

# **SPACE FOR WATER: SHARING LESSONS ON FLOODPLAIN MANAGEMENT POLICY BETWEEN QUEENSLAND, THE NETHERLANDS AND ENGLAND**

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## **Introduction**

The 2011 floods in Queensland have triggered a timely number of knowledge exchange initiatives between Queensland and Europe. The Netherlands Water Partnership, consisting of government representatives, research institutes and private companies, has shared experience about governance and practicalities of flood management with Queensland authorities. Also, UK experts were invited to Brisbane for a symposium on how R&D and high level planning can support enhanced floodplain management.

Queensland can benefit from the knowledge generated by research and practice in the Netherlands and England: how to embed the sense of urgency after a flood in policy; how to make big complex flood schemes happen and how to manage levees. Many smart tools developed with Dutch or British funding can be useful in Queensland. Conversely, we believe that the Queensland focus on land use planning and drought, and its community engagement can teach useful lessons to Europe.

This paper will introduce how floodplain management works in the Netherlands and England for a Queensland audience, and identify relevant topics for knowledge exchange, in particular where Queensland can learn from Dutch and British experiences.

The first section of this paper is about the Netherlands, and the second part is about England. Each section starts with a background on how flood risk management works and has developed over time in each country, followed by an explanation of processes that determine how much the countries invest in flood risk management and where it is spent, including broad scale amounts. Each section concludes with emerging approaches that are being developed in the current economic constraints. The key contrasts between the Netherlands and England are summarised, followed by our suggestions for lessons that Queensland can utilise from the experience in the Netherlands and England.

## **The Netherlands**

### ***How flood risk and its management works***

Flood risk and its management are crucial for the Netherlands. About two thirds of the country was reclaimed from the sea over the last 1,000 years and is now defended against the sea and rivers by large, legally prescribed defences. This floodplain area includes the four largest cities, the airport and much of the economic and cultural heartland. In this context, floodplain management is clearly of national importance.

The presence of the strong flood defence system means that the likelihood of major flooding is very small, but in an extreme event the potential consequences are disastrous, both locally and for the nation. No major floods have occurred since the 'Flood Disaster' in 1953, now 60 years ago, where over 2.500 people died, of which more than 1.800 in the Netherlands (see Box 1). Flood risk always remains on the political agenda and there is continuous research and development into optimising, finetuning and modernising flood risk management approaches. On the other hand, the strong legal basis means that it is difficult to make significant changes.

**Box 1** *1953 Flood Disaster*

On the night of 31<sup>st</sup> January – 1<sup>st</sup> February 1953, a combination of a high spring tide and a severe European windstorm over the North Sea caused a disastrous storm surge, leaving great part of the Netherlands, Belgium, England and Scotland flooded.

The numbers:

- 2551 people killed (1836 in NL, 307 England, 28 Belgium, 19 Scotland and the remainder at sea)
- 9% of total Dutch farmland flooded
- 30,000 animals drowned
- 47,300 buildings damaged of which 10,000 destroyed.
- Economic damage is estimated to be AUD 6.1 billion in present day terms (to be seen in perspective of a much smaller 1953 economy)



*Town of Oude-Tonge on the island of Goeree-Overflakkee, the Netherlands. Photo courtesy of US Agency for International Development.*

For geographical and historical reasons, the emphasis in Dutch flood risk management is on flood defence. The approaches for providing flood defence have changed in recent years. Following the disastrous 1953 floods the emphasis was on purely technical and infrastructural methods, driven by the national sense of urgency to make the country safe at all costs. The Delta Plan delivered 13 dams and barriers to shorten the coastline and raise protection levels. It also developed the world's first economic approach to flooding safety (relating standards to economic impacts), and embedded the sense of urgency in a strong legal basis for flood risk management, with legal standards up to 1:10,000 per year and clear organisational roles and responsibilities.

However, over the last 30 years society has started to move toward more balanced approaches, seeking to combine flood defence investment with win-win opportunities for social and environmental enhancements. As knowledge of natural processes increased, there is also now a strong move toward working with sand and water instead of against the force of these natural features. This is illustrated by the "Room for the River" programme which is now working to increase the discharge capacity of the Rhine and Meuse rivers, and also by the "Building with Nature" programme which is using natural coastal processes to improve the effectiveness of beach management, while also creating benefits for tourism, recreation and habitats.

**Box 2** *Room for the River*

Room for the River is a national flood risk management programme in the Netherlands. In essence, it is a collection of measures aimed at increasing the discharge capacity of the country's main rivers while also enhancing environmental and land use options. The programme's scale is immense: the entire river system of the Rhine-Meuse delta in the Netherlands is being reshaped.

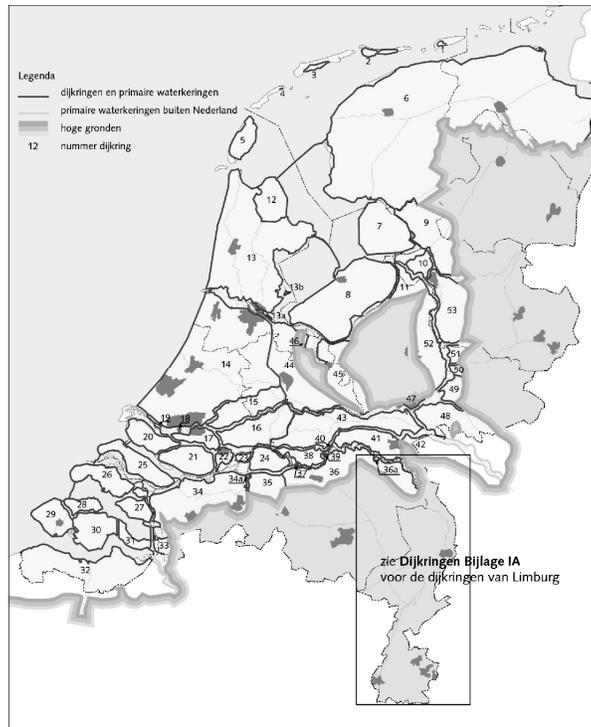
The programme consists of a coherent set of measures to be implemented at approximately 30 river locations in the country. Its total budget is AUD 2.8 billion and it is planned to be completed by the end of 2015.

Despite the continued emphasis on flood defence, in recent years there has been an increased focus on other intervention types such as incident management and land use planning, and even flood insurance is being debated.

***How flood risk is managed (governance)***

In the Netherlands, the Water Act prescribes the location (see Figure 1) and standard of protection of the primary flood defences that protect the country from flooding from the sea, the delta area, the large lakes and the main rivers (mainly the branches of Rhine and Meuse). There is also a large amount of secondary defences which protect against local flooding, with lower standards; their management works similar to the primary defences, but at a provincial instead of a national level.

The Act also describes the roles and responsibilities for flood risk management. The flood defence manager plays a central role and is responsible for ensuring that the defences meet the legal standards, and for maintaining the defences. Water boards, which are independent local authorities with an elected board and tax raising powers, are the managers of most flood defences. The rest of the flood defences, particularly the larger barriers and dams, are managed by Rijkswaterstaat; an agency of the Ministry of Infrastructure and Environment. Provinces have a supervisory role, and have a leading role in land use planning and in emergency management, with technical input from the flood defence managers.. At a national level, Rijkswaterstaat has a supervisory role and is responsible for implementing policy from the Ministry of Infrastructure and the Environment.



**Figure 1. Location of dike ring areas in the Netherlands (from the Water Act).**

The flood defence managers have to demonstrate that the defences meet the legal standards in a six-yearly cycle. This safety assessment is carried out on the basis of a prescribed method (Ministerie van Verkeer en Waterstaat, 2006), which contains an extensive set of procedures and calculation rules, covering each relevant failure mode. Government provides the hydraulic loading levels associated to the legal standards to be used in this assessment. If the assessment demonstrates that the defence does not comply, it has to be improved and becomes part of the Flood Protection Programme (*Hoogwater Beschermings Programma, HWBP*), see section 3.2. If the assessment is not able to determine whether the defence complies, it receives a score of 'uncertain', which is an explicit trigger for further research.

Dutch flood risk management does not consist of flood defence (prevention) only: there is an explicit policy of 'multi-layer safety'. This consists of three layers: prevention (i.e. flood defence), land use planning and incident management. The other layers have been receiving increasing attention in recent years, but the emphasis still is, and is likely to remain on flood defence.

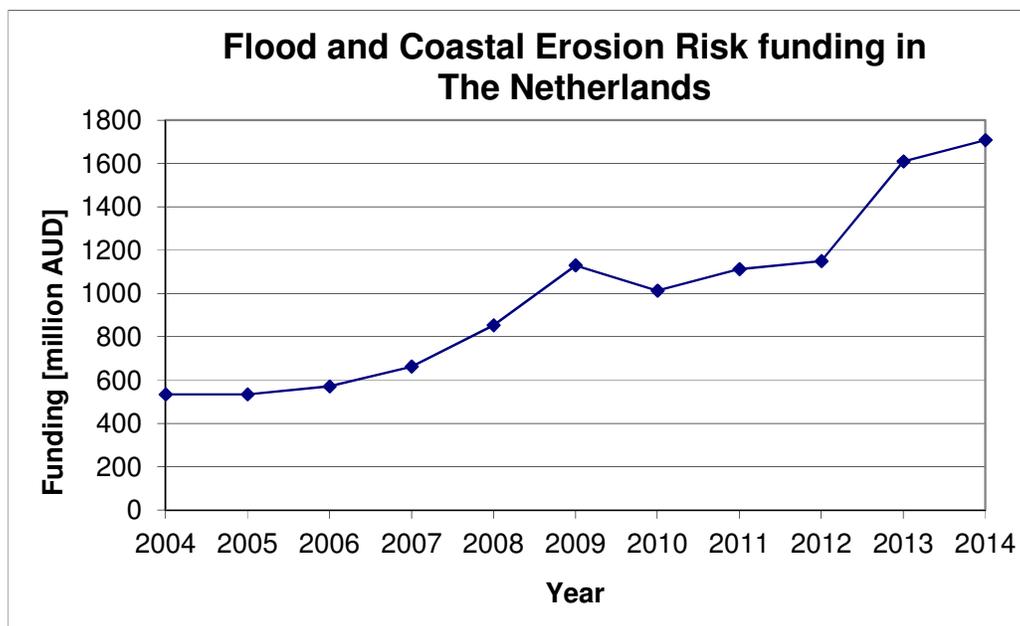
Flood risk plays a special role in Dutch public perception. Flood risk management is essential to the country. Most people are strongly aware that they live in a flood risk area, and there is a sense of pride in the Dutch having reclaimed their own land from the sea. At the same time there is a perception of absolute safety, because of the obvious strength of the flood defences and the fact that no significant flood events have occurred since the 1953 flood disaster. The Dutch trust but also expect their engineers (and government) to keep them safe from flooding. This also means that floods are not seen as a natural disaster but as being caused by infrastructural and human failure.

A comprehensive overview of water management in the Netherlands and the role of water safety is provided by Rijkswaterstaat (2011).

### ***How much to invest as a nation***

The legal status of the flood defences means that the authorities are obliged to spend as much as required to achieve the legally prescribed standards. In practice, investment has been dominated in recent years by large programmes designed to improve the defences up to the legal standards introduced in the 1990s. These improvement works have largely been funded by the national government.

Figure 2 illustrates how flood risk funding levels have trended in recent years. It shows a general increase since the early 2000s when the first safety assessment cycle was completed. There was a 10% decrease of funding levels in 2010 as part of the overall budget cuts, to be offset by efficiencies. The current level of investment is approximately AUD 1.23 billion per year, which will increase to AUD 1.6 billion in the coming years. There are approximately 10 million people at risk of flooding in the Netherlands (very similar to England), so the amount per person at risk has gradually increased from AUD 49 to AUD 166 per person.



**Figure 2. Flood risk funding in the Netherlands**

It is very noticeable that there has been a strong increase in flood risk management in recent years, despite the absence of significant flood events in the country. To a small extent, it may be possible to explain this from high profile events elsewhere such as Hurricane Katrina. However, the main cause is the choice of Dutch society, following the disastrous 1953 floods, to set high defence standards with a legal status, providing protection against short term political pragmatism.

### ***Where to invest - prioritisation***

As the investment needs increase and the economy is under pressure, Dutch society is starting to have to decide about prioritisation. In the Dutch context this is not about whether the defences need to be improved, but only which to do first. The approaches

to prioritisation are currently being finalised, making use of a wealth of technical information built up over the last decades.

There is an important role for the systematic flood probability and risk calculations developed in the long-running programme VNK ('Safety of the Netherlands mapped'). However, there is much more to this prioritisation than technical considerations only. The method will have to be feasible, effective and efficient. Most importantly, the results will have to be transparent and explainable to the public and politicians, who will query why one area has more right to flooding safety than another.

## **England**

### ***How flood risk management works***

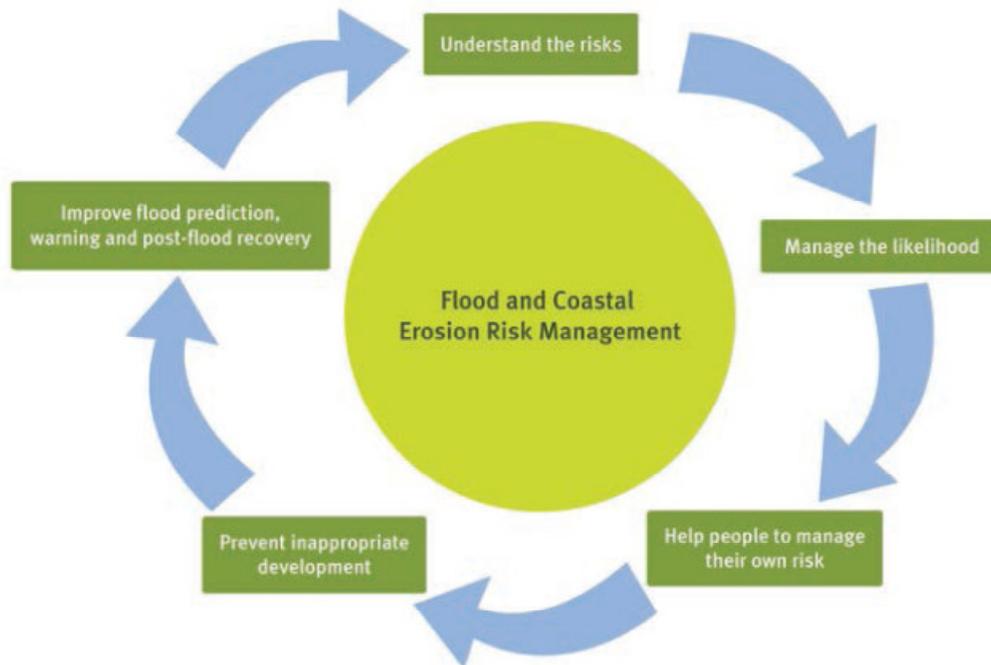
The essence of the English approach to flood risk management is to make best use of limited budgets. There is no legally prescribed standard of protection (apart from exceptional cases such as Thames Estuary). Instead, the Flood and Water Management Act gives authorities 'permissive powers' to carry out flood risk management activities. Government provides a budget for investment and sets high level priorities for the flood (and coastal erosion – not discussed in further detail in this paper) risk management outcomes that it wants to achieve. It is then the role of so-called operating authorities to spend the available budget in a way that maximises the outcomes, taking into account the government's priorities.

The responsible Ministry is the Department for Environment, Food and Rural Affairs (Defra); Defra sets overall high level policy and works with the Treasury (Ministry of Finance) to determine national budgets. The Environment Agency has an overview role for all flood risk management. It is responsible for implementing Defra's policy and for allocating the national budget across projects to maximise the outcomes. The actual projects are carried out by the operating authorities. The Environment Agency itself is the largest of these: it is responsible for flood risk management from all designated main rivers (broadly, any water course wider than three metres), estuaries and the sea. In that role, it builds flood defence structures, operates and maintains them, is responsible for flood forecasting and warning, and has important roles in development control and incident management. Local authorities are also operating authorities; they are responsible for local flood risk, and are the primary contact point for the public on flood risk (from any source). In addition, local authorities are responsible for coastal protection on high ground frontages. Finally, the Internal Drainage Boards are responsible for water level management in the low-lying parts of the country.

The Government's priorities for flood risk management are described in the National Flood and Coastal Erosion Strategy for England (Defra & Environment Agency, 2011). The overall aim is to ensure that the risk of flooding and coastal erosion is properly managed by using the full range of options in a co-ordinated way. This is specified in three strategic aims:

- manage the risk to people and their property;
- facilitate decision-making and action at the appropriate level; individual, community or local authority, and river catchment, coastal cell or national;
- achieve environmental, social and economic benefits, consistent with the principles of sustainable development.

Figure 3 illustrates the methods for achieving these three strategic aims.



**Figure 3. Managing flood and coastal erosion risks (from Defra & Environment Agency, 2011).**

The final part of this section is a discussion of the public perception of flood risk. England is a country where flooding happens regularly: there are significant local and regional flood events that make the national news every few years: Cornwall 2010, Cumbria 2009, Summer floods 2007, Boscastle 2004, Autumn floods 2000, Easter floods 1998. The impact of these events is local or regional. Flood risk is generally seen as a natural risk. In the mind of the public and the politicians, flood risk is important (especially after events, and especially where flooding has occurred), but it is one of many important issues – this is an important difference with the Netherlands.

### ***How much to invest as a nation***

Defra (2009b) sets out the rationale for government investment in flood risk reduction. If left to the market and to individuals, there would be underinvestment and poor decisions (with a tendency to free-ride on the investment of others). The economic performance of flood risk investment over recent years (in terms of damage avoided) has been extremely high: government sets a minimum expected benefit cost ratio of 5:1, but in fact annual results up to 18:1 have been achieved. This demonstrates the validity of government investment. It also shows that a further increase of the investments makes economic sense; government primarily aims to achieve this by further stimulating local contributions.

Government determines how much national funding is available for flood risk management as part of its overall budgets in a three-yearly cycle called the Comprehensive Spending Review. In addition to the general drivers and pressures for setting public investment budgets, there are a number of specific informal 'lobbies' in the English context:

- Flooding victims and their political representatives lobby for local investment. However, in recent years they have also organised themselves in organisations such as the National Flood Forum. They speak for all flooding victims, aim to influence government in a general sense, and are also accepted as partners by the public authorities.
- The Environment Agency also plays an implicit lobbying role by providing factual evidence about the benefits of investment in flood risk management. They produced a Long Term Investment Strategy in 2009 (Environment Agency, 2009), setting out a number of national scale investment scenarios for the coming 25 years and comparing them on the basis of costs, benefits and the number of properties affected. This suggested that the most favourable scenario, in terms of the net return on investment, would require a year-on-year increase of around AUD 29 million plus inflation. This investment profile has not been implemented as yet (see Figure 2), but these findings are informing high-level debate about flood risk management, for example in the House of Commons' Committee of Public Accounts recent report (House of Commons, 2012).
- The third important lobby is the insurance industry. There is currently an agreement between the Government and insurers that insurers will provide cover to almost all properties, even those at significant risk, in exchange for adequate Government investment in flood risk management. There have been ongoing discussions between the parties about renewal of this so-called Statement of Principles after it expires in 2013, but it was confirmed in early 2012 that this will not be the case. The Association of British Insurers (ABI) has been vocal in recent years that investment will have to increase for them to continue their commitment. The impacts of the non-renewal of the Statement of Principles will become clearer over the coming months and years.

Figure 4 summarises how the level of Government funding has developed over the last ten years, based on a number of Environment Agency datasets. It shows a marked increase following the 2007 Summer floods, a 6% decrease as part of the overall budget cuts in 2010, and finally an increase to AUD 1.06 billion following a very wet 2012. There are approximately 11 million people at risk of flooding in England, so this amounts to approximately AUD 96 per person at risk. The comparison between the Netherlands and England shows that the amount per person was similar 10 years ago, but is now almost twice as high in the Netherlands, as the investments to meet the legal standards start to come on stream.

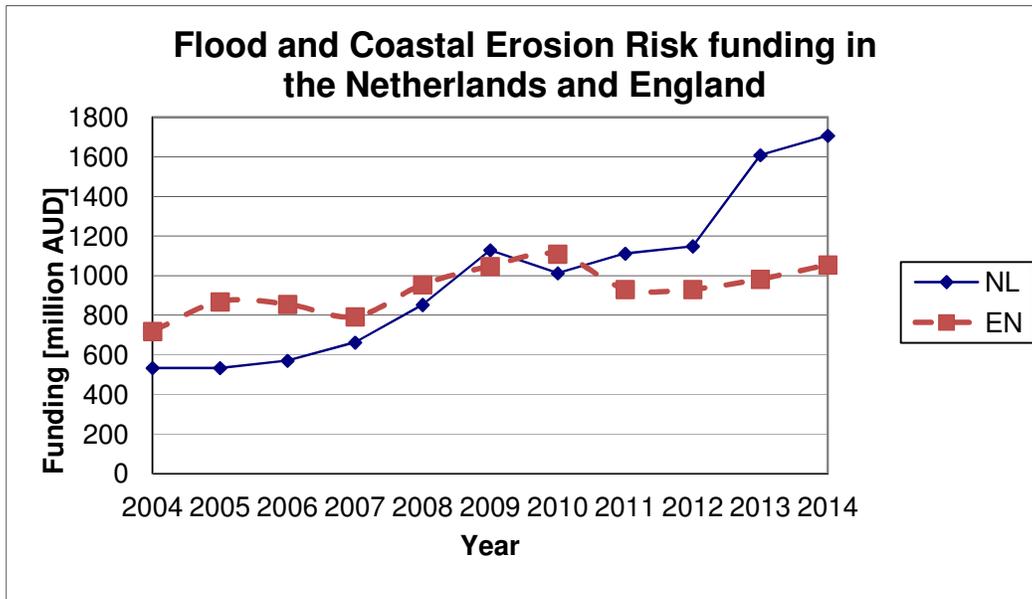


Figure 4. Flood and coastal erosion risk funding in England.

**Where to invest - prioritisation**

In the English context, prioritisation of investment is at the heart of flood risk management: there are no legal standards and it is acknowledged that the available public money is not sufficient to meet all needs. There is therefore an explicit policy that the budget needs to achieve the best possible outcomes, based on high-level government steer. Prioritisation of investment happens through a combination of a bottom-up and a top-down process (see Figure 5).

The top-down element is that Government sets its priorities in so-called Outcome Measures. These are a high level steer on end results: the broad economic benefits, the number of households protected, the ratio of these households that are deprived, and the broad influence on designated habitats.

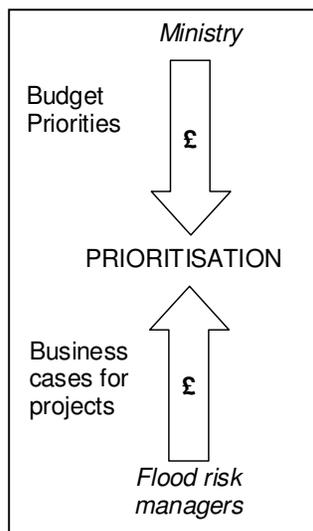


Figure 5. Prioritisation process in England.

The bottom-up element consists of business cases produced locally to apply for national funding. These business cases, or Project Appraisal Reports, have a better chance of success if they maximise the outcomes in line with Government's outcome measures. The principles of this appraisal are set out in Defra's policy statement on flood and coastal erosion risk management appraisal (Defra, 2009a). This is supported by the Environment Agency's appraisal guidance (Environment Agency, 2010) and a well-developed body of supporting documents and evidence to demonstrate the economic, social and environmental benefits of flood risk management projects.

The appraisal guidance outlines a systematic process of problem understanding and objective setting, option development and appraisal, and preferred option decision making and testing to develop a business case for a preferred solution for reducing flood risk. The decision on the preferred option is primarily based on the relative performance of each scheme in terms of benefit/cost and incremental benefit/cost ratios. While the overall project needs to be cost-beneficial, the extent to which external contribution is available also affects the decision, because such contributions are subtracted from the overall cost to give the benefit/cost ratio of the investment from the central government. Other factors also affect the choice, including:

- the relative scales of intangible benefits,
- extent of delivery of the project objectives,
- adaptability to climate change and uncertainties, and
- the preference of the local community.

The top-down and bottom-up processes come together in the Environment Agency's decision making about the allocation of national funding. In broad terms, the prioritisation process looks at all the available schemes and selects those which, as an overall national package, deliver the best return on investment, measured by Government's outcome measures.

In 2011, the prioritisation approach was adapted to facilitate and stimulate local funding contributions (Flood & Coastal Resilience Partnership Funding), see Defra (2011a, 2011b).

The old system was fully based on national funding only. If a project's outcome measure score was high enough, it would receive 100% national funding; if not, no national funding was available. In the new system, the level of national funding is calculated on the basis of the outcomes. There are calculation rules for the payment rates in terms of the number of households protected at particular levels, the number of deprived households (in classes), the extent of habitats created, and the remaining economic benefits (e.g. for business, infrastructure, health, tourism, etc.).

If the calculated national funding for a project is enough to cover the project costs, then in principle it will still be fully funded. If not, then it can still receive its share of national funding if the shortfall is complemented by local contributions, from local authorities or other sources. The new approach fits with the overall vision of the current Government for Localism, and is set up to achieve three key aims:

- Increase local funding and ownership: there are many viable and desirable projects that were not being carried out due to the shortage of national funding, so it is expected that local partners will be interested in contributing funding.
- Increase efficiency: the new system means that any cost savings will directly benefit the local parties; conversely, any cost overruns will have to be borne locally.
- The payment rates are set in such a way that vulnerable and deprived households have a larger chance of receiving funding, and to maximise the number of households that would achieve the standard of protection required to get flood insurance.

The Flood & Coastal Resilience Partnership Funding approach is starting to work and Government has confirmed that it will remain in place for the foreseeable future. Government and the Environment Agency are reporting the first successes of the new approach (Defra, 2012): it is enabling schemes that would otherwise not have happened. For more complex situations, with multiple contributing businesses and communities, the new approach takes time and has therefore been less successful thus far. However, many such projects are in preparation and the extra stakeholder engagement is already having the benefit of increasing local ownership.

## **Key contrasts between the Netherlands and England**

The analysis shows that the approaches to investment decisions are very different in the Netherlands and England, but that each country's approach aligns with its context.

Floodplain management in the Netherlands is essential to the country's survival: the majority of the land is at risk. This has historically created a focus on flood protection. However, in the last 20 years, increasing awareness that building ever bigger defences is not sustainable, has shifted the focus to making more space for water and managing flooding consequences through preparation and planning.

In England, there are significant floods almost every year, usually at a local scale. There are no legal standards but government does provide over AUD 870 million each year, which generates a high return on investment in prevented damages (currently over 8:1; Environment Agency, 2013), using a portfolio of measures. The UK approach is very strong on achieving maximum flood reduction benefits, through a structured business case approach.

The different focus is illustrated by the volume and maturity of processes and guidance. The Netherlands have an extensive body of technical guidance with a semi-mandatory character for the design of flood defences. In England the focus is on economic appraisal of projects, supporting the preparation of business cases to justify investment – this is reflected in a body of guidance of similar size to the Dutch guidance for flood defence assessment, and strong focus of research and development.

Common trends can be seen in both countries, as less money becomes available for flood risk management. In particular, there is a greater pressure on the operating authorities to generate efficiencies in the delivery, and there is a shift to more local funding contributions, coupled with more local decision making powers.

Both countries offer good examples of rational approaches, each in their own way:

- In the Netherlands, the legal framework secures a minimum level of investment, based on rationally derived defence standards. This is complemented by an excellent understanding of defence performance, relative to other countries.
- In England, the outcome measures enable Government to provide an appropriately high level political steer for prioritisation. The system is geared toward optimum use of limited funds, and this is supported by mature processes, guidance and research.

In both countries, flood risk management is characterised by a balanced relationship between science and engineering on the one hand, and politics on the other hand. Science and engineering provide factual information, analysis and design, while politics provide high-level steer and translate priorities into investment levels.

## Lessons for Queensland

What might this experience mean for flood risk management in Australia? This issue was considered for Queensland in September 2012, as part of a 2 day information exchange on flood risk management (Sayers and Filet 2012) <http://www.sayersandpartners.co.uk/australian-exchange.html>). The symposium involved flood risk specialists from the UK and the Netherlands and flood risk managers from Queensland and Victoria, Queensland Local Governments, NGOs and Research groups.

Based on the European experiences and based on the pending flood planning and implementation needs for various parts of Queensland, the forum came to a view that the following responses are critical to underpinning a sound approach, namely:

**1 Capitalise on the opportunity that currently exists to do things differently** – there is a clear risk that the Queensland Floods Commission of Inquiry report's recommendations will be implemented without utilising the broader international lessons in the future management and planning decisions. Experience from across the world (e.g. UK in the early 2000's, Europe following the 2007 floods, US following Katrina) shows that it is possible to use the heightened political and public awareness post-event to make real and lasting improvements; in England the Foresight study strongly supported this process (Evans et al, 2004).

**2 Develop a shared vision** - Flood risk management planning provides an opportunity to support the strategic vision for the river basin, but that vision must be known and shared. The importance of an articulated (and shared) strategic direction on flood management is a key guide for all the planning, policy and implementation participants.

**3 Establish a lead, whilst working in partnership** – Flood risk management is a collaborative undertaking, but without someone (or organisation) with a clear lead responsibility (providing the strategic overview from within existing structures and not necessarily a new authority), progress would be slow at best. Experience shows however that the lead authority should primarily be a facilitator, tasked to 'make it happen'. The resulting plan should not just be the lead authority's plan, but should be owned by all relevant partners, including political buy-in.

**4 Plan early** - It is never 'too early' to start to developing the flood risk management plan. The lack of data should not be a barrier to starting – the plan and the evidence upon which it is based can be refined progressively as required. Strategic seed funding can ensure that critical initial steps can be initiated. Without an early start to the planning process any modelling or data collection is likely to be inefficient and unlikely to be targeted towards supporting the actual development of management choices that will arise in the process. This does not mean a complete Plan is required at the outset of course, but rather:

- A shared vision for flood risk management for the catchment is debated and outlined as early as possible, linked with the broader vision for the catchment's land use.
- The decision making framework (setting out how monetary and non-monetary benefits will be included, appraisal periods of interest, how uncertainty will be reflected in the choices made, etc.) is set out at the earliest opportunity.
- The current understanding of the drivers of risk and what are the potential responses to manage it, are described to guide the analysis. These can then be progressively updated as the study proceeds.
- Articulating potential future storylines – what might the catchment look like in 10, 20, 50 and 100 years under different assumptions about the future?

**5 Understand the true nature of the risk and opportunities** - It is easy to solve the 'perceived' problems rather than the 'real' problems. It is easy to rely upon 'traditional' rather than 'innovative' solutions. To help ensure the plan delivers real risk reduction and promotes opportunities it will be important to understand as early as possible (and refine as necessary):

- the drivers of flood risk in Queensland and/or specific catchments like SEQ;
- the responses that can be implemented to diminish the flood risk;
- the organisational roles and responsibilities;
- the key planning and decision-making process that would need to occur over the next 3 years.

**6 Utilise the golden rules of good flood risk management** - European experiences from considering past approaches to flood risk management in contrast to emerging trends are summarised as nine golden rules of good flood risk management (Sayers et al 2012). These were introduced throughout the symposium and agreed to be relevant in Queensland. They are:

- 1 Accept that absolute protection is not possible and plan for exceedence.
- 2 Promote some flooding as desirable.
- 3 Base decisions on an understanding of risk and uncertainty.
- 4 Recognise that the future will be different from the past.
- 5 Do not rely on a single measure, but implement a portfolio of responses.
- 6 Utilise limited resources efficiently and fairly to reduce risk.
- 7 Be clear on responsibilities for governance and action.
- 8 Communicate risk and uncertainty effectively and widely.
- 9 Reflect local context and integrate with other planning processes.

This suite of recommendations for a Queensland approach to flood risk management aligns with the previous aspects in this paper on "How flood risk management works and is managed". The holistic planning and governance is a foundational start to a flood risk management pathway.

In this paper, the issues of how much to invest and where to invest was not yet considered in the Queensland analysis. But once the strategic visioning and floodplain planning is underway and various scenarios and options start to become obvious, it is then that the aspects of financing, prioritisation and key project location will become evident. And it is then that the experiences from Europe and other parts of the world will become a useful guide on how best to undertake this significant community and government investment. Certainly the business case approach used in England is attractive as it aligns with constrained budgets in Australia, and the evidence of benefits ensures that the investment is properly targeted.

Through this knowledge exchange opportunity, Queensland can also share their experiences with Europe, e.g. on emergency management and drought management. From 2005 to 2007 an extreme low rainfall period saw a community-wide programme

“Waterforever” (<http://www.waterforever.com.au/>) developed that involved households, companies and government agencies, responding to reduce water availability. The social and policy aspects are worthy of consideration for European partners. As part of a total water cycle management approach, which is also a Queensland focus, any aspects whether flood, drought or governance can be considered and will provide a valuable comparison for all partners.

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