



Flood and coastal defence and municipal engineers

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The impact of floods is devastating. The Easter 1998 floods in the UK caused five deaths, £400 million damage and resulted in 1500 people being evacuated from their homes. Autumn 2000 saw some of the worst floods in living memory with floods occurring in over 700 locations, over 10 000 homes and businesses flooded and a further 300 000 properties at risk. English and Welsh local authority (LA) powers to undertake flood and coastal defence works are permissive. Subject to meeting certain criteria laid down by the Department for Environment, Food and Rural Affairs (DEFRA) and the National Assembly of Wales, LA expenditure can attract grant aid. This paper reviews the current approach to flood defence in England and Wales. It presents an overview of the service and outlines some of the issues facing those responsible for service delivery. Particular reference is made to DEFRA's High Level Targets for flood and coastal defence and the Elaboration of the Supervisory Role of the Environment Agency which place obligations on LAs to make annual returns about the service they provide.

1. INTRODUCTION

Large parts of the UK are vulnerable to the devastating effects of flooding. Approximately 10 000 km² or 8% of the total area of land in England is at risk from river flooding, including tidal rivers and estuaries. Approximately 30% of the coastline is developed and some 2500 km² of land (1.5% of the total area) is at risk of direct flooding by the sea. As a result, in England and Wales, about 1.9 million homes, five million people and 185 000 commercial properties worth over £200 billion and 1.3 million ha of agricultural land worth about £7 billion are at risk from flooding. This equates to about 10% of the population and 12% of the agricultural land, including 61% of Grade 1 agricultural land.

The Easter 1998 floods caused five deaths, £400 million damage and resulted in 1500 people being evacuated from their homes. Autumn 2000 saw some of the worst floods in living memory with floods occurring in over 700 locations, over 10 000 homes and businesses were flooded and a further 300 000 properties were at risk (Figs 1 and 2. This flood drew the attention of the public and politicians (Fig. 3) to the role of local authorities and civil and municipal engineers in defending people and property from flooding.

Terminology for flooding can be confusing. The following definitions are from the National Strategy.¹

- Flood defence: alleviation of flooding by rivers or the sea.
- Sea defence: defence against sea and tidal flooding.
- Coast protection: protection of the land from erosion and encroachment by the sea.
- Coastal defence: term used to encompass both coast protection against erosion and sea defence against flooding.

The management of flood and coastal defence is shared between the Environment Agency, local authorities and Internal Drainage Boards (IDBs), all as 'operating authorities' under current legislation. This is a complex arrangement not often understood by those affected by flooding. Local authorities providing a flood and coastal defence service are acting under permissive powers. This results in differing levels of service across the country because flood and coastal defence services are often provided to meet other economic, environmental and social objectives.

This paper outlines the current structure of flood and coastal defence and the management issues of interest to those responsible for service provision.



Fig. 1. Autumn 2000 floods



Fig. 2. Urban flooding



Fig. 3. John Prescott, Deputy Prime Minister in Upton-upon-Severn (By Roy Booker)

2. ORGANISATION OF FLOOD AND COASTAL DEFENCE MANAGEMENT

There are three pieces of legislation covering flood and coastal defence

- Water Resources Act 1991
- Land Drainage Act 1991
- Coast Protection Act 1949

The Flood Management Division of the Department for Environment, Food and Rural Affairs (DEFRA) is responsible for setting national policy in England; the National Assembly has the same role in Wales. Arrangements differ in Scotland and are not discussed here. DEFRA's policy aim is as follows.¹

To reduce the risk of flooding to people and the developed and natural environment from flooding and coastal erosion by encoura-

ging the provision of technically, environmentally and economically sound and sustainable defence measures.

DEFRA's key objectives to achieve this policy are to

- encourage the provision of adequate and cost-effective flood warning service
- encourage the provision of adequate, economically, technically and environmentally sound and sustainable flood and coastal defence measures
- discourage inappropriate development in areas at risk from flooding and coastal erosion.

Under the Water Resources Act 1991, the Environment Agency, through its Regional Flood Defence Committees (RFDCs), has powers to deal with flood defences covering 40 000 km of river and estuarial defences (known as 'main rivers') (Fig. 4) and 1000 km of sea flooding; and power to undertake defence measures in default of IDBs or on behalf of local authorities. The Environment Agency is also responsible for the general supervision of all matters relating to flood defence, and for providing the national flood warning service.

Local authorities have powers, under the Coast Protection Act 1949, to undertake coast protection works and, under the Land Drainage Act 1991, they have powers to undertake flood defence measures where not covered by the Environment Agency or IDBs. Local authorities also have the powers to undertake flood defence measures and recharge the costs to the landowner when their inaction presents a serious threat of flooding to people and/or property.

Through the Land Drainage Act 1991, IDBs have powers to undertake flood defence works in Internal Drainage Districts. IDBs are established in the particularly low-lying areas of England and Wales where flood protection and land drainage are necessary to sustain both agricultural and developed land use. There are about 250 IDBs, covering an area of some 1.2 million ha. A high proportion of this area requires pumped drainage to evacuate water. Figure 5 illustrates the legislative arrangements.

While these arrangements are understood by those responsible

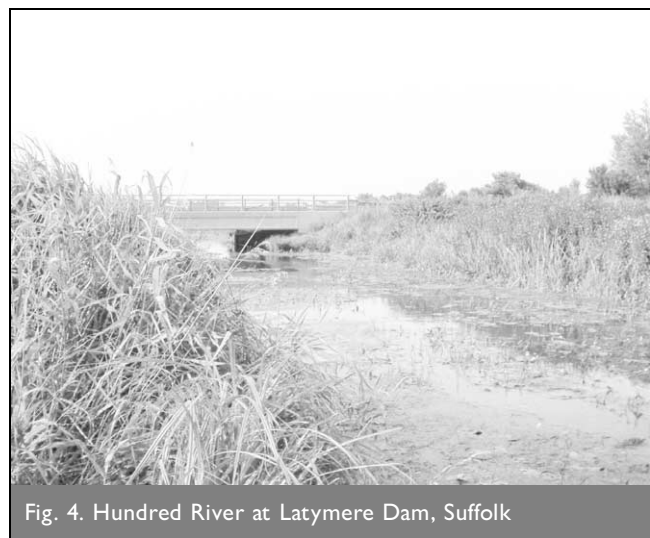


Fig. 4. Hundred River at Latymere Dam, Suffolk

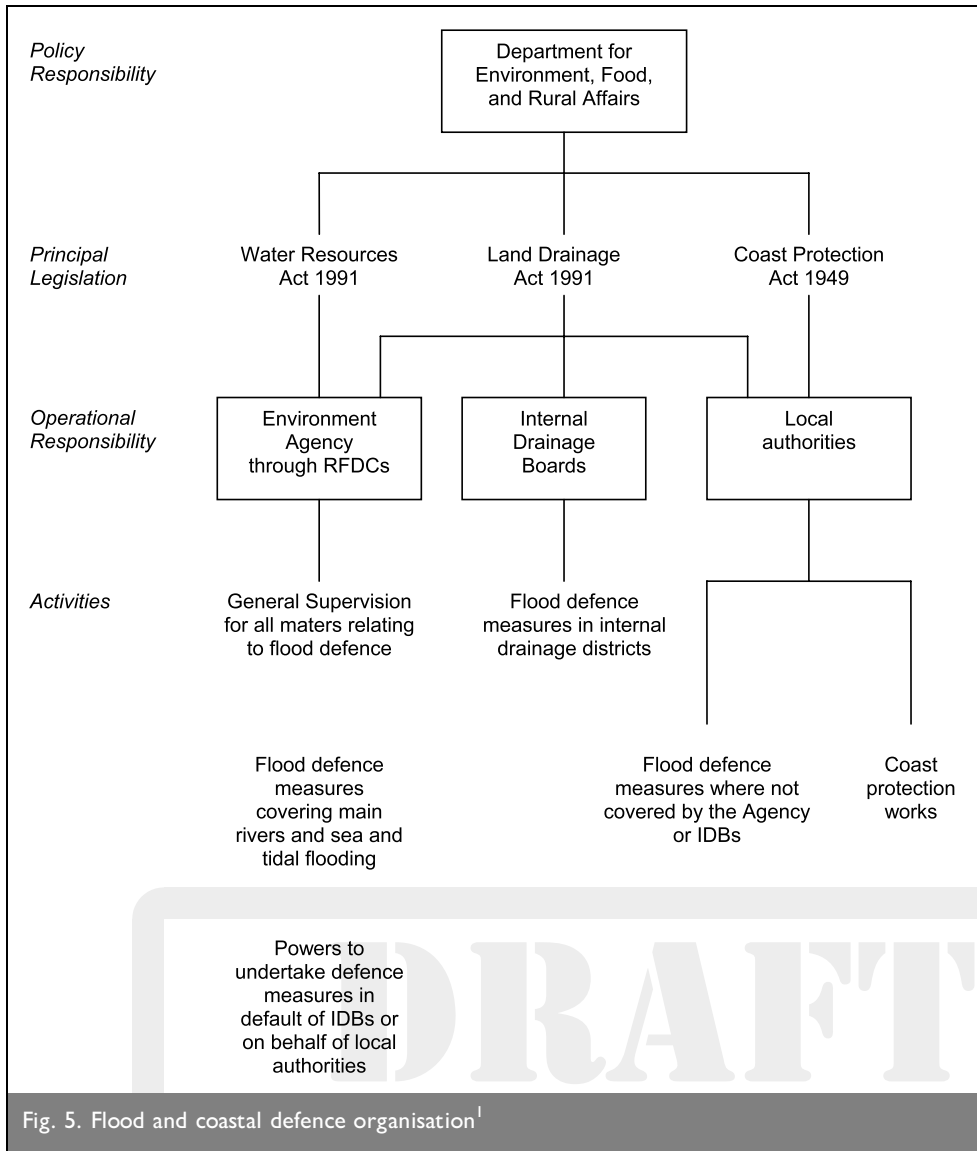


Fig. 5. Flood and coastal defence organisation¹

- (c) Detailed local studies for scheme implementation or management of a risk.
 - (i) Section 105, Water Resources Act 1991 mapping of floodable areas plans which indicate the areas subject to a risk of flooding for a 1-in-100-years return period. The Environment Agency is obliged to produce these maps for the local planning authority.
 - (ii) Specific scheme studies.
 - (iii) Specific process studies.
 - (iv) Emergency response plans.

A consequence of the UK's sectorial approach to flood and coastal defence is the proliferation of policy, strategy and management plans relating to the service. Each river catchment, estuary and length of coastline has, or will soon have, a plan determining how it should be managed. This has led to

for the provision of the flood and coastal defence service, the number of different authorities involved (at around 600) and the complexity of the legislation can confuse the public as to who does what. However, in practice, the public generally looks to local authorities as a key point of contact during a flood emergency, particularly in respect of local protection (usually in the form of sandbags, Fig. 6) and the provision of rest centres for those displaced from their homes.

3. MANAGEMENT PLANS

DEFRA and the operating authorities are working together to achieve a more strategic basis for flood and coastal defence (Fig. 7). Decisions about the longer-term issues are informed by a series of studies used to produce a set of coordinated management plans and flood emergency plans. These plans include the following.

- (a) High-level plans determining overall policy options for a river catchment or a length of coastline
 - (i) Catchment Flood Management Plans (see Section 4)
 - (ii) Shoreline Management Plans.
- (b) Strategy studies along rivers and at the coast, examining how best to implement the overall policy.



Fig. 6. Use of sandbags



Fig. 7. Oulton Broad, Suffolk

some confusion and duplication of effort. Attempts are being made to integrate these plans at a 'high' level but much more work is required to ensure a consistent approach at the boundaries of adjacent plans.

The Regional Coastal Defence Groups in England and Wales provide a good example of how a partnership approach can deliver a more integrated service. Recommendations and policies for the management of the coastline contained in their non-statutory Shoreline Management Plans are being adopted by local planning authorities. This coordination of approach does not extend inland but the production of Catchment Flood Management Plans will provide an opportunity to develop a similar approach.

A lack of resources adds to the inconsistencies of service provision and response. Pressures on revenue budgets have led to local authorities concentrating on statutory duties. For flood defence a local authority has only two statutory duties, both in the times of an emergency: to assist the police and to provide a mortuary. The difficulty for engineers having to function under this 'statutory duty only' approach is deciding when other statutory obligations, such as under planning and building control legislation, require a local authority to act when flooding and erosion are threatening properties.

4. CATCHMENT FLOOD MANAGEMENT PLANS

DEFRA and the Environment Agency are currently introducing Catchment Flood Management Plans (CFMPs) to provide a holistic framework for the management of flood risk on a catchment-wide basis throughout England and Wales (Fig. 8). Policies set out in the CFMPs will enable Strategy Plans (identifying the appropriate types of flood defence solution) and Solutions (e.g. flood relief channels, floodplain storage, etc.) to be tiered in a logical manner. This should enable management of flooding in urban and rural sub-catchments to be established in a sustainable manner.

Pilot studies are currently under way in five catchments and guidelines for carrying out the 80 CFMPs will be published in autumn 2002. Local authorities are to be major consultees and the CFMP will become an important means of integrating flood management policy into wider strategic planning.



Fig. 8. Bewdley, Worcestershire

5. HIGH LEVEL TARGETS AND ENVIRONMENT AGENCY GENERAL SUPERVISORY DUTY

DEFRA published a set of High Level Targets (HLTs) in November 1999 as a framework to measure the achievement, by the operating authorities, of its flood and coastal defence aims and objectives. The targets came into operation in April 2000.²

The targets were accompanied by an elaboration of the scope of the Environment Agency's Flood Defence Supervisory Duty. These targets should now be focusing the activities of all operating authorities and improving the consistency of the service but many local authorities have taken no action to complete the annual returns, claiming a lack of resources to undertake this additional work.

There are 14 targets. Those most relevant to local authorities involved in flood and coastal defence are as follows.

- *Target 1: Policy Statements.* This requires local authorities to prepare a policy statement setting out plans for delivering the Government's aims. A template is available to assist local authorities in producing the statement.
- *Target 4B: National Flood and Coastal Defence Database.* Local authorities should provide the Environment Agency with information on flood and coastal defence assets to be incorporated in the National Flood and Coastal Defence Database (NFCDD) developed by the Agency.
- *Target 5: Flood defence inspections and assessment of flood risk.* Authorities are required to determine a method of evaluating the risk of failure of the various elements making up a defence, to recording the condition of the flood defence assets, produce a risk assessment report and provide it to the Environment Agency.
- *Target 6: Coast protection inspections and assessment of coastal erosion risk.* This is a similar Target to 5 but in respect of coastal defences.
- *Target 7: Expenditure programmes.* Local authorities to provide DEFRA with a prioritised forward programme of capital and maintenance works for the assets in the database.
- *Target 8: Shoreline Management Plans (SMPs).* The authority acting as a lead in the production of a Shoreline Management Plan is to report on the progress of preparation and revision of these strategic level plans. (New guidance on

the production of the second generation of Shoreline Management Plans was published by DEFRA in July 2001.³⁾

- **Target 9 (Part): Biodiversity.** Operating authorities are positively encouraged to seek and consider opportunities for environmental enhancement when selecting flood and coastal defence options at a strategic level and in developing schemes to set out the arrangements that they have in place for compliance to protect and enhance the environment when carrying out works of their proposals on biodiversity.
- **Target 10 (Part): Water Level Management Plans (WLMPs).** Where they act as the operating authority, local authorities, in conjunction with English Nature or the Countryside Commission for Wales, are to complete Water Level Management Plans for European sites and sites of special scientific interest (SSSIs).
- **Target 12: Development in areas at risk of flooding.** Local planning authorities are to assist the Environment Agency report to DEFRA on how local authorities dealt with the Agency's responses to planning applications for developments considered to impact on flood defences.
- **Target 13: Development in areas at risk of coastal erosion.** Similar to Target 12, but in respect of coastal defences.

At the time of the production of this paper, a significant number of local authorities had not responded within the time-scales published in the High Level Targets. This is a matter of concern being addressed by DEFRA.

Section 6(4) of the Environment Act 1995 gives the Environment Agency a general supervision over all matters relating to flood defence. Following a consultation with operating authorities, DEFRA published a document elaborating the scope of the supervisory duty with the High Level Targets.⁴ There are eight sections as follows.

- **Section 1.** This section obliges local authorities to: identify all of their flood defences and those on ordinary watercourses; identify critical watercourses, inspect and report on their condition to the Agency; identify any coastal flood defences for which the local authority is responsible and to report on their condition to the Agency (Fig. 9).
- **Section 2.** Local authorities, in partnership with the Agency,

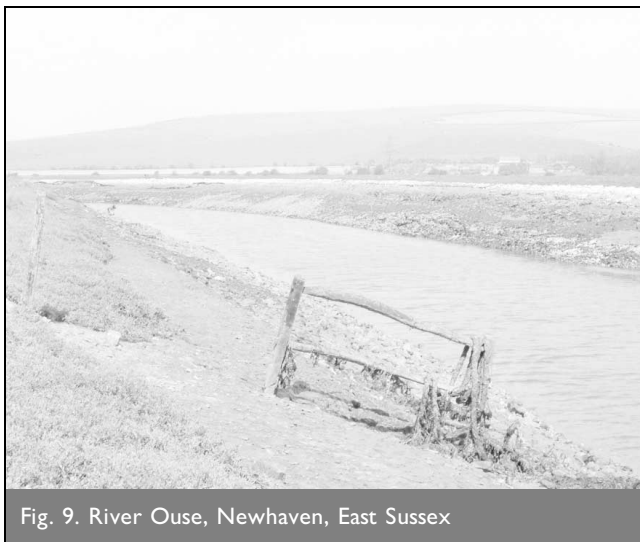


Fig. 9. River Ouse, Newhaven, East Sussex

are to assess the risk of flooding. The Agency is commissioning a National Flood and Coastal Defence Database to collate the condition surveys. New Forest District Council is piloting the database on behalf of the Local Government Association.

- **Section 3.** Local authorities to report on their performance and achievement of the DEFRA High Level Targets.
- **Section 4.** This section relates to flood warnings given by the Agency.
- **Section 5.** This section relates to raising public awareness.
- **Section 6.** Local authorities to assist the Agency in providing information to DEFRA on how the Agency responds to requests for comments on development plans and planning applications and to provide the Agency with information on the inclusion of adequate flood risk statements in development plans.
- **Section 7.** Local authorities to report to the Agency on the use of their powers requiring others to maintain ordinary watercourses.
- **Section 8.** Where local authorities are the operating authority, to prepare Water Level Management Plans and programmes for their implementation and to report on progress towards achieving targets set in the national Biodiversity Action Plans.

6. LINKS WITH PLANNING AUTHORITIES

Planning Policy Guidance Note 25 (PPG 25)⁵ explains how flood risk should be considered at all stages of the planning and development process in order to reduce future damage to property and loss of life. It sets out the importance the Government attaches to the management and reduction of flood risk in the land-use planning process, to acting on a precautionary basis and to taking account of climate change. It summarises the responsibilities of various parties in the development process. PPG 25 places an onus on engineers and planners to work together, to ensure that new development is safe and not exposed unnecessarily to flooding, by considering flood risk on a catchment-wide basis and, where necessary, across administrative boundaries. It seeks to reduce and certainly not to increase flood risk and to help ensure that floodplains are used for their natural purposes, continue to function effectively and are protected from inappropriate development (Fig. 10). The guidance also outlines how flood risk issues should be addressed in regional planning guidance,



Fig. 10. The flooding of new houses built on floodplains

development plans and in the consideration of planning applications.

PPG 25 states that

- the susceptibility of land to flooding is a material planning consideration
- the Environment Agency has the lead role in providing advice on flood issues, at a strategic level and in relation to planning applications
- policies in development plans should outline the consideration which will be given to flood issues, recognising the uncertainties that are inherent in the prediction of flooding and that flood risk is expected to increase as a result of climate change
- planning authorities should apply the precautionary principle to the issue of flood risk, using a risk-based search sequence to avoid such risk where possible and managing it elsewhere
- planning authorities should recognise the importance of functional floodplains, where water flows or is held at times of flood, and avoid inappropriate development on undeveloped and undefended floodplains
- developers should fund the provision and maintenance of flood defences that are required because of the development
- planning policies and decisions should recognise that the consideration of flood risk and its management needs to be applied on a whole-catchment basis and not be restricted to floodplains.

The Environment Agency's stated policy on development in flood risk areas presents a dilemma for local authorities trying to regenerate waterside frontages or considering applications for further development in areas already protected to a standard marginally lower than as decreed by the Environment Agency. Engineers are in an excellent position to help resolve these apparent conflicts.

7. REVIEW OF FLOOD AND COASTAL DEFENCE FUNDING

Following a review of flood and coastal defence funding mechanisms, DEFRA launched a consultation with local authorities and key stakeholders on alternative means of funding and possible amendments to institutional arrangements. The closing date was 17 May 2002 and all the documents are accessible on the DEFRA website.⁶

Basically, the documents consulted on proposals to restructure institutional arrangements by creating Regional Customer Bodies (RCBs) that would in effect become the clients for the flood defence service. Membership of these RCBs would include some local authority members.

The role of the RCBs would be to define the local service to be provided and provide the necessary funding, to bid for that funding to Government and then to commission the service from a new operating authority. The RCBs would contract with the operating authority for the delivery of the service.

Provision of the service would be the sole responsibility of a new operating authority reporting directly to the RCBs. The shape of the new operating authority would not be dissimilar to the current Environment Agency regions. The operating

authority would establish the standards of service and mode of delivery and would have the possibility of subcontracting works to local authorities.

8. FUNDING WORKS

In common with other local authority expenditure, works for flood and coastal defence can be funded through revenue or capital spending. Revenue spending is usually related to staff costs and maintenance, minor improvements and monitoring the performance of existing defences. Capital spending can be expenditure on strategic and scheme studies, regional monitoring programmes, provision of new defences and major improvements to or refurbishment of existing defences. Under certain circumstances, emergency works may also be categorised as capital spending.

However, a major difference is that under certain criteria and subject to the availability of funds, operating authorities' capital spending can be grant-aided by DEFRA. To be eligible for this grant aid, projects need to meet or exceed technical, environmental and economic criteria laid down by DEFRA in the National Strategy,¹ the Project Appraisal Guidance Series⁷ and Grant Memoranda.⁸ Proposals which achieve a score above a predetermined threshold and scored in accordance with DEFRA's Scheme Prioritisation System⁹ are eligible for grant aid. The new system operating from April 2002 measures the benefits of a proposal against the three criteria of economics, people and environment.

Local authorities may use their own capital resources to fund projects but DEFRA's approval is still required. In effect this means that any proposal must meet all the criteria mentioned above.

Operating authorities often fund small schemes and annual maintenance and monitoring works from their revenue budget. This also applies to any strategic work which might be developing local polices and/or management proposals, including the costs of inspecting watercourses and preparing the DEFRA High Level Target returns.

Fortunately, almost all the annual costs of providing a flood defence service can be recovered from central Government as part of their annual settlement. (Finding the specific allocation in the settlement is not so easy and can often lead to heated discussions with finance officers about the size of budgets and the net cost of the service.) However, the settlement is made retrospectively so there can be a delay of two years before the contribution is received.

Emergency financial assistance is available to local authorities dealing with severe events. This assistance is made by Ministers using section 155 of the Local Government and Housing Act 1989 and is known as the Bellwin Scheme. To be eligible, a local authority must be taking immediate action in response to an emergency or disaster. There is no automatic entitlement to financial assistance but the Bellwin Scheme has traditionally been seen as a response to incidents in which bad weather caused threats to life and property beyond all previous local experience. The level of reimbursement is based on a formula¹⁰ which assumes local authorities have made a reasonable

allowance in their revenue budget to deal with a 'typical' number of emergency events over an 'average' year.

Past settlements led to criticism of the size and timing of reimbursements which were regarded as too small and arriving too late. The Local Government Association of England lobbied Government for an improvement in the formula stating that: (a) the mechanism for cost recovery means that many local authorities have no effective way of recouping the costs of the actual work they engage in during the height of a crisis; and (b) the overall gross underfunding of emergency planning at local level represents significant barriers to the effective management of national emergencies. This led to an improvement in the system by which formula grant is allocated to local authorities and which came into operation during 2001–2002.

It is important to note that local authorities are still required to make a budgetary allowance for dealing with emergencies and they have to incur the expenditure before the scheme comes into operation. Furthermore, the Bellwin Scheme only applies to expenditure on major, unforeseen incidents.

9. DEFRA SPENDING REVIEW 2003–2006

The results of the Spending Review for DEFRA were announced by Secretary of State Margaret Beckett on 19 July 2002.¹¹

Protecting our communities from flooding

Government investment in flood defence has increased significantly in real terms since 1997. Additional funding of £15 million a year was made available in the wake of the autumn 2000 floods. The new funds over and above this which have been allocated in the Spending Review will ensure that this growth will now accelerate to reach 8·6% a year in real terms over the SR2002 period. The further allocation to the Department of £15 million in 2004/05 and £40 million in 2005/06, together with the amounts available for grants to local authorities and the revenues we expect to be able to raise from new funding mechanisms, will deliver an increase of £150 million in the third year of the Review. This level of resources, together with simplification of the administration of flood defences and effective partnership working with homeowners, local government, the Environment Agency, scientists and the insurance industry will allow us to reduce the risk of threats to life and damage to property from flooding.

In summary, the DEFRA spending programme for flood and coastal defence is now as shown in Table 1.

In making the case for these extra funds DEFRA highlighted a need for operating authorities to increase expenditure on

- maintenance of defences
- inspections of defences
- flood warning and public awareness campaigns.

DEFRA reviews its medium-term plans and the Priority Scores allocated to submitted bids for project support during early autumn. It then announces in October or November each year how the available funds will be split between the budget headings. At the same time the indicative priority score threshold for the next two years is also announced.

This settlement offers local authorities an opportunity to bid for funds for additional flood and coastal defence projects and improvements to the service. In building their bids, authorities will need to bear in mind

- the case made by DEFRA
- what level of contribution (i.e. levy) they are prepared to make to the Environment Agency and Internal Drainage Boards for their flood defence activities
- the level of their own activity and expenditure on flood management.

10. WHAT NEXT?

The general public and politicians are still expecting local authorities and the Environment Agency to work closely to reduce the threat of flooding. There are several initiatives municipal engineers could take to improve the management and performance of the service:

10.1. Management issues

Management issues include the following.

- Bidding for additional funds for flood and coastal defence to respond to the increasing needs of the service.
- Working with Environment Agency staff to identify, inspect and record the location and condition of critical ordinary

Year	DEFRA capital funding: (£ million)*	DEFRA other expenditure: (£ million)†	Standard spending assessment figures: (£ million)‡	Total: (£ million)
2003/04	114	8	292	414
2004/05	129	8	332	469
2005/06	154	8	382	564§

* Covers the grant to operating authorities for capital projects; funds to local authorities for Supplementary Credit Approvals related to capital projects; and contributions to the Environment Agency for extra statutory national initiatives such as flood warning, the development of the National Flood and Coastal Defence Database and flood risk mapping.

† Covers the costs of running the department, provision of the storm tide forecasting and wave recording services.

‡ Standard Spending Assessment (SSA) is part of the formula that the Treasury uses to assess the amount of Rate Support Grant (RSG) that an authority requires to bring its spending level in line with other similar authorities. It is a means to ensure that poorer authorities have sufficient funds to provide the same level of service as richer ones. The money spent by authorities on flood and coastal defence is returned to them via another formula and is contained in the RSG. For flood defence the RSG to local authorities is a contribution towards the costs of the levies given to the Environment Agency and Internal Drainage Boards and the cost of their own service provision.

§ This includes an allowance of £20 million from proposed connection charge to be levied on developers.

Table 1. DEFRA projected spending programme for flood and coastal defence

watercourses. Flooding of these critical ordinary watercourses caused immense flooding in 2000 when runoff water was able to outflank or get trapped behind main river defences.

- Working with colleagues in local planning authorities to minimise the risk of increased flooding created by the demands for more development in the floodplain. This will involve negotiations with the Agency and developers on methods to avoid development in the floodplain (many of the homes flooded in 2000 were part of fairly modern developments built inappropriately in the floodplain). Further pressures for the redevelopment of brownfield sites will require balancing these proposals with the policies of PPG 25 (see section 6) and the new funding proposals.

Ensuring that the DEFRA's High Level Target returns are completed. As mentioned earlier, a significant number of local authorities have failed to make any returns, claiming that they have no funds to undertake this work. Others have made incomplete returns. These authorities run the risk of not receiving approval for future scheme applications as DEFRA will not be able to relate the proposals to their policies.

10.2. Technical issues

Technical issues can be summarised as follows.

- Assessing the risk of failure of defences and putting in place a programme for repair and improvement.
- Assessing the likely impact of climate change on the standards of defence.
- Reviewing the outputs from the DEFRA/Environment Agency Research and Development Theme Advisory Group's programme of projects, thereby ensuring that the latest advice is taken up and implemented in project management.
- Working with the Environment Agency to develop the proposed Catchment Flood Management Plans.
- Reviewing and updating emergency response plans. This is an essential activity which unfortunately can be overlooked or given low priority when other pressures exist.

11. CONCLUSIONS

The future involvement and role of local authorities in flood and coastal defence will be determined by Ministers towards the end of 2002 when the Government publishes its response to the consultation on flood and coastal defence funding. Early indications are that there is a general level of support for the proposals outlined in section 7 above. If these are implemented then the role of local authorities will be as 'agents' to the new operating authority.

Active local authorities will resent this move as a further reduction in their role within the community. Others will see it as a political and financial relief, particularly as so many of

them no longer directly employ engineers capable of dealing with flooding issues. Sadly, this will be a further 'nail in the coffin' of the municipal engineer.

Next year is the fiftieth anniversary of the 1953 East Coast floods. The Environment Agency is to implement a major publicity campaign to remind the public of the threats from coastal flooding. Municipal engineers should support this campaign to promote their role in protecting communities from flooding and to demonstrate how they are ideally placed for integrating the service with other local authority activities for the benefit of the public.

REFERENCES

1. MINISTRY OF AGRICULTURE, FISHERIES AND FOOD. *Strategy for Flood and Coastal Defence in England and Wales*. MAFF, September 1993.
2. MINISTRY OF AGRICULTURE, FISHERIES AND FOOD. High Level Targets for Flood and Coastal Defence and Elaboration of the Environment Agency's Flood Defence Supervisory Duty. MAFF, November 1999. See also www.defra.gov.uk/envIRON/fcd/hltarget.htm
3. DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS. *Shoreline Management Plans—A Guide for Coastal Defence Authorities*. DEFRA, July 2001.
4. DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS. Document available online at: www.defra.gov.uk/envIRON/fcd/hltarget/envagenc.htm#duty.
5. ?????????????? *Planning Policy Guidance Note 25: Development and Flood Risk*. ?????, 17 July 2001. Available online at: <http://www.planning.odpm.gov.uk/ppg25/>.
6. DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS. Documents are available online at: www.defra.gov.uk/envIRON/fcd/default.htm.
7. DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS. *Flood and Coastal Defence Project Appraisal Guidance Series*. DEFRA, 2001.
8. DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS. *Memorandum Relating to Scheme Approvals and Grant Under the Coast Protection Act 1949; and the Memorandum Relating to Flood Defence Grants under the Water Resources Act 1991 and the Land Drainage Act 1991*—one for the Environment Agency, one for Internal Drainage Boards and one for local authorities. DEFRA (formerly MAFF), ??????????
9. DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS. *Scheme Prioritisation System*. DEFRA, March 2002. Available online at: <http://www.defra.gov.uk/corporate/regulat/forms/flood/LDW14.pdf>.
10. Available online at: <http://www.local.dtlr.gov.uk/finance/bellwin/bell023g.htm>.
11. DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS. News release 295/02. DEFRA, 19 July 2002.

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