' habitat along the river corridor. In addition, through partnership, they managed to gain a financial contribution towards the wetland.

The main incentive for WCC to be involved is that the major highway route in Pershore would be protected and they are making substantial cost savings on these works by using the agency contractors. Similarly STW is benefiting from infrastructure protection.

PTC and local landowners are benefiting from property and town flood protection. This is especially important to PTC because there was significant local pressure from Pershore's residents after the 2007 floods. Additionally, the landowner that provided the land for the wetland will receive stewardship payments on previously uneconomical land. The main driver for WDC is that this scheme brings investment into the district. By working in partnership the Environment Agency has been able to fulfil not only its flood risk management targets but some of its biodiversity targets as well.

The main objective of this scheme is to provide a flood defence to the town of Pershore whilst also enhancing the environment along the river corridor. The objectives were very much Environment Agency lead and other organisations such as the WWT had to fall in line with agency timescales and requirements. For example the wetland designs were adapted to provide the amount of clay required for the flood defence works. With the Environment Agency taking a strong lead this meant there was little disagreement between partners and decisions were made quickly.

The main objectives for this scheme were as follows;

- To provide a 1 in 100 annual chance level of protection to the town of Pershore
- To provide 15 hectares of wetland habitat

2.3.3 Partnership

The main partners and funders for this scheme are the Environment Agency, WWT, Worcestershire County Council (WCC), Severn Trent Water (STW), Pershore Town Council (PTC), and local landowners. The partnership was brought together by the Environment Agency project manager through a scoping process which identified the relevant organisations, who were then approached. The project manager sought to build a relationship with these partners on a one-to-one basis rather than in a formal partnership, engaging them with the scheme and communicating the potential benefits they could receive if they became involved.

The partnership was formed through a network of bilateral relationships managed and negotiated one-to-one by the Environment Agency as the lead. A particularly strong relationship was formed between the Environment Agency and WWT. By completing most of the negotiations and detailed work on a one-to-one basis partners were far more willing to contribute and the project manager could call on their expertise when necessary. This also provided a more productive use of everybody's time as organisations were only consulted upon issues relevant to them. This approach was said to be much simpler and easier to manage rather than bring all partners together at every milestone. However it was still necessary to bring all partners together at a preconstruction meeting, which proved useful as it allowed any final issues to be resolved with all of the organisations input.

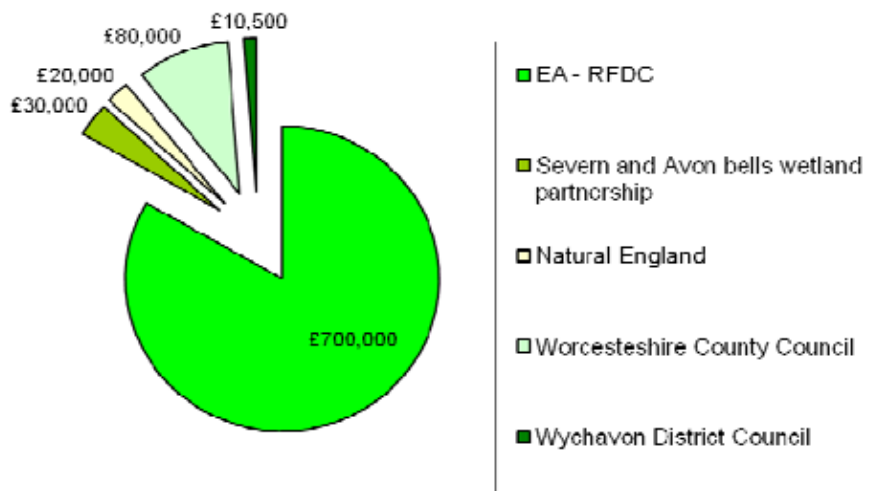
The scheme also benefited from local community support. By providing a range of public consultation and drop-in events the Environment Agency were able to gain a high-level of detail on flooding in the area from the local residents. This supported the business case for the scheme. Engagement with the local community meant that public support for the scheme was so strong that a petition supporting the plans was submitted to the planning authority at the time of the application.

The scheme is now the responsibility of the Environment Agency to maintain the flood defences. The managing of the wetland will be completed by the land steward appointed by Natural England with the support of WWT.

2.3.4 Funding

The Pershore Flood Alleviation scheme was funded by the Environment Agency, Severn and Avon Bells Wetland Partnership, Natural England, WCC, and WDC (Specific contributions can be seen in figure 5.5).

Figure 2.5 Pershore flood alleviation scheme funding package - £900,000



Each of the partners has offered either a direct contribution or a contribution in-kind to the scheme but in addition they have all provided their support and expertise to the scheme. For example WDC as the planning authority came along to public meetings to answer any questions or concerns raised by the local residents. STW did not provide a financial contribution however they did donate land to the scheme. Similarly PTC did not provide a financial contribution but did act as liaison to the local allotment owner that would be disrupted by the scheme, this saved time and resources from the project budget. If a cost was attributed to these elements, external funding could potentially be much higher.

Specific funders were not identified until part way through the scheme as initially it was not known where the clay would be sourced from. The funding was managed by both the Environment Agency and the WWT.

WWT lead on the task of identifying, applying for and managing the funding for the wetland, whilst the Environment Agency's project manager was responsible overall for the wetland funding package and additional external funding for the scheme. In total approximately ten funders were identified and approached by the project manager who used his own experience and the experiences of Environment Agency colleagues. Internal communication between staff ensured the Environment Agency budgets could be maximised, for example, a portion of the biodiversity budget was used to provide the 15 hectares of compensatory biodiversity habitat.

2.3.5 Lessons learnt

- Through improved planning and cross-government body working, projects can be sympathetically scheduled to ensure delays, costs and disruption to local residents is reduced.
- Early consultation with relevant partners and key stakeholders should be carried out to ensure working relationships are established and these organisations can be approached for contributions.
- Completing detailed negotiations and plans with partners on a one-to-one basis maximises time and reduces the possibility of conflict in open negotiation meetings.
- Engaging the local community at an early stage helps provide supporting evidence related to flooding in the area and builds overall support for the scheme.
- When seeking funding, communicate with as many individuals as possible both internally and externally.
- The PAR is an excellent business case model the Environment Agency uses to demonstrate its case for funding aspects of it may also be used to assist the partners develop their own business cases to justify funding. External contributions must be documented within the PAR therefore external funding should be negotiated at the project appraisal stage well before the PAR is completed.
- Effective and regular communication is vital when engaging the partners, funders and the public. It helps to minimise problems further down the line.
- It is important to be open-minded and flexible as this allows the scheme to evolve.

Source; Allen and Rees (2010), EA (2010), EA (2010b), PTC (2010), Rees (2010)

2.4 Rotherham Community-wide Flood Alleviation scheme

2.4.1 Introduction

Rotherham is the principle town in the South Yorkshire borough of Rotherham. The city is currently undergoing extensive regeneration works as part of the Rotherham Renaissance programme. The 25 year programme is looking to 'create a new vibrant town centre and ignite the economy in Rotherham'. The city of Rotherham is built upon the confluence of two rivers, the River Don and the River Rother.

Phase one of the flood defence scheme was completed at the end of 2008 and comprised of 1.7km of flood protection. This involved construction of flood protection sheet piles, reinforced concrete walls, major land forming, the removal and raising of bridges and the diversion of massive infrastructure. In addition to this there was the reclamation of a former industrial site into an urban wetland park. This park as well as being a community resource provides compensatory flood relief for the area as it provides an area for excess water when the level of the Don is particularly high. Now completed, these defences provide a 1 in 100 annual chance level of protection to a range of commercial properties, 30 hectares of brown field urban development land, a canal, the main western canal gateway, rail and road infrastructure. In addition the scheme has the potential to provide over 1,000 full time jobs through the regeneration of the Templeborough area that runs adjacent to the river.

The main partners and funders for the £15 million community wide flood alleviation scheme were RMBC, the Environment Agency, Sheffield and Rotherham Wildlife Trust (SRWT), Yorkshire Forward and the European Union's Objective One structural funding.

2.4.2 Objective Setting

During the 2000 floods a major regeneration site for the city was badly flooded. Consequently a partnership lead by Rotherham Metropolitan Borough Council (RMBC) included the Environment Agency, began working on a community wide flood alleviation scheme to protect these renaissance sites. Work started when the partnership commissioned a study into the nature of the River Don and the potential leak points in and around Rotherham city centre. Following this research it was identified that compensatory flood relief and riverside adaptation was the best flood protection method.

The main driver for RMBC, Yorkshire Forward and the EU objective one structural funds was the potential for renaissance in the area, once the flood defence work had been completed. As until the high flood risk had been reduced, it was unlikely that this area would attract investment.

The driver for the Environment Agency to be involved in this scheme was the ability to protect numerous properties from flooding. Without this scheme it is unlikely that the Agency would have been able to protect Rotherham as the area did not score high enough on their project appraisal process. In addition the Environment Agency was interested in the secondary benefits this scheme offered, such as improved access, new flood defence infrastructure and a large community wetland.

SRWT became involved in this scheme through development of its Living Landscapes programme which aims to promote and deliver joined up environmental services along the River Don. By working as a partner on this project, SRWTs objectives related to wildlife, community and sustainable development could be incorporated into this scheme.

The 2000 floods in conjunction with these different organisational drivers acted as the catalyst for the Rotherham community wide-flood alleviation scheme (CWFAS).

When setting the objectives for the Rotherham renaissance scheme RMBC consulted with a wide range of internal and external stakeholders to incorporate their views in the project objectives. Through this process there was an overwhelming consensus that there needed to be a focus on improving the river in Rotherham. By engaging these stakeholders at early stage, individuals were more receptive when setting the objectives for the community flood alleviation scheme.

The key aims and objectives of the flood scheme were as follows;

- To provide enhanced protection to the city of Rotherham.
- To stimulate further regeneration of the town by attracting new investment and improving the job prospects for local residents.
- Enhance biodiversity along the River Don.
- To provide a community resource that improves access to the river and promotes local recreation and tourism.

2.4.3 Partnership

The main partners and funders for the £15 million community wide flood alleviation scheme were RMBC, the Environment Agency, Sheffield and Rotherham Wildlife Trust (SRWT), Yorkshire Forward and the European Union's Objective One structural funding.

The most beneficial asset that each of the partners brought to this scheme was their expertise and contacts. These applied to the operational side of the scheme and when trying to lever external funding and contributions. For example, by working with the Environment Agency, RMBC was able to gain access to engineers and other expert Environment Agency staff. Additionally they were also able to use the Environment Agency's external consultancy framework to appoint expert consultants. Yorkshire Forward used their knowledge and expertise to assist in obtaining the Objective One European funding. The SRWT used its knowledge and expertise to apply for additional funding that was not available to the other

organisations in the partnership. In addition SRWT were able to mobilise a workforce of volunteers and provide an expert landscape team to be used by the project.

In terms of project governance the lead partner was the RMBC. Council officers in the regeneration department project managed the scheme with technical assistance from EA officers and staff from SRWT. The primary objective of this project was urban regeneration; therefore RMBC took the lead role. The Environment Agency's role is not to deliver regeneration objectives and therefore took a partner role, supporting the council throughout.

There was no formal decision making structure within the project, however decisions such as the design of the scheme and appointment of contractors were made in partnership. The partnership was predicated on healthy respect and dialogue between the key partners, meaning decisions were made through open discussion and rationale. It did not feel necessary for a formal agreement to be put in place between the partners, as the significant investment of money and resource was enough to ensure partner commitment and project success.

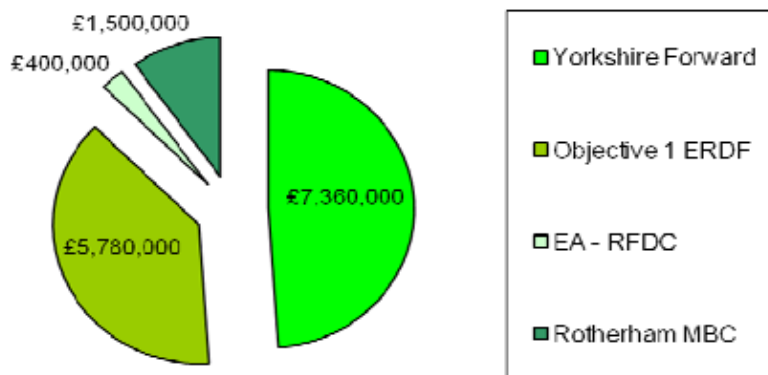
In addition, RMBC consulted with a stakeholder group of local landowners and a consortium of local businesses that reside along the River Don. Discussions were held with local landowners to allow the local authority to gain access to their land to complete the flood works, however these discussions were not formalised, meaning once construction began RMBC had to re-negotiate with land owners and draw up a legal agreement. By engaging these individuals early on in the scheme the council was able to gather support from the local community but the failure to formalise agreements with land owners resulted in minor project delays.

Once the scheme was completed the Environment Agency took over responsibility for the flood defence assets. This was one of the major benefits for RMBC working in partnership with the agency as they did not have the resources or expertise to maintain these assets alone.

2.4.4 Funding

The scheme was funded by RMBC, the Environment Agency, Yorkshire Forward, Objective One European Regional Development Fund, and the Environment Agency regional flood defence committee. The relative contributions are identified in figure 5.6.

Figure 2.6 Rotherham flood scheme funding package - £15 million



In addition, SRWT brought a £350,000 funding package to the project, specifically for the creation of the compensatory flood plain that provided a wildlife habitat and community resource. This funding was gained through landfill tax funds administered by BIFFA, WREN and SITA trusts together with Interreg VALUE and WRAP support.

In many cases the different sources of funding were largely negotiated by RMBC, as they were the first to invest in the scheme and opted to become the lead organisation. As the first

investor RMBC had a strong negotiation platform on which to engage, inspire and catalyse other potential investors. Identifying and applying for contributions was made easier for the council as they harnessed the contacts and expertise from the other partners, for example the £350,000 external funding package was only possible through the work and contacts of the SRWT.

2.4.5 Lessons learnt

- Funding sources should be identified as early as possible as there are often funding sources specifically for project development. (For example in this instance RMBC were able to utilise Objective One funding that was designed to help develop regeneration projects.)
- A joint business case can be used to address multiple funding criteria, particularly if their objectives are similar. (In this case, the EU and Yorkshire Forward had the same business case.)
- When third parties such as land owners are involved it is important to get legal documentation rather than just a gentlemen's agreement. These agreements help to reduce the projects exposure to risk (delays through disputes and costs through unforeseen compensation.)
- It is important to put in place a stakeholder group at the beginning of the project that includes local landowners, business and member of the community. This helps to gain support for the scheme and avoid difficult issues at a later stage.
- The Environment Agency may not always be the best partner to lead a flood risk scheme as it can be framed with a regeneration focus which could fall under the role of the local authority as an infrastructure issue therefore it is important that individuals are flexible.
- The project governance arrangement set-up presented a risk to the partnership and the project, although formal contracts between the Environment Agency and other Government Departments are not possible, a Memorandum of Understanding (MoU) would have been a better formal arrangement.

Source; Mead (2010), Smith (2010), Lingley and Smith (2010), RMBC (2010)

3. Lessons Learnt

The case studies and FRM schemes examined in this project provide some excellent lessons on developing successful flood alleviations schemes in partnership using external funding to meet multiple objectives. The schemes discussed, use a variety of approaches and address many different flood causes. It is important to remember that while these case studies can present some strong lessons the lack of empirical research means that they provide only anecdotal findings and this must be remembered when applying lessons to other FRM schemes. The evidence shows that to develop urban FRM schemes that use diverse funding and achieve multiple objectives partnership working is integral.

3.1 Partnership working and governance

The case study evidence from this project highlights the fact that there is no 'one size fits all' approach for developing partnerships to support FRM schemes. The most appropriate approaches vary with location, problem and personal approaches of the project manager. For example in Carlisle a flexible high level stakeholder board was the partnership approach chosen (Battersby et al. 2010), whereas in Pershore communication was largely done on a one-to-one basis between the project manager and key partners (Rees 2010). Aspects of the approach used by the Carlisle flood alleviation scheme provide the most transferable lessons; therefore these approaches to partnership working will be focused on.

The Carlisle scheme used a stakeholder board as its primary method of partnership working. The board was set up early on in the projects lifecycle and had individuals from the most appropriate organisation at the right level of seniority (Roddy 2010). They suggested that if possible, a stakeholder board should include representatives with a wide range of skills and expertise as a balance of perspectives helps to deliver better solutions and encourages joined-up thinking (Battersby et al. 2010). The Carlisle board carried out quick and efficient decisions making and a joined-up approach to FRM as the partners all had a vested interest in the success of the scheme, predominantly driven by local and political pressures. An important lesson to draw from the Carlisle scheme is that involving senior level individuals in the decision making process reduces the potential for difficult issues to halt or stall the scheme, as these individuals can trouble shoot many issues quickly (Battersby et al. 2010).

The practical evidence shows that the Environment Agency is not always the best stakeholder to lead on FRM schemes, although they have the overall strategic responsibility for reducing FR (Linley and Smith 2010). This is largely due to the way in which flood alleviation schemes can be framed, for example in the Rotherham case study, FR is placed in a regeneration setting meaning it falls outside the mandate of the Environment Agency (Mead 2010). If other organisations take the lead on flood alleviation they allow schemes to pursue multiple objectives such as regeneration or providing community infrastructure (Linley and Smith 2010).

When other organisations take the lead on FRM it often means that flood work is completed well in advance of proposed Environment Agency work especially in areas with a low priority ranking. This is evident in both the Rotherham case study and in work being currently completed in the village of Peopleton. Here the local parish council has gained the ability to complete flood work via a delegation of power from the Local Authority. If the parish council was not leading on this work it is unlikely that any other organisation would have tackled FR in Peopleton, as the village scored low on both national and regional ranking (Lashley 2010). However schemes that have been studied could not be completed without the support and expertise of the Environment Agency staff therefore it is necessary for organisations to work together and provide joined-up solutions.

Case study evidence suggests that project management should be the role of the lead partner to ensure that the scheme continues on track. It is especially important to maintain buy in from key partners and requires a commitment to continual communication (Smith 2010). All of the schemes studied in this project suggest that early communication and consultation is vital to the success of a scheme. In particular the Pershore case study suggested that early consultation with relevant partners and key stakeholders should be

carried out to ensure working relationships are established and these organisations can be approached for contributions (Rees 2010). In the Pershore case study detailed communication was largely completed on a one-to-one basis in order to maximise the use of partner time and reduce the possibility of conflict (Allen and Rees 2010). The need for early and detailed communication is supported by the Bangor scheme, the project manager suggested that communication and negotiation should be done as early as possible and partnership agreements should be obtained up front (Morrison 2010). In addition lessons from the Bangor scheme suggest that communication with the wider public is critical to the success of a scheme. The scheme managed their communication by keeping the general public informed of progress. One particularly effective method of communication was targeted letter drops focusing on the areas where construction work would next be taking place (Ibid 2010). As this was such a large scale project a dedicated Liaison Officer was required to manage the communication strategy for the local community. This approach worked particularly well as the individual built relationships within the area which allowed the project manager to focus on running the scheme efficiently (Ibid 2010).

The Carlisle case study also highlights the importance of addressing general public concern. This was done particularly well in the Carlisle scheme where the partners came together at public meetings and provided a united message about the works being completed (Battersby et al. 2010). The partners also worked together to minimise the disruption to local residents. Through improved planning and cross government body working projects were scheduled sympathetically to ensure delays, costs and disruption was reduced (Ibid 2010). The partners of the Carlisle scheme believed it is particularly important to engage with the local community so that they support FR work and feel a sense of ownership of the scheme (Ibid 2010). The support of the general public was invaluable in the Pershore case study too. By involving the local community at an early stage the Project Manager was able to gain additional evidence detailing the flood areas which was used to support the internal business case (Allen and Rees 2010). Mobilising the local community to be involved in flood work helps to ensure the scheme's success. In the Deerhurst flood alleviation scheme the local community set themselves up as a limited company in order to contribute to the scheme financially meaning the scheme had enough resources to be completed (Tomlin 2010). Communication with the local community is integral to the success of any flood alleviation scheme. The very nature of FRM schemes means that risk can only be reduced and not eliminated. Therefore it is especially important that the local community understand the detail of the FRM scheme and the level of protection that is being provided (Nun 2010). This proved particularly important in the Uckfield flood alleviation scheme; due to the nature of the problem in the area, FRM could only be reduced to a 1 in 25 annual chance level rather than the 1 in 100 annual chance level the agency first proposed. Through open and honest communication the Environment Agency were able to help the community understand the issues in the area and minimise conflict (Ibid 2010).

The case studies and information from other FRM schemes suggest the importance of a partnership approach to tackling FR. The evidence suggests that by involving the right individuals and the local community a scheme can be significantly enhanced, via improved expertise, contacts and access to funds. Although there is no overall best approach for managing FR the principles suggested above should be considered and incorporated where possible to improve performance.

3.2 External funding

The case studies analysed in the previous section also present some interesting lessons relating to achieving external source of funding, in particular that when seeking funding it is important to consider a wide range of potential contributors. In the Pershore case study communication with internal colleagues meant that the flood alleviation scheme could benefit from additional Environment Agency funding as it fulfilled biodiversity objectives (Allen and Rees 2010). Similarly, working in partnership allows for the identification of additional funding sources. In the Rotherham case study SRWT were able to access sources of funding that the other organisations were unable to access, due to their charity status (Lingley and Smith 2010).

The Rotherham case study highlights the importance of identifying sources of funding early. In this case RMBC were able to utilise Objective One funding from the European Commission, specifically designed to help develop regeneration projects (Linley and Smith 2010, Mead 2010). Interestingly, the Rotherham case study also used joint business cases to address multiple funding criteria. In this case, the European Commission and Yorkshire Forward had the same business case as they had similar requirements (Linley and Smith 2010). The Bangor flood scheme also benefited from European funding, the project team found that when applying for European funding it was beneficial to have one person in the team who is an expert as the requirements and application process can be lengthy (Morrison 2010).

When trying to gain funding this research highlights the important of being flexible. In-kind funding can be just as beneficial to the scheme as direct finance therefore negotiators need to remain flexible. In the Carlisle scheme CCC did not have cash available to contribute to the scheme, however they allowed the Environment Agency to use their car parks as an area to store resources (Battersby et al 2010). This saved the project an estimated £0.5 million and was as beneficial to the scheme as a cash contribution. Interestingly, the Carlisle scheme empowered all members of the project to seek contributions and in this case the scheme engineers gained contributions as well as the project manager and key partners (Ibid 2010). In the Carlisle scheme, contributions paid for both specific FR works (such as flood defence in front of the redeveloped Tesco site) and discretionary add-ons (such as the cycle path). Interestingly, the private sector organisations Tesco and Toby's Inn provided contributions towards the flood defence works that protected their assets, but only after pressure from the Environment Agency project manager.

In contrast the majority of the external funding in the Pershore scheme paid for add-ons (the wetland creation) rather than fundamental FR works (Rees 2010). Whilst these types of funding allow FR schemes to pursue more diverse objectives they do not reduce the dependency on national funding sources. Therefore it is important that where possible funders contribute to the entire project rather than the discretionary add-ons.

Unfortunately there is no 'one size fits all' method for obtaining external funding for FRM schemes, except for high-level guidance only recently provided by the Environment Agency through its external contributions approach to securing contributions towards flood and coastal risk. The evidence from the case studies shows that by working in partnership, and communicating with contacts, schemes have a better chance of identifying and obtaining funding. However project managers must balance the amount of funding required for a scheme and the time available to build relationships with funders (Morrison 2010). It is clear from this research that when attempting to lever external funding it is important to be as flexible as possible in your approach.

3.3 General Flood Risk Management Lessons

In addition to the lessons relating to partnership working and funding, the case studies also identified some more general lessons relating to the project management of FRM schemes. The evidence shows that teamwork is critical both internally and externally (Morrison 2010). The team needs to have an open-mind and be flexible in order to allow the scheme to evolve and adapt. Flexibility was paramount in the Pershore case study, to overcome the shortcomings of local infrastructure, materials had to be transported by barge (Allen and Rees 2010). This fell largely outside the initial project plan and required the project team to be open-minded and flexible to new approaches.

Successful schemes identified are those that have taken a holistic approach to FRM. In particular the Carlisle scheme consisted of flood defence works, a cycle path, and improved public infrastructure. By combining multiple objectives and elements of work substantial economies of scale can be realised resulting in overall reduction of project costs. For example, officers as part of the Dagenham Washlands project believed the enhancement and FR works were two separate schemes and therefore the opportunity for joined up working was lost (Gor 2010).

When developing a scheme one FR practitioner suggested that it is important for the whole team to use contacts and lessons learnt from other projects (Morrison 2010). It was

suggested that this should form part of the Environment Agency project appraisal process and operating instruction. By adopting the best practice of the key stakeholders and contractors this should provide a continuous cycle of improvement for FR work, driving an improved level of performance each time a new project is started.

These findings must be treated with caution due to the anecdotal nature of the research, however they do point to some interesting lessons. They suggest that partnership working is a strong vehicle in which to deliver FRM schemes as they offer the potential for joined-up solutions and the opportunity to gain additional sources of funding.

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