Long-term Planning for Flood Management – a Comparison of Australian and United Kingdom Approaches

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Abstract: In recent years there has been a movement internationally towards longer term catchment scale flood planning. This has been necessitated by a range of environmental, social and economic issues, including the effects of climate change, increasing public awareness and sensitivity to flood risk, the need for land use planning consistency, changes in the insurance industry, and improvements in flood prediction technology. These issues are driving development of catchment scale plans which try to anticipate the effects of these issues, and which develop long term land and flood management policies to address them. The United Kingdom has recently started a programme to develop such plans for the whole of England and Wales, to be completed by 2008. The development of these plans is discussed, and contrasted against common practice within Australia.

1 INTRODUCTION

Flooding is the most manageable of all natural disasters; relative to the uncertainty of other natural disasters, such as drought, earthquakes and bushfires. It is easy to determine how and why a flood occurs, and where it will happen.Flooding can be planned for, its effects can be mitigated and regulations can be put in place to address the residual problem remaining after mitigation. The only parameters we do not know are when, and how large the flood will be.

As floodplain management professionals, we are responsible for managing the risk posed by this uncertainty. Our approach is guided by our experience, reasoning and diligence. However, our approach is also determined by implicit factors such as legislation, the structure of government, government policy initiatives and improvements in technology.

In this paper we have two aims:

• to compare the governmental structures of Australia and the United Kingdom which support flood management, and discuss the effect this has on long-term planning
• to outline the current Catchment Flood Management Plan system in England and Wales, and compare it with Australian practice

2 WHAT IS FLOODPLAIN MANAGEMENT

2.1 GENERAL

In the context of this paper, Floodplain Management is the management of the flood risk associated with the human occupation of the floodplain for both urban development and agricultural production. That risk is addressed through management decisions that satisfy the social and economic needs of the community, the constraints that flooding imposes and being compatible with the maintenance or enhancement of the natural ecosystems that the floodplain sustains.

An integrated, catchment-based approach to floodplain management features not only a consideration of flood characteristics but also a variety of other interrelated issues such as community desires, and the ecological and economic impacts of various land use and flood mitigation measures. In other words, development on flood prone land is considered across the broad spectrum of issues.

Such an approach to floodplain management recognises that:
• Flood-prone land is a valuable resource that should not be sterilised by unnecessarily precluding its development; and

• If all development proposals for flood-prone lands are assessed according to rigid and prescriptive criteria, some of them may be unjustifiably disallowed or restricted.

• Based on these considerations there are three main principles that are applied:

• Three types of flooding problems affect flood-prone areas: the existing problem, the future problem and the residual problem, and that the most effective means of floodplain management is through the development of a comprehensive Floodplain Management Plan.

2.2 OBJECTIVES

The primary objective of floodplain management is to reduce the impact of flooding and flood liability on individual owners and occupiers, and to reduce private and public losses resulting from flooding.

2.3 FACTORS FOR EFFECTIVE FLOODPLAIN MANAGEMENT

The principal requirements for effective floodplain management, identified in [Floodplain Management in Australia: Best Practice Principles and Guidelines, (SCARM 2000)] are:

• An authority with the primary responsibility for floodplain management policy and practice;

• Appropriate and effective legislative powers for the responsible authority, with powers applied on a catchment-wide basis;

• Appropriate mechanisms for coordination of land use planning and floodplain management on a catchment-wide basis;

• A community awareness of the flooding problem and the planning/management process, and a willingness to become involved;

• Completion of flood studies and floodplain management studies overseen by a steering committee representing all interested or affected parties;

• Provision of adequate resources to undertake studies and implement measures;

• Access to technical advice, standards and guidelines for the authority responsible for floodplain management;

• Legal provisions ensuring that the responsible authority exercises its powers responsibly, such as legal liability for the consequences of decisions; and

• Provision for intercession by a Central Authority when necessary.

We will return to these requirements when discussing the roles of various stakeholders and the comparison of approaches below.

3 GOVERNMENT FRAMEWORKS FOR FLOOD MANAGEMENT

3.1 THE NATURE OF GOVERNMENT

In both Australia and the United Kingdom environmental management is regulated at state or constituent country level. In Australia, each state has its own approach to environmental management, and there are different internal structures within state governments. In the United Kingdom, Scotland and Northern Ireland have independent environmental management organisations, which are controlled by local devolved government. However in England and Wales, which constitutes 88% of the United Kingdom population, the
Table 1: Structure of government

<table>
<thead>
<tr>
<th>Australia</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia is a federation of individual states and territories.</td>
<td>The United Kingdom is the political union of four constituent countries.</td>
</tr>
<tr>
<td>At federation, the Federal Government gained powers over defence, foreign affairs and taxation. The States retained powers in relation to the provision of services to their populations, such as health, education and transport. The provision of these services is supported financially from both Federal and State taxation funds.</td>
<td>In 1998, the United Kingdom devolved a range of powers from central United Kingdom government to Scotland, Wales and Northern Ireland. The Scottish Executive, National Assembly for Wales and Northern Ireland Assembly assumed responsibility for a range of activities, including environmental management and flooding. In England, central government retains direct responsibility for these functions. Funding for devolved governments is largely from central government taxation.</td>
</tr>
<tr>
<td>Local government is principally charged with provision of local services, such as local roads, waste disposal, and, of particular importance in floodplain management, vested powers over land use management.</td>
<td>United Kingdom local government has a similar role to that of Australian local government, including planning authority and development control. Provision of local government services is funded mostly by central government grants and local taxation.</td>
</tr>
</tbody>
</table>

3.2 BROAD ROLES OF GOVERNMENT IN FLOODPLAIN MANAGEMENT

State government in Australia provides the policy and technical framework within which floodplain management planning is carried out. The same is true within the United Kingdom within the devolved countries. In Scotland and Northern Ireland this framework is provided by the Scottish Environmental Protection Agency and Northern Ireland Department of the Environment. In England and Wales, this is provided by the Westminster government department Defra and Environment Agency. The Environment Agency is a statutory organisation, created in 1996 and funded and managed by Defra.

As might be expected, local authorities in both the United Kingdom and Australia have similar roles in managing the floodplain to ensure sensible land use planning and development. However, while Australian local authorities are responsible for preparing floodplain management plans for all aspects of planning control and risk management, this is not the case in England and Wales. The Environment Agency is responsible for flood risk management on watercourses designated ‘Main Rivers’. Local authorities retain planning control along these watercourses, with the Environment Agency a (non-binding) consultee on development applications.

In a broad sense, the allocation of roles looks roughly similar in terms of a central government - state/devolved government – local government model. However, as the next section illustrates, there are significant differences in the allocation of roles due to the statutory definitions of the organisations involved.
Table 2: Broad roles of government hierarchy

<table>
<thead>
<tr>
<th>Role</th>
<th>Australia</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central (federal) government</td>
<td>Provision of funds for floodplain management measures and flood relief. This is done through programmes such as the Natural Disaster Mitigation Programme, which fund studies and measures to address all natural disasters except droughts.</td>
<td>Provision of overall operating budget to devolved authorities, for them to allocate. In England direct management through provision of funding, research and policy by the Department of Environment, Food and Agriculture (Defra), and to local authorities</td>
</tr>
<tr>
<td>State Government / Devolved Government</td>
<td>The principal floodplain management role of State and Territory Governments has been stated as follows (DPIE, 1992): &quot;....to develop appropriate standards and strategic approaches for floodplain management and to ensure that they are applied in a coordinated and integrated fashion across the State. This role encompasses the provision of expert technical support via a principal water resources authority(s), of planning advice through a State Planning Agency and of effective counter-disaster and welfare services&quot;.</td>
<td>Devolved governments and Defra fund and manage flood policy development. They carry out flood management activities through their respective environmental management bodies: England and Wales: Environment Agency Scotland: Scottish Environment Protection Agency Northern Ireland: Department of the Environment. Through these environmental management bodies, government also: • directly carries out floodplain management of ‘Main’ watercourses*; • has broader scale floodplain management responsibility across local authority boundaries</td>
</tr>
<tr>
<td>Local government</td>
<td>Implement floodplain management strategies through land and development control plans and building regulations, and through flood mitigation measures. Floodplain management strategies devised by local government are defined in partnership with State Government, balancing local community aspirations with statewide consistency and standards.</td>
<td>Implement floodplain management strategies through land and development control plans and building regulations, and through flood mitigation measures on ‘Ordinary’ watercourses*. Local plans should be developed to take account of regional planning and the views of government environmental management authorities, which have a wider view of regional flood management</td>
</tr>
</tbody>
</table>

* Watercourses in England and Wales are categorised as either ‘Main Rivers’ or ‘Ordinary Watercourses’. Main Rivers are larger watercourses or those important for drainage, and the Environment Agency maintains flood defences on these watercourses. All other watercourses are Ordinary Watercourses, and are maintained by either Local Authorities or Internal Drainage Boards.

3.3 ALLOCATION OF ROLES WITHIN GOVERNMENT

All tiers of government and the community at large have an obligation to ensure that the local community is adequately protected from flood risk, both now and in the future. However, there is necessarily a formal allocation of roles within government. The following table outlines how this allocation varies between Australia, and England and Wales.
<table>
<thead>
<tr>
<th>Flood Management Action</th>
<th>Australia</th>
<th>England and Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing floodplain management plans</td>
<td>Local authority</td>
<td>Local authority (planning emphasis) Environment Agency (risk emphasis)</td>
</tr>
<tr>
<td>Developing flood emergency plans</td>
<td>Local authority / State Emergency Service</td>
<td>Local authority (emergency response) Environment Agency (awareness raising, flood warning and defence structure management)</td>
</tr>
<tr>
<td>Implementing flood management plans (planning control)</td>
<td>Local authority</td>
<td>Local authority</td>
</tr>
<tr>
<td>Implementing flood management plans (flood defence maintenance and construction, flood warning equipment installation and operation)</td>
<td>Local authority / State Emergency Service / Bureau of Meteorology / Water Resources Agency</td>
<td>Ordinary Watercourses: Local authorities and Internal Drainage Boards Main Rivers: Regional Flood Defence Committees*</td>
</tr>
<tr>
<td>Setting floodplain management policy, regulation and standards</td>
<td>State Water Resource Agency</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>Providing expert technical advice</td>
<td>State Water Resource Agency</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>Advising central government agencies on flood forecasting, flood warnings and natural disaster and flood relief needs of the affected community.</td>
<td>State Water Resource Agency / State Emergency Service / State Community Services Agency / Bureau of Meteorology</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>Regional planning control, providing advise to local authorities, ensuring regional plans taken into account in floodplain management plan development</td>
<td>State Planning Authority</td>
<td>Regional Assemblies (regional planning bodies formed from local authority representatives, and community, business and environmental group representatives)</td>
</tr>
<tr>
<td>Increasing awareness of flooding matters at local authority and community level</td>
<td>Local authority</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>Ensuring special environmental issues taken into account in flood management plan development</td>
<td>Local authority on advice from State Planning Authority</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>Preparing plans for the management of flood events</td>
<td>State and Territory emergency planning agencies</td>
<td>Local authorities</td>
</tr>
</tbody>
</table>
Flood Management Action | Australia | England and Wales
--- | --- | ---
Managing and conserving the soil, mineral, water and vegetation resources, including resources on floodplains. Protecting fauna and protecting and enhancing riverine corridor, riverbank, wetland and floodplain habitats and water quality. | Natural resource management agencies and environmental protection agencies | Environment Agency
Incorporating environmental issues into floodplain management plans | Advise from Natural Resource and Environmental Protection Agencies to local authorities | Environment Agency indirectly through provision of advice to local authorities, and directly within its own floodplain management plans.
Encouraging the development of effective long-term strategies for the sustainable management of the nation's floodplains. | Federal government / State government | Environment Agency
Funding floodplain management studies | Federal, State and local government | Central and local government
Providing flood forecasting services | Federal Government Bureau of Meteorology | Environment Agency

*Regional Flood Defence Committees are composed of representatives from central government, the Environment Agency and local authorities.

For England and Wales, the Environment Agency manages flood risk from ‘Main Rivers’ and the sea, and is responsible for spending 80% of the total government funding for flood defence under the direction of Regional Flood Defence Committees. The Environment Agency is also responsible for flood forecasting, flood warning, nation-wide floodplain mapping, public awareness raising, and acting as a development control consultee. It also has a general supervisory role with respect to flood defence and strategic floodplain management planning.

Local authorities have powers to provide flood defences on ‘Ordinary Watercourses’. They also develop local plans and regulate floodplain development. They do this by incorporating floodplain management controls into their plans, often developed based on their own floodplain management plans, or through reference to Environment Agency floodplain mapping studies.

Internal Drainage Boards are independent bodies which manage drainage in areas with special drainage requirements. As part of their role they have powers to provide flood defences on ‘Ordinary’ Watercourses.

### 3.4 FUNDING FOR FLOODPLAIN MANAGEMENT

There is a range of funding programs that are applied to floodplain management throughout Australia; again each State seems to have adopted a different approach and accepted differing levels of funding.

In essence, the Federal Government provides for funding through specific programs within the annual budget cycle. These programs are considered on a three-year cycle (the nominal term of a government) and while there are forward estimates, these are not always fixed and may vary from time to time. This funding is provided on the basis that the State or Territory matches the funds allocated.

The States have programs that are either based on the matching of Federal funding or, as is the case in NSW, contains additional funding that is over and above the Federal funding. The cycles of funding and budgetary allocations again reflect the variations across States.
The most consistent application of funding is that the local agency must also contribute to any studies, works or measures that are implemented under these funding programs. The funding ratio is usually on a 1:1:1 (Federal:State:Local) basis and while this may create financial issues for smaller local agencies, it reflects the shared responsibilities for floodplain management.

In the United Kingdom, Defra provides funding for flood defence through grant aid through Regional Flood Defence Committees to the Environment Agency, local authorities and Internal Drainage Boards. This covers activities such as maintaining and improving watercourses, sea defences, installing and operating flood warning equipment, and controlling the action of riparian land owners. Grant aid will cover a proportion of the total Flood Defence Committee expenditure. The proportion will vary from year to year, and according to the level of funding requirements relative to local resources.

4 THE FLOODPLAIN MANAGEMENT PROCESS

4.1 THE NSW APPROACH

Floodplain management is ideally achieved through the formulation and implementation of a strategic Floodplain Management Plan by a local authority. This plan forms part of a Local Environmental Plan, which controls land use and provides procedures for obtaining consent and environmental assessment for development. This Local Environmental Plan is then implemented through a Development Control Plan, which gives a detailed description of the controls on permitted development.

The floodplain management process is the responsibility of the relevant local authority. Specialist technical assistance and advice are provided by government authorities with the relevant skills.

To assist local authorities, the NSW Government has published a Floodplain Management Manual that not only describes the process, but also gives detailed appendices on a broad range of floodplain management issues. Victoria and Western Australia are in the process of developing similar Manuals. The State Planning Authority also ensures that the regional planning objectives are taken into account in the development of the local plan.

LOCAL STEERING COMMITTEE

The formation of a local Floodplain Management Steering Committee is the first step in the Floodplain Management Process. Its main function is to assist the local authority in the development and implementation of a floodplain management plan for the area(s) under its jurisdiction.

FLOOD STUDY

The Flood Study consists of a detailed technical investigation of flood behaviour. It defines the flood hazard by providing information on the extent, level and velocity of floodwaters and the distribution of flood flows across various sections of the floodplain. It does this for a range of floods up to the Probable Maximum Flood.

FLOODPLAIN MANAGEMENT STUDY

The Floodplain Management Study brings together flood risk, economic, social and ecological facts so that, with input from the community, a balanced sustainable solution to the flood issue can be achieved. Amongst other things, the Study identifies appropriate management options and assesses their effectiveness in mitigating the social, economic and ecological impacts of flooding. Often, no single floodplain management option will be sufficient and determining the optimum combination of measures requires complex investigations, wide ranging consultation with the community and the exercise of professional judgement.

A detailed appraisal of proposed management measures needs to be undertaken to ensure that costs are justified by associated benefits. This analysis usually follows conventional cost-benefit procedures. It is not unusual however, to proceed with urban flood mitigation schemes on largely social or environmental grounds and, schemes are now often designed to enhance the local environment.
It may be impractical on a broad range of grounds to adopt the PMF as the design flood or development flood. It is essential however to know where such a flood may effect and what peculiar conditions may apply, especially from the emergency management context and the need to ensure that essential services and specific properties are not within the PMF extent.

FLOODPLAIN MANAGEMENT PLAN

A Floodplain Management Plan is a strategic plan for the management, development and control of flood liable land in both the short and long terms. It is based on the results of the above studies, and provides a common rationale for both site specific and general development decisions, and a sound basis for decision making regarding mitigation works and measures. It is essential that local authorities actively involve the community and emergency managers in the preparation and review of the management plan. The plan, therefore, is initially prepared in draft form and exhibited. Public comment is actively sought and taken into account before the plan is finalised and adopted.

IMPLEMENTATION

Implementation of a Floodplain Management Plan involves civil engineering works, where viable, and the application of planning controls by the local authority. Successful implementation means that development is now controlled and conditioned to minimise flood damage and to remove adverse environmental and social impacts. The adoption of a Floodplain Management Plan does not mark the completion of the Floodplain Management Process. Over time, more flood data will become available that, particularly where the original plan had to be prepared on the basis of limited data, may show that some aspects of flood behaviour are, in reality, not quite as anticipated. Some issues may also emerge during implementation of the original plan that were not foreseen.

4.2 ENGLISH AND WELSH APPROACH

In recent years the United Kingdom has been moving towards more strategic flood management, over a longer term and at a broader scale. This is product of a mixture of experience, governance, law and politics, specifically (ICE, 2001):

- the impact of recent flooding such as the Autumn 2000 floods, and the extent of damage and disruption this caused;
- good practice identified in other countries;
- the formation of the Environment Agency in 1996, a statutory organisation responsible for flood management at a range of scales, in addition to its role in environmental management;
- legislation which requires consideration of the wider effects of floodplain management activities, particularly European Directives such as Habitats and Species Directive, Birds Directive, Water Framework Directive, Strategic Environmental Assessment Directive, and the forthcoming Flood Directive; and
- Political drivers such as dealing with climate change and national and regional land use planning.

A critical factor in the success of this strategic approach is the interaction of different levels of government, and the production of floodplain policies which can be implemented in regional and local plans. In England and Wales, this has led to a tiered approach to flood management planning. Different scale flood risk assessments are used to guide the planning process, control proposed development, create flood management plans and develop flood defences.

In England and Wales, there is a distinction between flood risk assessment for development planning, and flood risk management. Development studies concentrate on designating areas for development, and setting constraints within these areas. Flood risk management studies consider long term management of the flooding problem, and measures to address this.

Despite this, Catchment Flood Management Plans (CFMPs) will be common to both the planning and the flood management process. Their aim is to draw together the long-term interaction of planning and flood
management, which then helps govern plan development at local scales, as well as guiding the improvement of flood defences and flood management practices.

In carrying out flood studies to guide development planning, four different levels of study are used (Defra/EA, 2005):

- **National Flood Risk Assessments**: Studies to gain better understanding of the existing fluvial, tidal and coastal flooding risk and required investment levels at national or regional scale. These studies are used by central government to help plan the quantity and location of new housing and other development within England and Wales. (*undertaken by the Environment Agency*).

- **Catchment Flood Management Plans** (CFMPs) and Shoreline Management Plans: High level strategic planning studies of entire river catchments or groups of catchments to explore and define long-term sustainable policies for flood risk management. These are intended to mesh into general regional and local plans. CFMPs will allow planning to take account of long-term flood risk, and help guide strategic land development and land use within the catchment in future. (*undertaken by the Environment Agency*).

- **Strategic Flood Risk Assessments**: Local scale studies used to develop spatial plans, in a similar way to Australian Floodplain Management Plans. These studies identify present and future flood risk, both with and without development. Their outcomes are used to set planning constraints within a local plan area. (*undertaken by local authorities*).

- **Site specific Flood Risk Assessments**: Studies to determine the actual flood risk to a development site and surrounding area, for the purposes of development consent approvals. (*undertaken by developers*).

For flood management and defence, studies are also carried out using a tiered approach. This approach aims to ensure any proposed flood defence measures are consistent with planning aims and flood management aims in the wider catchment. The key flood management studies, all carried out by the Environment Agency, are:

- **Catchment Flood Management Plans**: In addition to their role shaping development plans, CFMPs will also guide future flood management and defence. They will decide flood management policies within different parts of the catchment — for example whether any intervention should take place, whether the effectiveness of existing management measures (including defences) should be preserved, increased or decreased. CFMPs will identify where more detailed Strategic Flood Studies should be undertaken.

- **Strategic Flood Studies**: Local scale studies which determine the flood management approach in detail for a specific part of a catchment. Once the flood management policy for an area has been determined by the CFMP, a strategic flood study may be carried out to determine the best way to implement this policy. The strategy will identify site specific measures that will be carried out, such as building a flood warning model, or constructing a particular flood defence.

- **Site specific measures**: Implementation of measures identified by the strategy. This includes feasibility assessment, securing funding, consultation, design and construction of flood defence measures.

This split structure reflects both the nature of government and the complicated allocation of roles in flood management in the United Kingdom. The Environment Agency’s responsibility for flood management along ‘Main Rivers’ and its overall interest in flood management intersects with local authorities role in development planning and smaller scale watercourse flood management.

### 4.3 THE CATCHMENT FLOOD MANAGEMENT PLAN PROCESS IN ENGLAND AND WALES

#### 4.3.1 OBJECTIVES OF THE CATCHMENT FLOOD MANAGEMENT PLAN PROCESS

Catchment Flood Management Plans (CFMPs) are the means by which the governments of England and Wales are attempting to ensure consistent and sustainable long-term flood management planning. The key objective of the CFMP process is:

‘To develop complementary policies for long-term management of flood risk within the catchment that take into account the likely impacts of changes in climate, the effects of land use and land management, deliver multiple benefits and contribute towards sustainable development.’
Specific stated objectives of the CFMP process are to:

- undertake high level strategic assessment of current and future flood risk
  - from all sources (although coastal flooding and erosion is considered under separate plans)
  - in terms of both probability and impact
  - including the effect of current risk reduction measures
  - quantified in broad economic, social and environmental terms
- identify opportunities and constraints for reducing flood risk through strategic responses, such as changes in:
  - land use
  - land management practices
  - flood defence infrastructure
- identify opportunities to maintain, restore or enhance the total stock of natural and historic assets
- identify priorities for studies, actions or projects to manage flood risk and assign responsibility for them

4.3.2 DRIVERS

CFMPs are required to identify the best ways of managing the risk of flooding within the catchment over the next 50 to 100 years. The objectives stated above reflect a number of the key drivers which have led to the CFMP process in its current form. Of particular importance are climate change and development control.

CLIMATE CHANGE

Climate change is expected to significantly increase flood risk in the United Kingdom within the 50 to 100 year CFMP policy horizon. A key study shaping policy is the UK Government Office of Science and Technology Flood and Coastal Defence ‘Foresight’ Flood and Coastal Defence project, completed in 2004. The study aimed (Foresight, 2004):

‘to produce a challenging and long-term (30-100 years) vision for the future of flood and coastal defence in the whole of the UK that takes account of the many uncertainties, is robust, and can be used as the basis of policy and its delivery.’

The study identifies potential scenarios and uses these to identify long-term flood risk. It considers factors increasing flooding probability such as climate change and development encroachment, as well as socioeconomic and environmental factors that determine the severity of flood damage. Combinations of probability and consequence scenarios give a picture of how the picture might develop by 2080.

Key findings of the study were:

- Under every scenario considered, flood will increase substantially by 2080. Average annual damage from flooding could rise from the present level of GBP 1 billion ($2.4 billion AUD) to between GBP 1.5 billion ($3.5 billion AUD) and GBP 23 billion ($54 billion AUD) in the worst case
- Climate change is an important factor in increasing flood risk
- Land use, increased urban development and effects of increased wealth and higher standards of living are also important factors
- The number of people at high risk from flooding could rise from 1.5 million to 3.5 million
- More effective land management will help reduce the risk in most scenarios. However, in the worst case scenario these are of little benefit and greater use of flood defences and coastal re-alignment will be required
- Increased flooding could bring both opportunities and threats to the environment.

These findings directly relate to the stated objectives and scope of CFMPs. CFMPs are intended to consider a planning horizon of 50 to 100 years, a period over which significant changes will occur in the climate and the socioeconomic state of England and Wales. The Foresight study noted that these factors are highly uncertain, and that future policies will need to be flexible enough to work under a wide range of possible outcomes.

DEVELOPMENT CONTROL

As discussed earlier, different scale flood risk assessments are used to guide the development planning in England and Wales. CFMP development attempts to take existing and future land use plans into account,
considering how catchment response and flood risk might change as development occurs. Representatives
from planning bodies are included in the CFMP development process, and have the opportunity to shape the
policies the CFMP produces.

In addition, outcomes of the CFMP process will help shape future land development plans, and ensure flood
risk management is taken into account. Regional Assemblies and local authorities will use CFMP outcomes
to guide planning. This will form the basis of development planning and regulation. Drainage boards and
water companies will also use CFMP to plan their activities within the catchment.

### 4.3.3 CFMP PROCESS AND MANAGEMENT

CFMP development is managed by the Environment Agency. The Environment Agency is funding their
development, and outputs are produced in its name. A Project Board generally oversees project resources and
programmes. It consists of senior strategic flood management Environment Agency staff, as well as the
Environment Agency Project Manager.

A Steering Group will develop CFMP objectives and policy outcomes, and ensure wider ownership and
acceptance of the CFMP. The group may include representatives from the Environment Agency, regional and
local authorities, water companies, farmers unions, fishing and environmental organisations. It is important
that this group takes an active interest in the project, so that stakeholders buy into the CFMP process, and that
the outcomes can be used in wider planning activities. They also assist in gaining a wider picture of the
catchment, and ensuring comprehensive data collection.

The CFMP process consists of the following stages:

1. Project start-up: forming a Project Board and Project Team
2. Inception Stage: Establishing a Steering Group, collating catchment information and developing
   an initial catchment understanding
3. Scoping Stage: Identifying flood risk and relevant economic and social issues, identifying future
   scenarios, opportunities and constraints, and producing draft objectives for flood risk
   management in the catchment (followed by a 3 month public consultation period on the
   outcomes)
4. Draft CFMP stage: Finalising scenarios and future flood risk assessments following consultation,
   identifying and appraising flood risk management policies (followed by a 3 month consultation
   period on the draft policies)
5. Final CFMP stage: review of the CFMP following consultation and final production

It is intended that CFMPs will each take between one and two years to produce, depending on the size and
complexity of the catchments involved. Each CFMP will be reviewed and updated on a six year cycle. CFMP
production will be timed to link in with other related initiatives, such as the production of River Basin

### 5 COMPARISON OF THE TWO APPROACHES

As a means of comparing the NSW and English and Welsh approaches, we identified a number of issues
affecting floodplain management plan development. Table 4 summarises how the two systems deals with
each of the issues.
## Table 4: Approach to selected issues in long term floodplain management

<table>
<thead>
<tr>
<th>Issue</th>
<th>NSW</th>
<th>England and Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flood Management Plan procedures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National / state guidance on flood</td>
<td>Floodplain Development Manual agreed as appropriate standard. Some</td>
<td>CFMP production is supported by purpose written guidance, as well as technical</td>
</tr>
<tr>
<td>management planning</td>
<td>site specific issues require approaches not necessarily covered by Manual. Manual concentrates on site specific studies; catchment wide approach needs to be further investigated and implemented. Broad scale “rural” situations not well covered.</td>
<td>resources including templates, project examples and specialised mapping and damage assessment software. Guidance on CFMP development is high level, as it is being applied to all English and Welsh catchments, with widely varying level of data, different levels of historical flood knowledge, and different flooding mechanisms. Aspects of the process are still being clarified, including the detail of scenario modelling, report length, style and amount of technical information, and the type of policy outcomes.</td>
</tr>
<tr>
<td>Procedural consistency</td>
<td>The NSW Manual applies across the State so basic procedure is consistent. Application across DNR Regions may not be consistent.</td>
<td>The CFMP process is being applied across the whole of England and Wales. The national management of the process by the Environment Agency will ensure relatively uniform development.</td>
</tr>
<tr>
<td>Level of detail of floodplain management plan</td>
<td>Level of detail varies, usually due to supposed budgetary constraints. Smaller Councils unable to cover all issues due to competing demands for limited finances.</td>
<td>The tiered approach to flood management provides varying levels of detail. CFMPs are broad scale studies, which do not make assessments of flood risk at specific locations. They are intended to identify flood management issues, and recommend smaller scale flood risk studies. In practice, this approach is still being implemented, and consensus is still emerging about the appropriate level of detail in a CFMP.</td>
</tr>
<tr>
<td>Ensuring floodplain risk is taken into account in plan development</td>
<td>Local authority is responsible for managing floodplain risk and plan development.</td>
<td>Environment Agency has extensive role in dealing with floodplain risk. However, it only acts as a consultee in local and regional plan development. CFMPs aim to address this by making a direct connection between long term flood risk, land use and development.</td>
</tr>
<tr>
<td>Ability to produce consistent ‘whole catchment’ planning</td>
<td>Where local authorities encompass specific catchments, they are responsible for floodplain management and development control. In larger catchments containing more than one authority, agreement must be reached on consistent planning and flood management within the catchment.</td>
<td>The development of Catchment Flood Management Plans (CFMPS) in England and Wales will give direction to catchment wide flood management and planning control. The national extent of the Environment Agency allows it to deal effectively with whole catchments, groups of catchment and river basins in a unified way. A part of CFMP development is attempting to agree long term planning priorities between different authorities within each catchment.</td>
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<tr>
<td>Issue</td>
<td>NSW</td>
<td>England and Wales</td>
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<tr>
<td><strong>Consultation</strong></td>
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<tr>
<td>Stakeholder engagement</td>
<td>There is an emphasis on stakeholder and community consultation within the Manual, but there are widely divergent views about what this may mean and what it really costs.</td>
<td>There is an emphasis on stakeholder steering groups driving flood management policy selection in CFMPs. In some areas, good working relationships have developed between key government and private stakeholders.</td>
</tr>
<tr>
<td>Consultation ‘fatigue’</td>
<td>Some key stakeholders are becoming wary of detailed or on-going consultation, and may be becoming reluctant to be involved in the process. The increase in consultation in recent years, while positive, has placed additional demands on stakeholders’ resources and community patience.</td>
<td>Similar to Australian experience. Some attempts to address this through coordination of consultation with other activities such as abstraction planning, and through the use of regional groups instead of catchment specific ones.</td>
</tr>
<tr>
<td>Raising public awareness about flood risk and the planning/management process</td>
<td>This issue is sporadically addressed, depending on the processes adopted in the Floodplain Management plan. Occasional special events undertaken, usually to commemorate major flood events. Public exhibition of Plans usually only of interest to those with a vested interest. Requires considerable effort by local authority and priority may not be there for major effort.</td>
<td>As part of its role, the Environment Agency raises public awareness about flooding and flood management. It provides an internet and telephone based public flood warning system. The Environment Agency also makes considerable effort to publicise individual studies and projects, and their objectives and outcomes. Consultation on flood management plan development is a legal requirement in England and Wales.</td>
</tr>
<tr>
<td>Public understanding of the flood risk planning/management process</td>
<td>Rarity of flood events and / or rarity of need to utilise Plan can reduce community interest to minimal levels, or below. Those directly affected (or potentially directly affected) are the most interested.</td>
<td>Community awareness of the flood management process is poor in England and Wales, partly due to complexity of the allocation of roles, and partly by the way flood management is presented to the public. There is relatively little publicly accessible information explaining the difference between the roles of the organisations, and how their studies and plans relate to each other.</td>
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<tr>
<td><strong>Timeframes</strong></td>
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<td>Programme of flood risk management plan development</td>
<td>No timeframe for completion of studies and construction of measures. Totally dependent on funding.</td>
<td>The Environment Agency has committed to a deadline of completing all CFMPs in 2008. Meeting this will require considerable effort, especially given shortages of suitable staff.</td>
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<tr>
<td><strong>Staffing and knowledge</strong></td>
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<td>Depth of technical skills and availability of suitable staff</td>
<td>There is a serious shortage of flood engineers in the relevant NSW Agency. Other skills needed for the floodplain management process are spread through a number of disparate agencies and there is no clear mechanism for co-ordination. Very dependent on consultants for some specialist skills.</td>
<td>The Environment Agency has a large number of skilled technical and managerial staff, including specialists in ecology, fisheries, water quality and groundwater, making this knowledge more readily available to inform the flood management process. However, there is a serious shortage of flood engineers in the UK.</td>
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<tr>
<td>Issue</td>
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<td>England and Wales</td>
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<tr>
<td>Sharing knowledge and experience between technical and management staff in different catchment</td>
<td>No formal knowledge sharing between DNR, Regions, Councils and consultant staff.</td>
<td>Knowledge is shared between different regions, as Environment Agency and consultant staff discuss different approaches and techniques in formal workshops and through informal contact.</td>
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<tr>
<td><strong>Technical approach</strong></td>
<td><strong>The ability to identify future flood risk is limited by uncertainties or insufficient information about the effects of climate change and land use changes. Climate change and land use change risk analysis has not been translated into specific or even regional guidance for the process. No specific planning horizon specified, though review recommended every five – ten years.</strong></td>
<td><strong>In many catchments, climate change is expected to be the key driver for changes in future flood risk. CFMPs must consider this, given their intended planning horizon of 50 to 100 years. In practice, effect of climate change is currently being incorporated as a 20% peak flow increase. Information on regional variation in future flood risk, or the effect of specific land use changes has not been incorporated into CFMP procedure yet.</strong></td>
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<tr>
<td>Ability to incorporate future land use changes and climate change scenarios</td>
<td>Wide range of methods employed and no centralised data repository to add to and review damages estimates.</td>
<td>A flood damage estimation methodology and estimation guidelines has been distributed by central government as the standard approach. Social, economic and environmental effects of flooding are still only partially quantified by the CFMP process. Process does not take into account indirect economic costs, infrastructure damage and environmental costs.</td>
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<tr>
<td>Accurate flood damage assessment</td>
<td><strong>Stream flow data collected and managed by DNR. Flood data collected on relatively ad hoc basis with limited streamlining, consistency of quality and distribution.</strong></td>
<td>Initiatives in the Environment Agency are leading towards nationally consistent datasets of information subject to controlled update, verification and distribution. National data purchase agreements in place for a range of environmental data.</td>
</tr>
<tr>
<td>Data management and purchasing</td>
<td><strong>Technical innovation mainly generated from consultancies as technical work within DNR limited. Limited technical expertise may result in inconsistent production standards.</strong></td>
<td>Flood research is funded by Defra and the Environment Agency. A range of technical measures have been implemented to try to streamline CFMP production and ensure consistent production standards. This includes GIS based software to automate broad-scale flood mapping and damages estimation.</td>
</tr>
<tr>
<td>Level of technical innovation in the process</td>
<td><strong>Flood research is funded by Defra and the Environment Agency. A range of technical measures have been implemented to try to streamline CFMP production and ensure consistent production standards. This includes GIS based software to automate broad-scale flood mapping and damages estimation.</strong></td>
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6 CONCLUSIONS

Comparing the floodplain management planning process in different countries helps identify strengths and weaknesses of each system. Often, the approach to floodplain management planning is determined by the structure of each level of government, and the allocation of roles within them. This affects the development of methodology and technology, types of plans produced, ability of plans to address different issues, and regional consistency of plan outcomes.

In New South Wales, local authorities carry out both plan development and floodplain risk management. This gives them the opportunity to ensure floodplain management issues are fully recognised in the development of local plans. By comparison, in England and Wales, the Environment Agency has responsibility for flood management on most watercourses with substantial flood risk, while local authorities are responsible for plan development. This complicates plan development, and central government has developed policy guidance specifically for local authorities to encourage better floodplain management. Shared responsibility for flood management between the Environment Agency, local authorities and Internal Drainage Boards also confuses the public.

As Table 3 illustrates, the Environment Agency has a broad range of roles over all of England and Wales, including conservation, fisheries, abstraction management, air quality, groundwater and waste management. This has encouraged development of broad scale long term floodplain management planning which takes into account a range of environmental effects. CFMPs, which aim to provide catchment wide sustainable management, are currently being developed for all of England and Wales. This approach will offer a more consistent approach to flood management, once the CFMP development process has been rigorously tested and improved.

The national extent of the Environment Agency also offers potential advantages in innovation, sharing knowledge, and data gathering and management. Centrally funded technical research and tool development is helping to improve and standardise methodology, and the development of standard data formats and national data storage. There is also a pool of expertise and information sharing on a regular, formalised basis.

This is the major contrast with New South Wales, and other States in Australia. Floodplain Management has become a “poor relation” – the responsible State Agency is losing expertise and the ability to centrally organise and control the standards within the process. Expertise at the local level is falling, and without a strong and consistent application of policy from the State, standards will fall, data collection and management will become more burdensome and long-term planning and management of flooding will become very much a niche issue, only relevant when another disaster occurs.

Does it need a disaster such as the English and Welsh floods of 2000 to again make New South Wales serious about the management of floods? We have experienced more than enough flood disasters to know it is not a matter of if, it is a matter of when. The more the expertise is cut back, the more data that is lost, the more flood plains are developed ad-hoc, the more difficult it will be to recover and to achieve the objective of floodplain management:

The reduction of the impact of flooding and flood liability on individual owners and occupiers, and the reduction of private and public losses resulting from flooding.

Future generations will not thank us if we do not act now.
REFERENCES


CSIRO 2000.


The Institution of Civil Engineers (2001). Learning to Live with Rivers – Final Report of the Institution of Civil Engineers’ Presidential Commission to review the technical aspects of flood risk management in England and Wales
