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RESPONDING TO THE ENVIRONMENTAL CHALLENGE?

Spatial Planning, Cross-Border Cooperation and River Basin Management

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Introduction

It is increasingly being recognised that land-use change and environmental quality are closely related; with the nature, scale and location of development impacting on both the generation and resolution of environmental issues. And with spatial planning having a key role in regulating development, and managing and balancing the pressures placed upon land and its surrounding watercourses and habitats, it is essential that environmental management and development strategies are no longer prepared in isolation of each other.

The environment of the island of Ireland plays a key role in the quality of life of its citizens, the attraction of visitors and the decisions of foreign companies to locate here. And given the many elements that make up the environment – rivers, mountains, lakes, forests, habitats, flora, fauna – it is essential that none of these assets are considered in isolation when devising national, regional and local-level policy. To achieve this necessitates a commitment to cross-sectoral, cross-departmental and inter-jurisdictional collaboration as many of these assets transcend the Irish border.

On the island of Ireland, policy-makers and practitioners are discovering new ways to share visions and objectives, and to seek ways to mitigate negative influences that may be economic, social or environmental in origin. This has arisen pragmatically through the need to recover from a global financial crisis, and a growing understanding that there is much all sectors of society can do by taking local responsibility, and sharing experience, to bring about progressive and positive change. This is reflected in recent changes to the EU Territorial Agenda which formally recognises environmental quality as one of the important factors contributing to a better quality of life and to a more cohesive European Union (European Commission, 2011).

Water, for example, is an important facet of all life – for example, in generating and sustaining wealth though activities such as agriculture, forestry, aquaculture, power generation, industry, services, transport and tourism – and the publication of the Water Framework Directive (WFD) in 2000 sets standards which will ensure the safe access and utilisation of this resource. A key aspect of the WFD is the emphasis being placed on the 'ecological-quality' of all waters; and to facilitate such an assessment, Europe has been divided into 31 eco-regions – twenty-five for rivers and lakes and a further six for transitional and coastal waters. As noted by Carter,

> "…water is essentially a finite resource over large parts of Europe, there are limits to which it can provide for the crucial functions that societies rely upon for their current prosperity and long-term sustainability" (2007: 332).

It is increasingly clear that the environment lies at the heart of European thinking; with the need to protect and conserve the environment referenced in numerous Directives, not least the Water Framework Directive (WFD). Understanding how to protect and conserve the environment during periods of change offers us the opportunity to live harmoniously with nature, while continuing to reap the benefit of a quality living environment. In the case of the WFD, its far-reaching impacts necessitate collaborative working not only across government departments in a single jurisdiction but also across the administrative boundaries of member states. Similarly, the likelihood of climate change, for example, is widely accepted – even if the reasons for change are not. In April 2009, the European Commission published a *White Paper on Adapting to Climate Change* which presents the EU framework for adaptation measures and policies to reduce vulnerability to the impacts of climate change. Examples of adaptation measures include using scarce water resources more efficiently; adapting building codes or standards to future climate conditions and extreme weather events; and building flood defences and raising the levels of dykes – initiatives that all impact on water management.

The introduction of River Basin Management Plans (RBMPs) is seen to offer a significant opportunity for national, regional and local measures to be implemented; such measures being based upon strategic principles of environmental management, and the close relationship between this and spatial planning.

According to *Europe 2020*, the design and Implementation of all EU Policies should take account of their effect on economic, social and territorial cohesion; territorial cohesion referring to the recognition that different "territories" or places, have different needs that may justify different localised policy responses – providing the outcome is focused on achieving the regional or national strategic objectives. The regulatory process that is planning is, as such, central to the achievement of WFD targets. Similarly, in its 2010 environmental performance review of the Republic of Ireland, the Organisation for Economic Cooperation and Development (OECD) called for the harmonisation of environmental legislation with EU Directives to be maintained, and as part of this, for greater advances to be made in the integration of water quality and management considerations into

spatial planning processes (OECD, 2010). Across the island of Ireland, such integration is underway with the *Regional Development Strategy* (RDS) for Northern Ireland being under 'review' whilst the *National Spatial Strategy* (NSS) for the Republic of Ireland has recently been 'refreshed'. Rather than being fixed in time and space, these pliable strategies enable policy to lead each government's response to emerging and ongoing development challenges that were not envisaged at the time of their original adoption in 2001/2002.

More recently, the joint publication of a consultative framework for spatial planning collaboration on the Island of Ireland[1] by the Department for Regional Development and the Department for Environment, Heritage and Local Government provides the rationale for a more structured process of stakeholder engagement and mutual recognition of strategic objectives, North and South. In relation to river basin management, such a framework makes clear that the impact of any policy is likely to be diminished if a fragmented approach is adopted and policy decisions taken in isolation. Unsurprisingly, in recognition of this very point, the 2010 OECD report calls for the better coordination of environmental responsibilities at different administrative levels, including the establishment of dedicated river basin agencies to implement the WFD.

[1] The consultation on a Joint Collaborative Spatial Planning framework was jointly launched by DoEHLG and DRD on 15 February 2011 (see http://www.environ.ie/en/DevelopmentHousing/PlanningDevelopment/NationalSpatialStrategy/News/MainBody,25408,en.htm)

Chapter I: Spatial Planning and Water Resource Management: River Basin Management Plans

Historically, water pollution on the island of Ireland has been associated with a number of factors such as agriculture, inadequate wastewater infrastructure and unsewered properties, industrial pollution, forestry and development. In the Republic of Ireland, it is estimated that there are over 400,000 septic tank systems in operation (Daly, 2011); with 25,000 of these impacting on groundwater and a further 120,000 impacting on surface waters (Cussen, 2010). In Northern Ireland it was calculated that in 2005, 17 per cent of homes used septic tanks, compared with a UK average of just 4 per cent. This is thought to translate into over 130,000 unmapped septic tanks with an unknown impact on the receiving environment (*Interview, Northern Ireland*). This lack of historical information on the various pollution sources is matched by a lack of coherent and integrated monitoring arrangements. Despite advances in spatial modelling techniques, it will be some time before there is sufficient data to allow GIS and other mapping and monitoring tools to be useful in the integrated management of water resources and land-use.

In terms of water delivery, there is a sense that the institutional systems in both jurisdictions are fractured and outdated. In the Republic of Ireland, for example, thirty-four local authorities, working in near isolation of each other, are responsible for the infrastructure, delivery and treatment of water (*Irish Times*, 22 March 2010). In Northern Ireland, policy and resources are provided by the Department for Regional Development; with operational responsibility for providing infrastructure and delivery devolved to Northern Ireland Water (NIW), an arm's length body.

The cross-border dimension of managing water resources and shared river basins brings up interesting challenges for both jurisdictions while, at the same time, generating opportunities for collaborative working in the preparation and implementation of River Basin Management Plans (RBMPs) under the European Union Water Framework Directive (WFD). Spatial planning policy that is sustainable and 'fit for purpose' – and recognises that environmental assets do not adhere to man-made boundaries – is a key ingredient in the effective management of our waterways and its associated asset-base. An identified problem, however, across both jurisdictions is that land and water management processes are not yet integrated. In the case of the river basin management plans, these are also not being prepared in tandem with local development plans (Carter, 2007). And where there happens to be a consistency in the timeframes of both the 'local'

development plan and river basin management plan, this will be accidental – rather than a conscious effort by policy-makers.

This Chapter provides a brief overview of the WFD and highlights the emphasis that has been placed on all EU member states to prepare River Basin Management Plans (RBMPs), including the objectives of these plans. It reflects on the growing importance that is being placed on recognising the inter-relationship between water resource management and spatial planning, and how this is being encapsulated in recent policy changes across the island of Ireland.

1.1 Water Framework Directive

While published in 2000, the idea of a Water Framework Directive was first mooted in 1995 in response to severe flooding in northern Europe and drought conditions in southern Europe (see Appendix II); a scenario that still plays out today as evidenced by the extreme flooding experienced in the UK and Ireland during the winters of 2009 and 2010. At a conference organised by the European Commission in 1996, it was widely agreed that existing policy was fragmented and that a single piece of legislation was required to create an integrated approach to water management (Watson and Howe, 2006).

The resulting Water Framework Directive (WFD) advocates an integrated approach to water resource management and has resulted in the expansion of water protection measures to cover all waters (surface, groundwater and coastal waters), and required the achievement of 'good status' for all waters by a certain timeframe, namely 2015. The WDF and its related directives repeal twelve of the thirty directives that concern water from the 1970s and 1980s; in the hope of moving from "a fragmented and burdensome regulatory system" (McNally, 2009: 132) to an integrated system for the sustainable development of this resource. This, in effect, means the adoption of common approaches, standards and measures for water quality control and management on a comparable basis throughout the European Union (Murphy & Glasgow, 2009). It entails the promotion and adoption of new governance systems for water management whereby the emphasis is no longer primarily on monitoring and responsibility no longer lies with local councils and environmental agencies alone. The WFD symbolises a new generation of water resource management.

A central element of the WFD is the development of river basin management plans (RBMPs), the aim of which is to “manage water in an integrated way to prevent degradation of … rivers, lakes and bays” (*Irish Times*, 22 March 2010). The resulting plans, it has been argued, should acknowledge that activities in one part of the river basin will have consequences for the remainder of the area drained by the system and, on this basis, the resulting coordinated planning scheme should “strike a balance between environmental, social and economic interests” (Northern Ireland Environment Agency, see http://www.ni-environment.gov.uk/water/wfd/themes/riv_bsn_mngt_plng.htm). Another important feature of the Directive is that it encourages active public consultation and involvement in the decision-making processes on future pollution control investment, ensuring that due account is taken of the environmental, economic and social implications of such investment.

1.1.1 The ’Daughter’ Surface Water Directive

The European Commission adopted a proposal for a new Directive to protect surface water from pollution on 17 July 2006. The Directive, which is required to support the WFD and was subsequently adopted in December 2008, sets limits on the concentrations in surface waters of 41 dangerous chemical substances that pose a particular risk to animal and plant life in the aquatic environment and to human health. There are currently 33 substances (or groups of substances) on this priority list which will be reviewed on a regular basis. These substances are referred to as 'priority substances'; and those which are thought to pose the greatest threat are further identified as 'priority hazardous substances'.

The Directive is a “daughter directive” of the WFD – (2000/60/EC[1]) – and repeals five older directives. Member states were required to bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 13 July 2010.

1.1.2 The ‘Daughter’ Groundwater Directive

Also in 2006, and in response to the requirements identified under the WFD, the Groundwater Directive (2006/118/EC) was published by the EU setting out underground water quality standards and introducing a series of preventive measures and limits in terms of pollution control. Under the Directive, member states were required to carry out pollution trend studies and establish quality standards by the end of 2008; with identified trends then to be reversed by 2015 by using measures laid out under the WFD.

1.2 River Basin Management Plans

A key component of the WFD is the development of River Basin Management Plans (RBMPs). Over 100 River Basin Districts have been established across the EU; with over one-third being International River Basin Districts as they cross a national border (McNally, 2009). The RBDs across the island of Ireland have been designated based on an existing grid of forty hydrometric areas, established in the 1970s for the purposes of water management (North South Ministerial Council, 2003). For each of these Districts across the EU, a River Basin Management Plan (RBMP) was to be developed by December 2009, implemented by 2012 and reviewed by 2015. Thereafter, the RBMPs are to be reviewed every six years.

This follows ten years of preparatory work – from the adoption of the WFD to its transposition into national legislation[2], to the establishment of a Characterisation Index for each of the river basins, and the commencement of a monitoring programme. The overall objective of the management plans is to establish an integrated monitoring and management system for all waters within a River Basin District (RBD), and to develop a dynamic Programme of Measures (POMs), including action required to achieve set environmental quality objectives, namely:

- Prevent further deterioration;
- Protect 'high status' where it exists; and
- Restore the status of water bodies to 'good' by 2015 (Environmental Protection Agency, 2010).

Taking account of the principle of subsidiarity, the WFD gives Member States wide discretion in terms of how the RBMPs are implemented i.e. whether at local, regional, national or international level (North South Ministerial Council, 2003). For example, across the Republic of Ireland, the onus is currently on local government agencies to deliver the river management plans, and thus achieve the key objectives.

To assist in the development of RBMPs, including those that are transboundary in nature, a regional coordinator was assigned to each RBD; with the coordinator located within the local council charged with leading the plan preparation process.

[2] In Ireland, the WFD has been transposed into national legislation by *Statutory Instrument No. 722 of 2003, European Communities (Water Policy) Regulation 2003*; while in Northern Ireland, this transposition occurred through the *Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003*.

In the Republic of Ireland, the issue of Environmental, or Reserved, Capacity (i.e. the ability of the environment to accept wastewater discharge or to supply drinking water) is to become, for the first time, a statutory requirement in land-use planning policy and practice. This does not apply in Northern Ireland where the capacity of the receiving environment is seen by planners as an additional material factor amongst others in any development management decision. This has implications for future development; the capacity to accept discharges must now be fairly distributed between upstream and downstream. This applies to not only residential development and its location, but also commercial and industrial activity. What this in effect means is that development simply may not be permitted on certain land banks, or in areas where the receiving water environment does not have the capacity to accept discharges (*Interview, Republic of Ireland*). This, in turn, may lead to de-zoning of land, or a reduction in occupation densities[3].

1.2.1 Application of RBMPs across the Island of Ireland

In the context of the island of Ireland, eight RBDs were jointly established by the Department of Environment, Heritage and Local Government (DoEHLG) in the Republic of Ireland and the Department of Environment Northern Ireland (DOENI) following a joint consultation process in 2003 (Daly, 2011; McNally, 2009); with four located in the Republic of Ireland, one in Northern Ireland and three cross-border. The resulting International River Basin Districts (IRBDs), for both Northern Ireland and the Republic of Ireland, must adhere to the objectives outlined above; with the end goal of achieving 'good status' waters. All the RBMPs relating to the island of Ireland have been subjected to a Strategic Environmental Assessment (SEA) to identify wider effects on the environment[4].

Meeting the December 2009 deadline for the completion of plans (in line with the EU's timeframe for final adoption) proved to be a challenge on an inter-jurisdictional basis[5]. In Northern Ireland, the final RBMPs, including the International River Basin Districts, were published in December 2009. In the Republic of Ireland, the final RBMPs, including the three cross-border RBMPs were

[3] See http://www.dppllp.com/our-knowledge/publications/water-framework-directive-republic-of-ireland.aspx

[4] Strategic Environmental Assessments (SEAs) were undertaken for each of the designated RBMPs and their associated Programme of Measures (POM) in accordance with national and EU legislation. Where the RBD was international in nature (i.e. crossed a national boundary) – and there are three on the island of Ireland – each jurisdiction undertook their SEA up to the borderline.

[5] The objective had been to publish a single joint cross-border plan. In the event, however, the DOENI felt it necessary to publish separate arrangements for Northern Ireland within the EU timeframe to avoid infraction proceedings against the UK. Arrangements for the Republic of Ireland were delayed due to the intervention of local government elections.

adopted in July 2010[6]; with work commencing immediately on the implementation of the Programme of Measures (POMs)[7].

This adoption of two separate plans for the International River Basin Districts (IRBDs) (see Section 1.2.2 below), as well as the delay in the adoption of the plans in the Republic of Ireland, demonstrates the complexity of inter-jurisdictional working and monitoring on both a sectoral and spatial basis. This is particularly acute when competing interests and varying agencies are involved in the processes of framework development and delivery in both jurisdictions.

1.2.2 The North Western International River Basin District

One of the three cross-border IRBDs on the island of Ireland is the North Western International River Basin District (NWIRBD). Spatially, it covers all of County Donegal, large parts of counties Cavan, Monaghan, significant areas of counties Leitrim, Longford, and a small portion of County Sligo in the Republic of Ireland; and large areas of counties Derry, Tyrone and Fermanagh in Northern Ireland (see Figure 1.1). It is bounded to the north and west by the Atlantic Ocean, to the south by the Western River Basin District (RBD) and Shannon IRBD, and to the east by the Neagh Bann IRBD. It covers an area of 7,400 km^2 in the Republic of Ireland and 4,900 km^2 in Northern Ireland (NIEA, 2009).

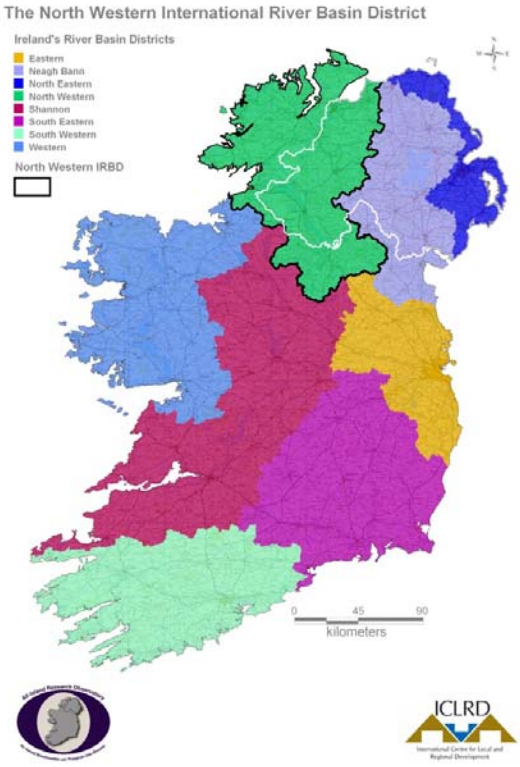
While Article 13.2 of the WFD called for the production of a single river basin management plan for each district – irrespective of whether they were cross-border in nature – two plans have been produced for the North Western IRBD[8], with each adhering to its respective national jurisdictional boundaries. This is despite the production of single reports for the IRBDs including a report on significant water-management issues and a scoping report on the environmental impacts on plans and programmes for each district (Murphy & Glasgow, 2009).

[6] In June 2010, the European Commission issued a first warning letter to twelve Member States, including the Republic of Ireland, concerning the absence of RBMPs as required by the WFD. Interestingly, a number of the RBMPs were adopted in the Republic of Ireland by the City / County Managers rather than the elected members as was originally envisaged; indicating that the political will is not always present to deal with far-reaching policies (Daly, 2011).

[7] See for example http://www.ni-environment.gov.uk/water-home/wfd/public_partic_3.htm

[8] Two plans have been produced for each of the three International River Basin Districts on the island of Ireland, each adhering to their respective jurisdictional boundaries.

Figure 1.1: The North Western International River Basin District



(Source: All Island Research Observatory)

The production of both cross-border and single-jurisdiction reports and plans has, according to one interviewee, encouraged a strong coordination between the jurisdictions and relevant stakeholder bodies (*Interview, Cross-Border Agency*). In fact, the point was made that both governments have been working closely (even pre-WFD) to ensure that activities in one jurisdiction do not impact negatively on the water quality of the other, and that the relevant key agencies have been working together to put in place common targets and standards of working (Northern Ireland Environment Agency, see http://www.ni-environment.gov.uk/water/wfd/themes/riv_bsn_mngt_plng.htm; Murphy & Glasgow, 2009). The RBMPs now formalise these arrangements; and where two plans do exist for the same river basin district, these are linked by a 'Working Together' document that is prepared jointly by both jurisdictions.

The Republic of Ireland plan for the North Western IRBD (2009-2015) relates to the portion of the District that falls within its jurisdictional boundaries. It covers the upland catchment areas of the Erne and Foyle systems, along with other smaller rivers, such as the River Swilly, and areas

around Ireland's coast, including coastal waters up to one mile from the coastline. The District, which is home to less than half a million people, has a low average population density; with less than 2% of the land being urbanised and many people living in small villages or single dwellings in rural areas. Most of the main urban areas are located beside rivers: Ballybofey, Buncrana, Cavan, Donegal Town, Letterkenny and Lifford.

The Northern Ireland plan, also covering the period 2009-2015, takes in large parts of County Fermanagh, County Londonderry and County Tyrone. The area is very mountainous, with the Sperrins in the east, and this contributes to the low average population density in the District. Most of the urban areas are located beside rivers. In rural areas, many people live in small villages or single dwellings. The principal river systems are the Foyle, with its tributaries the Mourne, Derg, Strule and Finn Rivers, and the River Erne which drains the uplands of counties Cavan, Fermanagh and Monaghan.

The joint *Working Together: Managing our Shared Waters* document, which accompanies the NWIRBD, outlines the coordination that has taken place to date between the two jurisdictions in terms of getting to the stage where two RBMPs have been published, and future commitments to collaborative working on shared waters (North South Ministerial Council, 2008). While both RBMPs for the NWIRBD – and for the two other IRBDs – have been adopted and attention has now turned towards their implementation, these joint documents on managing our shared waters have yet to be ratified. It is not clear why this is the case, and given the challenges faced in 'actioning' these plans, there is a strong rationale for adopting these documents – and giving the relevant authorities, and coordinators, the teeth they require to work across jurisdictional boundaries.

1.3 Recognising the Inter-Relationship between Spatial Planning and Water Resource Management

The impact of RBMPs on strategic spatial planning will become increasingly significant as the implication of an integrated water-land-use management system is better understood at the level of central government. On paper, it is recognised that river basin planning must engage, and work, with other planning processes – as well as key stakeholders – to provide effective environmental protection (OECD, 2010; Murphy & Glasgow, 2009; Environment Agency, 2006; Northern Ireland Environment Agency, see http://www.ni-environment.gov.uk/water/wfd/themes/riv_bsn_mngt_plng.htm). To

make this happen, the necessary policies must be embedded in the hierarchy of spatial plans, from national planning frameworks right down to local area plans such as County Development / Area Plans in the Republic of Ireland and Northern Ireland respectively. The plan hierarchy and their associated strategies need to take account of / incorporate key aspects of this new tier of plans, the RBMPs, specifically as they relate to housing, transport, retail, and climate change. In so doing, they would provide "a framework for holistic cross-sectoral thinking and policy making" (Carter, 2007: 332). This can only happen once the national planning and development frameworks for both jurisdictions 'take the lead' and this is beginning to happen.

In the Republic of Ireland, the 'refresh' of the non-statutory *National Spatial Strategy* (NSS), published in 2010, acknowledges the "close interrelationship and interdependency between spatial planning and addressing Ireland's key environmental challenges". This is specifically so in the areas of "reducing our over-dependency on fossil fuels and greenhouse gas emissions while adapting to the effects of climate change, *protecting and improving water quality*, conserving and improving the qualities of habitats, sustainable land use management ..." (italics added; DoEHLG, 2010: 15). Complimentary to this, and demonstrating 'policy fit' in action, the *Planning and Development (Amendment) Act 2010* now transposes the provisions of the WFD directly into planning law (see Box 1.1).

Box 1.1: The Planning and Development (Amendment) Act 2010 and Water Management

- Enhanced alignment between settlement planning and Population Equivalent (PE) capacity of waste water treatment plants;
- Greater integration between planning and the protection and conservation of the ecological integrity of Natura 2000 sites;
- Forward planning policies to support compliance with environmental standards and objectives established by both the Surface Waters and Groundwater Regulations;
- Statutory planning guidance to be issued by Government on such issues as Flood Risk Assessment; and
- New regulations for quarries and peat extraction.

(Source: Adapted from Daly, 2011).

The *Regional Development Strategy* (RDS) for Northern Ireland[9] clearly sets out the need to conserve and protect the natural environment at the strategic level. This objective is contained in the original RDS published in 2001 and is restated[10] in the draft 10 year Revision of the RDS published in January 2011. It requires (*inter alia*) that the quality and ecological status of the water environment should be improved through fulfilment of statutory obligations, including the preparation of RBMPs, so that all coastal and inland waters reach good status by 2015. Area Plans, prepared by the Department of Environment (DOENI), must in turn be 'in general conformity' with the RDS. However, this position is likely to change as part of the ongoing reform of planning.

Now that both governments on the island of Ireland have river-basin management legislation in place, the next challenge will be to actively link water resource management and land-use planning within their respective jurisdictions, and the cross-border management of the International River Basins.

There are many good examples of how water resource management and land-use planning have been linked; for example, in England and Wales, policy-makers at the various scales of government did not wait until the adoption of RBMPs to begin thinking about, and planning for, the increased emphasis that was to be placed on the inter-relationship between water management and future physical developments – especially in terms of environmental capacity (Environmental Agency, 2006). Local governments across the island of Ireland now find themselves grappling with these issues as they move from plan preparation to implementation. These challenges will be further highlighted in Chapter II.

[9] The RDS is a statutory document and its contents are intended to inform public sector policy development and decisions about development.

[10] *Strategic Guidance (SG)18, Conserve, protect and, where possible, enhance our built heritage and our natural environment*. Consultation on the Review of RDS 2025 (10 year Review), DRDNI, January 2011.

Chapter II: Spatial Planning and Water Resource Management: Marrying the Institutional and Policy Environments

The previously narrow focus of land-use planning on zoning and regulation has, over the past decade, been transformed into the spatial planning concept (see Box 2.1). This 'new' way of planning takes cognisance of not only the construction of the built environment but also the wide-range of human activities that are played out in this, and the natural environment. In the context of the island of Ireland, planning policy is guided by the NSS for the Republic of Ireland covering the period 2002-2020, and the RDS for Northern Ireland covering the period 2000-2025. Both documents, which are framed by the *European Spatial Development Perspective* (ESDP), emphasise the importance of sustainable development that is cross-sectoral in delivery and which transcends national / regional boundaries; for example, through EU Directives and Strategic Environmental Assessment (SEA). This "new" way of planning will be further reinforced if the arrangements contained in the draft Collaborative Spatial Framework are endorsed following the completion of the consultation process.

Box 2.1: Requirements for a new integrated approach to spatial planning

- Planning decisions should no longer be restricted to just 'land use zonings'. This requires more holistic planning, even if this requires legislative change. Planning must cover a ***wider range of activities,*** including such matters as health and the environment, supported by community plans which set out short term corporate programmes of joint action.
- Planning decisions should no longer be constrained by artificial local administrative areas, which are often arbitrary and potentially constraining to ensuring the most effective dialogue. Planning must be better related to ***coherent areas*** at the local, regional and national levels, in terms of socio-economic geography and natural regions. For example, the areas within which people search for jobs and homes or natural watersheds and river catchments. This requires a more flexible approach to 'planning areas' dependent upon the issues being addressed - different regions for different issues.
- Planning decisions should no longer be seen as just a local authority activity. Planning should be ***linked to the expenditure programmes*** of key government and corporate agencies. This requires that the expenditure programmes of sectoral agencies are 'validated'; their conformity with the approved plan should be a condition of entry to funding mechanisms.

(Source: Adopted from the RTPI, 2001).

With the RBMPs having just been adopted, attention now turns to how the objectives of these plans can be implemented – effectively, efficiently and in a coordinated manner across both jurisdictions. In parallel to this, there is a growing recognition among practitioners, and in particular amongst policy-makers and planners, that the implementation of the RBMPs must be married to the spatial planning policies and practices that impact on the overall development of the cities, towns and villages across the island of Ireland. This is a key challenge for the range of stakeholders involved in the governance of RBMPs, specifically in terms of:

- What are the implications of the RBMPs for future spatial planning policy[11] and development?;
- How can policy alignment be achieved across inter-jurisdictional RBMPs?;
- Who decides on relative priorities between RBMPs and other spatial policy objectives?; and
- What opportunities exist for cross-border cooperation in the delivery of good water quality?

This Chapter addresses these key questions, considering what is happening in terms of cross-departmental, cross-sectoral and cross-jurisdictional engagement in water management.

2.1 Provisions for Water Resource Management in Spatial Planning Legislation and Policy

Planning on the island of Ireland is characterised by two separate systems, North and South; the former being very centralised in nature albeit currently considering mechanisms to decentralise a range of powers to local government including planning, while the latter works to a decentralised model of planning where elected representatives hold a lot of the power (for a further discussion on the planning systems of the Republic of Ireland and Northern Ireland, see the 2010 ICLRD report, *All Change But Any Alignment? The Impact of the Proposed Governance and Planning Reforms Across the Island of Ireland on Inter-Jurisdictional Planning*[12]). Despite this, at a strategic level the end goal of spatial planning policy across both jurisdictions is largely the same – to ensure balanced social, economic and environmental development.

[11] Given that, for example, 54% of rivers have protected areas – such as Natura 2000, areas of outstanding natural beauty (AONB), etc. – associated with them.

[12] This report can be downloaded at http://iclrd.org/web/wp-content/uploads/2010/10/ICLRD-Report-Final-All-Change-But-Any-Alignment-Sept10.pdf).

However, based on current discussions in both jurisdictions, the harmonisation of RBMPs and associated policies and implementation arrangements in the Republic of Ireland and Northern Ireland does not appear to be a high priority issue (*Interview, Republic of Ireland*). The RBMPs in both jurisdictions are generic in nature, with actions to achieve objectives set against specific themes in the Programme of Measures. The need to act is largely determined locally by risk-based assessments and the perceived added value that action will bring. Put simply, the most cost effective solutions, or those likely to tackle the biggest threats to pollution, will invariably have greatest priority. For example, there is an expectation that there will be early 'big wins' in tackling pollution from agriculture and commerce – with the challenge of dealing with non-point or dispersed sources of pollution, such as that from rural housing, being dealt with at a later time (*Interview, Northern Ireland*). This view reflects the reality that the more complex the lines of institutional interaction, or the more numerous the centres involved in policy/decision making, the more difficult it becomes to agree action points. There is often a sense of frustration that decisions are made based on sectoral interests rather than shared strategic goals, and that decisions are made in the context of available resources rather than results which need to be achieved (*Interview, Northern Ireland*).

Carter (2007) argues that three key aspects of spatial planning systems impact on environmental quality, including water resources; these are

- Spatial plan preparation
- Development control
- Planning approaches and techniques.

In terms of *spatial plan preparation* across the island of Ireland, the long-term focus of the NSS and RDS – covering twenty to twenty five-year periods respectively – provide the relevant scope to deal with environmental challenges; issues that generally can only be resolved over the longer-term. In addition, such strategic frameworks tend to recognise that it is not only resources such as water that are finite – but also land (Carter, 2007). The existence of a plan hierarchy in both jurisdictions further facilitates the redress of environmental challenges at the appropriate scale – a recognition that has implications for the implementation of corrective actions (see Section 2.3).

Development control procedures, including pre-application discussions and the attachment of conditions to permissions, have a key role to play in protecting water courses and their environmental capacity; the form and location of development having significant impacts on water

quality. Diffuse pollution, while not the biggest source of water pollution, is a growing player – a challenge highlighted by the estimation that up to 80% of all septic tank systems are malfunctioning (*Interview, Republic of Ireland*). The form and location of development also has implications for the protection of pristine environments; the number of which has fallen very significantly over the last 15 years or so (*Interview, Republic of Ireland*).

In terms of *planning approaches and techniques* available to strengthen the links between water management and spatial planning, the EU has played a pivotal role in this area. This includes the introduction of Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) to the plan making process. The SEA and AA processes have a central role to play in determining the scale, location and form of future development, and in providing a statutory platform for stakeholders to engage in that process. However, not all decision-makers realise this – despite its huge implications for one-off housing (*Interview, Republic of Ireland*). Nationally, government in both jurisdictions is placing increasing emphasis on stakeholder engagement (see Section 2.4), in some instances driven by the 'carrot and stick' tactic of the EU.

2.1.1 Republic of Ireland

The adoption of the *Planning and Development (Amendment) Act* in July 2010 represented the first practical step taken by the Irish legislature to establish a link between river basin management and spatial planning. Under this Act, all County / City Development Plans must seek the alignment of land-use planning policies and objectives, as well as those that relate to flooding and climate change, with those of the relevant RBMPs. The establishment of such a link is viewed as central to achieving 'good' status in all water bodies by 2015, a stated obligation under the WFD. Water quality objectives will, thus, form an integral part of statutory land-use and development planning.

However, it is only now as the implementation of the RBMPs come to the fore that engagement with Local Authority planners and engineers is starting to take place. In the preparation of the plans, there was no such imperative for the RBMP regional coordinators to engage with other sections of the councils; for the task at hand, they themselves had the required expertise. As such, the most engagement that took place internally within the councils was with the environment sections (*Interview, Republic of Ireland*). There is a sense that it is only as County / City Development Plans come up for review that planners and elected officials are becoming fully aware of the RBMPs – and their implications for the location and scale of future developments.

There is a growing recognition that RBMPs will fundamentally shape policies around housing and capital investment programmes[13] as they relate to roads and waste water treatment facilities for example. While this is acknowledged to be a steep learning curve for planners and engineers, it is recognised that the growing relationship between County / City Development Plans and RBMPs will support the principles of 'sound planning' (*Interview, Republic of Ireland*); with RBMPs being viewed by planners as an additional tool to support them in making decisions – and their subsequent enforcement. Nevertheless, the lack of national policy guidance on how to execute the plans will stifle progress as plans move into the implementation phase (Daly, 2011).

As well as the requirements under the 2010 Act, the EPA's *Code of Practice for Wastewater Treatment Systems and Disposal Systems serving Single Houses*, published in October 2009, represents "a significant step forward in ensuring environmentally sustainable rural development" (Donegal County Council, 2010: 55). In providing guidance on the methods for assessing site suitability for on-site wastewater treatment systems, selecting appropriate systems to site conditions, and the maintenance requirements for such systems, this Code of Practice will play a key role in contributing to the protection of surface and groundwater resources. It also has significant implications for spatial planning policy and practice, particularly in relation to one-off housing; with the soil conditions of some counties meaning that new standards for on-site private waste water treatment systems being unachievable (Daly, 2011). Furthermore, in terms of the relationship between this Code and the RBMPs, it is envisaged that the plans have a role to play in the generation of, for example, risk-area maps in the area of housing and flood risk – thus supporting the Code of Practice on where future build can take place based on such factors as soil conditions (*Interview, Republic of Ireland*).

The importance of these recent developments is evident from the growing interaction within the Department of Environment, Community and Local Government (DoECLG) of the Spatial Planning and Water Quality Units; demonstrated by the joint hosting of events and the delivery of training to Local Authorities on the inter-relationship between RBMPs and spatial planning policy and practice.

[13] Capital programmes are being aligned – not only to reflect the importance of the WFD but also its 'daughter' directives on groundwater and surface waters.

2.1.2 Northern Ireland

The protection of surface and groundwater resources from inappropriate development is ensured through the *Strategic Planning (Northern Ireland) Order 1999* and the *Planning (NI) Order 1991*. Development management decisions are based upon policy contained in Development Plans and Planning Policy Statements. However, there is no specific policy guidance on the relationship between water resource management and development; although the discharge of waste water to the environment does require a specific consent under environmental health legislation. In practice this is not linked to development consents under planning legislation and enforcement difficulties arise when the terms of the two consents do not sit happily together (*Interview, Northern Ireland*). This is a procedural difficulty, but not seen as an immediate cause for concern by planning officials (*Interview, Northern Ireland*).

Under the Review of Public Administration (RPA), there will be extensive reform of the planning system and the legal status of the RDS. Under current proposals, the requirement for plans and policies to be "in general conformity with" the RDS will be amended to "take account of" all relevant government strategies. Additionally, the preparation of Area Plans will pass to new local authorities, although the date for this change has slipped considerably, perhaps by four years. Since many existing Area Plans have already run beyond their expiry date, there will be a period when reliable guidance is not available for policy-led decision-making.

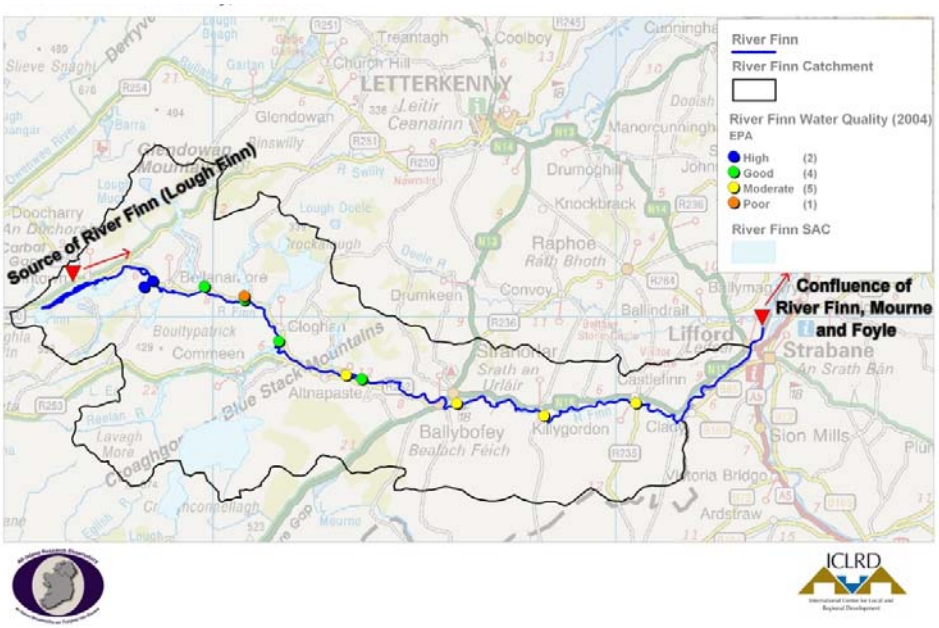
2.1.3 Housing Development and Water Quality: An Illustration

The future development of our cities, towns and villages are contingent upon the necessary infrastructure being in place to ensure necessary water supplies and waste water treatment capacity being in place to facilitate growth (Border Regional Authority, 2010). In the absence of such systems, and having due regard to Local Agenda 21[14], the development capacity of our cities, towns and villages is severely hampered; or where growth is permitted without accounting for its potential impact, the water quality standards can deteriorate.

In the case of the NWIRBD, the water quality of the River Finn has deteriorated between 2004 and 2007 as illustrated in Figure 2.1a and Figure 2.1b.

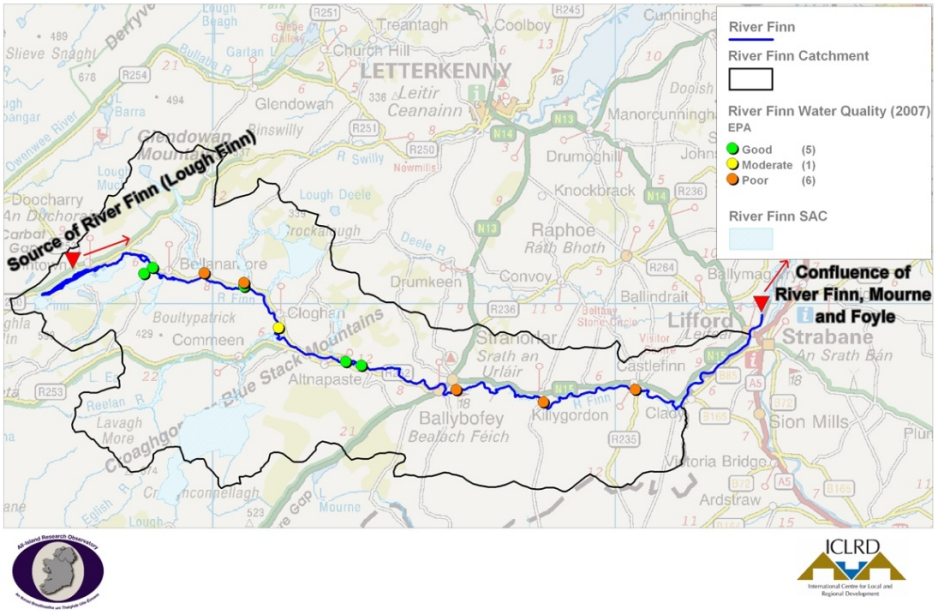
[14] Local Agenda 21, dating back to 1992, promotes the concept of "sustainable development"; arguing that development which meets our present needs must not compromise the ability of future generations to do the same.

Figure 2.1a: River Finn Water Quality, 2004 (measured by EPA)



(Source: All-Island Research Observatory)

Figure 2.1b: River Finn Water Quality, 2007 (measured by EPA)

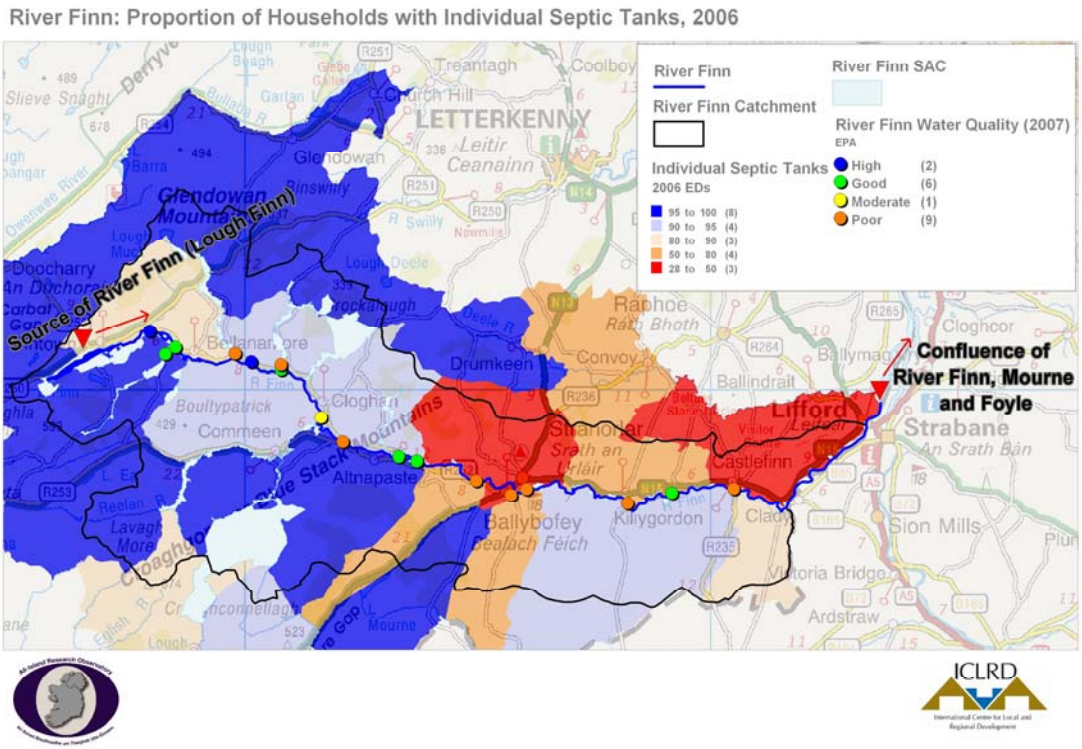


(Source: All-Island Research Observatory)

While this deterioration in quality cannot definitely be attributed to diffuse pollution as a result of malfunctioning septic tanks (see Figure 2.2); the question does arise whether the scale of

development that has taken place between 2004 and 2007 has had an impact on the River's environmental capacity (see Figures 2.3a and Figure 2.3b).

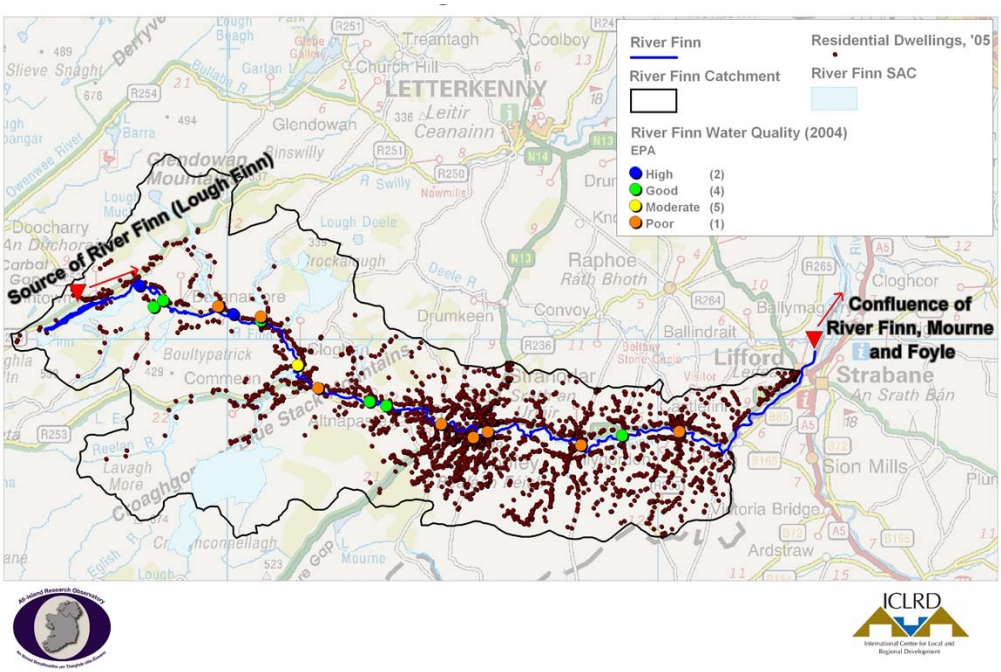
Figure 2.2: Proportion of Households in the River Finn Catchment Area with Individual Septic Tanks up until 2006



(Source: All-Island Research Observatory)

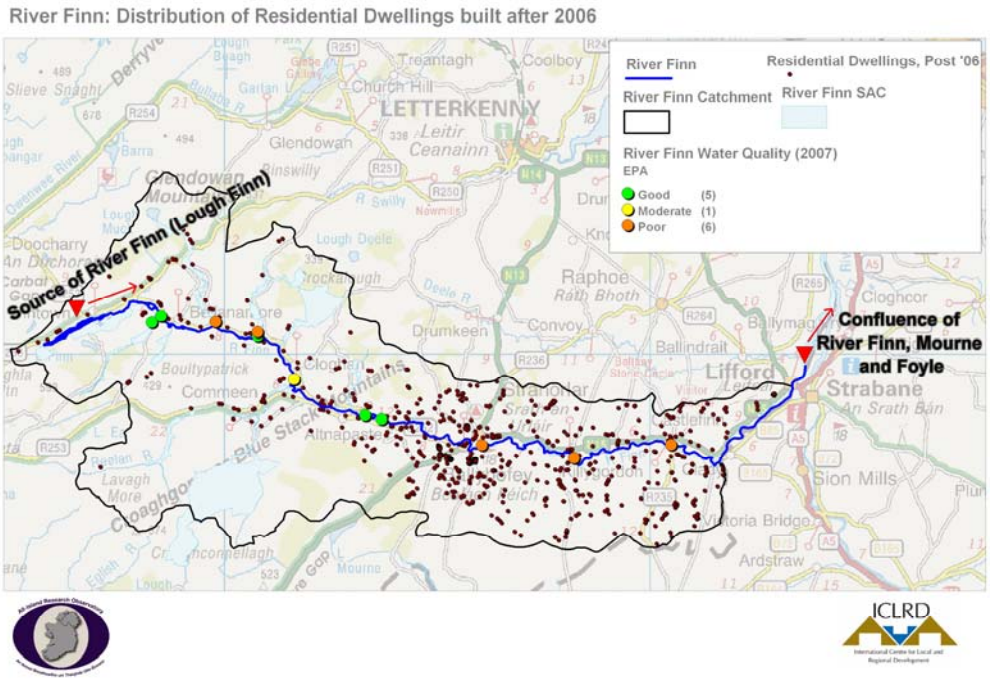
As noted by Daly (2011), there are approximately 66,500 unsewered properties located in areas within the NWIRBD where the hydrogeological characteristics mean that adequate percolation is unavailable, and approximately 93 rivers have been assessed "to be at risk of failing to achieve the required standards due to unsuitable hydrogeological conditions...high density and location of unsewered properties in these areas" (Donegal County Council, 2010: 11).

Figure 2.3a: Distribution of Residential Dwellings along the River Finn Catchment until 2005



(Source: All-Island Research Observatory)

Figure 2.3b: Distribution of Residential Dwellings along the River Finn Catchment post-2006



(Source: All-Island Research Observatory)

2.2 Plan Preparation and Policy Alignment

Transboundary issues, such as water quality, require cross-border working. Integrated water management requires risk assessment, and agreement on these risks and the actions required to deal with them (*Interview, Republic of Ireland*). Ideally, once the measures are agreed upon, there should be no issues with having different vehicles in each jurisdiction to drive them forward, namely: a whole territory approach by the Northern Ireland Environment Agency (NIEA) versus individual Local Authorities with one lead council per RBD in the Republic of Ireland. There is no clear evidence to date, that these varying approaches are having a negative impact on the preparation of the RBMPs and their respective Programme of Measures. However, the challenges – and opportunities – lie in the implementation of RBMPs and the structures and processes put in place to translate policy and agreed action points into practice.

As noted earlier, measures promoted and adopted under the RBMPs will have a wide range of impacts on future development and spatial planning policy – specifically in terms of the suitability and capacity of the environment to absorb the impacts of future development. The RBMPs will impact on future patterns of development – from the location of housing to the selected routes of road / rail projects. They will impact on the location and harvesting of forestry plantations. Their policies will determine the position of wind and hydro farms, as well as other renewable energy projects. The plans will also have a bearing on the siting of water-based tourism activities. All these activities have impacts on local waters and their wider catchments, including groundwater. The redress of such challenges is not only hampered by the institutional arrangements in place in both jurisdictions to oversee the implementation of RBMPs (see Section 2.3) but also by the variances in the legislative and governance systems of both jurisdictions.

While PPS21 (formerly PPS14) and the imposition of rates have positively curtailed the amount of development that is permitted in the Northern Ireland countryside, the Republic of Ireland has, until recently, operated a very ‘open policy’ to construction in the countryside – with excellent guidelines from the Department and EPA not being legally binding.

The WFD places a significant emphasis on water pricing and cost recovery; with ‘adequate pricing’ viewed as an incentive for the sustainable use of water resources. Furthermore, Member States will be required to ensure that the costs charged to water consumers reflect the true costs of sustainable abstraction and distribution (European Commission, 2011, see

http://ec.europa.eu/environment/water/water-framework/info/intro_en.htm). Yet, with the debate on the introduction of water pricing gaining momentum across the island of Ireland, little work has been undertaken on the economic benefits of river basin management, particularly to primary users such as fishermen, anglers, and surfers. Without this, it is hard to convince users of the varied – and costly - impacts of diffuse pollution. More work is, therefore, required on highlighting the economic benefits of good water quality and building awareness among various stakeholders on the strong inter-relationship between river basin management and spatial planning. More so, the evolution of the planning system from one merely focused on land-use planning to a more integrated spatial planning system with its "complex multi-dimensional and inter-related issues" (Daly, 2011: 8) has not been matched by the adequate resourcing and training of planners and elected officials. As such, it remains difficult to convince councillors, especially in the Republic of Ireland where they play a key role in the planning decision-making process, to instigate change (*Interview, Republic of Ireland*).

2.3 Current Governance Arrangements

The WFD requires International River Basin Districts to coordinate their implementation efforts. While there has been a tradition across the island of Ireland in cooperating on the management of a number of waterways this has largely tended to be informal in nature. Through the WFD, existing informal arrangements become formalised and more structured in some cases (Murphy & Glasgow, 2009). The Loughs Agency for example, a cross-border body established under the Good Friday Agreement, provides more formalised arrangements in relation to the Foyle and Carlingford catchments but also sees itself as having a role to play in river basin management – either formally or informally (see Section 2.3.3).

In such instances where RBMPs cross jurisdictional boundaries, it is essential that clear governance arrangements and structures are put in place from the outset – both at a national and regional level. Such arrangements are not only key to resolving any "conflict between meeting development needs and protecting the environment" (EPA, 2010: 22) at the local level but also in ensuring a horizontal and vertical 'fit' between the goals and objectives of the RBMPs and relevant strategic development frameworks; for example, the NSS and RDS at national level, and the Regional Planning Guidelines (RPGs) at regional level.

However, there is presently a clear lack of emphasis on implementation at the 'local' level i.e. amongst those responsible for 'actioning' the RBMPs. There are three main reasons for this:

- Lack of capacity within the local authorities to deliver on the plans;
- Issue of resourcing (*Interview, Republic of Ireland*); and
- Moving from planning to implementation brings a new range of actors and learning curves 'into play' (*Interview, Northern Ireland*).

While other European countries such as Germany are very strong in water planning (see Chapter III), this is not the case in Ireland (*Interview, Republic of Ireland*). One reason put forward for this is data – or the lack thereof; an issue that became apparent with the drafting of the characterisation reports[15]. Traditionally, water has been considered an infinite resource that required no planning and had little economic value. Whereas, water resource management and planning in Germany is a long-established and institutionally embedded policy domain and practice, it has been a residual activity in the Irish context, drawing on limited resources and expertise. In Northern Ireland, although water pricing has been carried out as part of the WFD process the Northern Ireland Executive has decided that the cost of supplying fresh water to households should be absorbed and not passed on to households.

2.3.1 RMBP Governance in the Republic of Ireland

One of the first steps undertaken across the island of Ireland post-2003, and the transposition of the WFD into national legislation, was to identity the competent authorities who would have responsibility for the roll-out and implementation of the RBMPs. In the Republic of Ireland, three key stakeholders were identified which would have overall responsibility for the plans in terms of their delivery and monitoring (see Figure 2.4) namely, the Department of Environment, Heritage and Local Government – since renamed the Department of Environment, Community and Local Government – the Environmental Protection Agency and Local Authorities. While Figure 2.5 illustrates the workflow among these key agencies in a more simplified format, both diagrams capture the complexity of the process and the 'busy-ness' of the institutional relationships.

As an entity, the ***Department of Environment, Community and Local Government*** (DoECLG) has an overall coordination role in terms of RBMP implementation; a role that is enshrined in

[15] These reports provide an analysis of the characteristics of river basin districts, undertake a review of the impact of human activity on the status of waters and provide an economic analysis of water use in accordance with the requirements of Article 5 of the Directive (adapted from National Summary Report, Ireland 2005)

national legislation. The Department has issued technical guidance on how the plans should be translated into action at the local level. In practice, this function lies with the Water Quality Section within DoECLG specifically. This Section is responsible for ensuring the relevant policies and legislative frameworks are in place so that the effective implementation of the RBMPs can take place (*Interview, Republic of Ireland*).

Interestingly, the Spatial Policy Unit within the Department has had had no role in the preparation of the plans, and a minimal role to date in their implementation[16] (*Interview, Republic of Ireland).*

The recent adoption of the *Planning and Development (Amendment) Act 2010* should, however, improve the (inter)relationship between water management and spatial planning. As illustrated in Figure 2.5, the legislation calls for the better integration of RBMP policies – and wider WFD legislation – across the plan hierarchy. The importance of such heightened interaction between water management and spatial planning has been also been brought to the fore by the ruling of the European Court of Justice on Ireland's failure to fully transpose the EU Waste Water Directive (75/442/EEC) into Irish legislation. This ruling particularly emphasises Ireland's failure to monitor the installation and performance of septic tank systems throughout the Irish countryside. In response, and to prevent further infractions, the government is currently drafting legislation and procedures around septic tank usage and monitoring. This will, in turn, support the EPA's *Code of Practice for Wastewater Treatment Systems and Disposal Systems serving Single Houses.*

Up until 2010, a **National Advisory Committee** supported the work of the DoECLG in river basin management. This grouping, made up of representatives from a number of Local Authorities, the Environmental Protection Agency (EPA), the Department of Agriculture[17] and other key stakeholder agencies was responsible for redressing the late adoption of the RBMPs by the Irish Government. It was charged with giving an impetus to the finalisation of the plans, and providing a forum where the difficulties could be discussed i.e. getting the plans 'over the line' (*Interview, Republic of Ireland*). As the process has moved from plan adoption to implementation, this grouping has gone into abeyance.

[16] Interestingly, since 2009 the Spatial Planning Unit and Water Quality Section have been part of the same division within the DoECLG. As the RBMPs move into implementation phase, the Spatial Policy Unit of the Department has a key role in play is devising policy responses to what the scientific data tells us in terms of water quality and the impact of physical developments on same.

[17] The Department of Agriculture is considered one of the key departments in the area of water management and water quality. This is attributable to agriculture being a big pressure source for water quality in Ireland.

Figure 2.4: River Basin Management Planning in the Republic of Ireland

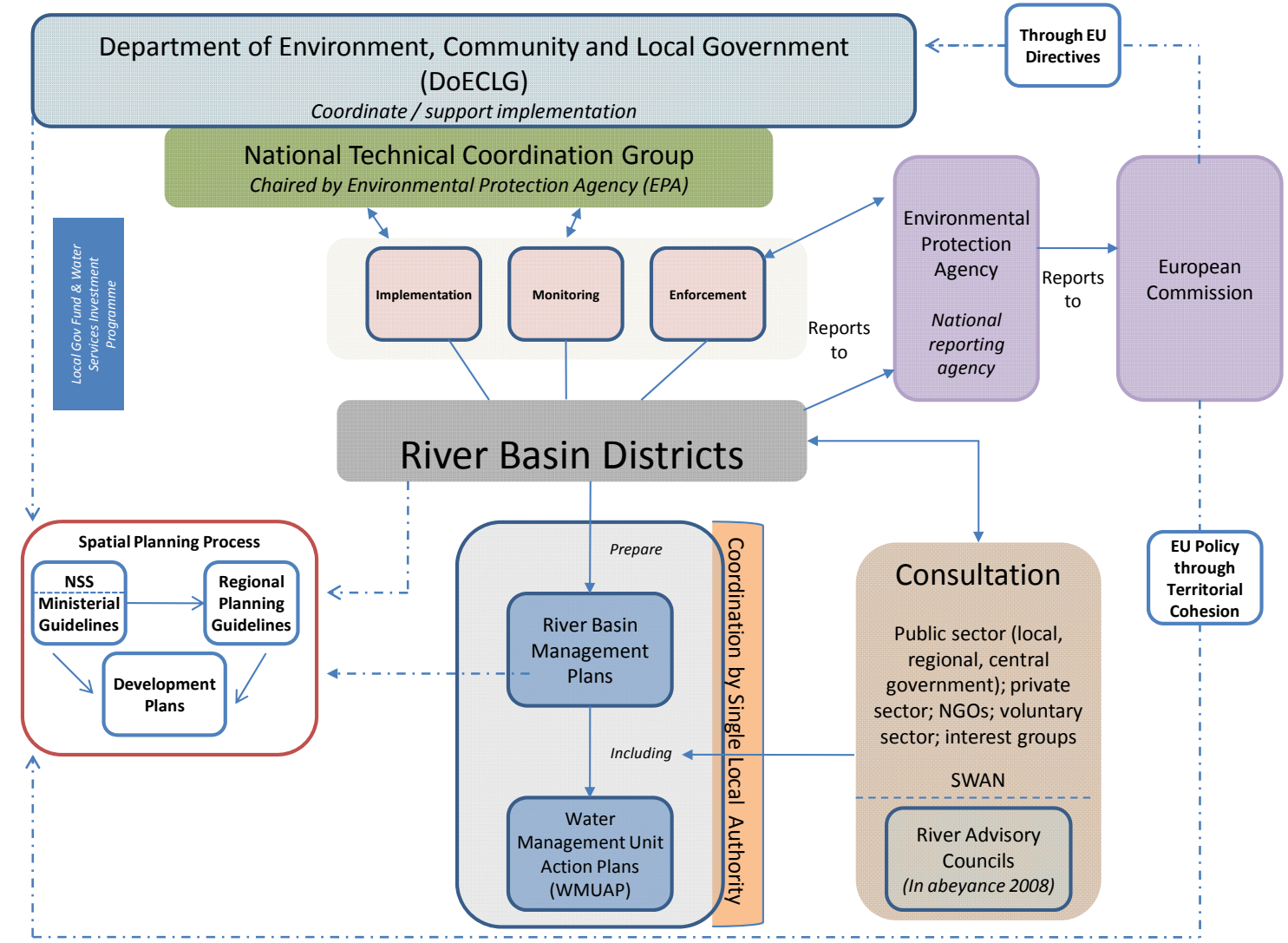
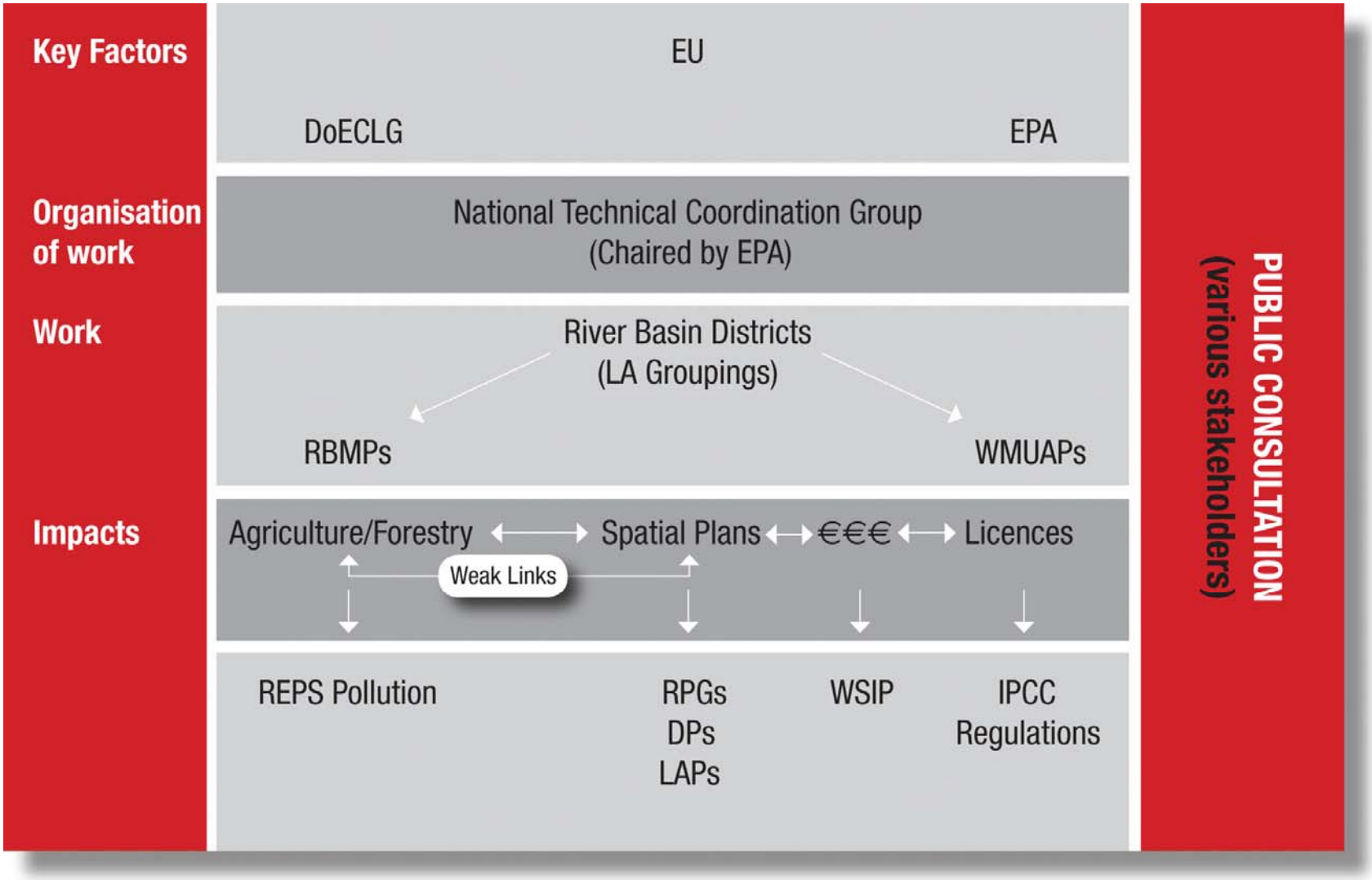


Figure 2.5: At a Quick Glance – River Basin Management in the Republic of Ireland



The ***Environmental Protection Agency*** (EPA) is responsible for reporting progress on the roll-out and implementation of the plans to the European Commission. It has an oversight role in terms of the connections between River Basin Management Plans and Development Plans / Regional Planning Guidelines – a role that has been strengthened with the adoption of the 2010 Planning Act. In addition, it chairs the *National Technical Coordination Group* which coordinates the implementation of the RBMPs from a technical perspective. Specifically, the EPA offers encouragement, provides technical advice and strives to bring all the relevant actors together to achieve consensus on proposed actions. It was this grouping that identified the need for a wider governance review of water management, particularly as the process was shifting from policy development to implementation. This review is due to be completed by the end of 2011.

At the local level, it is currently the ***Local Authorities*** who have responsibility for developing the RBMPs, setting the water quality objectives for the waterways involved and translating these into a Programme of Measures. For each RBMP, one local council is appointed the role of coordinating authority; and in the case of the NWIRBD, this responsibility lies with Donegal County Council.

A now absent tier is the **River Advisory Councils** that were disbanded in 2007 in the build-up to the local elections. The Councils' membership (similar to Strategic Policy Committees within Local Authorities) was comprised of two-thirds elected members and one-third other stakeholders; the Councils were to be reconvened after the elections – but this did not happen and for these other stakeholders, there was a sense of being 'spoken at '. In a report prepared for the Environmental Protection Agency, the authors noted that for various reasons including time pressures to meet EU deadlines, the River Advisory Councils did not provide a forum that encouraged the active participation of stakeholders. With the ongoing absence of this operational tier, there is a growing concern regarding the lack of public accountability in the process of river basin management (*Interview, Republic of Ireland*; see also Bruen et al, 2010).

It is acknowledged across the key national stakeholder agencies that there are major problems in relation to the structures for implementation; both in terms of their effectiveness and efficiency. It is recognised that, for example, many of the objectives in the RBMPs fall outside the remit of local government. Councils lack the power to ensure appropriate action is taken by government departments and state agencies (*Interview, Republic of Ireland*) and, as such, are not deemed the appropriate vehicle to drive implementation. The River Basin Management Coordinators in the coordinating local authorities in each RBD are to be funded until the end 2011. It is expected that

a decision by the Department on new implementation arrangements will be made by then (*Interview, Republic of Ireland*).

2.3.1.1 Flood Risk Management – Its Links to RBMPs

It is important to note that in a number of the interviews held, concerns were expressed regarding the disconnect between flood risk management, river basin management and spatial planning. This is despite the growing acknowledgement that planning, river basin management and flooding is inter-linked. Currently, separate flood risk management plans are being prepared. In the Republic of Ireland, it is currently the Office of Public Works (OPW) who has overall responsibility for flood risk assessment and management, The OPW, however, only has a peripheral role in the management of the river basins, limited to monitoring only.

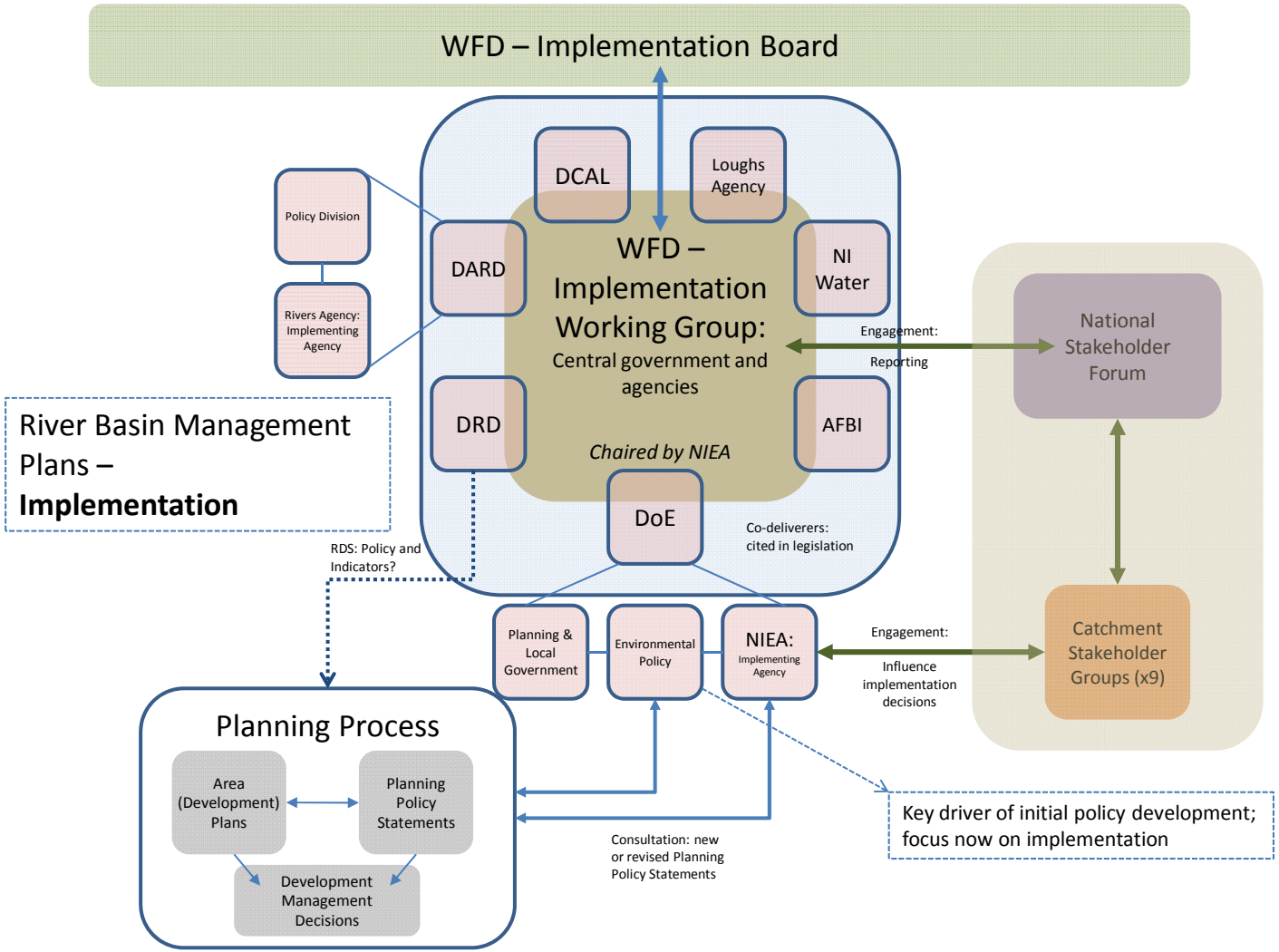
2.3.2 RBMP Governance in Northern Ireland

The system of governance in Northern Ireland is similarly complicated to that of the Republic of Ireland (see Figure 2.6). A difference to the arrangements in the South is that a significant number of agencies are being given a voice 'at the table' – rather than being viewed as interested parties.

Overall implementation of the WFD is coordinated by the ***Department of Environment***; a coordination role detailed in the *Water Environment (Water Framework Directive) Regulations (Northern Ireland) (S.R. No. 544 of 2003).* Its agency, the ***Northern Ireland Environment Agency*** (NIEA) has, in turn, responsibility for the technical aspects of implementing the RBMPs. As well as working closely with the Department of Environment, the NIEA has to deal with other Departments who also have a responsibility for water management – including Department of Agriculture and Rural Development (DARD), Department for Regional Development (DRD), and Department of Culture, Arts and Leisure (Murphy & Glasgow, 2009). While the Northern Ireland Executive has a policy coordinating role, considerable power lies with individual Ministers to make Departmental decisions within their functional responsibilities and budgets. Each of these Departments has also devolved operational responsibilities to arms length agencies, further extending the decision chain.

In recognition of this distributed responsibility, and to facilitate the involvement of these four government departments in implementing the WFD, an ***Interdepartmental Working Board*** was established "to oversee and coordinate the strategic implementation of the directive" (Murphy &

Figure 2.6: River Basin Management Planning in Northern Ireland



Glasgow, 2009: 141). This Board, in turn, established an ***Implementation Working Group*** to coordinate the activities of the various government departments and other relevant agencies. The ponderous nature of the Interdepartmental Working Group has been characterised as passive rather than active, and the work of the Group has not attracted any political curiosity (*Interview, Northern Ireland).*

The value of stakeholders within the governance arrangements is recognised by a stakeholder forum at both local and regional level.

2.3.3 Cross-Jurisdictional Collaborative Arrangements

As well as the respective structures put in place in each jurisdiction, a number of North-South initiatives were rolled-out in the early to mid-2000s in support of the preparation of River Basin Management Plans. A key programme in this regard was the NS SHARE Project (see Box 2.2) led by Donegal County Council.

Box 2.2: The North South Shared Aquatic Resource Project

Better known as the NS SHARE Project, this initiative was supported by the INTERREG IIIA Ireland/Northern Ireland Programme. Its aim was to strengthen the inter-regional capacity for environmental monitoring and management at the level of the River Basin District (RBD), to protect and enhance the aquatic environment and dependent ecosystems, and to improve public awareness and participation in water management issues (see http://www.nsshare.com/downloads/NS%20Share%20Leaflet.pdf).

Operational from March 2004 to August 2008 (and extended until January 2010 under NS SHARE II), this initiative focused on three River Basin Districts (RBDs):

- The North Western International River Basin District
- The Neagh Bann International River Basin District
- The North Eastern River Basin District.

As such, the project covered over one-quarter of the land mass of the island of Ireland (over 27,00km^2), and involved the major river systems of the Foyle, Erne, Lagan, and Neagh-Bann. During its lifetime, the NS SHARE Project played a key role in the preparation of the river basin management plans, characterisation and the identification of significant water management issues, the development of the Programme of Measures (POMs) for each RBD, and the facilitation of public consultation.

In addition, a number of cross-border groups were also established to support the cross-jurisdictional coordination required for IRBDs – both in terms of the technical aspects of water

management and its cross-border administration. It is important to note, however, that the Loughs Agency[18], which plays a key role in the sustainable management of the Foyle and Carlingford catchments, has not been brought into the WFD governance framework.

2.3.3.1 North South WFD Coordination Group

The focus of this cross-border grouping is on the coordinated and practical implementation of the RBMPs; with the working group involving representatives from NIEA, EPA, the two Departments of Environment, and others. This Group falls under the auspices of the North South Ministerial Council (NSMC); with the work being facilitated by an Implementation Sub-Group, involving Donegal County Council, Monaghan County Council and the NIEA. Originally meeting once every Quarter, it has been suggested that the frequency of these meetings may be reduced as the river basin management plans move more into their implementation phase; this would recognise that informal cooperation is taking place outside of the formal avenues.

2.3.3.2 North South Technical Advisory Group

During the preparation phase of the RBMPs, it was at this level that the real cross-border coordination work took place. Representing the actors 'closest to the ground'– including representatives from the EPA and NIEA – the focus of this Group was on agreeing on the scientific data to be undertaken, and monitored, on an all-island basis.

2.3.4 Determining Priorities between RBMPs and other Spatial Policy Objectives

Following the adoption of the RBMPs, difficulties have arisen in translating their objectives into concrete measures – this is largely considered to be the result of their being too weak on the 'how' (*Interview, Republic of Ireland*).

For the Republic of Ireland, ensuring that the policies of various Departments – and various sections within a single Department – 'fit' with those of the RBMPs would greatly benefit from the creation on a formal basis of working groups within and across Departments. In the case of the Department of Environment, Community and Local Government, for example, an in-house working group on water management should be established involving water quality, spatial planning and housing.

[18] This agency was established with a statutory cross-border remit under the 1998 Good Friday / Belfast Agreement.

In Northern Ireland a start was made towards the in-house coordination of those elements which are within the remit of the Department for Environment; these being water quality and development management. Yet, it was soon realised that effective progress is dependent upon having a new series of Area Plans as a means of developing and delivering integrated policy; many of the existing Area Plans being several years out of date. As such, progress has been halted until it is clear which planning powers will be devolved to new Local Authorities, and when this will happen.

On a cross-border basis, the opportunities to meet formally to discuss river basin management are limited. Where water management is discussed at North South Ministerial Council sectoral meetings, this is usually as part of a wider environmental brief. To better facilitate such cross-border engagement, reference has been made to the possible establishment of cross-border implementation groups – thus providing a space for the river basin coordinators to meet and speak with each other, to share learning and experiences (*Interview, Republic of Ireland*). The establishment of such groups would not only ensure coordination of policies and associated actions, but would also redress the inherent culture of silo working across state agencies (Daly, 2011).

2.4 Stakeholder Engagement

From the outset, public participation has been a key aspect of the WFD, a scenario driven by the recognition that "integrated land-water management" cannot be achieved by governments working alone (Watson &Howe, 2006: 472). During the course of the drafting of the RBMPs across the island of Ireland, a series of public information events were held – these were organised on a cross-RBD basis where relevant. The events (see Figure 2.7a) were attended by a cross-representation of agencies and interested stakeholders and, as illustrated, this was facilitated by events being sequenced geographically so that the public was within 30km of one or more events (see Figure 2.7b).

The view of these events is that they were poorly attended and not as effective as intended. This is still considered to have been a 'missed opportunity' for the various NGOs and other stakeholders who sat outside the formal plan preparation process. For the NGOs in particular, this is attributed to staffing and resourcing issues (*Interview, Republic of Ireland*).

Figure 2.7a: Location of Public Awareness Events

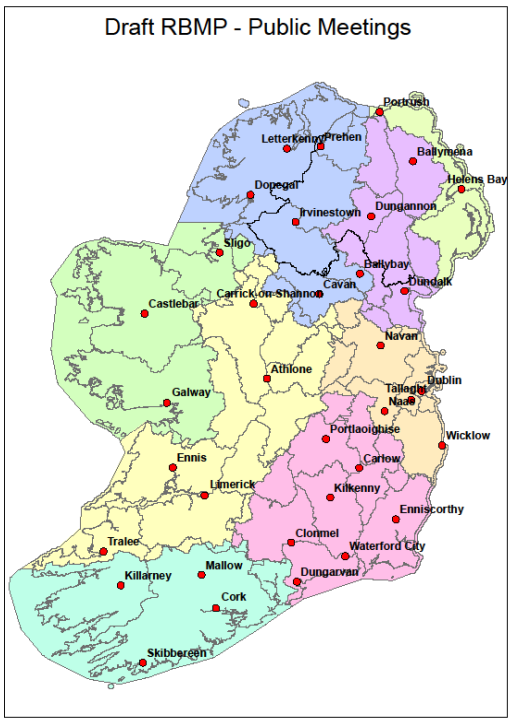
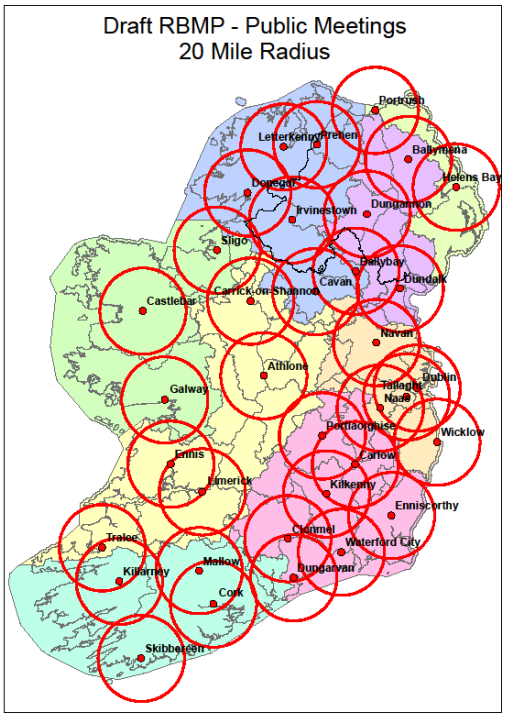


Figure 2.7b: Geographical Spread of Public Awareness Events



(Source: McNally, 2009b)

It was difficult for these small-scale, largely voluntary-operated groupings to mobilise their members to be present at all these events – and thus, increase their engagement with the issues as they arose (*Interview, Republic of Ireland*). Interestingly, despite the poor attendance at these events, a large number of written submissions were received from public bodies, eNGOs and sectoral groups – estimated to be approximately 400 nationally, and 83 covering the NWIRBD and the neighbouring Neagh Bann International River Basin District (McNally, 2009).

2.4.1 Stakeholder Engagement in the Republic of Ireland

There is a significant risk that there is insufficient communication between local government and the wider public, and the water and planning sections of local authorities (*Interview, Republic of Ireland*). With the River Advisory Councils having been disbanded, there are no fora within the Republic of Ireland facilitating public engagement with water management issues. Unlike

Northern Ireland, Ireland did not establish a National Stakeholders Forum or Local Stakeholder Advisory Councils; the absence of such local platforms being most decried *(Interview, Republic of Ireland).*
On the ground, there is a sense of a lack of momentum in terms of implementation - at present project coordinators are dealing with 'local' issues as they arise (Interview, Republic of Ireland).

In the Republic of Ireland, SWAN – Sustainable Water Action Network – was established as an umbrella organisation specifically to ensure there was public participation in the actions stemming from the WFD. For the most part, SWAN engages with national policy on a range of water-based issues and, as part of this promotes active engagement with the wider public rather than mere consultation. It also engages in public awareness work – but due to resourcing, this is largely left to individual members to pursue.

In 2009, SWAN produced a blueprint, at the behest of the then Department of Environment, Heritage and Local Government, entitled *Water for Living, Water for Life: A Blueprint for a Public Awareness Campaign on Water*. Recognising the "distinct capacity which various sectors possess to impact upon water quality" (p.9), the document detailed what 'tailored' mechanisms and indicators could be employed by a wide range of sectors that use and / or manage water, and impact on its quality. According to SWAN, none of its recommendations have been adopted or implemented to date (*Interview).*

2.4.2 Stakeholder Engagement in Northern Ireland

The membership of local catchment group forums has been open to all stakeholders. This approach appears to be valued since many stakeholders have been constant in their attendance. However, while these fora provide a feedback mechanism they have not diminished a sense of stakeholder frustration that they are talking shops rather than integral parts of a planning or delivery mechanism (*Interview, Northern Ireland*).

It is also expressed that officials have failed to recognise the existence of expertise amongst stakeholders and failed to harness latent resources (*Interview, Northern Ireland).* There is a danger that stakeholders will start to desert the implementation phases of RBMP if they are not recognised by officials as worthwhile partners bringing skills and insight (*Interview, Northern Ireland)*.

Consideration is now being given to allowing some interface between the National Stakeholder Forum and the Interdepartmental Board in order to provide a “reality check” for senior officials and a better understanding of resource issues by stakeholders (*Interview, Northern Ireland*).

2.5 Monitoring and Reporting

While integration between the RBMPs and the spatial planning hierarchy is viewed as very important, the key issue is the monitoring of the cumulative impact of pressures from a range of sectors. It is this cumulative effect over time that will – and should – inform planning policy, and resulting practice; the collective impact being critical in terms of water bodies crossing thresholds from high to moderate to poor quality (*Interview, Republic of Ireland*). The number of high quality sites has, for example, fallen very significantly over the last 15 years (*Interview, Republic of Ireland*). While there is currently a lack of scientific information on the specific causes of these deteriorations in water quality in specific areas, there is, however, a need for preventive action in the interim.

The redress of these declining standards is not only dependent on increased monitoring and joint responses on a cross-border basis but also on improved communications between the water and planning sections of local authorities – and central government departments.

2.5.1 Monitoring and Reporting in the Republic of Ireland

The availability of water quality data – and its ongoing monitoring – should not be an issue. With the preparation of the river basin Characterisation Reports pre-2005, and the ongoing classification of water bodies (due for completion in 2013), a wealth of comprehensive water quality data has been generated. Under the WFD, there are a number of parameters laid out against which the status of waters must be judged (*Interview, Republic of Ireland);* and the expertise to do this lies across a wide range of agencies, including:

- Environmental Protection Agency (EPA): biological parameters such as *q* value
- Marine Institute: coastal waters
- Local Authorities: physical environment, water quality
- Geological Society of Ireland (GSI): groundwater quality
- Office of Public Works (OPW): morphology.

Local authorities, as key players in the current water management arrangements, are responsible for the 'operational monitoring' of rivers; with operational monitoring being less frequent than surveillance monitoring. The councils monitor where they think there are issues or problems; the purpose being to flag particular issues where there are known, or potential, problems. The EPA, on the other hand, is responsible for 'surveillance monitoring' that is undertaken 12 times a year at the surveillance stations (*Interview, Republic of Ireland*). In addition, it processes the monitoring information received from local authorities. The EPA also play a role in the monitoring and surveillance of groundwater; with groundwater being sampled 4 times a year.

In terms of reporting, this largely is the responsible of the EPA; with the Agency reporting directly to both the European Commission and, where warranted, the Department of Environment, Community and Local Government.

Focusing specifically on the issue of enforcement, SWAN has recommended to the Irish government that they establish an Environmental Enforcement Office that, similar in its function to An Bord Pléanala, would be independent of the EPA. This would, in effect, be a unit where breeches would be followed through rather than going unchecked because of lack of resources within local government or the National Parks and Wildlife Service – as anecdotally, is currently the case (*Interview, Republic of Ireland*).

2.5.2 Monitoring and Reporting in Northern Ireland

Changes in the way data is labelled over time, and out-of-date base maps, has made it difficult to retain a coherent view about habitat change and RBMP progress (*Interview, Northern Ireland*). Monitoring policy has been established and results recorded in the public domain but the sheer volume of data, and the need for technical skills to interpret its significance, can be daunting. Although web-based layer maps are available, these still need skill levels and patience beyond that of most stakeholders or policy officials. This outcome makes it very difficult to assess cumulative progress and identify where development policy change might be needed.

Many of the changes to development policy which would bring about positive environmental change conflict with accepted dispersed settlement patterns and economic aspirations. In practice evidence must be very clear and compelling, and the need for corrective action widely

accepted, before any prospect of changing the policy status quo is proposed – never mind considered (*Interview, Northern Ireland).*

2.5.3 Cross-border Monitoring and Reporting

A key link, North and South, is the common platform of evidence – on which future policies and programmes of measure are based. This makes cooperation possible – and irrespective of differences in implementation structures, such collaboration will be key to the success of these plans. Data coordination, as well as mapping, will play an important role in linking the policies and objectives of RBMPs that transcend jurisdictional boundaries. As part of the shift into implementation, increasing efforts are being made to consolidate the databases of each of the key stakeholders in both jurisdictions (*Interview, Republic of Ireland*). The EPA in the Republic of Ireland, for example, has a statutory role in the generation and update of datasets; and with the Local Government Computer Services Board, has established EDEN (the Environmental Data Exchange Network). This system has a role to play in generating a 'status' for each waterway, and mapping this evidence-base. However, not all districts have adopted this programme; the Eastern River Basin District, for example, has adopted its own mechanisms for data collation. This is a direct result of it adhering to the original date for completion of the RBMPs – and thus adopting its plan in advance of all other districts in the Republic of Ireland (*Interview, Republic of Ireland).* By so doing, issues have arisen regarding the comparability of datasets between it and neighbouring RBDs.

An issue raised during the course of this study was the challenge of reconciling economic development with the 'in-combination' cumulative carrying capacity of the area i.e. the cumulative impact of multiple developments on a water course or hydrogeologically sensitive area (*Interview, Republic of Ireland*; Daly 2011). Nor is it possible to monitor every point on every watercourse. These are, therefore, central tenets to any cross-border collaboration on river basin management. Points must be identified where monitoring can be undertaken and which will reflect the condition of the wider environment, particularly those of a cross-border nature, through extrapolation.

In the management of the Foyle, a SIM-CAT model is used to map all discharge points, location of Waste Water Treatment Plants, etc, - and the impact of this on different parameters. It has many uses; such as scenario testing, measuring potential capacity for future development, and measuring capacity upstream and downstream incl. capacity load. Undertaken for each license

application, the SIM-CAT model is a regulatory tool in the U.K. but not in the Republic of Ireland (although the Environmental Protection Agency did consider it).

2.6 Conclusion

As attention turns towards the implementation of the RBMPs, a main challenge will be integrated governance – not only internally within each jurisdiction but also on a cross-border basis *(Interview, Republic of Ireland).* Given the number of stakeholder agencies involved in river basin management – and as such the complexity of the current governance arrangements in place – it is challenging for people to engage with the process, and to understand the system as a whole. The involvement of the local authorities in the Republic of Ireland is an added layer of complexity; in terms of their capacity and competency – but also in terms of the divergence with the implementation structures in the North which, for the most part, are very centralised.

One solution tabled during the course of this research was the need for a single agency within each jurisdiction to be charged with implementing the RBMPs. However, for such an arrangement to work where water catchments traverse a jurisdictional boundary, one agency only would need to have ultimate responsibility. As argued by one of the organisations interviewed, it would not make sense to have two separate organisations – centralised public agency and Local Authority with distinct roles and responsibilities – charged with managing the same waterway, albeit on different sides of the border (*Interview, Cross-Border Agency*).

In the preparation phase of the cross-border river basins, the scientists did an excellent job in spanning the data divide and reaching agreement on key characterisations and monitoring indicators. However, in the implementation phase, the expertise of a more diverse grouping of stakeholders is needed. Without this expertise, there is a risk that targets will not be met; and failure to reach the required standards can – and most likely will – lead to further infractions (*Interview, Cross-Border Agency*).

Developing an integrated water management planning approach across the island of Ireland can be achieved when central government, and their respective Departments, find ways to cut across ‘institutional silos’; and equally important, when divisions within the same Department recognise the value added of collaboration – and act upon it. With the adoption of the RBMPs across the island of Ireland in 2009 and 2010, it is more imperative than ever that the policies

and POMs of the resulting plans be closely aligned to relevant spatial planning policy and practice at the relevant scales. In the Border Regional Authority *Regional Planning Guidelines 2010-2022*, for example, the settlement strategy for the border region highlights the growing stresses on surface and ground water, particularly in rural locations of pristine landscapes where development pressures tend to be greatest (Border Regional Authority, 2010). These demands will inevitably conflict with the aims of the WFD and resulting RBMPs.

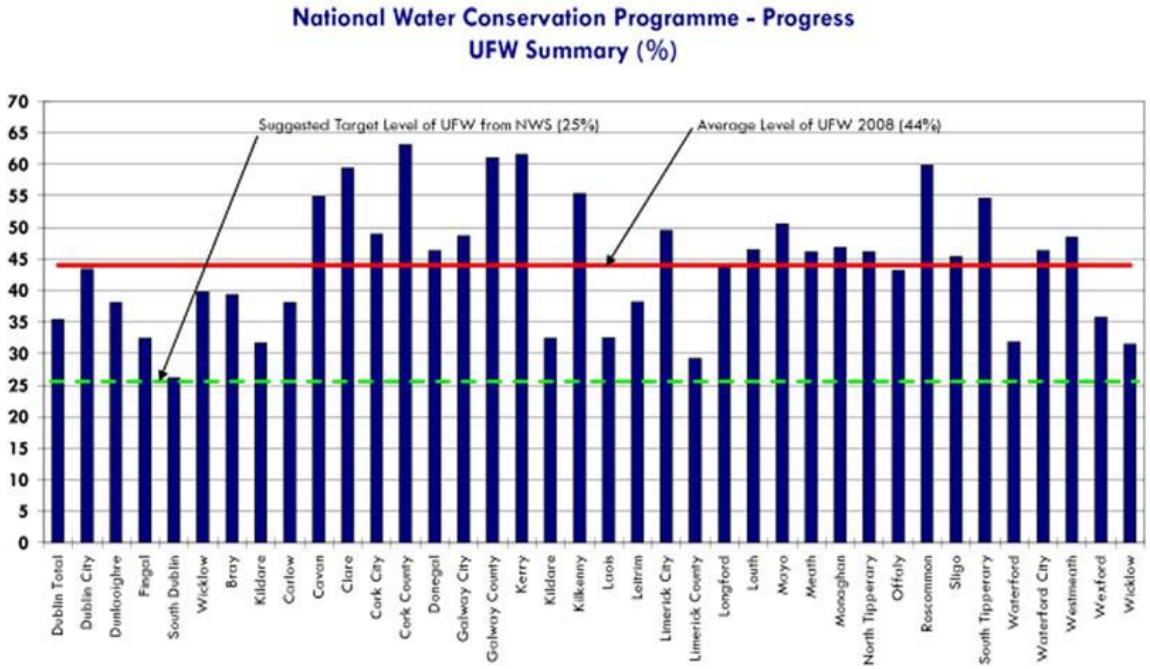
To minimise such conflicts, it is essential that all future County / City Development Plans in the Republic of Ireland, and Area Plans in Northern Ireland, incorporate the relevant land-use issues outlined in the RBMPs as they relate to their administrative boundaries. Planning policies must also take cognisance of related EU Directives, such as the Urban Waste Water Directive, Drinking Water Directive, Habitats Directive, and the Nitrates Directive. Emerging projects such as the North West SPACEial Project and the Irish Central Border Area Network's (ICBAN's) Spatial Planning Initiative will also play a role in gathering data on pre-defined parameters on a cross-border basis; thus potentially alleviating legislative difficulties (*Interview, Republic of Ireland*).

In addition, the implementing agencies – and funders – for the RBMPs and spatial planning policy, irrespective of the scale at which they operate or whether they span two jurisdictions, should collaborate with each other to address the on-going problem of 'Unaccounted For Water' (UFW). While the scale of this issue is well documented (Border Regional Authority, 2010), it took the harsh weather conditions of winter 2010/2011 to bring this 'hidden crisis' to the fore (see Figure 2.8). Water conservation is a critical dimension of any integrated water management strategy and will influence the demands put on valuable water resources and the costs of delivery. In fiscally difficult periods, policy makers and planners will have to evaluate the costs and benefits of targeting investment funds towards repairing existing water networks to address the substantive losses and water quality and the need for new networks if settlements are expanding.

In addition, there is a need for greater access to land-use mapping which in turn can be overlain with licensed discharges – such as IPCC licenses – and wastewater treatment plants. The technology exists to carry out such mapping yet many of these maps will not be made publically available because of commercial sensitivity surrounding Section 4 licenses (*Interview, Republic of Ireland*).

In terms of implementation, there is a clear lack of momentum at present (*Interview, Republic of Ireland*). There has been no mechanism established for stakeholder collaboration on a cross-border basis despite the central objective of RBMP that there should be a single joint plan for IRBDs. Informally, collaboration does occur at a practical level since many issues of interest to stakeholders have no geo-political restriction. For example, local catchment groups in Northern Ireland have an open door policy and are prepared to deal with any local issues which clearly have a cross-border dimension, including stakeholder membership from both jurisdictions.

Figure 2.8: Water Loss in Local Authorities in Ireland



(Source: WSTG & DoEHLG: Guidance Manual on Network Management and Leakage Control; Quoted in Border Regional Authority, 2010)

Integration between RBMPs and spatial plans is viewed as very important. To bring about enhanced opportunities for stakeholder engagement in water management – and to better 'connect the dots' linking water planning with spatial planning – there is a clear need to review the planning polices of both jurisdictions. Specifically, attention needs to be paid to the impact of such policies on cross-border areas and their relationship with the objectives of the WFD; the key issue here being the monitoring of the cumulative impact of pressures from a range of sectors and making decisions on this basis (*Interview, Republic of Ireland*). Without this,

separate and different planning policies will negatively impact the same river basin, and the core objectives of water management, such as improved quality, will not be met. Thus, the spatial dimension is very important to this integrated approach of planning and decision-making.

In the Republic of Ireland, the issuance of new guidance on the implementation structures for the RBMPs before the end of 2011 is expected to redress the current engagement vacuum that has existed since the abeyance of the River Advisory Councils. Realistically, it is only when this new forum is established that attention can turn towards the convening of a representative cross-border grouping. In the interim, however, agencies such as SWAN and Northern Ireland Environment Link can informally take on this role; ensuring that there is cross-border engagement on priority issues.

There are also emerging issues of key agencies involved in water management having overlapping function and not communicating effectively with each other. While the frequency and quality of communications between the EPA and NIEA cannot be faulted, there are other agencies in existence – some with a cross-border brief – that remain at the periphery of such collaboration. The Loughs Agency, for example, has a role to play in monitoring water quality and its published results are made available to interested agencies; yet there is no formal relationship with those agencies currently central to river basin management such as, for example, the EPA. Such 'breaks' in the governance system need to be plugged sooner rather than later – and given the ongoing review of governance, now is the time.

Chapter III: European Good Practice – Berlin-Brandenburg and the Elbe River Basin District

Since 1970s, the policy and practice of water resource management internationally has been influenced by ecological approaches. This ecosystem perspective grew out of environmental critiques of previous large-scale water management projects in the US and elsewhere, which had a strong development focus (Hooper, 2003). This environmental perspective has subsequently led to the concept and practice of Integrated Water Resource Management (IWRM). It has been defined by the Global Water Partnership[19] as:

> a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (Global Water Partnership, http://www.gwp.org/The-Challenge/What-is-IWRM/).

It is an approach to water resources management and planning which specifically encourages stakeholders to consider a wide range of social and environmental interconnections. In this context a catchment or river basin management approach has been widely adopted internationally. The European Union Water Framework Directive builds on existing international experience in IWRM and river basin management and seeks to translate these principles into the European policy context.

Approaches to IWRM vary significantly internationally, depending on a variety of policy, institutional, cultural and resource factors. The interrelationship between river basin management and spatial planning also varies significantly, in part depending on the extent to which spatial or land-use planning is institutionalised within policy systems and has the capacity to substantively influence patterns of development. Even within Europe, recent studies have shown that EU member states are responding in very different ways to the policy framework set out in the Water Framework Directive (Liefferink et al, 2011). A number of countries, including Denmark have adopted a centralized approach to policy formulation. France similarly is

[19] An international body founded in 1996 under the World Bank, United Nations Development Programme and the Swedish International Development Cooperation Agency.

characterized by a high level of central control, but complemented by relatively strong institutional structures at the river basin level. In Sweden, by contrast, the main actors in long-term water planning are 290 local authorities governed by elected politicians, although water authorities at river basin district level have been established in order to coordinate and oversee WFD implementation. (Hedelin and Lindh, 2008). What is common in all cases is that the WFD poses significant challenges to traditional ways of working and current institutional practices. It requires water resource managers and planners to reach out across sectoral boundaries. It requires dialogue and substantive interaction between environmental scientists, social scientists, professional planners, policymakers and a wide range of civil society stakeholders. Lastly, it requires policymakers and practitioners to work outside of administrative boundaries and to think in terms of river basins that cross administrative and political boundaries.

For the purposes of this study, two international case studies were selected: Berlin-Brandenburg and the Elbe International River Basin District in Germany and the Connecticut River Basin, Massachusetts in the USA. The European case study presents many insights of relevance to International River Basin Districts including the North Western International River Basin District, and WFD implementation on the island of Ireland. This is particularly the case in relation to the institutional and governance structures for implementation at the international and inter-state levels for the Elbe IRBD (as discussed in Section 3.2) and the experiences of coordination with spatial planning in Berlin and Brandenburg (as considered in Section 3.5). The US case study focuses on the important role that non-statutory cooperation among jurisdictions at various spatial scales in the strategic planning and governance of river basins. This case also highlights the importance of projects with both social and environmental objectives in fostering public support for river basin management

3.1 The Elbe International River Basin District

The Elbe International River Basin District covers approximately 148,000 square kilometres (see Figure 3.1) and has a population of 25 million. It encompasses parts of the territory of Germany (65.5% of area) and the Czech Republic (33.7%), and also crosses the borders of Poland (0.2%) and Austria (0.6%). The river basin includes the major cities of Berlin, Hamburg, and Prague as well as numerous smaller urban centres and extensive rural and protected areas.

The Cooperation in water and river basin management in the Elbe river basin offers insights to the institutional and governance structures at three levels:

- International: between Germany and neighbouring states
- National: among all federal states within Germany
- Inter-state: among neighbouring federal states within shared river basins.

Figure 3.1: The Elbe International River Basin District

(Source: ICPER Information Sheet, 2009)

Table 3.1 outlines the roles and responsibilities of the key agencies among these three levels of interaction.

3.1.1 Cooperation at the International Level

River commissions for the protection of international river basins have existed in Germany before WFD implementation. The **International Commission for the Protection of the Elbe River** (ICPER), was first established in 1990, following German reunification and the fall of the Iron Curtain.

Table 3.1: Institutional Framework of Water Framework Directive Implementation in the Elbe International River Basin District and the State of Brandenburg

Level	Key Actors	Actions and Responsibilities
International River Basin District	International Commission for the Protection of the Elbe River	Coordination and Preparation of International River Basin Management Plans, Ensuring cross border cooperation, Resolving conflicts of interest and information exchange and harmonisation issues
Inter-state coordination	Elbe River Community Council (FGG Elbe)	Resolving border issues, development of transboundary concepts and strategies, exchange of experience, data harmonisation
Federal	Federal Ministry of the Environment	Reporting to the European Commission, providing enabling framework legislation, Representing Germany on International Commissions
Federal States	Ministry for Environment, Health and Consumer Protection	Development of policy and legislation, participation in interstate and international fora
	State Environment Agency	Implementation of River Basin Management Plans – Drafting of waterbody development concepts and programmes of measures
Regional and Local	State Environment Agency, consultants, local authorities, stakeholders	Development of waterbody development concepts with stakeholder and public participation, hosting of and participation at regional information seminars

At the end of the 1980s, the Elbe was one of the most polluted rivers in Europe. Pollution from uncontrolled and, in part, untreated wastewater from agricultural, industrial and urban sources contributed to a significant deterioration in water quality over the previous decades to the extent that it was unsafe to drink water or eat fish from the river.

Germany and the Czech Republic are the principal partners while Austria and Poland and the European Union have observer status.[20]The objectives of the ICPER focus on the use of water in the river basin district for drinking water and agriculture, and achieving the 'most natural ecosystem possible'. Achievement of these objectives requires improvement in the physical, chemical and biological water quality status of the Elbe River and its tributaries (ICPER online: http://www.ikse-mkol.org). Since 1990, the river has improved significantly, and a number of fish species have returned (ICPER, 2010).

The effectiveness of the International Commission is viewed in terms of its 'international weight' (see Figure 3.2). Agreement is reached on critical and strategic issues of cross-border cooperation at annual conferences of the signatory powers. Decisions take the form of non-binding recommendations which may then be acted upon within each jurisdiction as appropriate. The Commission relies on voluntary cooperation and persuasion which has been shown to be effective in practice, particularly in relation to controlling pollution from specific point sources (*Interview, NGO*). The work of the ICPER is structured around three working groups:

(a) water quality (implementation of the EU Water Framework Directive);
(b) flood risk management (implementation of the EU Floods Directive); and
(c) responding to incidences of accidental water pollution.

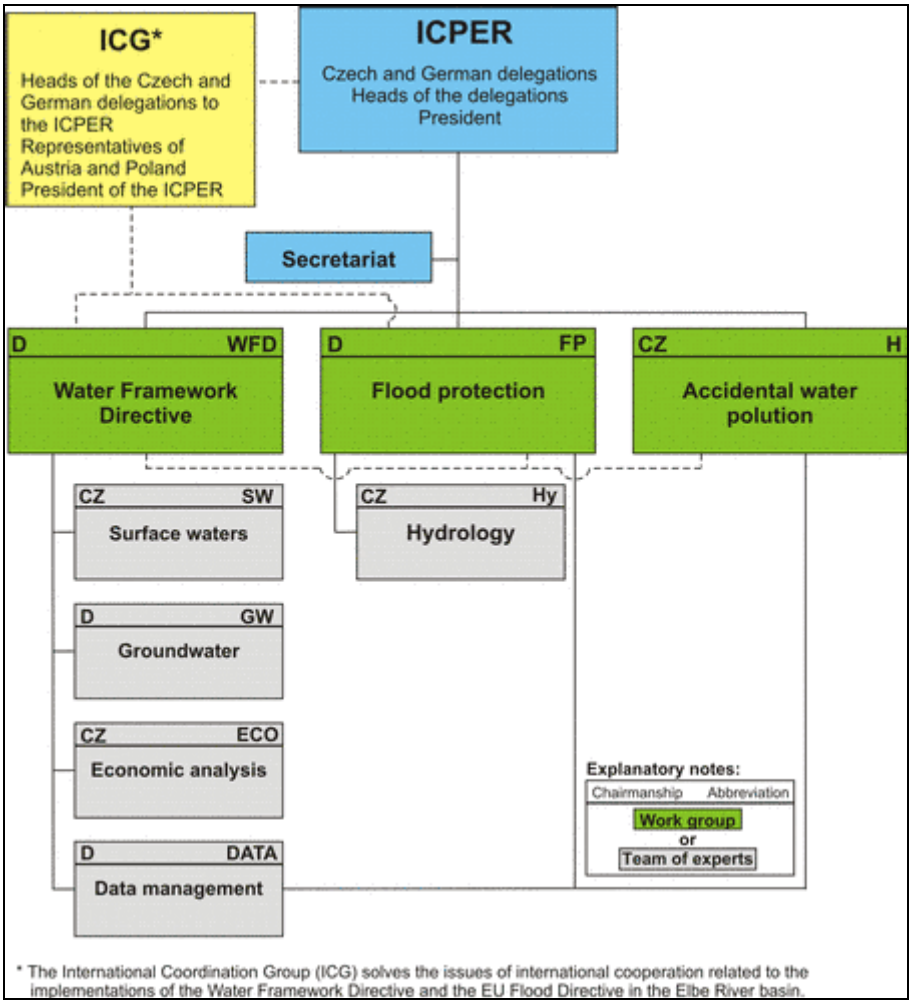
There is also a secretariat with eight staff members that provide expert, language and organisational advice to the Commission and its working groups.

The ICPER has established a significant institutional presence and status as an international body. The parties involved have invested significant resources of time and energy over a long period. Looking back on the first 20 years of the ICPER, the leaders of the German and Czech delegations note that regular contact between colleagues from the participating states has led to the development of mutual trust and understanding (ICPER, 2010). The Commission draws on a high level of expertise with teams of specialists working on planning, monitoring, and implementation issues. For example, the work of the WFD working group is supported by four expert groups focussed on surface waters, groundwater, economic analysis and data management. Recommendations of the ICPER are thus supported by a strong evidence base.

[20]The initial signatories were the German and Czechoslovakian Ministers for the Environment and the General Secretary of the EC Directorate General with responsibility for the environment.

In line with the public participation requirements of the WFD, the ICPER hosts annual seminars (under the title of the International Elbe Forum), aimed at members of the public and specific stakeholder groups. Annual seminars were held in 2007, 2008 and 2009. The open seminar in 2007 and 2009 attracted between 100 and 160 participants; while approximately 40 participants attended the seminars targeted at stakeholder groups (ICPER online: http://www.ikse-mkol.org/). Environmental NGOs participate in the working groups of the Commission as observers.

Figure 3.2: Organisational Structure of the International Commission for the Protection of the Elbe River (ICPER)



(Source: ICPER, 2009 – RBMP A)

One such NGO is the Grüne Liga (Green League), a network of local and regional environmental groups founded in 1990 following reunification. The Water Policy Office of the Grüne Liga is active at regional, national and international levels and participated in the drafting process of the WFD in the late 1990s (Grüne Liga onlne:http://www.grueneliga.de/). There is also participation from representatives of neighbouring International Commissions in each case; for example, the Rheine, Oder and Donau in the case of the Elbe.

3.1.2 The International Elbe River Basin Management Plan

Similar to the case for cross-border river basin planning across the island of Ireland, the International Elbe River Basin Management Plan consists of Part A dealing with the whole catchment area, with Part B dealing with in detail with the national parts of the Elbe catchment area. Part A, prepared under the auspices of the ICPER, was published in Czech and German in December 2009; it includes a detailed overview on all aspects of WFD implementation including characterisation, monitoring, environmental objectives, and economic analysis.

The National River Basin Management Plans and associated programmes of measures were also published in late 2009. The preparation of the German National River Basin Management Plan for the Elbe was coordinated by the Elbe River Basin Council (see Section 3.3) with significant participation from the principal water authorities of each of the ten federal states involved, as well as the federal level (FGG Elbe, 2009).

From the perspective of the International Commission, the publication of the International River Basin Management Plan is viewed as the start of the process of implementation of the WFD. The focus in the years ahead will be on preparation of the River Basin Management Plan for the period 2016-2021 (see Table 3.2). This will be supported by a review and update of key areas of research and analysis on a continuous basis. It is furthermore envisaged that climate change implications will also be afforded increased attention in future years. As more research on climate change adaptation is conducted, and specific results with relevance for water resource management emerge, the issue is likely to be integrated more fully with WFD concerns (interview with water planners, Brandenburg).

The Elbe International River Basin District is geographically divided into nine Coordination Areas, the boundaries of which are aligned to river catchments and thus cross both federal state

and international boundaries (Figure 3.3). Five of these areas are within Germany and in each case, one federal state is designated as the lead authority.

Table 3.2: Important dates for implementation of the Water Framework Directive in the Elbe IRBD: 2010-2015

Key Milestone	Delivery
By end 2012	Publication of timetable and work programme of the River Basin Management Plan for the period 2016 – 2021 for public consultation
By end 2013	Review and as necessary update environmental and economic analysis of the Elbe catchment area from 2004, including an inventory of emissions, discharges, and losses of all priority substances and other pollutants; publication of updated overview of the significant water management issues in the Elbe catchment area for public consultation
By end 2014	Publication of Draft River Basin Management Plan for the period 2016-2021 for public consultation
By end 2015	Publication of final River Basin Management Plan for the period 2016-2021

(Source: ICPER, 2009)

Figure 3.3: Coordination Areas in the Elbe International River Basin District

(Source: Berlin Senate Administration for Urban Development, 2004)

For example, Brandenburg is the lead authority for the Havel Coordination Area but is also a partner in the Mulde/Elbe/Schwarze Elste, and Middle Elbe/Elde Coordination Areas. The state of Bavaria in the Southeast is a partner in four international Coordination Areas led by the Czech Republic. The designation of one state as the lead authority with respect to Coordination Areas is broadly comparable with the current designation of lead local authorities in the case of River Basin Districts in the Republic of Ireland.

3.2 Cooperation at the Federal Level

Coordination in the implementation of the Water Framework Directive among the federal states in Germany is achieved through a number of specific structures. A 'Working Group on water issues of the Federal States and the Federal Government represented by the Federal Environment Ministry' (LAWA) was established as early as 1956 with the task of harmonising and co-ordinating the various approaches in policy and legislation concerning water management under the various water acts. This cooperation has brought about a convergence of water resource protection and management, while also disseminating procedures and guidelines across the federal states (Lindblom and Viehauser, 2007). This working group continues to play a central role in WFD implementation[21].

3.3 Cooperation at the Inter-State Level

At the level of River Basin Districts, specific structures are also in place governing interstate cooperation. In the case of the Elbe River Basin District, the work of the relevant ministries in the ten federal states, which are located within the IRBD, is coordinated through the Elbe River Basin Council (*Flussgebietsgemeinschaft Elbe* – FGG Elbe). The Council (see Figure 3.4) was established in 2004[22]with its offices located in Magdeburg, thus ensuring close cooperation with the ICPER which is also located in Magdeburg.

[21]This working group has also been directly involved in the development and roll-out of the Common Implementation Strategy (CIS) for Member States coordinated by the European Commission (European Commission, 2001).
[22]The Council's origins may be traced to the formation of the Working Council for Control of Pollution in the Elbe (ARGE Elbe) in May 1977. Until the 1990s, only Federal States located within the Federal Republic of Germany (i.e. West Germany) participated in the ARGE Elbe.

Figure 3.4: The Elbe International River Basin District within Germany managed by Elbe River Basin Council

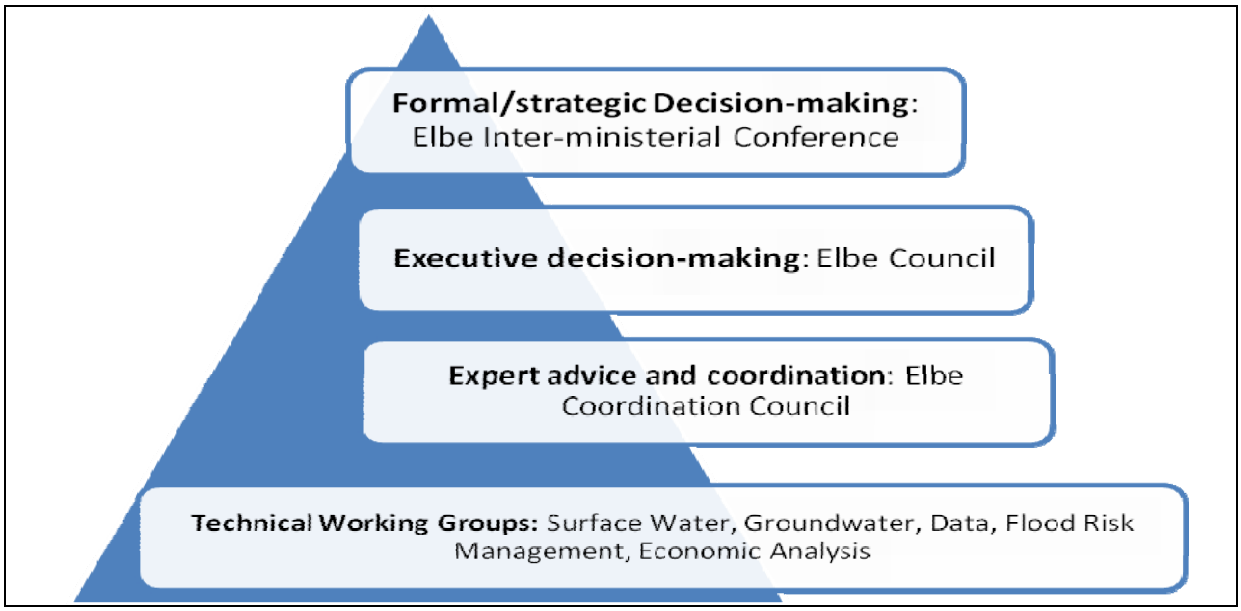
(Source: FGG Elbe, 2007)

The FGG Elbe has a three level structure:

- Formal decisions are made by the Elbe Ministerial Conference which consists of the Ministers (or Senators) with responsibility for water policy from each of the ten participating federal states associated with the Elbe River Basin;
- Executive decisions are taken at the level of the Elbe Council, a forum of senior civil servants from the water management sections of the relevant ministries; and
- A Coordination Council acts as a technical committee of experts which coordinates the work of specialist working groups.

Each participating federal state and the German Federal Ministry for the Environment are represented at all three levels (Figure 3.5).

Figure 3.5: Organisational Structure of the Elbe River Basin Council (FGG Elbe)



(*adapted from FGG Elbe: http://www.fgg-elbe.de/tl_fgg_neu/aufgaben.html*)

Current inter-state cooperation initiatives are focused on the development of strategies and work programmes aimed at making river systems more navigable for fish and other organisms. Management and control of nutrient levels is a second area of substantive cooperation. Despite the high level of coordination across state boundaries, problems have been identified in the areas crossing over jurisdictional boundaries due to differences in legal and policy systems and funding mechanisms. Data harmonisation is also a critical issue, particularly as different monitoring standards may be used in neighbouring states. Where problems are identified, they are usually tackled through specific sub-regional or local projects (*Interview, NGO*).

3.4 River Basin Management and Spatial Planning in Brandenburg and Berlin

Looking at river basin management coordination between two adjoining states, Brandenburg and Berlin, offers insights on how two adjoining jurisdictions within the same coordination area defined by common river catchments can cooperate.

The first joint water management plan at the inter-state level in Germany was for Brandenburg and Berlin. It was published in the mid-1990s. Discussions between water planners in both states began just weeks after the fall of the Berlin Wall in 1989 in the context of anticipated large-scale urban and suburban development post unification in the capital city-region [23].

The need to include flood risk appraisal in spatial plans was recognised following severe flooding of the Oder River in 1997. This led to the identification of areas of high flood risk in the statutory joint spatial plans for Berlin and Brandenburg in 2004 and subsequently 2009. The Joint Spatial Planning Department for Berlin and Brandenburg furthermore acted as lead partner in an INTERREG project on flood prevention and monitoring in the Oder catchment area (OderRegio online). Along with the WFD, other EU directives, including those on flooding and Strategic Environmental Assessment, are recognised as significant in terms of strengthening the environmental dimension of spatial plans. These joint initiates at the project level also can lead to practical integration of water protection measures through sector-specific programmes (Moss and von Haaren, 2009; von Haaren and Galler, 2011).

Climate change adaptation is an emerging area of policy in Berlin and Brandenburg. It is recognised that there are significant implications for water resource management and planning. Drier summer months are expected to lead to reduced water levels with implications for water quality and ecological status. A range of projects focus on 'landscape water budgets' where a similar range of measures may apply and specific WFD objectives may be accommodated. Water resource management projects currently involve direct consultation and negotiation with farmers, foresters and other landowners. A significant emphasis is placed on restoring the natural ecological functioning of river systems. Practical steps in this regard include removing obstacles, creating fish passes, introducing or augmenting vegetation and controlling pollution from agriculture and other sources.

Sub-regional scale implementation is structured through the preparation of waterbody development concepts (*Gewässerentwicklungskonzepte – GEKs)* which provide an assessment of current status and a programme of measures for individual waterbodies. A total of 161 hydrological areas have been identified in Brandenburg for the purposes of preparing GEKs.

[23] This growth did not occur as anticipated.

They aim to provide an integrated approach whereby the impact of WFD measures are considered from an integrated perspective in relation to existing flood risk management measures and the management of Natura 2000 sites. Stakeholder participation is also an integral element of the preparation of GEKs.

The River Panke

In the state of Berlin a pilot project in river basin management for the River Panke and its catchment represents a joint initiative between two Berlin Senate administrations responsible for the environment (including WFD implementation) and urban development respectively. The project provides an integrated ecological 'concept' or strategy drawing on both water management and landscape planning disciplinary traditions and expertise. There is significant emphasis placed on public participation including information seminars and an educational computer game for school children[24].

The river restoration approach adopted in the case of the Panke pilot project is widely accepted internationally as an essential complement to more traditional conservation and natural resource management measures (Wohl et al, 2005). The River Restoration Centre (see http://www.therrc.co.uk/index.php) is active in promoting this approach and providing technical advice in this area in the UK. The research report (Berlin SGUV, 2009b) provides details of the specific measures required for integration with spatial, landscape and land-use plans in order to achieve the objectives set out in the strategy. In the Berlin case, local land-use plans are the most significant, while spatial and landscape plans focus on strategic objectives.

The Lakes of Uckermark

A second good practice example of WFD implementation concerns the Lakes of Uckermark in Northeast Brandenburg (see Figure 3.6). River basin management measures have been introduced through a large-scale nature protection project (*Naturschtuzgrossprojekt Uckermaerkische Seen*) over the period 1996-2010. The project has been financed to the extent of €20.6 Million through the Federal Ministry for the Environment (75%), Brandenburg Environment Ministry (19%) and NGOs (6%) (Bender and Schäfer, 2009).

[24]The strategy document and a detailed research report were published in 2009 (Berlin Senatsverwaltung für Gesundheit, Umwelt, und Verbraucherschutz (SGUV), 2009a, b).

The project area lies in a hilly landscape with numerous glacial lakes and peat-lands that lies in a protected Nature Park. Eutrophication, deforestation and artificial drainage are among the problems impacting on the ecology of the park. Priority objectives of the project include a stabilisation of water levels and the improvement of water quality in order to enhance the ecological capacity of the lakes and river systems.

Figure 3.6: Lakes of Uckermark

(Source: Bender and Schäfer, 2009)

The project requires a significant level of negotiation with local agriculture and forestry landowners. Conflicts of interest arise in relation to the control of pollution and the management of competing land-uses and development objectives. Where floodplain restoration measures are introduced, areas of private property may also become flooded. Here, spatial planners have a role in relation to the management of competing land-uses. As such, the regional planning office is represented on the steering group of the project, and on the Board of Trustees for the Nature Park.

3.5 Lessons for River Basin Management on the Island of Ireland

At the scale of international river basin management, the Elbe River has advantages in that the **International Commission for the Protection of the Elbe River** was a well established and resourced cross-border organisation prior to the introduction of the Water Framework Directive. Protocols and good working relationships were already in place such as the annual conference

of the signatory powers where agreements are reached on critical issues of cross-border cooperation. The commission has a secretariat and is organised around three work groups (Water Framework, Flood Protection and Accidental Water Pollution) and supported by teams of experts. This structure provides both an organisational capacity to manage the cross-border activities in river basin management and an important technical capacity allowing recommendations of the ICPER to be supported by a strong evidence base. The commission and its staff have the capacity to continuously review and update the RBMPs and address longer-term issues such as adaptation to climate change.

Importantly, public outreach takes place through annual seminars and environmental NGOs participate in the working groups of the Commission as observers. There is also participation from representatives of neighbouring International Commissions in each case; for example, the Rheine, Oder and Donau in the case of the Elbe.

Within the federal structure of Germany, the **Working Group on Water Issues of the Federal States and the Federal Government** has helped to bring about a convergence of water resource protection and management activities, while also disseminating procedures and guidelines across the federal states. It is also important to note that water resource management is well financed.

The Elbe River Basin Council manages river basin activities across the ten German States within the Elbe River Basin and provides a three level structure that allows for agreement on key policies and the allocation of necessary resources among involved Ministers; coordination, implementation and oversight through senior officials and specialist working groups to consider important technical issues. The joined-up focus on developing navigable rivers for fish and other organisms and the management and control of nutrient levels are areas of substantive cooperation. Data harmonisation is also a critical issue. Many of the measures required to improve the ecological status of water bodies require specific programmes focused on environmental improvement in individual water bodies and river systems. It is through these specific sub-regional or local projects that many of the inter-jurisdictional issues are ironed out.

The cooperation between the two States of Brandenburg and Berlin provide examples of how the Water Framework Directive and river basin planning among two adjoining jurisdictions cab be integrated into environmental planning and indirectly into spatial planning. Currently there is

limited awareness on the part of many spatial planners of specific water management issues, and of implementation programmes currently underway in the context of River Basin Management Plans.

Clearly, the implementation of the WFD needs to be integrated with other aspects of river basin management. Good practice examples (such as the Panke project in Berlin and the Lakes of Uckermark in Brandenburg) illustrate how in meeting the objectives of improving water quality, the development of open spaces and the amenity value of the natural environment can come together at the ‘local level’.

There may also be lessons in how the strong tradition of landscape planning and landscape ecology in Germany can provide the basis for an integrated environmental planning practice that brings together a range of environmental considerations, including climate change mitigation and adaptation, biodiversity, flood risk and water quality in planning and development decision-making (von Haaren and Galler, 2011).

The development and implementation of Elbe river basin management plans at both the international and national levels underscores how the implementation of the WFD relies on consultative and negotiative governance with an emphasis on coordination and good working relationships across policy sectors, territorial boundaries and governance levels. Setting specific regulatory standards alone will not be sufficient.

Chapter IV: International Good Practice – The Connecticut River Basin, Massachusetts

Following the implementation of the Clean Water Act in 1972, the United States Environmental Protection Agency recognised that nonpoint source pollution was a significant contributor to water pollution in U.S. waterways. This led to the promulgation of watershed-based management policies in the early 1990s that for the first time forced public agencies to address environmental protection issues on the watershed scale. At the same time, citizens were becoming active in environmental movements and post-industrial cities were rediscovering and reclaiming urban waterfronts and seeking new development strategies to improve economic and social conditions for their residents. The convergence of these trends led to new partnerships to improve water quality and bolster economic development starting in the 1990s. The roughly ten-year lead time of U.S. implementation of watershed plans provides an opportunity to examine the challenges and strategies of drafting plans, integrating water quality and spatial plans, and taking action, particularly in inter-jurisdictional watersheds.

This case study examines watershed management of the Connecticut River (hereafter Conn. River), the longest river in New England which flows through four U.S. states. The Conn. River Valley is a largely agricultural and forested watershed with a few major cities and substantial suburban developments. Figure 4.1 helps to understand the linkages among Federal and State regulations, the Connecticut River Valley Events and corresponding organisations and activities to manage the river basin.

4.1 Spatial Development Patterns in the Pioneer Valley

The Connecticut River starts near the Canadian border and drains 29,000 square kilometers in four states: Vermont (VT), New Hampshire (NH), Massachusetts (MA) and Connecticut (CT). In MA, the CT River is known as the Pioneer Valley and traverses 106km, draining an area of 1,709km^2 (Figure 4.2).

Growing populations and industrial development in the first half of the 1900s generated increasing volumes of domestic and industrial wastewater that were discharged untreated into the river. In the 1960s, the *New York Times* famously dubbed it “the nation’s best landscaped sewer”.

Figure 4.1: Watershed Timeline

From 1970 to 2000, the population in Pioneer Valley grew by only 4.4 percent, while developed land increased by 49.3 percent, a peculiar form of “sprawl without population growth”. For example, from 1971 to 1999, Hampshire and Hampden Counties, which comprise roughly two-thirds of the Pioneer Valley, lost over 12,000 hectares of farmland and forests to development (Figure 4. 3 and 4.4)

Figure 4.3: Percent Change from 1970-2000

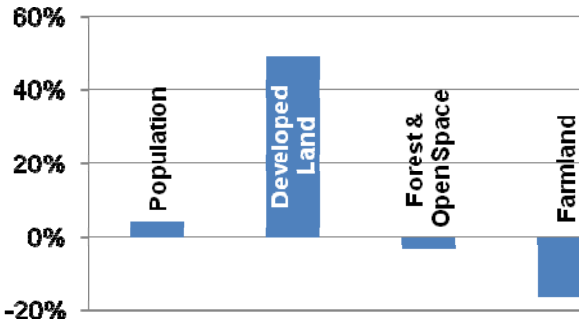
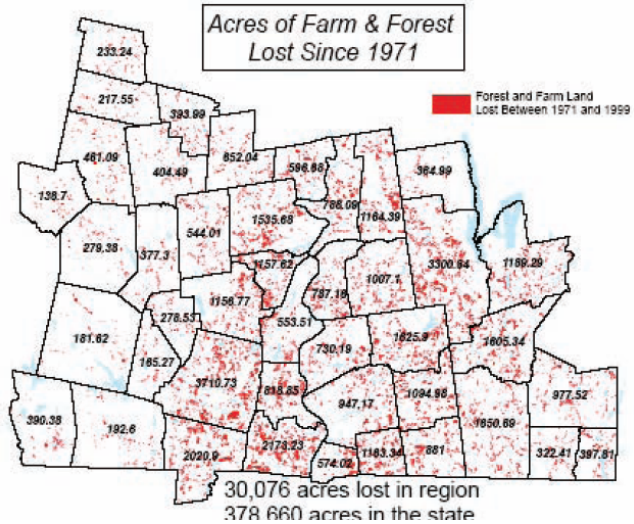
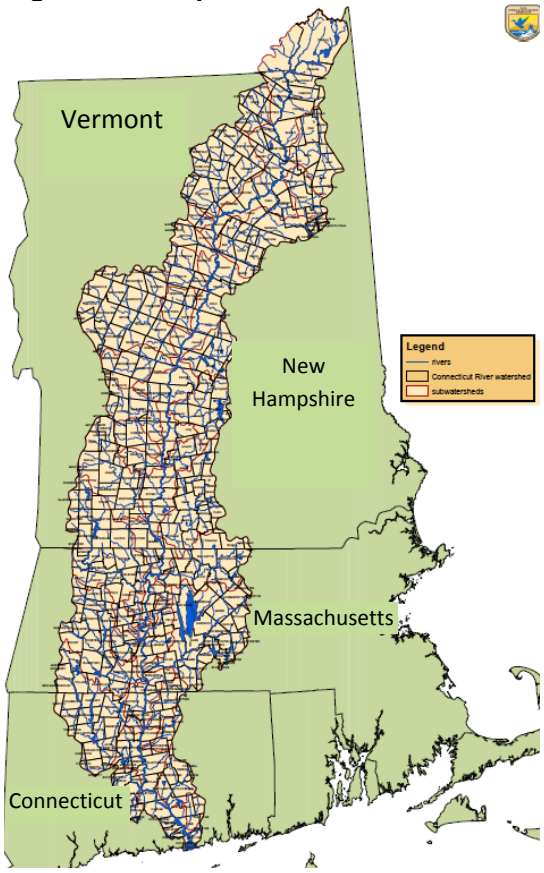


Figure 4.4: Farms and Forests Lost to Development 1971 to 1999 in Hampden and Hampshire Counties



(Source: PVPC Valley Vision 2, 2007)

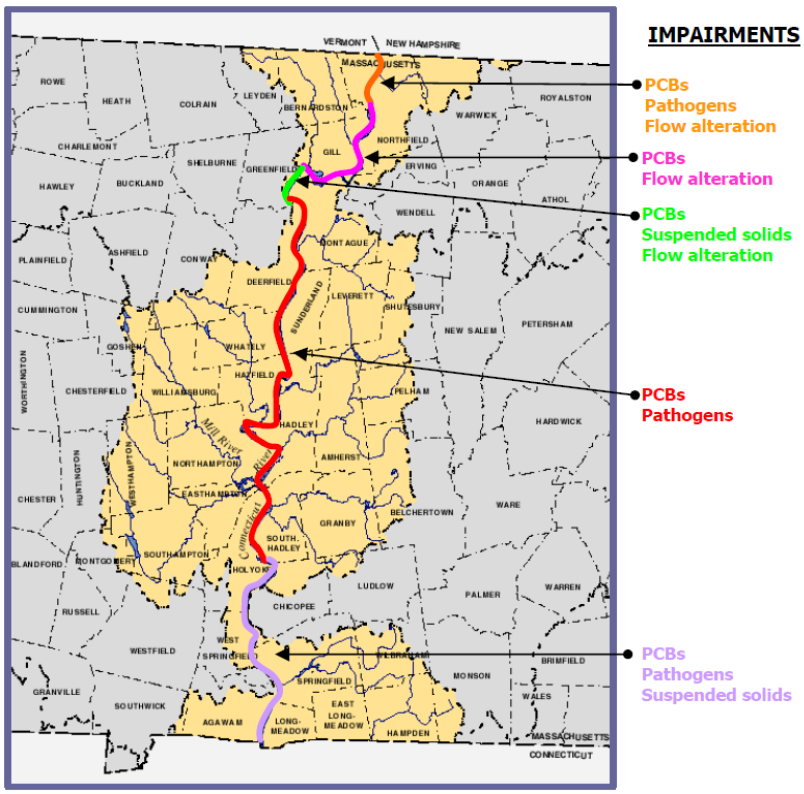
Figure 4.2: Map of CT River Watershed



Following the passage of the 1972 Clean Water Act, twenty-three Massachusetts municipalities discharging domestic wastewater into the Conn. River provided at least secondary wastewater treatment. By the mid-1980s, public agencies had spent US$333 million on cleanup and infrastructure improvements, and private companies in Hampshire and Hampden Counties spent US$22 million on building their own wastewater treatment facilities.

While these investments improved water quality, in 1995 the Mass. Dept of Environmental Protection determined that the entire length of the CT River in MA failed to achieve its designated Class B ("fishable and swimmable") water quality standards.

Figure 4.5: 2006 Impairments along Main Stem of CT River



(Source: Connecticut River Watershed Council, Volunteer Water Quality Monitoring Program Annual Report, 2008)

The river had particularly high priority organics such as PCBs, which ceased to be discharged as of the 1970s, but persisted in sediments and became concentrated in fish. South of the Holyoke Dam, the river had high levels of pathogens and suspended solids due to combined sewer overflows (CSOs, see Figure 4.5).

Additionally, 49% of lakes in the Pioneer Valley suffered from severe eutrophication. Relevant to downstream impacts, Massachusetts needed to document its nitrogen loading levels as part of a multi-state effort to reduce eutrophication in Long Island Sound.

4.2 Regional Models of Watershed Management in the Conn. River Valley

In 1987, the Clean Water Act passed by the US Congress required states to provide the Enviornmental Protection Agency (EPA) with plans to address non-point source pollution. Given that these pollution sources converge on a watershed scale without respect for political or

sectoral boundaries, the EPA began to advocate a watershed (or River Basin District) approach to water protection in 1991.

Broadly speaking, watershed management in the Connecticut River valley takes place on three levels: national/state, state/regional, and local.

National/State Regulatory Agencies

In the US Context, central government agencies such as the Environmental Protection Agency issue regulations either as funded or unfunded mandates that are implemented by each State. Federal regulations on water quality, and the limits on discharges permitted first by point and later by non-point sources are used by each state to develop their own regulations.

In certain cases, some Federal agencies play a strong role in fostering an inter-jurisdictional approach. For example, in the Conn. River valley, the National Park Service established "heritage corridors" that crossed four State boundaries and encouraged watershed planning and management across state boundaries.

State-backed Watershed Initiatives and Regional Commissions

Responding to federal requirements, states developed various frameworks to address watershed management. In the first example, the states of New Hampshire and Vermont, which share the Conn. River as their boundary, are both accountable for the discharge into the river. In 1987 and 1988 respectively, the State legislatures in New Hampshire and Vermont created state commissions for the management of the Conn. River. The governors in each state appointed 15 members to the respective state commissions, drawing on representatives of regional planning commissions, business groups, conservation organisations, riverfront landowners and citizens at large. These two volunteer commissions have met since 1989 as the Connecticut River Joint Commission (CRJC), which hired its first professional staff member in 1990. Though the Commission has no regulatory powers, it plays an important role in advocating for the watershed's ecological health, leading planning processes, and ensuring public involvement. For instance, it divided the Conn. River watershed spanning the two states into five sub-watersheds and created a committee for each watershed drawn from the elected town officials.

Under the direction of the joint commission, these sub-watershed committees provide advice about permit applications for projects that could affect the river, advise the joint commission, state and federal agencies on issues of local concern and prepare a river corridor management plan for the local segment of the river, and assist their towns and neighbours in adopting its recommendations. (http://www.crjc.org/localaction.htm). In 2009, the five local river subcommittees updated and expanded water resource plans for their five regions.

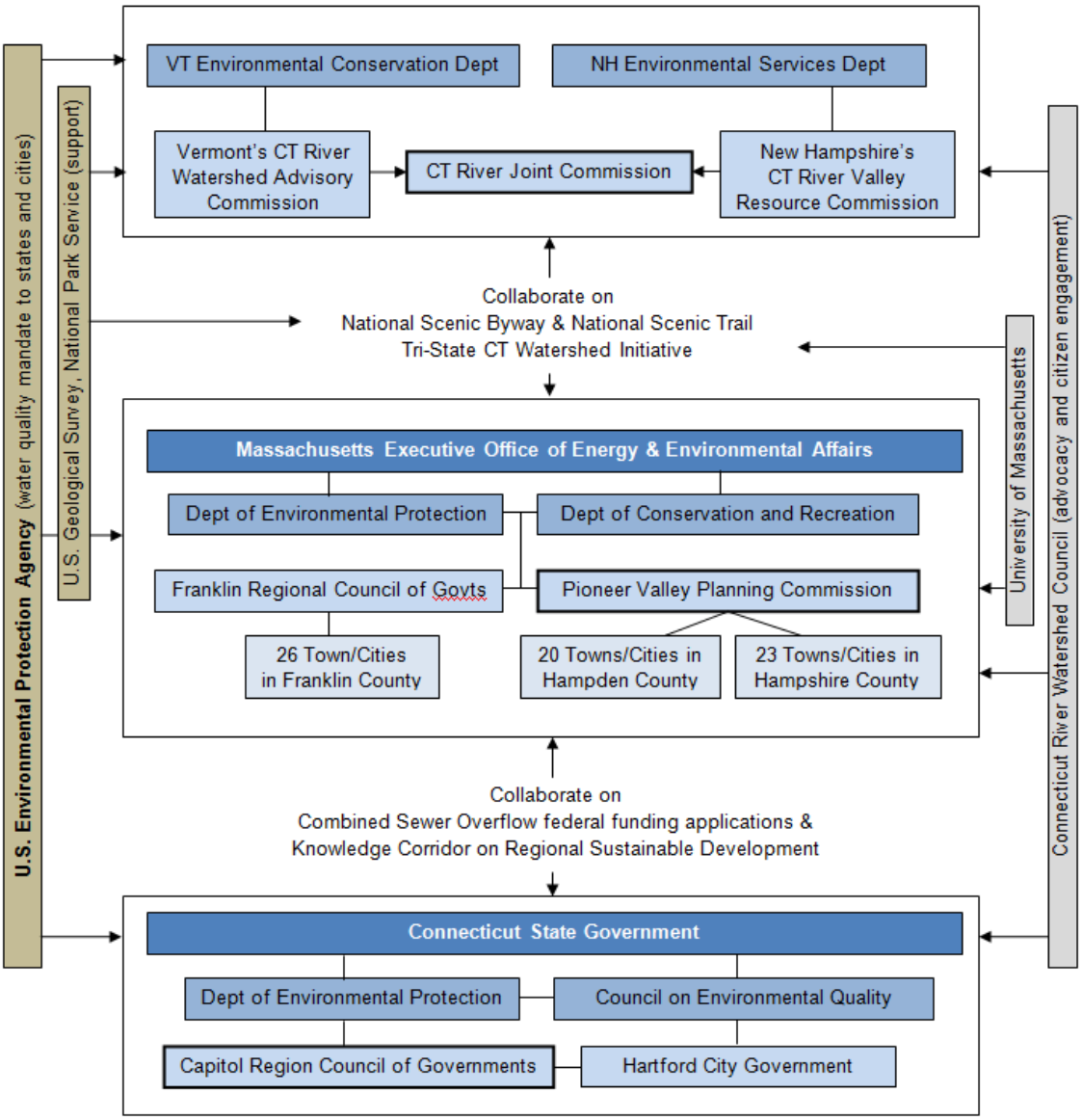
Unfortunately in 2010, due to loss of grant funding, the joint commission reduced its staff. While it is anticipated that their work will be partially be taken up by the various regional planning commissions, the commission will continue to play an important role in providing coordination and outreach at the watershed-scale.

In the second example, the Massachusetts Executive Office of Environmental Affairs (EOEA) led a coalition of local, state and federal government agencies, nonprofits and businesses to form the Massachusetts Watershed Initiative (MWI). In existence from 1993 to 2002, the objective was to create regional partnerships to improve the state's 27 watersheds. Under the programme watershed teams served as a forum to set goals, discuss, and make decisions within their respective watersheds. This provided a mechansim to bring together municipalities and local land-use and zoning officials, regional planning agencies, existing watershed associations and land trusts, businesses and chambers of commerce. Efforts were also made to engage community volunteers to gather information, note potential problems, take pictures and conduct visual monitoring to help to identify problems.

Under the MWI programme, the Pioneer Valley developed its own watershed team drawing on central government, state and local agencies, academic institutions and civic members. In 2001, the team issued MA's Connecticut River Strategic Plan (discussed in depth below). Said one former state participant of the watershed team, "That time was like Camelot. The roundtable discussions between all the different groups led to such great partnerships and cooperation".

During the period that MWI programme was in operation, the Department of Environmental Protection reorganised to work in watershed teams. In 2002, with a new administration in State government and a shift in priorities within the Department, the MWI programme and associated grant programmes ended. Without the support of the Department, the local watershed initiatives and plans were either picked up by other organisations or became inactive. In the Pioneer

Figure 4.6: Conn. River Basin—Linkages Among Inter-Jurisdictional Partners



Valley, the Pioneer Valley Planning Commission (PVPC) became the lead agency in the region, coordinating with other state agencies upstream and downstream, providing technical assistance and coordination among municipalities, and applying for every possible grant to implement the project piecemeal. As one PVPC senior planner noted, the watershed teams were very useful, although the program's short existence makes its impact difficult to evaluate. A third type of regional cooperation is represented by *ad hoc* partnerships among key regional players. In 1997, in the first partnership to engage all states, public officials in Conn. River Valley sought national designation of the river as an American Heritage River; the Connecticut

became one of 14 rivers to receive the designation. The application was submitted under the Connecticut River Watershed Council (CRWC), a nonprofit advocacy organisation dedicated to the entire length of the Conn. River. The initiative resulted in the national designation and the funding a watershed coordinator for five years. It was the first time agencies across the four states had collaborated on a river-wide project and established an important precedent for future partnership efforts. For example, in 2010, a consortium of regional stakeholders obtained a US$4.2 million federal grant to develop and implement a bi-state (Massachusetts and Connecticut) "Knowledge Corridor Regional Plan for Sustainable Develoment". The idea of the corridor first surfaced from the business community, which felt that it had to be collaborative in order to be competitive and effective; from there, it grew into a 40-organisation consortium.
The grant provides funding for numerous activities including: land-use and transportation planning, climate change and green infrastructure, work force development; funding for selected projects and monitoring for results.
In implementing these *ad hoc* partnerships both between counties and between states, the regional planning commissions have played a critical role.

- In Massachusetts, this was the Pioneer Valley Planning Commission (PVPC), established in 1962 to conduct regional planning for Hampshire and Hampden Counties' 43 cities and towns, and the Franklin Regional Council of Governments (FRCOG), which provides regional planning services for communities in Franklin County, the state's most rural county.
- In Connecticut, this role fell to the Capitol Region Council of Governments (CRCOG), which is the state's largest regional planning agency and serves the state's capitol, Hartford, and 29 surrounding counties.

Although these agencies have no regulatory authority they lead basin-wide planning, create platforms for partnerships, and assist municipalities in obtaining grants and federal loans and developing local land-use plans. This non-statutory regional collaboration means that effective planning commissions use consensus building approaches in their work with local governments.

Local Authorities

In the third tier, local authorities and their planning boards are responsible for implementing projects that achieve the goals of the watershed plans. This includes working directly with adjoining communities to acquire land for preservation or sharing information. Funding and

personnel constraints for some of these local authorities are an ongoing issue; for example, in Hampden and Hampshire counties, only 10 out of 43 municipalities have any planning staff. Providing these communities with technical assistance through a regional organisation such as the Pioneer Valley Planning Commission means that the necessary coordination, advisory and funding support is available to coordinate projects that contribute to improving the river basin.

4.3 Implementation Strategies in the Pioneer Valley

The Pioneer Valley Planning Commission continues to lead regional activities in implementing the 2001 Connecticut River Strategic Plan. [25] The plan identified five major programme areas:

- Improving water quality and quantity;
- Preserving streams and wildlife habitat;
- Managing land-use, growth trends and economic development;
- Planning public access, recreation and greenways; and
- Coordinating watershed management partnerships.

The approach in the Pioneer Valley is twofold: a targeted programme to address the legacy of combined sewer overflows; and an integrated development strategy that addresses infrastructure improvements and changes in land management practices. The 2001 plan introduces a host of programmes that include smart growth planning, preserving rural character and open space, assisting local boards to review zoning bylaws and stormwater requirements for developers, facilitating redevelopment in existing urban areas, and enhancing economic development in tourism and agriculture. Given the oversupply of zoned residential land, the plan encourages reuse and higher density development in existing urban areas as one way of reducing development pressures on farmland and forests.

Taken together, these strategies address long-term spatial growth management to improve environmental conditions that influence water quality. A challenge is how to measure the potential impacts of these broader strategies in eliminating nonpoint source pollution.

[25] The Pioneer Valley watershed includes the main stem of the Connecticut River in Franklin, Hampden and Hampshire Counties (see Figure 7); the four major sub-watersheds each have their own watershed plans.

4.3.1 Water Quality Management

Initiatives to improve water quality in the Pioneer Valley, some of which predate the establishment of watershed plans, can be grouped into three major categories:

- Voluntary cooperation to reduce combined sewer overflows
- Stormwater utility charges
- Supportive actions and measures.

Voluntary Cooperation to Reduce Combined Sewer Overflows

In 1993, the Connecticut River Cleanup Committee was established to address combined sewer overflows, a major pollution source. The committee included the Pioneer Valley Planning Commission and the Department of Public Works of seven municipalities that were under EPA orders to address their combined sewer overflows.

An innovative feature of this cooperation is the use of a Memorandum of Agreement signed by the city mayors and the director of PVPC. Non-voting members to the agreement include the the Mass. Executive Office of Enviornmental Afairs, the regional U.S. Environmental Protection Agency office, Hartford Metropolitan District Commission and Capital Region Council of Governments. While the MOA is not legally binding, it committed the parties to cooperate with each other and counterparts in other states in: lobbying for funding; adopting municipal policies to correct combined sewer overflows; collaborating on educational efforts; and agreeing on a priority list of mitigation projects. The MOA became an effective instrument for the Pioneer Valley Planning Commission, as a regional agency with no statutory authority, to secure cooperation and action on a consensus basis.

The committee was instrumental in securing federal and state funding that has reduced combined sewer overflows by half[26]. The remaining combined sewer overflows, however, are located in the largest three cities and require a level of investment which will be difficult to generate from federal sources given the current budget crisis. This initiative, using the memorandum of agreement, was later expanded to 60 towns to address stormwater drainage.

[26] By 2009, the 31 dry weather overflows had been entirely eliminated, and wet weather CSOs were reduced from 134 in 1988 to 67 in 2009.

Generating Fees – Stormwater utility charges

In 1998, Chicopee, a city of 54,650 residents, created a stormwater utility that charges property owners a fee based on their impervious surface coverage. For instance, parking lots that pay no sewer fees are charged a fee for generating stormwater runoff. In the past 25 years, the city's stormwater management has cost US$150 million, most of which has been funded through the stormwater utility[27]. Chicopee is the only city in the valley that does not consider funding to improve stormwater drainage to be a challenge. Other cities, for example, accumulate grant monies for as long as five years before they have enough funding to do one project. Despite the advantages of a separate stromwater utility, only two other municipalities are considering the approach, mostly due to a difficult economic environment in which to introduce new user charges[28].

Supportive Actions and Measures

In 2007,the states of VT, NH and MA together obtained a two-year grant from the EPA to improve water quality in the CT River. The grant, totaling US$1.34 million, including a 29% local match, funded ten projects on water quality monitoring with real-time data online, agricultural runoff control, riverbank erosion control, stormwater rebates for property owners installing onsite stormwater retention systems, innovative financing for contolling stormwater, smart growth tools to protect public water supplies, establishment of stormwater utilities, low impact development tools to control agricultural runoff, and public outreach. The Pioneer Valley Planning Commission led the project that brought together other key stakeholders and the University of Massachusetts Water Resources Research Center.

[27] In the beginning, the utility charged US$10 per quarter or US$40 per year; today it charges US$25 per quarter or US$100 per year on the sewer bill.

[28] The PVPC has published a guide for municipalities on how to create their own stormwater utility and also created an online toolkit for households to improve groundwater infiltration onsite.

4.3.2 Zoning and Local Land Use Plans

Since the early 2000s, efforts have been underway to implement various spatial proposals originally cited in CRISP and Valley Vision, the non-staturtory development strategy for the Pioneer Valley. From 2005 to 2007, the State of Massachusetts provided funding to the Pioneer Valley Planning Commission to provide assistance to municpalities to update their local land-use plans, implement zoning bylaws and develop strategies for smart growth. Similar initiatives were undertaken by the Franklin Regional Council of Governments. At the end of the programme, a total of 33 out of 43 communities had a new community development plan. This technical assistance provides an effective means to build consensus around smart growth and valley-wide initiatives.

Valley Vision 2, launched in 2007, establishes locations for low and high density growth, sites for brownfield redevelopment, areas that will become smart growth communities with state funding support, and protected open space corridors. The strategy also aims to strengthen riparian buffers, amend stormwater bylaws for developers, promote low-impact development, and establish zoning bylaws for floodplains, steep slopes and environmentally sensitive areas. The concept of providing assistance to each municipality continues through an 'online toolbox' about smart growth strategies. Importantly, the regional plan is supported by a Memorandum of Agreement endorsed by 40 out of 43 municipalities who have committed to implementing the regional plan.

4.3.3 National Status Designation and Protection

Since the late 1990s, various parts of the Connecticut River valley have become protected through national designations as refuges, scenic farm byways and scenic trails. These designations sometimes come with federal funding to support land purchases and authority to regulate land use; more often, these designations allow managing agencies to work with private and public land owners to voluntarily improve land management practices, work with conservation groups such as the Trust for Public Land and The Nature Conservancy to purchase and protect land, and to create opportunities for recreation and public education.

The largest protection designation is the 29,000km^2 Connecticut River watershed known as the Silvio B. Conte National Wildlife Refuge since 1997[29] (see Figure 4.7). The Fish and Wildlife

[29] The trail, established over half a century ago, was experiencing threatens from subsdivion development, pieces had been repeatedly relocated, with ever fewer options remaining tablished 553 such refuges throughout the country

Service has purchased important tracts of land for protection in the Conte National Wildlife Refuge, operates three cooperative visitor centers in the valley, and works with landowners to support habitat protection.

In 2009, the U.S. Congress recognised the Connecticut River Farm Byway, a state highway running alongside the CT River from Vermont and New Hampshire down to Massachusetts, as a National Scenic Farm Byway. The National Scenic Farm Byway Program recognises routes for their archaeological, cultural, historic, natural, recreational and/or scenic qualities and provides funding towards the preservation of valued byway characteristics. The designation also requires a corridor management plan to conserve existing resources and guide future development.

Figure 4.7: The Silvio B. Conte National Fish & Wildlife Refuge

(Source: U.S. Fish & Wildlife Service)

In 2009 Federal legislation established the 220 mile New England National Scenic Trail that is maintained by volunteers of the Connecticut Forest & Park Association and the Appalachian Mountain Club Berkshire Chapter. The orignial trail, established over half a century ago was experiencing threatens from subsdivion development. Although entirely voluntary and

discretionary, the trail's status provides some leverage in preserving the landuse and landscape along the CT River.

4.4 Lessons for Managing River Basins on the Island of Ireland

The strongest message from the Connecticut River case study in that regional partnerships and collaboration with civic society and non-government organisations are instrumental to managing river basins that lie within multiple jurisdictions. The other key message is that while directives and legislation are important in setting the regulatory parameters—individual river basins need champions who emerge or indeed drive these regional partnerships that bring together officials, politicians, civic society, recreational users, environmental organisations, the private sector and the private land owner. In the Connecticut River, regional planning commissions such as the Pioneer Valley Planning Commission served this role in Massachusetts and Connecticut, while in Vermont and New Hampshire it was an appointed, bi-state Joint Commission. The support and guidance of the Joint Commission in engaging civic and environmental leadership in developing watershed plans is notable in how the community was engaged in the process.

The Conn. River case shows that implementation is the most difficult challenge of river-basin management. In Massachusetts, the well intentioned and financed state-wide river-basin planning initiative led to new plans for the State's 27 watersheds. Due to funding cutbacks and shifting priorities, implementation and the task of identifying funding to implement river basin programmes fell to regional partnerships and organisations. Mainstreaming implementation of river basin measures into other regional initiatives, even if on an incremental basis due to funding constraints, helps to make the important linkages to other activities that impact the environmental quality of the watershed. In the case of the Connecticut River basin this included amending zoning and land use practices in local municipalities, updating regional spatial plans to promote more compact development and preservation of open space and seeking funding for specific projects such as eliminating the combined sewer overflows and improving riparian buffers. A good example of linked strategies Water quality, environment and land management) are the 2001 Connecticut River Strategic Plan and the two Valley Vision Plans from 1997 and 2007. The concept of an environmentally integrated river basis was further reinforced through existing or new designations such as the Silvio B. Conte Wildlife Refuge, American Heritage River the Connecticut River Farm Byway and the New England National Scenic Trail.

There is the pervasive question of ‘how to pay for watershed management?’ For the Connecticut River Basin, in spite of national and state mandates on water quality and watershed management, federal and state funding is inadequate and uncertain. This funding shortfall requires local stakeholders, in this case coordinated by the Pioneer Valley Planning Commission, to constantly package and lobby for multiple funding sources. A good example is the success in bringing together multiple local authorities to seek central government project funding to eliminate combined sewer overflows. Another example is the funding raised from central government to put in place supportive measures such as real-time monitoring of water quality.

Similar project cooperation in the Irish cross-border river basin context could be an effective way to raise funding from the respective central governments and the European Union. Generating alternative local revenue sources through user-fees such as the stormwater utilities, while not necessarily a transferable practice, does demonstrate the importance of local initiatives and an understanding of the often hidden costs of development – costs not always captured through traditional impact fees.

The Connecticut River basin case illustrated a number of practical approaches to implementing watershed plans that will be similar to the Irish context including: reducing point and non-point pollution, protecting riparian buffers, providing incentives for stormwater management, and improving agricultural and animal husbandry management. In implementing these projects, the Pioneer Valley Planning Commission has been innovative and forward thinking in its approach by understanding the key role that capacity building, technical assistance and voluntary cooperation can play among local governments who are taking individual decisions that collectively have a significant impact on their shared river basin. For example:

- **Capacity Building** – the commission offers manuals and/or on-line toolkits for local authorities and planning boards on model zoning bylaws, sub-division regulations, reducing impact and amount of impervious surfaces through new stormwater practices;
- **Technical Assistance –** particularly for rural communities that lack the resources for integrated planning, to develop local land use plans, strategies for smart growth initiatives, and open space protection; and

- **Voluntary Cooperation** – the use of Memorandums of Agreement was an effective method of bringing together local authorities and non-signatory partners to agree on joint actions.

In shaping an implementation strategy for cross-border river basins on the island of Ireland, these three elements of the Pioneer Valley Planning Commission's work should be strongly considered. For example, the use of the MOA and partnership agreements at project level could usefully be extended to regional activities.

Chapter V: Conclusions and Policy-Praxis Recommendations

To date, the RBMPs operate in parallel to the spatial planning systems of both jurisdictions on the island of Ireland. Yet, it is increasingly clear that they should, in fact, play a more integral part of these aforementioned systems. Supporting this contention, Kidd & Shaw argue that "...there is much to be gained by developing stronger links between spatial planning and IWRM [Integrated Water Resource Management] from both a conceptual perspective but also operationally" (2007: 315). Similarly, the OECD argues that Ireland must "further integrate water quality and flood risk management considerations into spatial planning and development management processes" (2010: 11). Unlike other mechanisms that can be used to both enhance and safeguard water quality, such as the installation of water treatment plants, spatial planning is "a low-cost option" (Carter, 2007: 339).

The case studies from Germany and the U.S. demonstrate the role for spatial planning in river basin management, but also that the interventions required are wider than mere land-use planning. As examples of international good practice, both case studies highlight the importance of coordination in river basin management not only with planning but agriculture, landscape assessment, ecological measures, and environmental management and conservation; expounding that it is not only planners that plan, act or think strategically. They demonstrate the important role of leadership both at a central and local level, of people working together both formally and informally, and the necessity of having the relevant resources and finances behind all this. They highlight the value of mechanisms such as Memorandums of Understanding (MOUs) in bringing different agencies together on a common theme – irrespective of their wider remit or operational scale.

The *Territorial Agenda of the European Union 2020*, agreed in May 2011, paves the way for new mechanisms to be utilised by agencies involved in the redress of new challenges such as environmental risks. While specific reference is made to the use of the European Groupings for Territorial Cooperation (EGTCs), this Agenda also makes possible the use of Memorandums of Agreement (MOAs) or Understanding (MOUs), Single Area Agreements (SAAs), and so on.

In this Chapter, some key findings from their analysis of the (inter)relationship between river basin management, territorial cooperation and spatial planning are put forward. The chapter

also draws out policy and practice recommendations for the institutional and policy environment (incl. operational aspects).

Across the island of Ireland, the protection of pristine environments is a key objective in the 'actioning' of RBMPs. It is these pristine waterways, such as headwaters, that are the most finely balanced ecosystems – and therefore the most fragile. Identifying and protecting waterbodies, currently classified as high quality, which may be particularly vulnerable to development pressures is a key priority. It is imperative that spatial plans and policies support the goal of achieving and maintaining good ecological status in all waterways and river basins.

The challenges involved in coordinating river basin management and spatial planning policy objectives are not only technical. They are also political. The WFD places emphasis on stakeholder involvement in processes of decision-making in implicit recognition of the fact that water resource management involves making decisions which effectively reshape the landscape in relation to future options and scenarios for development. The political implications of WFD implementation has recently come to the fore in the Republic of Ireland, where in the case of a number of Local Authorities, RBMPs were adopted by City/County Managers rather than elected representatives. This situation directly reflects a sense that councillors have been slow or reluctant to take ownership of the policy objectives in RBMPs.

A direct consequence of the different reporting arrangements involved is that the challenge of achieving policy alignment between river basin management and City/County Development Plans is accentuated. Public support will depend upon the benefits of integrated river basin management being demonstrated by an economic analysis which takes account of complementary social and environmental objectives, and good practice projects which achieve results that align with community needs and expectations. Interactive engagement with, and training of, elected representatives – and planners – may also be critical in ensuring that political decision-making takes into consideration all relevant factors in a balanced way.

At an operational level, the planning systems of both jurisdictions on the island of Ireland respond well to clear instruction. They struggle with the interpretation of opaque plans which lack clarity around the specifics of the actions needed. In this sense, it is imperative that direct links are established between concrete river basin management policy measures and spatial planning instruments and objectives.

Looking to the future, it is evident that environmental considerations will play an increasingly critical and decisive role in spatial planning. In particular, the pace of climate change, and the need for adaption, may bring new challenges, which may interact with water policy objectives in unexpected ways. In this sense integration between river basin management and spatial planning may be seen as part of a wider process of integrating spatial planning, urban development and environmental policy objectives.

5.1 Lessons from the International Case Studies

The two international river basin case studies share similar characteristics: they both encompass large rural areas with concentrations of urban settlements and both faced the challenges of cleaning up severely polluted rivers.

The case studies illustrate that good river basin management practices have moved towards engagement and negotiation rather than relying solely on compliance measures or regulatory enforcement. This approach creates the possibility of proactive management, through a convergence of interests seeking to protect and enhance the shared asset of the river basin. Engagement with a wide range of stakeholders is a key feature of the governance approach in both cases.

The cases also illustrate that while directives and regulations are set centrally, it is the sub-regional management of the river basin itself that is key to bringing together official and civic, and business and environmental, leadership in a meaningful way. This is especially the case when spatial planning decisions are made at the 'local level'[30].

The two cases also show that improving water quality will require a consistent approach to dealing with point and non-point sources of pollution. Systematic monitoring and integration of water quality measures into a broader environmental planning practice are shown to be critically important.

[30] Local authorities are envisaged to have significant planning responsibilities in Northern Ireland under the ongoing Review of Public Administration (see also ICLRD, 2010).

Key Lessons from the European Case Study

Distinction between policy and operational interactions:

In the case of the International Commission for the Protection of the Elbe River (ICPER) a strong distinction is made between policy and operational interactions. The ICPER meets formally on an annual basis with decisions taking the form of non-binding recommendations to be acted upon within each jurisdiction. The work of the ICPER is carried out through expert working groups in the areas of water quality, flood risk management, accidental water pollution and economic analysis. The Commission is also resourced with eight staff assigned to the secretariat. Critical areas of work requiring cross-border cooperation include data management and harmonisation, assessment of transboundary problem areas and reporting to the European Commission. Similar structures also apply at the level of inter-state cooperation within Germany; thus ensuring close coordination among the responsible authorities within each federal state, despite a high level of variation in operation structures.

As outlined in Chapter 2, there is a strong rationale for the North-South Technical Advisory Group and North-South WFD Coordination Group to continue to play a key role in ensuring cross-jurisdictional coordination at both strategic and operational levels throughout the implementation phase.

Policy recommendations are supported by a strong evidence base:

The recommendations of the ICPER are not binding on the participating member states. The effectiveness of this body thus in large part rests on its 'international weight'. The annual high-level meetings include senior civil servants (at the federal level in Germany) and representatives from the European Commission and also neighbouring River Basin Districts. A strong evidence basis and an objective, scientific approach to problem-solving and decision-making is fundamental in order to ensure that decisions take into account all relevant factors and are not driven by political factors. In the earlier years of the ICPER, significant resources were invested in understanding the institutional structures, legal context and indeed terminology of each participating country. More recently the focus has shifted to developing key issues of common concern, from flood risk to pollution control to the long-term implications of climate change.

It is imperative that cross-border cooperation in IRBDs on the Island of Ireland continue to be supported by a strong evidence base and objective, scientific analysis of critical problems and issues. This may require targeted research programmes supported by dedicated funding.

Strategic approach to stakeholder engagement:

During the preparation of the River Basin Management Plan for the Elbe River, annual seminars were held with the aim of generating public awareness and encouraging participation. A mixed approach was adopted, including both open and targeted seminars. These events addressed invited participants across a wide spectrum of private and civil society interest groups, were conducted at the national level, and focused on strategic issues. During the implementation phase local level stakeholder engagement is a key element in the development of targeted strategies and programmes of measures for individual water bodies (Waterbody Development Concepts).

Engagement with the general public and key stakeholders is critical to ensure public understanding of measures undertaken to safeguard water quality and achieve WFD objectives across the island of Ireland. The lessons learnt from experience with the River Basin Advisory Councils in the Republic of Ireland should feed into the design of engagement strategies for the implementation phase. Cross-border seminars focused on strategic issues for each IRBD should also be considered.

Coordination between river basin management and spatial plans at project level:

The River Panke and Lakes of Uckermark projects in Berlin and Brandenburg illustrate the extent to which projects with specific WFD objectives require an integrated approach. Coordination with other policy sectors and their responsible state agencies including agriculture, forestry and environmental policy is critical in order to ensure an adequate level of funding in the first instance and to ensure the success of the projects. The Panke River strategy draws on close cooperation with the urban planning departments of the Berlin Senate and local district authorities. In this case, planners brought specific landscape planning expertise to the table.

As River Basin Management Plans and associated Programmes of Measures are translated into practical projects with concrete objectives, opportunities for proactive collaboration and joint working with urban and environmental planners will emerge. Such projects will, however, have resource implications which should not be underestimated.

Key Lessons from the US Case Study

Non-statutory cooperation can work to promote river basin management at different levels:

Whereas, in the US context, the Federal and State Governments set water quality regulations, implementation and coordination occurs across State and local boundaries within the river basin district through joint commissions or regional planning agencies. These groups and NGOs become the champions for the watershed. Non-statutory cooperation is a key to inter-jurisdictional management; the Connecticut River Joint Commission (the States of Vermont and New Hampshire) and sub-regional groups such as the Pioneer Valley Planning Commission develop joint agreements and assist local authorities in implementation, based on the principle of subsidiary.

Non-statutory regional cooperation arrangements can act as local 'champions', providing local leadership and a catalyst for action, even where actual decision-making powers and resources for implementation are found at different levels of governance.

Targeted approaches are required, varying in response to changing land-uses along a river basin or valley:

Actions at local authority level in response to particular problems or pollution sources can benefit through joined-up approaches. These cooperation agreements can be formalised through Memoranda of Understanding (MOUs). Cooperation can also be very helpful in obtaining funding from external sources. Shared service agreements can also be used in order to provide for the sharing of expertise or joint commissioning of projects requiring external technical assistance.

There may be significant opportunities for local authorities and other responsible agencies to cooperate in direct response to particular problems. MOUs can provide an effective method to formalise this type of cooperation.

Projects which enhance amenity value as well as improving environmental quality are important for fostering public support:

River basin management and the public's perception of the benefits of environmental stewardship are reinforced through recreation and public access initiatives, such as the Silvio B Conte National Wildlife Refuge and the Connecticut River Farm Byway. River Basin Management Plans benefit from a wider range of activities and objectives. For example, in the case of the Conn. River: improving water quality, preserving habitat, managing land use, growth trends and economic development; encouraging public access and recreation opportunities; and coordinating water shed management partnerships.

There is significant scope for such initiatives in Ireland. In the case of the Northwest IRBD opportunities for collaboration and cooperation in the context of Glenveagh National Park should be explored with the National Parks and Wildlife Service.

5.2 Governance Arrangements for RBMP Implementation in the Republic of Ireland: Strategic Options

Institutional and governance arrangements for the achievement of the policy objectives set out in the RBMPs are currently the subject of discussion in the Republic of Ireland. As detailed in Chapter II, governance arrangements in place during the preparation phase were highly complex and in some critical respects, unsatisfactory. Whatever the specific institutional arrangements selected for the implementation phase, it is imperative that the approach to implementation takes due cognisance of the need for dedicated resources, the importance of an evidence-based approach, the necessity to ensure ongoing inter-jurisdictional cooperation and the strong rationale for integrating river basin management with strategic spatial planning functions at local, regional and national scales.

There are a number of strategic options in this regard. These 'strategic options' are outlined below, and are not listed in any particular order.

A. Establish the implementation of RBMPs as a function of regional government

Allocating responsibilities to Regional Authorities would establish a clear linkage between river basin management and strategic spatial planning. It would also allow for a significant concentration of resources and expertise at the regional scale and thus development of the required critical mass for effective action, which is not currently available at the level of local authorities. The spatial mismatch between the boundaries of Regions (NUTS III) and River Basin Districts would, however, require a high degree of close cooperation among Regional Authorities. Regional Authorities would also need to act in close cooperation with the water management and spatial planning sections of local authorities, as well as coordinating with sectoral agencies and stakeholders. Imposing an additional layer in an already cluttered and complex governance landscape brings inherent risks which would have to be carefully managed.

B. Centralise implementation responsibility under a new National Water Company/Agency

The current Fine Gael / Labour Programme for Government, includes proposals for the establishment of a National Water Company, provisionally known as 'Irish Water'-+. This is likely to be a semi-public agency that will sit alongside the Office of Public Works (OPW), EPA and others. This organisation could be established with a clear remit in relation to RBMP implementation from the outset. The recently published report on public sector capital investment indicates that a decision will be made in relation to the establishment of this agency by the end of 2011. It also refers to funding of 'priority schemes' in RBMPs under the Water Services Investment Programme (Department of Public Expenditure and Reform, 2011).

An advantage of this model may be a close linkage between river basin management and water treatment and supply policy which may have significant benefits in relation to cost recovery and sharing of resources. Such a model, may, however, favour more traditional 'hard' engineering approaches to water quality protection; approaches which the WFD seeks to move away from and are associated with inhibiting the development of integrated cross-sectoral approaches. In particular, a centralised, sector-specific approach of this nature, may make the establishment of links with spatial planning more difficult. This model would need to be accompanied by specific measures and additional

resources to ensure that that planning decisions are informed by river basin management and water quality concerns.

C. *Centralise implementation responsibility under the Environmental Protection Agency*

The Environmental Protection Agency (EPA) has significant technical expertise across the spectrum of ecosystem management, water quality protection and pollution control. The agency already plays a key role in the monitoring of water quality under the WFD. This model has the potential to lead to the development of innovative multi-disciplinary approaches to river basin management drawing on expertise, knowledge and data from across the environmental sciences. The disadvantages associated with a centralised model, outlined above, also apply in this case, however. Fostering stakeholder engagement and public support would require considerable additional resources and the development of skill-sets which are not currently well-developed in a technical organisation such as the EPA. The experience of water resource managers in Berlin-Brandenburg points to the challenges for technical organisations associated with a shift to the more participative form of governance which the WFD requires.

D. *Further develop and enhance the lead Local Authority model*

The preparation of RBMPs in the Republic of Ireland was led by local authorities with a lead local authority designated for each River Basin District. It is evident that local authorities currently do not have the requisite levels of resources required for implementation. With significant allocation of resources to lead local authorities, this model could, however, prove an effective means of coordinating and delivering implementation objectives. This model would involve limited reorganisation of existing institutional arrangements. The spatial mismatch issue would not arise, provided the lead authorities had the capacity to ensure cooperation from across the local authorities within the River Basin District. In Northern Ireland, the value of stakeholders was recognised from the outset; however, there is still work to be done in the Republic of Ireland to bring local stakeholders within the action programmes – for their value as environmental experts in their own right, and as leaders of community-based action and education projects.

Retaining responsibility for RBMP implementation within local authorities would provide opportunities for greater integration with the planning and development process than might otherwise be the case. This coordination objective would need to be supported with specific funding including enhanced capacity in the area of environmental planning.

It would also be possible to devolve implementation to individual local authorities. Again substantial investment of resources would be required in order for this model to perform effectively. Specific provision would also need to be made for coordination across local authority boundaries to ensure coherence at River Basin District level. In the medium to long-term, enhanced local autonomy may be instrumental to ensuring community acceptance and indeed ownership of local project-based measures which seek to integrate river basin management, and spatial development objectives.

5.3 Requirements for Effective Coordination between River Basin Management and Spatial Planning across the Island of Ireland

1. ***Development of expertise in environmental and landscape planning***
   The environmental dimension to planning is comparatively poorly developed across the island of Ireland. There is a need for a greater consideration of environmental issues and perspectives in spatial planning policy and practice. It is important to build on emerging approaches in this area in relation to green infrastructure, urban biodiversity, flood risk and Strategic Environmental Assessment (SEA).

2. ***Communication, learning and exchange across disciplinary and professional boundaries.***
   River basin management and water quality protection require a strong scientific evidence base. As a consequence, RBMPs produced to date are lengthy documents written in technical language, drawing on empirical data and scientific analysis. Effective implementation will require communication between scientists, engineers, and planners. The process of understanding, interpreting and translating the implications and recommendations of RBMPS into objectives for spatial policy should not be underestimated.

3. ***Development of effective integrated assessment methodologies and monitoring systems***

   Ultimately the scope for river basin management and water quality concerns to impact on planning and development decision-making will depend to a large degree on the strength and capability of assessment and monitoring systems. In particular, the ability to assess the cumulative impacts of multiple developments on water bodies and ecological systems is critical. Such an assessment must take into account the probable impacts from multiple sectoral sources including agriculture, forestry and housing development. Although a strong, multi-facetted evidence-base is required to support the operation of such a system, decisions must be taken on the basis of the *precautionary principle*. This implies that even where the scientific evidence is incomplete or inconclusive, decision-makers will need to draw conclusions from the best available evidence.

4. ***Inter-agency coordination and cross-jurisdictional cooperation***

   Effective coordination among responsible agencies is critical to the implementation of the RBMPs and the WFD on the island of Ireland. The WFD specifically requires an integrated approach that crosses sectoral and jurisdictional boundaries. The operationalisation of a river basin or catchment approach necessitates effective coordination among neighbouring jurisdictions and the development of harmonised or joint approaches across the border. Effective inter-agency coordination also requires an awareness among all actors of the roles played by all of the various agencies involved in the process of implementation. The example of the Loughs Agency suggests that the potential contribution of some agencies is currently under-utilised due to weak inter-agency coordination and leadership in this area. The Berlin-Brandenburg case study suggests that greater priority may need to be given to coordination and negotiation with key stakeholders in the agricultural and forestry sectors. Spatial planners, and planning strategies more broadly, have the potential to provide a framework for coordination across sectoral boundaries.

5. ***Strategic Leadership***

   Earlier sections of this report have highlighted the complexity of current institutional arrangements for RBMP governance, both North and South. The principal importance of leadership in developing proactive approaches to implementation is strongly evident. Effective and strategic leadership implies providing clarity in relation to institutional

arrangements, divisions of responsibility and resource allocation. It would seem that this currently only comes from central government in both jurisdictions – although this doesn't necessarily have to be the case (see previous section, 5.2). Strategic leadership also means ensuring that the lead authorities within each River Basin District are in a position to effectively negotiate with all stakeholders and deliver on key objectives.

6. ***Communication and engagement with elected representatives and other stakeholders***

   Coordination between river basin management and spatial planning must recognise that spatial planning is a political activity, as well as a technical disciple. Generating political and public acceptance for river basin management and water quality protection measures will be key to successful implementation. Recent difficulties in relation to the adoption of RBMPs by local authorities in the Republic of Ireland indicate the extent to which political support will need to be fostered and developed over time. International experience suggests that projects which serve to improve environmental quality and enhance amenity value may be particularly effective in generating public support – once the benefits and processes are understood and sufficient time is dedicated to the 'sale' of the programme.

7. ***Allocation of Resources***

   The effective implementation of RBMPs and compliance with the WFD requires significant investment and strategic allocation of resources. The water resource management sector in Ireland, both North and South, is currently fragmented and poorly developed in comparison to other countries. Investment is required to support the development and application of expertise and the roll-out of practical measures to preserve and enhance water quality and improve decision-making. The strategic allocation of resources is also critical in terms of providing certainty and support in relation to agreed policy objectives and programmes of measures, enhancing the capacity of lead authorities to demonstrate proactive leadership. Within this context, all potential cost recovery options need to be examined. The costs of non-coordination and the potentially significant cost savings derived through enhanced cross-sectoral, inter-agency and inter-jurisdictional collaboration need to be given due consideration.

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Appendix I: The International Centre for Local and Regional Development

A registered charity based in Armagh, Northern Ireland, the International Centre for Local and Regional Development (ICLRD) is a North-South-US partnership established in 2006 to explore and expand the contribution that planning and the development of physical, social and economic infrastructures can make to improve the lives of people on the island of Ireland and elsewhere. The partner institutions began working together in 2004 and currently include: the National Institute for Regional and Spatial Analysis (NIRSA) at the National University of Ireland, Maynooth; the School of the Built Environment at the University of Ulster; the Institute for International Urban Development in Cambridge, Massachusetts; and the Centre for Cross Border Studies in Armagh.

Each of these partners brings together complementary expertise and networks on both a North-South and East-West basis – creating a unique, all-island and international centre. The ICLRD continues to expand its collaboration with other institutions and has built up close working relationships with individual faculty and researchers from Harvard University, Queens University Belfast and Mary Immaculate College Limerick. It is also developing its international linkages, particularly with those organisations that have an interest in cross-border cooperation and collaboration; for example, Mission Opérationnelle Transfrontaliére (MOT) in France and Groundwork Northern Ireland.

What does the ICLRD do?

- Provides independent joined-up research and policy advice on cross-border and all-island spatial planning and local and regional development issues (economic development, transport, housing, the environment, service provision, etc.);
- Offers professional education and capacity building programmes for communities and local, regional and national government representatives and officials;
- Assists local governments / communities in translating policy into ‘on the ground’ action;
- Acts as a catalyst to bring relevant public and private actors, North and South, together to work on common goals;
- Promotes international cooperation and exchanges.

The ICLRD uses a variety of strategies to undertake this work, including engaging in action research with local governments, communities and central agencies; undertaking and publishing case study research to evaluate and develop good practice models; hosting conferences and workshops on key themes; and developing and delivering training modules for key stakeholders in the physical, social and economic development of the island of Ireland.

Why is this work important?

The ICLRD's work is important in relation to four key processes on the island of Ireland:

- Cross-jurisdictional commitment to spatial planning and infrastructure projects;
- Peace and reconciliation, and the regeneration of local communities in the Border area;
- Economic competitiveness and growth on the global stage;
- Multi-level governance and compliance with planning, economic and environmental directives from the European Union.

CroSPlaN

In cooperation with the Centre for Cross Border Studies, the ICLRD has started an exciting new programme to develop a cross-border planning network. This initiative has been made possible through funding from the EU's INTERREG IVA Programme; administered through the Special EU Programmes Body. Commencing in 2009 for three years, the new network (CroSPlaN) will undertake the following activities:

- Two action research projects per year that will enhance emerging cross-border activities and expertise in the vital area of spatial planning;
- One executive training programme per year for at least 20 central and local government officials, councillors and community leaders to assist them in both delivering and supporting these activities;
- An annual conference and technical workshop; the dual function of which is to facilitate networking and address identified areas of need.

Appendix II: EU Water Legislation and the UN Convention on the Protection and Use of Transboundary Watercourses

The 1992 UN Convention on the Protection and Use of Transboundary Watercourses and International Lakes[31] recognises the difficulties of protecting water bodies on a cross-boundary basis, and in response requires the adoption of prevention, control and reduction programmes for water pollution as well as monitoring systems. This was followed by a Protocol on Water and Health – as an addendum to the UN Convention – being agreed by an inter-ministerial conference in London in 1999 which linked human health, water resources and sustainable development together and targeted "the promotion, at all appropriate levels, of human health and well-being within a framework of sustainable development, including the protection of water ecosystems and through preventing, controlling and reducing water-related diseases" (quoted in Chave et al, 2006: 544).

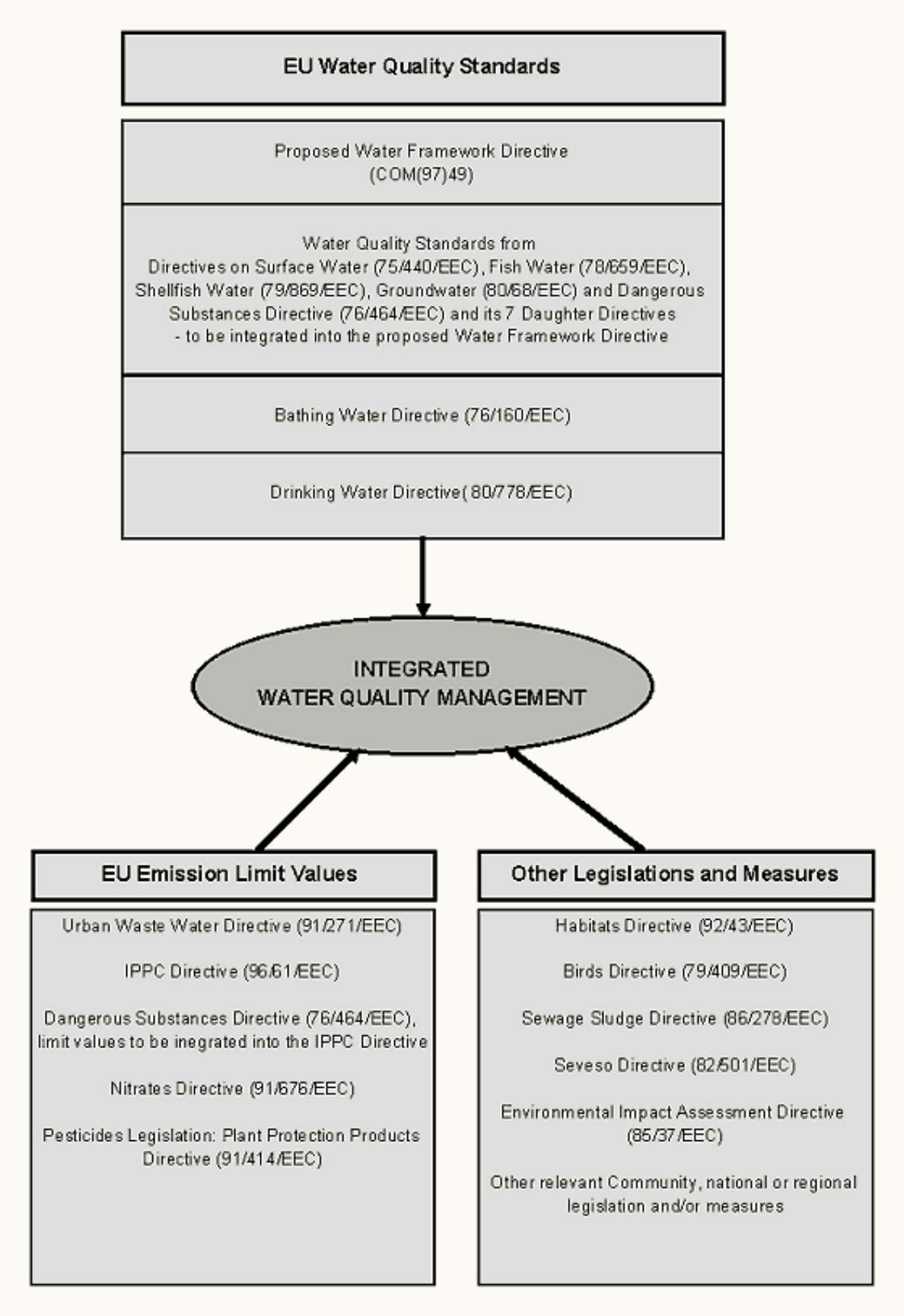
In 1995, the EU ratified the convention on the protection and use of transboundary watercourses and lakes which was agreed in 1992 (Council Decision, 95/308/EC). To date, over fifteen years later, neither the UK (including Northern Ireland) nor the Republic of Ireland have ratified this UN convention – although they both have recorded their support for it. Despite this, the adoption of the Amsterdam Treaty in the same year has committed EU member states to achieving the goal of sustainable development.

As noted, EU policy on water is based on the basic principles of ensuring a high level of protection, applying a precautionary principle, the prevention of – or where necessary the rectification of – pollution, the integration of environmental policies with other policies relating to agriculture, transport and energy, and the adoption of the polluter-pays principle (Chave et al, 2006). While the EU has a long history of involvement in water policy, the Water Framework Directive (WFD) is considered to be the most significant piece of water management legislation over the past forty years (Watson and Howe, 2006).

Whereas previous legislation would have focused on specific point and / or non-point source water quality issues, the WFD focuses on entire river systems and emphasises the sustainable use of water and their ecological restoration (see Figure 1). The WFD heralded the end of the EU's piece-meal approach to water management, and while it has fixed objectives, there is flexibility in terms of how member states achieve them.

[31] Signed in Helsinki in 1992.

Figure 1: EU Water Legislation, 1975 to 2000



(Source: http://ec.europa.eu/environment/archives/guide/part2d.htm)

Appendix III: 2001 Connecticut River Strategic Plan (Massachusetts)

Challenges & Goals	Strategies	Recommended Actions
Water Quality and Quantity		
Challenges: 1. Stormwater (SW) runoff from developed areas 2. Combined sewer overflows (CSOs) 3. Riverbank erosion and sedimentation Goals: 1. Improve water quality 2. Increase state and federal funding for water quality 3. Bring all segments up to Class B quality	1. Adopt a comprehensive CSO control program	• Seek Congressional action to continue and increase funding appropriations in the federal budget for CT River CSO cleanup • Encourage municipalities to apply for low-interest state revolving fund loans for CSO projects • Seek EPA support for Connecticut River CSO Cleanup Initiatives under American Heritage Rivers designation • Develop state enabling legislation for SW utilities to create significant new revenue stream to fund CSO clean up
	2. Develop a consistent water quality monitoring program	• Set up a multi-organization consortium to establish ongoing regional water quality sampling and monitoring program • Encourage DEP and volunteer monitors to establish a cooperative, ongoing river sampling program in the CT River and tributaries
	3. Reduce urban, suburban and rural nonpoint source pollution	• Implement improved street sweeping programs in every community to reduce pollutants in SW • Identify demonstration sites for innovative SW BMPs • Pass local SW ordinances/bylaws that require developments to comply with DEP SW standards • Reduce pollutants in agricultural runoff
	4. Reduce soil erosion and sedimentation	• Identify and map severe erosion sites in the watershed • Assist communities with the adoption of erosion and sediment control bylaws • Encourage streambank restoration projects
	5. Reduce toxins in fish tissue	• Undertake a program of PCB investigation and remediation • Increase public awareness of public health fish advisories by posting advisories in fishing and recreation areas
	6. Promote water conservation and efficient water supply in local communities	
	7. Protect watershed & aquifer recharge lands to prevent development & contamination	• Provide technical assistance to water suppliers in efforts to acquire watershed or aquifer recharge-lands • Minimize herbicide spraying along highways, utility corridors, and other right-of-way, especially within 100 feet of wetlands, rivers, and other surface waters

Challenges & Goals	Strategies	Recommended Actions
Preservation of Streams and Wildlife Habitat		
Challenges: 1. Loss of riparian buffer areas and wildlife habitat along streams 2. Introduction of non-native, invasive species to riverine areas 3. Pysical barriers block river connectivity Goals: 1. Increase public recognition & protection of important wildlife habitat 2. Identify & safeguard terrestrial & aquatic wildlife habitats 3. Preserve & restore vegetated riparian buffers	1. Encourage & support the establishment of Stream Teams on tributaries & mainstem	• Organize stream teams, where necessary, through outreach efforts, meetings, and training sessions
		• Support existing sub-watershed organizations by providing technical assistance.
	2. Ensure adequate fish passage in mainstem and subwatershed branches	• Advocate, through the hydroelectric relicensing process, for all facilities to operate on a “run of the river” basis • Continue to support the return of Atlantic Salmon to the Connecticut River • Support and work to ensure that both upstream and downstream fish passage is installed at non-licensed dams and or river obstructions
	3. Prevent the introduction/spread of non-native, invasive species, especially nuisance aquatic species	• Support agency and non-governmental organizations that are working to educate the public about the spread of exotics • When possible, prevent the spread of existing invasive species
	4. Reduce the impact of water withdrawals downstream of public reservoirs and withdrawal points	• Make modifications to the timing and rates of public water supply pumping to reduce impacts on stream flows and water levels • Establish ecologically-based streamflow requirements
	5. Restore vegetated riparian buffers	• Map priority areas for protection or restoration of vegetated riparian buffers • Preserve, protect, and improve vegetated riparian buffers
	6. Restore river connectivity	• Develop strategies for the removal of barriers to river connectivity • Upgrade driveway, road, highway, and railroad stream crossings to promote greater fish and wildlife passage
Land Use, Growth Trends and Economic Development		
Challenges: 1. Loss of farmland and forestland to development 2. Environmental impacts from poor development practices, such as SW runoff 3. Low density urban sprawl and its impacts on community character, open space and	1. Promote “Smart Growth” in the watershed	• Identify the Connecticut River as a model or pilot for a Smart Growth initiative • Promote compact growth in and around existing urban centres
	2. Preserve rural character of watershed by planning development based on understanding of town’s natural resources	• Create watershed-based open space plans • Work with towns to develop or update open space plans
	3. Improve SW management in watershed communities	• Assist community boards with the review and regulation of development to improve stormwater management • Minimize development impacts through better site design

water quality. Goals: 1. Encourage good development practices that do not adversely affect environment 2. Help communities protect open space (e.g. open space planning, zoning guidelines) 3. Complete Master Plans and revise zoning regulations	4. Identify and protect valuable open space in the watershed	• Secure federal TEA-21 Enhancement grants and state transportation bond funds to acquire farmland (APRs) to help preserve rural character • Encourage communities to adopt provisions of the Community Preservation Act
	5. Promote and facilitate brownfield redevelopment	• Create an inventory of brownfields in region that can be redeveloped • Develop a model for a regional brownfield industrial park
	6. Promote environmentally sustainable economic development, such as tourism and agriculture	• Seek designation of a National Heritage Corridor for the Connecticut River corridor • Promote agricultural tourism within the Connecticut River Scenic Farm Byway • Support increased funding for the APR program
	7. Identify a location and process for developing an "eco-industrial" park	
Public Access, Recreation and Greenways		
Challenges 1. Lack of connected greenways of protected open space and wildlife corridors 2. Lack of public access along the river 3. Over-use of sections of the river for recreation Goals 1. Create connected greenways & trails 2. Expand the purchase of development rights to protect farmland and open space 3. Clean up and improve the aesthetics of the riverbank	1. Continue and Support the Establishment of a Network of Greenway Corridors	• Develop a regional network of greenways along the Connecticut River and its tributaries
	2. Use the river as a tourism destination point and an agricultural economic development tool	• Support the completion of design and construction plans for the Connecticut River Walk and Bikeway and the development of the Franklin County Bikeway
	3. Enhance the visual aesthetic of the Connecticut River in urban areas	• Organize annual trash clean-up days
	4. Balance increased water related activities and interests with environmental concerns	• Identify and evaluate options to reduce the adverse impacts of over-use of the river • Work with the Public Access Board to develop additional public access sites, particularly for universal access
Coordination and Watershed Management Partnership		
	1. Integrate the five-year cycles, work and plans of the five major tributary basins – Farmington, Westfield, Deerfield, Millers, Chicopee – and the Connecticut River	
	2. Develop a River Corridor Management Plan with the 19 riverfront towns long the main stem of the CT River and the riverfront towns along the Farmington, Westfield, Deerfield, Millers and Chicopee Rivers	

Appendix IV: Interview Schedule

The Elbe International River Basin District

1. Bender, M. and T. Schaeffer. Grüne Liga, Water Policy Section (environmental NGO), 23rd February 2011, Berlin.
2. Dr. W. Dinkelberg, Joint Spatial Planning Department, Berlin-Brandenburg, 18th February 2011, Potsdam.
3. Dr. Dunkel and Dr. Schütte, Brandenburg Ministry for Health, Environment and Consumer Protection (Water Resource Management, Policy and Planning), 22nd February 2011, Potsdam.
4. Dr. T. Moss, Liebniz Institute for Spatial and Structural Planning, 21st February 2011, Berlin.
5. Henze, C. Regional Planning Council, Barnim-Uckermark, Brandenburg, 16th March 2011 (telephone interview).

The Connecticut River Basin

1. Albertson, Douglass. Town Planner, Belchertown. 9th March, 2011.
2. Cohen, Russ. Rivers Advocate, Massachusetts Department of Fish and Game. 18th March, 2011.
3. Curtis, Christopher. Chief Planner, Pioneer Valley Planning Commission. 27th January, 2011 and 17th February, 2011.
4. Feiden, Wayne. Director of Planning and Development, City of Northampton. 9th March, 2011.
5. Fuqua, William. General Superintendent, Holyoke Department of Public Works. 9th March, 2011.
6. Garrigan, Trish. Regional Coordinator, U.S. Environmental Protection Agency, Region 1. 21st March, 2011.
7. Kietner, Joseph. Environmental Compliance Supervisor, Chicopee Department of Public Works. 9th March, 2011.
8. Kulig, Stanley. Superintendent, Chicopee Department of Public Works. 9th March, 2011.
9. Mulligan, Adair. Former Conservation Director, Connecticut River Joint Commission. 18th March, 2011.

River Basin Management in the Republic of Ireland

1. Allen, Damien. Water Quality section, Department of Environment, Community & Local Government. 23rd March 2011.
2. Cussen, Niall. Spatial Planning Unit, Department of Environment, Community & Local Government. 6th April 2011.

3. Daly, Donal. Groundwater Section, Environmental Protection agency. 14th April 2011.
4. Green, Allanah. Planner, Donegal County Council. 10th March 2011.
5. McCartney, John. Director of Conservation and Protection, Loughs Agency. 11th April 2011.
6. McNally, Dr. Tony. Coordinator, North Western International River Basin District. 10th March 2011.
7. Maguire, Pádraig. RPG Implementation Officer, Border Regional Authority. 4th November 2010.
8. Murphy, Dr. Conor. ICARUS, NUI Maynooth. 14th March 2011.
9. O' Brien, Sinead. Project Coordinator, Sustainable Water Action Network (SWAN). 6th April & 15th April 2011.
10. Quinn, Eunan. Senior Planner, Donegal County Council. 10th March 2011.

River Basin Management in Northern Ireland

1. Christie, Dr. Sue. Director, Northern Ireland Environmental Link. 1 April 2011.
2. McMurray, Phillip. Water Policy Team, Department for Environment (NI) .18 March 2011.
3. Nelson, Gabriel. Head of Water Management Unit, Northern Ireland Environment Agency. 6 April 2011.
4. Raphael, Ian. Deputy Director, Regional Planning and Transportation Division, Department for Regional Planning (NI), 18 March 2011.
5. Thompson, Jim. Planning Manager, Strategic Planning Division, Planning and Local Government Group, Department of Environment (NI). 1 March 2011.

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