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UK-TAG-WFD21 Comparison of Draft River Basin Management Plans

Final Report – 27th March 2009

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ACTeon

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1 Introduction of the report's main objectives

The implementation of the Water Framework Directive has been an intensive on-going process since the Directive's adoption in 2000. The Common Implementation Strategy was established in recognition that an integrated approach to river basin management throughout Europe is crucial for the successful implementation of the Directive. In this process, a number of stakeholder and interest groups were involved, as well as the EU Member States (MS), to contribute to the development of common approaches and methodologies. In addition to these official activities, several bilateral activities continue to take place.

In this context, the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER[1]), on behalf of UK TAG, is co-ordinating a comparison of the draft River Basin Management plans (RBMPs) across the UK, the Republic of Ireland, the Netherlands and France. The draft RBMPs were published on the environment agencies' website on 22/12/08. The selected River basins are:

- Scotland RBD (Scotland, UK)
- South East RBD(England and Wales, UK)
- Neagh Bann International RBD(Republic of Ireland
- Delta Rhine National RBMP (the Netherlands and Germany)
- Seine – Normandie RBD(France)

The review of the draft river basin management plans will broadly compare them and will mainly focus on:

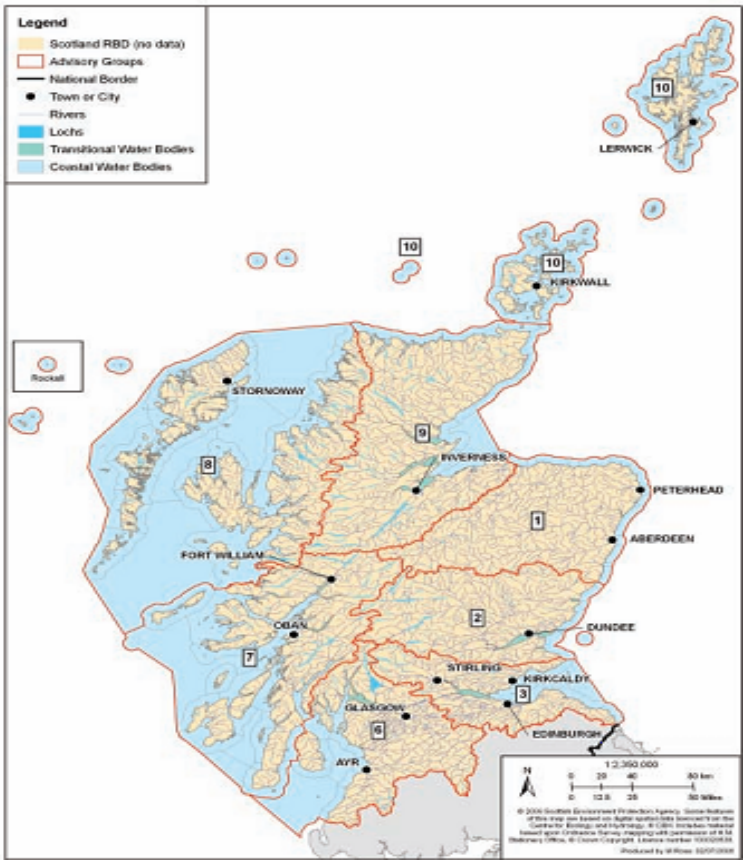
- Assessing the differences and similarities between the plans and the supporting background documentation and information;
- Comparing the structure of the plans;
- Comparing the key messages of the plans;
- Comparing how the plan is presented, the level of detail for a particular audience, accessibility and the possible understanding by all stakeholders; and
- Looking at specific areas:
    - Classification: comparing how classification results are presented;
    - Objectives: comparing how objectives are presented and understanding the proposed level of ambition;
    - Programme of measures (POMs): comparing how programmes of measures are presented. Specific attention will be given to measures proposed by Member States to tackle similar problems (are these measures different? And if yes, why?).

In this context, it is important to note that no specific attention is given to Article 9 WFD. Furthermore, the assessment is based only on the summaries provided in the plans. The various technical background papers which have been prepared in recent years and have been mobilised for developing the RBMPs have not been considered. This review also included the annexes to the RBMP summaries, but not the web based GIS maps provided in some cases.

[1] For further information on SNIFFER please visit our website at www.sniffer.org.uk

2 The six River Basins in a Nut shell - key facts

2.1 Scotland River Basin District



The Scotland National River Basin District (see Fig.1) covers around 113,920 km² of land and water. It contains extensive inland, coastal and ground waters. Around 4.8 million people live in the district, mostly in the central belt between Glasgow and Edinburgh. Water bodies in Scotland RBD are subject to less pressure than many other regions in the UK. The district's most significant environmental problems are concentrated around the larger population centres such as Glasgow and Edinburgh, but also in the productive agricultural areas along the east coast.

Figure 1: Scotland RBMP

2.2 South East River Basin District

The environment of the South East River Basin District (see Fig. 2) is very distinctive. The landscape in the south of England supports a wealth of wildlife, some of it within protected areas. More than 3.1 million people live here, and the major urban centres of Brighton and Hove, Southampton and Portsmouth draw visitors from around the world. The natural environment is essential to the livelihoods of the residents in the South East and helps attract businesses as well as visitors. Retail, health and business services are the largest employment sectors in the river basin district. Nearly two thirds of the land is used for farming, which employs over 25.000 people in vegetable growing, animal husbandry and other activities.

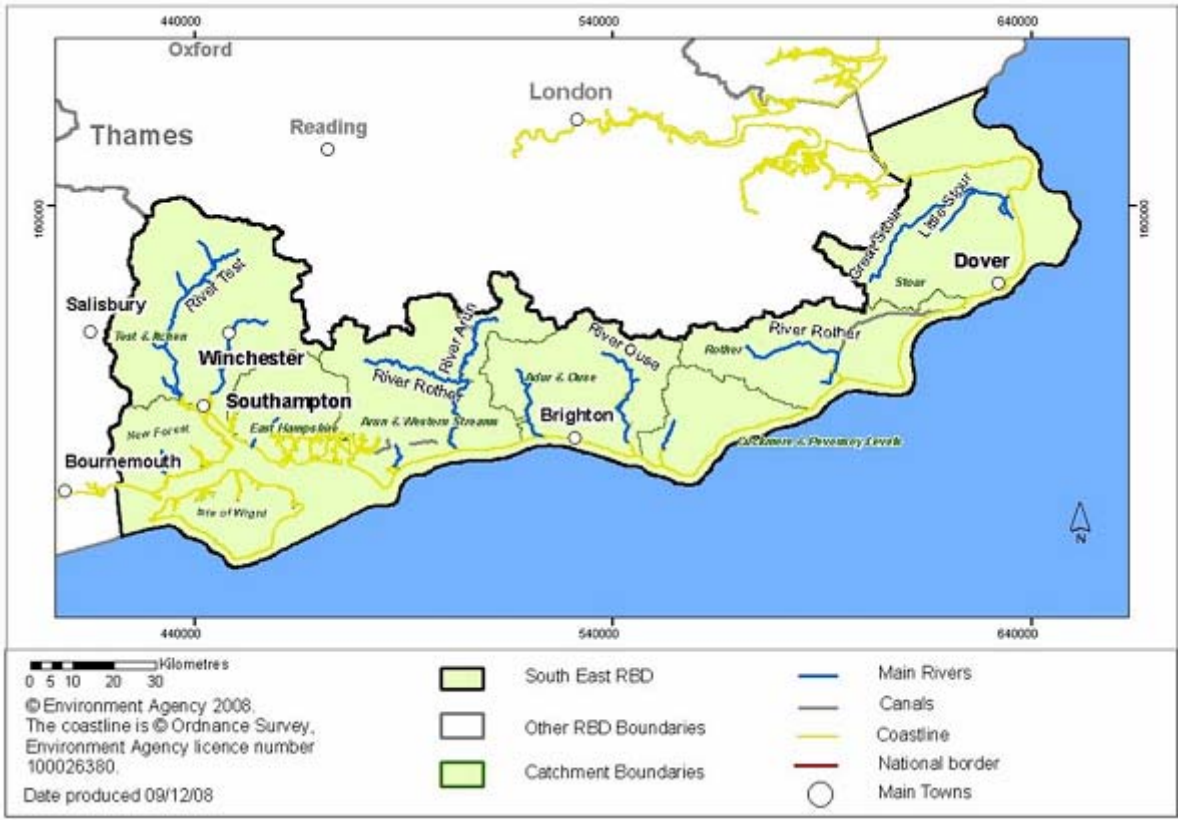
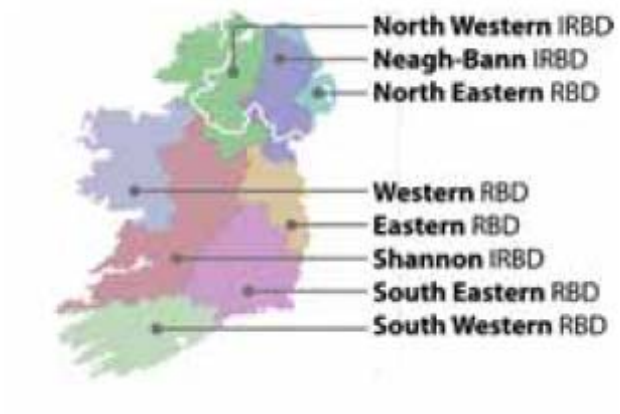


Figure 2: South East RBMP

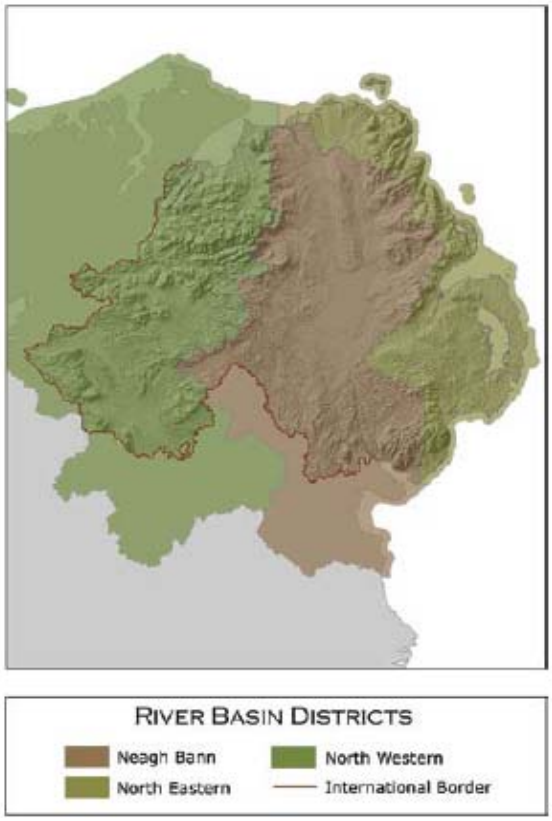
2.3 Neagh Bann International River Basin District



The Neagh Bann International River Basin District (see Fig. 3) is a transboundary basin between the Republic of Ireland and Northern Ireland. The international draft plan is issued by the Irish county councils of Monaghan, Cavan, Louth and Meath as well as councils in Northern Ireland. In the Republic of Ireland, the International River Basin District covers around 2,000 km². More than 0.5 million people live in the district, most of them in small villages or single dwellings.

Figure 3: Neagh Bann International RBMP

2.4 Neagh Bann River Basin District



The Neagh Bann River Basin District (see Fig. 4) is an international River Basin District mostly located in Northern Ireland; a smaller part also extends into Ireland. It covers an area of around 5,740 km². Agriculture, mostly grassland-based, is the main water user. The waters of the Neagh Bann area support fishing and boating, and the wetlands around Lough Neagh support a wide range of plants and animals. The district is divided into the Upper and the Lower Bann area. Lough Neagh is located in the centre of the area and, at almost 400 km², is the largest freshwater lake in the British Isles. Groundwater is found in nearly all of the bedrock in the district.

Figure 4: Neagh Bann National RBMP

2.5 Delta Rhine River Basin District

The international Rhine River Basin District (see Fig. 5) covers around 31,800 km². Around 90% of the district lies in the Netherlands and the remaining part is in Germany. The Rhine River Basin can be subdivided in four sub-areas in the Netherlands (Rhine-West, Rhine-North, Rhine-East and Rhine-Middle) and three parts in Germany; (Deltarhinezuflüsse, Vechte and Ijsselmeerzuflüsse). More than 11.5 million people live in the Dutch part of the district, with 60% of them in the sub-area Rhine-West. In contrast, around 0.7 million people live in the German portion of the Rhine River Basin.

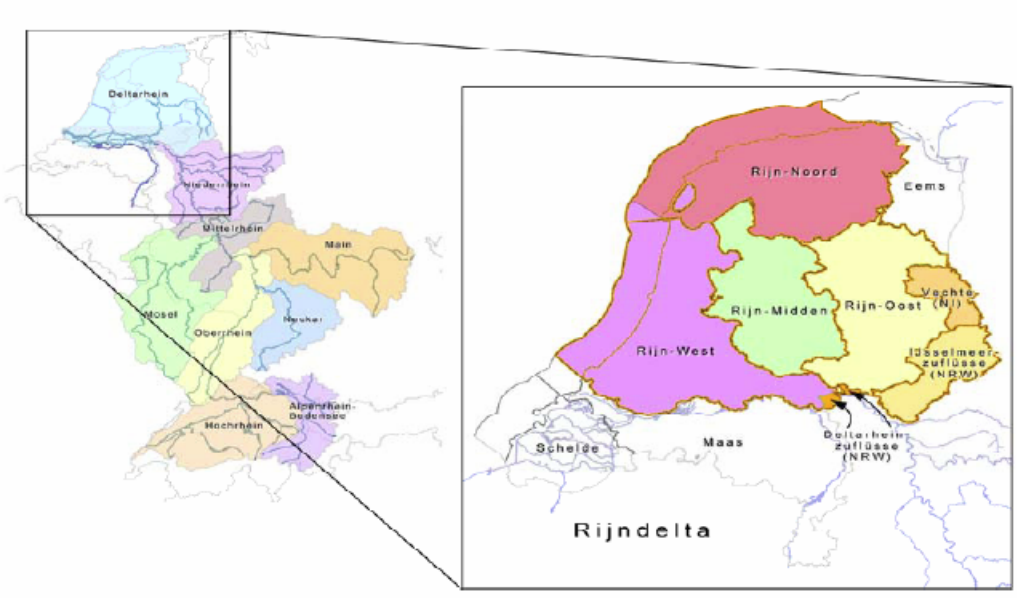


Figure 5: Delta Rhine National RBMP

2.6 Seine – Normandie River Basin

The Seine – Normandie River Basin (see Fig. 6) covers one-fifth of France. It includes 700 km of coastline and 70,000 km of rivers. The basin has 17.6 million inhabitants (30% of French population) including Paris. It is characterised by an important industrial sector (40% of the French industry) and an intensive agricultural sector (25% of France's agricultural diffuse pollution). In addition, 60% of the drinking water supply is withdrawn from groundwater bodies in this region. The basin has 4,800 drinking water pumping points (1.515 Millions of m3 / year) and 2,500 water treatment plants.

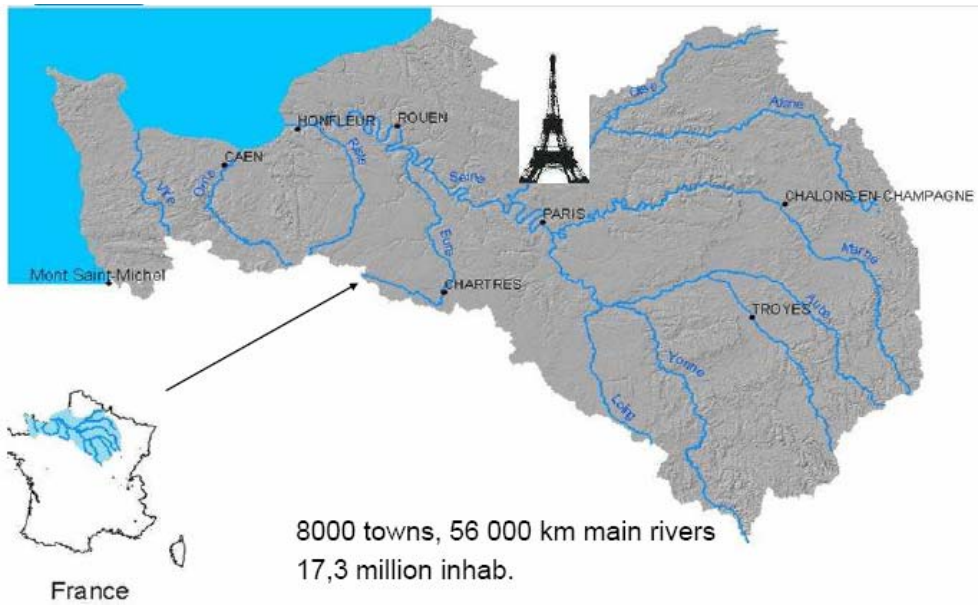


Figure 6: Seine-Normandie RBMP

2.7 Distance to the Target - current status of water

Under the WFD, all river catchments (rivers, streams, lakes and the land that drains into them) are assigned to administrative River Basin Districts (RBDs) by Member States. Within each RBD, "water bodies" must be identified as ground water or as distinct and significant elements of surface water (rivers, lakes, canals, estuaries and coastal waters). Protected Areas are defined as the water-dependent areas that are designated under other EU directives (such as the Habitats Directive 92/43/EEC and areas for drinking water abstraction). Member States must produce river basin management plans (RBMPs) for all RBDs in the EU by 2009 (WFD Articles 11 and 13), thus developing an integrative approach to managing water resources. The goal is for every water body to achieve a "good" status by 2027 at the latest. To identify the necessary level of action, Member States have to assess the "starting point for action". Table 1 gives an overview of the current status in each of the basins assessed.

Table 1 – Current status of the water bodies

Name of the RBMP	Water body	High	Good	Moderate	Poor or Bad	Not yet assessed
Scotland	SW	19%	39%	22%	14%	6%
	GW		75%		25%	
South - East	SW		10%	47,8%	13,6%	28,6%
	GW		33%		67%	
Neagh Bann International– Republic of Ireland	SW		18%	46%	25%	2%
	GW		96%		4%	
Neagh Bann– Northern Ireland	SW	23%		71%		6%
	GW		93%		7%	
Delta Rhine	SW		1%	45%	45%	9%
	GW	No information provided				
Seine-Normandie[2]	SW	29%		22%		49%
	GW			82%		

[2] The RBMP does not provide the current status of water bodies but the risk of not achieving the environmental objectives of the WFD.

2.8 Main drivers and pressures in the basins

The main pressures and impacts within each basin are listed in the tables below:

Table 2 – Main drivers for not achieving the good status in all water bodies

River Basin	Agriculture	Households	Industry	Electricity production	Navigation	Flood protection	Others
Scotland	x	x		x			Forestry, climate
South East	x	x	x		x	x	Climate, fishery
Neagh - Bann	x	x		x			Forestry, climate, solid waste
Delta Rhine	x	x			x	x	
Seine - Normandie	x	x	x	x	x	x	

Table 3 – Main pressures on the water bodies

River Basin	Point	Diffuse	Abstraction	Hymo	Artificial recharge	Saltwater intrusion	Others
Scotland	x	x	x	x			Alien species
South East	x	x	x	x			Alien species
Neagh - Bann	x	x	x	x			Alien species
Delta Rhine	x	x	x	x	x	x	Upstream inflow
Seine - Normandie	x	x	x	x			Microbiological (coastal)

Agriculture and households are the main sources of pollution in all of these case studies. In view of the different pressures; diffuse pollution, water abstraction and hydro-morphological changes represent significant issues that have to be addressed in the programmes of measures (POMs).

3 RBMP - Ways of presenting the issues

3.1 The main audience

The comparison of RBMPs illustrated the different audiences countries were attempting to target with their RBMPs. For example, while the general public and those organisations that will be involved in delivering the programmes of measures are the main target audience for the RBMPs prepared by the UK, Ireland and France, (exhibited by a simpler level of detailed information in the main text). The RBMP for the Rhine has a more technical focus, and contains a relatively complicated level of technical information. The presentation of the plans clearly reflects different histories in reporting. However it makes a comparable assessment difficult. It will be interesting to see how the European Commission will take potential target audiences into account in the compliance checking. Clearly, one cannot assume that the level of ambition of RBMPs written for the general public is less than more technically-focused RBMPs. Indeed, the former include several references to accompanying (technical) documents providing more detailed information. In addition, for the Neagh Bann and Scotland, interactive web based maps are available, presenting information about the status of individual water bodies. All plans provide the maps requested by Annex VII.

It should be noted, however, that our assessment has been based on the information provided in the main text of the plans and the corresponding annexes if they exist. Additional documents were not considered.

3.2 The plans in the wider context

A River Basin Management Plan is a far reaching plan that influences other planning activities and therefore should be linked to them. Further River Basin Management Plans are seen as an important instrument with enough flexibility to allow adaptation to climate change and climate change-related issues. In order to reflect these issues some plans provide additional chapters which are not part of Annex VII of the Directive:

- The issue of climate change is addressed in a specific chapter or annex in the plans of South East, Scotland and the Neagh- Bann. The other plans also refer to climate change but in a more general way.
- Links to other planning activities (e.g. Agricultural planning, land use planning) are provided in the Northern Irish part of the Neagh-Bann, Scotland, South-East Basin.

A description of these issues allows the uninformed reader to set the WFD in the wider context of environmental policy making and planning.

4 The issue of classification – a comparison

4.1 Water body delineation

Member States have to develop a methodology to properly identify and differentiate water bodies in order to assess the current status of these bodies of water. The first step for classification is to delineate the water bodies. Article 2 of the Directive provides the definitions for a surface or ground water body. However, these definitions do not include any specific methodology in delineating water bodies and MS are free to decide[3]. Table 4 compares the total number of water bodies among the assessed river basins.

Table 4 – Number of water bodies in the River Basin District

River Basin	Area	Number of water bodies SW	Number of water bodies GW	Average size SW	Average size GW
Scotland	113.920 km2	2.807	275	40,58 km2	414,25km2
South East	14.000 km2	405	30	34,57 km2	466,67 km2
Neagh -Bann	5.740 km2	264	14	21,74 km2	410 km2
Delta-Rhine	31.800 km 2	659	37	48,25 km2	859,46 km2
Seine-Normandie	100.000 km2	1.784	53	56,05 km2	1886,79 km2

From the table above, it is clear that the average size of the water bodies vary widely among the basins. The reason for such a variation can only be assumed, since a detailed description of how water bodies have been delineated is only provided in the Rhine plan. All of the other plans do not cover this issue in detail as it is not requested by Annex VII of the Directive. However, some detailed explanations could be beneficial to improve the overall understanding.

4.2 Defining the status - What approach has been taken?

Classification systems are needed to assess the state of the environment at any point in time. Such schemes demonstrate where the environment is of good quality and where it may require improvement. However, no exact methodology is presented by the Directive, and MS have to develop their own approaches on how to classify water bodies along the quality elements (QE) provided by the Directive.

[3] The CIS Guidance: "Identification of water bodies - Horizontal guidance document on the application of the term "water body" in the context of the Water Framework Directive dated 15 January 2003 provides some guidance on delineation. However there remains room for interpretation by MS.

For **surface water** the ecological status is determined by biological, physico-chemical, hydro-morphological and specific pollutants QE of status. The status is classified into five categories, from high to bad, and uses the one out all out principle. The chemical status refers to the most polluting substances (listed in Annex X and the Article 16 Daughter directive) and has only two classes, 'good' or 'failing to achieve good'.

The classification for **groundwater** uses two QE: "Groundwater quantitative" status, which assesses whether there is sufficient water to maintain the health of the ecosystems it feeds, and 'Groundwater chemical status', which assesses the chemical quality of the water against certain criteria.

Based on the Intercalibration exercise and the rules set out in the CIS Guidance document "overall approach to the Classification of Ecological Status and Ecological Potential"[4] Member States have to apply their own methods / tools when classifying a water body. An inherent problem is the variability in methods and outcomes. Based on a similar set of data, one Member State might classify a water body as good while another might classify it as moderate.

The level of detail on the subject of classification provided by the plans varies. The Rhine, Seine Normandie and Scotland provide a more detailed level of information than the others. In order to fully understand the work carried out over the last years, a detailed assessment of the monitoring system and related methodological documents would be required. However, by comparing the dRBMPs and the discussions at the workshop the following key similarities and differences have been identified:

- Classification is a complex exercise that requires a large amount of information. In some cases (see for example, the classification of coastal, transitional and HMWBs in France), it directly builds on expert knowledge. This makes it difficult to communicate the classification scheme to the general public.

- The time period the data uses to define the basic classification is different (Scotland, France and Netherlands 2007, South East and Ireland 2008). However, monitoring data is also used that is not always collected under the WFD, as the interpretation of the data takes more time than expected. However, all basins except France will try to update the data with more recent information from 2008. This can influence the classification of some particular water bodies. Furthermore, all dRBMPs still have some gaps in the status assessment; however, all of the cases intend to close these gaps before publishing the final plans by 2009.

- France will update the classification in between the WFD cycles. Every three years they will produce a document that is approximately 40 pages long, which will include more detailed information about the classification of the water bodies. For England and Wales the EA will update the classification of the water bodies every year, but until now is not fixed if the result will be published or made available on the web site. Also Scotland will update the classification of the water bodies, but the result of analysis will not be part of the plan.

[4] See http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/classification_ecologica/_EN_1.0_&a=d

- The implementation of the WFD has changed the classification systems in many cases in Europe and status of several water bodies has decreased due to this change without changes in water quality as more parameters, e.g. morphology and flow are being assessed. However all RB except France are applying the five classes regime provided by the WFD. France has used for the characterisation of the current status 6 classes: very bad, bad, moderate, good, very good, no data to characterise each one of the QE. All this data are thus converted in a risk of no reaching the good status in 4 classes: High risk, moderate, doubt, no risk including an identification of the main limiting parameters. France will convert this system to the WFD system when the final plan is made (the results will be presented to the Basin committee in July 2009).

- To classify ecological status/potential, the WFD stipulates that the lower values of the biological and physico-chemical monitoring results for the relevant quality elements should be used (Annex V, 1.4.2. (i)). In other words, a water body might pass 'good status' for chemical and physico-chemical assessments, but be classed as 'moderate status' for the biological assessment. In this case, it would be classified overall as having a 'moderate' ecological status. This "one out all out" approach is applied in all RB; however, some differences still exist. *In Scotland, for example, a failure in a physico-chemical QE standard corresponding to the good/moderate boundary will result in a water body being classified as moderate ecological status even if the biological quality elements are good or better. This is in line with the Common Implementation Strategy guidance. In Scotland and the rest of the UK, environmental standards corresponding to the moderate/poor and poor/bad boundaries have also been established for a number of chemical and physicochemical quality elements. These are used in controlling pressures on the water environment (e.g. in order to prevent deterioration of status). In the case of the Rhine basin the situation is presented less clear* and it seem that there the "one out all out" approach is applied more strictly (if one QE is out, all are out).

- Even if all of the details on the process of classification are not provided in every plan, it can be assumed that the classification is different to the extent to which some parameters of the QE are considered. This refers in particular to biological parameters (phytoplankton, fish) and morphological issues. In the cases of England, Wales and the Neagh –Bann RB hydromorphology was used to determine high status but it remains unclear if morphology was used to classify the other status categories. In the case of the Delta Rhine, the different importance hydro-morphology plays in Germany and the Netherlands is openly discussed and explained. In the Netherlands morphology plays a more fundamental role than in Germany. Different efforts in the creation of the nationally developed classification systems can be seen as the main reason for these variations. During the workshop it was agreed that taking into account morphological issues even under high uncertainties would support the precautionary principle.

- Classification is an issue often related to high uncertainty requiring further research and better monitoring data to achieve a more comprehensive picture. There is no doubt that the current classification might change in the future if more knowledge becomes available.

- Information about the level of confidence in the assessment is not provided in any of the plans, except South East which provides this information in a specific annex. The basins located France, Scotland, Ireland and Northern Ireland mention confidence as an issue. Detailed figures are only provided in a few cases (e.g. for landfills, quarries, mines, contaminated lands and urban areas risk assessment and status results in the South Eastern District). From the discussion at the workshop it became clear that there were differences in addressing confidence. The United Kingdom applies confidence levels to each QE, while France applies confidence to the ecological status of the water bodies in total.

- The classification of lakes, coastal zones and estuaries are provided in the dRBMPs, but there are different levels of information available. So the uncertainties related are therefore higher than for rivers.

4.3 Key challenges

Based on these similarities and differences the following key challenges in regard to classification have been identified in the workshop:

- Classification is not a closed process since the first WFD cycle and new classification methods (e.g. methods that allow better incorporation of hydro-morphology in the classification scheme by establishing a reasonable link to biology) and improved data might change the status of a water body. This will also influence the objectives and the POMS. This might result in situations in which several measures are taken, but due to changing the status because of new data and/or classification methods to a lower class no status improvements are visible to the public.
  Therefore, it will be important to find appropriate ways of communicating these changes to the general uninformed public. It is important that the results of the classification are objective, transparent, traceable and understandable, (e.g. explain in the plans how many monitoring points in a water body are necessary and how to achieve a combination of information from these different points, explain how water bodies which have not been monitored are considered in the classification). Showing the changes and improvements for each QE separately might also be a possible solution

- The second key challenge is how to track progress through the different WFD cycles in the water status while the baseline is changing due to new datasets. How to ensure comparability if the baseline is changed?

- Furthermore, a better understanding of the information used in the classification is needed, such as the confidence of data and in particular the parameters. This also requires a better understanding of the gaps in the assessments.

5 Objective setting – experiences gained in the five plans

Article 4 of the WFD sets out various requirements for making the programme of measures operational as specified within river basin plans for surface waters, ground water and protected areas. This includes the ability to set alternative objectives to that of achieving 'good status' by 2015 for individual water bodies by using a process of exemptions and/or the setting of less stringent objectives. These are set out in Article 4 of the Directive, in particular the "extension of the deadlines" (4 (4)) and the "less stringent objectives" (4(5)). This also requires setting objectives in the case of heavily modified water bodies, which is not an easy task.

5.1 How have objectives been set?

The environmental objectives constitute the core of the Water Framework Directive and are some of the main challenges in the development of the RBMP. While the issue of classification is not always explained in detail in the plan, the information on how the objectives are set is clearly demonstrated. The comparison shows different approaches among the several Member States in setting objectives.

- **Scotland River Basin District:** The draft plan for the Scotland River Basin District set objectives until 2027, with an overall aim to achieve good status in all water bodies by that time. For the 2015 objectives, a series of planning assumptions are taken to assume the degree of improvements which can be expected from the available measures. The assumptions are elaborated for certain pressure types, such as agricultural diffuse pollution or urban waste water. Further specific consultation among the various stakeholders was carried out. In other words, the proposed objectives are based on estimates of environmental improvements expected when taking a certain set of measures that was agreed upon with the stakeholders under the budgets given.

- **South East River Basin District:** The objectives in the RB are set for each water body and for the different QE. They are based on an assessment of the effects of applying the basic measures and the most cost-effective combination of supplementary measures. The outcomes of this process were used to identify recommended default or alternative objectives for each water body. The draft plan clearly distinguishes between water bodies that will meet the good status or good ecological potential by 2015 and those failing to meet the objectives. In case of failing these objectives, the reasons for failing are provided on an aggregated level. Currently in all plans it is assumed to achieve good status in all water bodies by 2027. However this assumption might not hold and will be reviewed before elaborating the next RBMP for the 2nd management cycle. The targets for 2021 are to halve the gap between the predicted status in 2015 and the target for 2027.

- **Seine – Normandie River Basin District:** The objective settings for the Seine-Normandie River Basin District is based on EU norm (2006/118) taking into account the effects and the inertia of the measures selected. Inertia is taken into account in particular concerning diffuse pollutions of pesticides (some of them are already abandoned) in groundwater bodies. For each water bodies the objective has been settled based on technical assessment of the measures effectiveness and economic analysis of disproportionate cost. Concerning the effectiveness of measure on water quality, pollutants balances have been established for

each water bodies to simulate the level of measures required to reach the good status in 2015. With regard to coastal and transitional waters as well as the good potential definition are based on expert analysis, as there are no official defaults on national or EU level.

- **Neagh Bann International River Basin District.** The main approach of setting the objectives for the Neagh Bann dRBMP is based on the principle to improve each water body below good by at least one class in every management cycle. That means a water body with currently moderate status should turn into good status by 2015. Therefore, by 2027 all water bodies should be in good status. This approach has been validated by a series of workshops involving experts. Based on their discussion the general approach was refined and alternative objectives have been set.

- **Rhine Delta River Basin District:** Objectives have been set based on existing legislation and standards as well as on the basis of the guidance given in the CIS process. Most of the surface water bodies and some groundwater water bodies should achieve the "good" status after 2015. Under certain premises, a prolongation for two cycles is possible. "Less stringent objects" for the water bodies are not designated in the draft plan, but it is mentioned that, in some cases, lower objectives might be applied in the second and third cycle.

Table 5 provides an overview of the predicted status in River Basin Districts assessed. It clearly shows the different starting points which partly can be explained due to differences in driving forces and the pressures they put on waters. However also differences in the classification systems applied have an impact.

Table 5 – Predicted status in 2015, 2021 and 2027

		Predicted Status in %					
		2015				2021	2027
dRBMP	Type of Water Body	High	Good	Moder-ate	Poor	Good (or better)	Good (or better)
Scotland River Basin District	Surface WB	20,1	45,4	18,7	10,2	~ 68	~ 70
	Ground WB		81,1		18,5		
South East River Basin District	Surface WB	14,6		n/a	n/a	14,8	70,4
	Ground WB		33,3		66,7	33,3	100
Neagh Bann International	Surface	83,3		n/a	n/a	98,4	98,4

River Basin District	WB					
	Ground WB		100		0	100	100
Neagh Bann National River Basin District	Surface WB	63,0		37,0		98,0	99,6
	Ground WB		93,0		7,0	100	100
Delta Rhine	Surface WB	22,2		n/a	n/a	n/a	100
	Ground WB		54,1		n/a	n/a	100
Seine-Normandie	Surface WB	55,0		n/a	n/a	100	
	Ground WB		36,0		n/a	100	

At least all of the compared RBMP predict improvements due to the activities of the first management cycle, but reaching good status is mainly expected after the third cycle by 2027.

5.2 Defining good ecological potential HMWB designation

In accordance with Article 4 (3), the WFD allows Member States to identify surface water bodies which have been physically altered by human activity as "heavily modified" under specific circumstances. If the uses of such water bodies (e.g. navigation, port or harbour, or flood defence) would be significantly affected by the mitigation measures required to achieve good ecological status and if no other better environmental options exist, then these water bodies can be designated as "heavily modified" and good ecological potential is set as an environmental objective. The principal objective for such water bodies is to aim to achieve good ecological 'potential' by 2015.

According to the developments under the CIS the setting the objectives for HMWB is a complex process which can be carried out in two ways. The figure below summarises the two main approaches to define the good ecological potential (GEP).

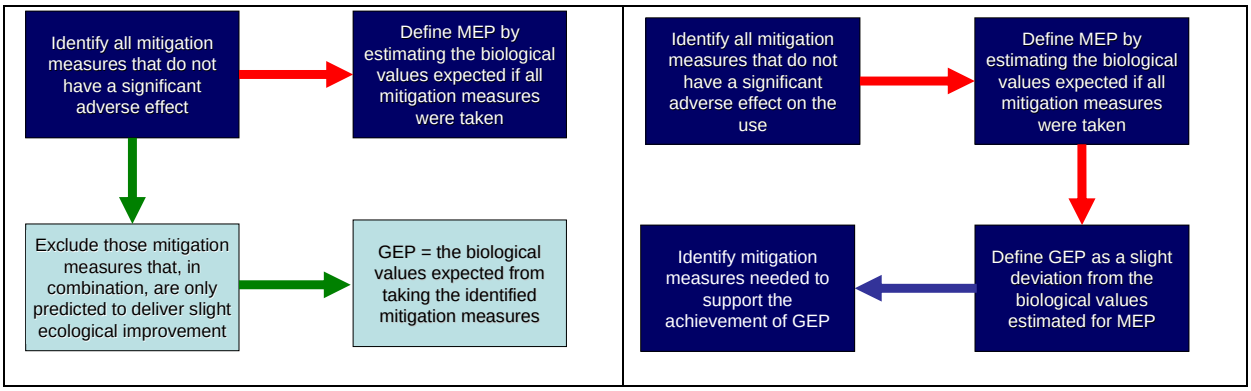


Figure 1: Steps involved in defining GEP using the Prague approach (left side) compared to the relevant steps in the approach described in CIS Guidance Document No. 4 (right side); red arrows: steps following CIS method, green arrows: modifications of CIS method.

The assessment of the dRBMP shows the following picture as regards to the definition of the GEP:

- In the Neagh Bann RB, the Prague approach is applied. Guidance on how to achieve the GEP has been developed by the Irish.
- In the case of South East, mostly clear cut cases have been identified as HMWB. No approach on how to define the GEP is presented in the main plans although other linked documents explain this; only a reference to research needed is made. There is a clear need to investigate the ecological potential of heavily modified waters to establish mitigation measures to achieve good status. The plan also refers to the Irish guidance.
- In the Rhine basin, the Netherlands used both approaches, leading to the same results. The Germans only used the Prague approach on their section of the Rhine.
- Scotland is also using the mitigation (Prague) approach for the classification of the HMWBs
- France is defining the good ecological potential based on experts' knowledge, combining a range of knowledge on hydro-ecology and mitigation measures.

Scotland, South East and Ireland have developed detailed annexes providing details on the HMWB designation and defining GEP. However, in all basins the classification as HMWB will be reviewed or updated before the final plan is published.

The extent of designating HMWB varies widely (e.g. in the Netherlands 98% of the water bodies are considered to be HMWB, while in Scotland only 12% are designated). However the main reasons for designation are the same in all cases, namely:

- Flood control,
- Navigation,
- Drainage.

In certain cases, urbanisation, power generation, drinking water supply, water storage and recreation were further reasons for the designation.

5.3 The use of Exemptions

As stated in section 5.1, the good status will not be achieved everywhere by 2015 in any of the basins and therefore it will be required to justify exemptions. The level of ambition to justify these exemptions and the type of exemptions used varies among the RB assessed:

- **Scotland River Basin District:** For the Scottish draft plan, the UKTAG recommendations on a consistent list of reasons for setting alternative objectives[5] are basically used to justify exemptions, mainly for extending the deadline. General justifications have been developed and are linked to water body specific fact sheets providing information about classification results, the set objectives and reasons why the water body doesn't achieve the good status by 2015. Further information to prove the justification in terms of specific water body conditions is not presented. But it is mentioned that assessments are currently on-going, whether further measures are technically feasible or not disproportionately expensive. Most common reasons that river basins cannot achieve good status by 2015 are that the pace of improvement necessary would impose disproportionate burdens on those who would have to pay for the measures or that the technical constraints involved in planning, developing and implementing capital works make meeting the deadline infeasible. With regard to Article 4.7, exemptions will be included in the final plan if decisions are made to permit deterioration of status in order to accommodate important water uses.

- **South East River Basin District:** Exemptions in the South East dRBMP are only applied to justify a longer period (art. 4.4) for achieving good status until 2027 at the latest, even if not all water bodies are assessed. For the justification of exemptions the plan also uses the recommendations of UKTAG. Although there are no justifications for less stringent objectives, investigations are planned during the first planning cycle to identify if, for some water bodies where less stringent objectives are the realistic approach. Water bodies for which there is no known solution to improve status are candidates for less stringent objectives after the first or second management cycle.

- **Neagh Bann International River Basin District:** The Irish plan for the Neagh Bann International River Basin district proposes an extension of deadline for most cases of exemptions. Less stringent objectives are only proposed in few cases where it is likely that the implementation of the necessary measures will be disproportionately expensive. A "costs tests" to confirm is carried out early in 2009. Assessments concerning these issues are currently running and are expected in 2009. Reasons for extended deadlines include where further investigation is required to obtain more information about a pressure and the corresponding driving sector or where recovery from agricultural nutrient losses or morphology enhancement will take several years. Individual justifications on water body level are not contained in the draft document. Another reason for justifying exemptions is if WFD measures have negative impacts on other environmental issues, e.g. air quality. If a measure generates negative impacts on other environmental issues, it has to be adjusted. The dRBMP of Northern Ireland for the Neagh Bann River Basin district also applies the

[5] http://www.wfduk.org/tag_guidance/Article%20_11/POMObjectivesetting/alternative_objectives

UKTAG recommendations for justifying exemptions. No justifications are stated on water body level so far.

- **Delta Rhine River Basin District:** Justifications for exemptions in the Delta Rhine River Basin District are separately presented for surface water bodies and groundwater bodies. Most of the expected improvements that occur through the measures will take a while to take effect, so the positive effects for water bodies will appear after 2015 and an extension of deadline will be required. For groundwater bodies, the justifications for exemption are almost exclusively natural conditions, whereas for surface water bodies additional reasons in terms of disproportionate costs (166 surface water bodies) and technical infeasibility (460 water bodies) are applied. Extending the deadline due to natural condition means the intended measure needs more time to adapt into biologic or hydrologic system, usually more then 10 years after implementation. Disproportionate costs may be caused, for example, by the acquisition of agricultural land within one management cycle due to increasing land costs. Extending this measure over a longer period will ensure more steady land costs. Furthermore the plan mentions the possibility of flooding and droughts in the Netherlands. In such case alternatives plans will take effect.

- **Seine – Normandie River Basin District:** Within the Seine-Normandie dRBMP only Art. 4.4 exemptions are used. The reasons to justify these exemptions are presented for each water body with the concerning parameter (biological, chemical, physicochemical, morphological), which cause the water body to fail the good status. The exemptions mentioned are:

    - inertia of measures effectiveness (in particular concerning ground water bodies affected with diffuse pollutions of pesticides),

    - technical limits of the measures available (particularly concerning river ecological continuity, hydro morphological alteration and surface water bodies submitted to the outflow of water treatment plan with already high treatment yields but which is insufficient to reach good status),

    - disproportionate costs (therefore two methods have been mobilized and compared: cost and benefits analysis, and a comparison of the timeline of the costs of the program of measure to the past cost of the water policies.

Comparing these approaches the following picture can be drawn:

- Most frequently applied in all draft plans are Article 4.4 exemptions to extend the deadline for achieving objectives. Only in a few cases are less stringent objectives (art. 4.5) provided. Arguments for using an extension of deadlines or establishing less stringent environmental objectives are based in accordance with the Directive using technical infeasibility, disproportional costs and natural conditions as well as uncertainty aspects (e.g. provisional objectives or insufficiently advanced assessment) as arguments.

- The Directive requires applying these justifications on a water body level. However, this information is not always provided. While for exemptions based on natural conditions and technical feasibility a grouping seems feasible a case by case on the water body level is

requested by the EU-Commission in the case of disproportional costs[6]. None of the plans provides such information in the case of disproportional costs or refers to more detailed case studies.

- Ireland has not applied the economic analysis to the measures. However, only after this working step is it possible to reduce the objectives argued by disproportionality.

- The application of article 4.6 (natural disaster) and 4.7(new modification) is not foreseen in any of the basins. (In Seine-Normandie River Basin, article 4.7 could be applied to projects of overriding public interest which will have significant impact on Waterbody status. These are identified in the SDAGE, at the end of Annex 4. They will probably be narrowed to 3 projects in the RBMP final version).

5.4 Protected areas

Under Article 6, competent authorities need to establish a register or registers identifying those areas requiring special protection under other Directives or legislation with respect to drinking water. This includes those areas defined as conservation of habitats, species depending on water, and water bodies that provide drinking water. The protected area obligations have a range of requirements arising from the interaction with other Community water policies.

The issue of setting objectives was not deeply discussed in the workshop. The assessment of the dRBMPs shows that the level of detail as regards to objective setting in protected areas is very differently addressed:

- All RB are listing relevant protected areas and built a link to the EU legislation influencing the objective setting for these areas. A share of how many protected areas are currently complying with these additional objectives is only provided in the case of Scotland and the Neagh Bann Basin (Northern Ireland plan).

- Zones for drinking water abstraction are also covered by protected areas. However Art 7 setting rules for the abstraction of drinking water is only shortly addressed in the DRBMP. The seine Normandy RBMP is putting this in its programme of measures. For each drinking water abstraction point with present high concentrations in nitrates or pesticides or an upward trend voluntary measures are proposed.

- Under certain circumstances there might be conflicts in the objectives set by the WFD and other legislation on protected areas. Only in the Rhine basin discusses this issue.

5.5 What are the main uncertainties related to objectives?

As stated before, considerations of uncertainties regarding the achievement of the objectives are only explicitly expressed in the Rhine plan. There uncertainty is mainly related to remobilisation of pollutants, pollutants in sediments in relation to the sensitivity of ecosystems and the effectiveness of supplementary measures which will be applied from 2010 onwards. This last uncertainty is also the main argument why measures are taken stepwise in the subsequent planning cycles. Uncertainty

[6] See European Commission (2008): CIS Guidance document on exemption.

issues are mentioned in the French RBMP, and specific measures are defined to decrease uncertainty mainly concerning dangerous substances reduction, hydro morphological interventions, and further indicators to assess measures effectiveness.

However, from the discussions at the workshop, it came clear that no certainty is given to achieve the objectives after 2015 in all the basins assessed. As the main reason the uncertainty of the effectiveness of measures and uncertainty in funding them were named.

5.6 Key issues identified

When comparing the different approaches in setting the objectives, the following similarities and differences can be found:

- All considered plans set the objectives at water body level. However the level of detailed provided is different. While in the Seine-Normandie and the Dutch part of the Rhine basin the measures are referenced to single water bodies (or group of water bodies, depending on the measures) such a reference is missing in the other cases. Scotland has developed sub basin plans which allow also a more detailed picture. The main concern why measures are not fully referenced to water bodies is the fear to limit flexibility in the implementation.

- Even if the focus is mostly on what is to be achieved within the first 6-year-planning-cycle until 2015, in all cases objectives are also set for 2021 and 2027. The different approaches are based on assumptions founded on the expected effects of currently available and proposed measures. The proposed measures are based in funding availabilities and acceptance. In the cases of the Rhine basins, the Seine-Normandie and England and Wales explain why the good status cannot be achieved in the first cycle. Northern Ireland does not justify the exemptions applied.

- The risk of not achieving the set objectives is only discussed in the Rhine basin. Specific reasons are mentioned but it remains unclear how this risk is taken into account.

- In all plans there are water bodies where no objectives have currently been set because of uncertainties, which are:

    - lack of knowledge concerning the current status of a water body;
    - uncertainty about the pressures affecting a water body;
    - no known measures available or uncertainty about the duration until measures take effect;
    - uncertainty concerning the availability of funding options.

- In the case of France, the Netherlands and United Kingdom the link on how to achieve favourable conservation status between the WFD and the Natura 2000 objectives could be further developed.

In the discussions at the workshop, the following future challenges have been identified to be addressed mainly in the remaining month before publishing the final plans:

- In the final plan, more information about how objectives have been set (e.g. by expert opinion) should be included in order to give a clearer picture.
- The EC has clearly stated that the arguments for justifying disproportional costs have to be solid and should be water body specific. None of the plans currently provides sufficient information on how disproportional costs have been assessed. This needs to be improved before publishing the final plan.

6 Programme of measures – approaches taken and gaps to close

A key element of the basin plans is a programme of measures (POM) for each river basin district. The POM outlines the most cost effective management measures and their application within the basin to meet the multiple objectives set to obtain good ecological status. The measures should remedy conflicts between economic benefits from water use and associated contamination. Programmes of measures must be implemented by 2012.

6.1 What was the process of selecting measures?

Developing a POM is a complex task that requires considering several aspects such as costs and effectiveness of the different measures but also socio-economic issues such as acceptance. In the basins different approaches to select measures have been taken:

- **Scotland:** The program of measures drawn up by a network of national and local stakeholders (NGOs, industry), and responsible authorities within existing legislation. The level of funding has been considered from the beginning focusing on closing the most significant gaps between current status and objectives.

- **South – East River Basin District:** The selection of measures is based on technical feasibility, rather than on the costs–benefit ratio. Furthermore, the measures were checked against the issue of climate change.

- **Neagh Bann River Basin District:** The Republic of Ireland made differences between mandatory (basic) measures and supplementary measures. The basic measures were defaulted by the European Legislation. The supplementary measures are selected the measures which were technically feasible and cost – effective. Furthermore the total costs of the selected measures had not been significantly greater than the benefits gained. All selected measures had to consider the aspect of environmentally sustainability.
  In Northern Ireland a similar approach was taken. In addition the public authority selected measures by policy initiatives.

- **Delta Rhine:** The general conditions of the selected measures in the Netherlands dRBMP were the national and European law and arrangements. In cooperation with the Dutch stakeholders the government developed a catalogue of measures. From this catalogue, the government selected those measures with the best cost– benefit ratio.

- **Seine – Normandie River Basin District.** The programme of measures is developed at the sub-basin scale level, combining experts' knowledge and studies on costs, technical feasibility and effectiveness. This information mobilizes also elements from a measures catalogue for the river basin district. This information is then aggregated at the district scale for further discussion at the river basin committee. Total costs of the programme of measures are compared to past efforts for different sectors (past investments in water), current water tariffs, existing financial resources (including subsidies from sector policies such as the Common Agriculture Policy). An overall assessment of benefits has also been carried out but it is not presented in the RBMP: some general statements on benefits are made,

complemented in some cases by estimates of costs avoided thanks to the implementation of the WFD and PoM.

6.2 What measures are applied?

The Program of measures can consist of different types of measures. Five main categories can be distinguished:

- Regulatory measures are state interventions mostly restricting the use of certain goods (e.g. ban);
- Technical measures refer to construction activities or technical solutions to clean water (e.g. treatment plan, fish passes);
- Economic measures can be used to restrict (penalties) to or to support (payments) certain activities;
- Agri-environmental measures in this context are measures taken in the agricultural sector in order to reduce water pollution. Measures include changes in farming practice and land use;
- Advisory/Information measures refer to the information, training and education of specific groups in order to change behaviour with the aim to reduce water pollution/consumption (e.g. water efficiency campaigns in Scottland).

Table 6 shows that all types of Measures will be applied in the basins assessed. However no detailed assessment was made if there are sector specific approaches (e.g. only regulatory measures in the case of industry).

Table 6 – Types of measures are used

River Basin	Regulatory	Technical	Agri – env.	Economic	Advisory/ Information
Scotland	x	x	x	x	x
South - East	x	x	x	x	x
Neagh - Bann	x	x	x	x	x
Rhine	x	x	x	x	x
Seine - Normandie	x	x	x	x	x

Measures are applied on a voluntary and mandatory basis. It is interesting to note that the highest share of voluntary action can be found in the agricultural sector; while voluntary measures are applied in the household sector eg water efficiency schemes.

6.3 How are measures presented in the plan?

The WFD does not request any particular format of how the measures taken should be presented in the plan. So MS are free to decide and can choose from different options. From the assessment of the dRBMP three main types of structuring the measures in the plan can be distinguished:

a. Presentation among basic and supplementary measures (Neagh Bann-International RB, South-East RB): In these cases first the measures under other existing pre-WFD legislation are presented, than those new measures solely taken for the WFD. Basic measures are structured among the legislation they are related to, WFD specific measures among pressures. Readers can clearly understand what measures are already in place and which activities are taken as part of the WFD implementation.

b. Presentation among pressures (Neagh Bann-Northern Ireland, Scotland, Seine-Normandie): In these case measures are structured among the significant pressures identified, allowing the reader to get the full picture how a pressure is aimed to be tackled. Measures are further split between “No deterioration measures” and “Improvement measures”. While the first type of measures aims to prevent a water body from deteriorating from its current status including mitigating the impacts of new pressures, later measures are aiming to actively improve the conditions.

c. Presentation among Article 11 WFD (Rhine Basin and South East in an Annex in addition to the approach under a.): This approach can be seen as a hybrid approach between the two options presented above. It allows easy comparison with the legal text of the WFD but makes understanding of the issues more complex as some pressures are addressed several times in different places.

In all plans measures are described on a general level and often clustered to groups of measures (e.g. improving farming practice). Detailed technical descriptions of the measures are missing as well as clear definitions of effectiveness and costs. The Neagh Bann plan of NI and the Scottish plan provide tables linking the technical measures to be taken to legal actions (delivery mechanism and support) as well as to the relevant authorities.

In all plans the measures are clearly related to the pressures identified but detailed references on the water body levels are only provides in the Seine-Normandie and the Dutch part of the Rhine basin .

6.4 What about the costs and how to pay them?

The EU Water Framework Directive (WFD) prescribes cost-effectiveness analysis (CEA) as an economic tool for the minimisation of costs when formulating programmes of measures. The WFD does not specify, however, which approach to CEA has to be taken by the EU member states. The issue of cost- effectiveness is addressed in all plans, in different ways:

- In the Dutch part of the Rhine Basin, a strategic CEA/CBA was carried out which assessed the cost, effects and benefits of three scenarios, each combining different measures. Results show that due to an ongoing high level of action, the cost-effectiveness is low in the case of emissions and therefore additional measures in this area are taken carefully. Instead, the focus is on measures in the area of hydro-morphology.

- The Scottish Government has prepared an impact assessment estimating the costs, benefits and implications of achieving the objectives outlined in the draft river basin management plan, together with the additional measures being considered to maintain the trend of improvements. In the South Eastern basin a preliminary cost effectiveness analysis (pCEA) was completed by 2007

- In the NI part of the Neagh Ban, an impact assessment identifying the costs and benefits and implications of implementing the additional measures required will be prepared for the final River Basin Management Plan, following the six month consultation on the draft Plan.

- In the South Eastern basin and the Irish part of the Neagh Bann basin, local authorities will also undertake more detailed assessment of the costs and effectiveness of the proposed measures and will apply forthcoming economic guidance on disproportionate costs to fine-tune supplementary measures and ensure that the cost of these measures is not significantly greater than the benefits gained.

- In the Seine-Normandie basin the costs of the measures have been evaluated based on previous implementation experience using a unique elementary cost file for all RB subunits.

The WFD does not require presenting the total costs of the programs of measures; however, this information might be useful in public participation activities. Stakeholders might be convinced to take action more easily if the total costs are known and judged to be acceptable compared to the achievements made, when spending the money to improve water status.

- In the case of Northern Ireland an impact assessment identifying the costs and benefits and implications of implementing the additional measures required will be prepared for the final River Basin Management.

- For the Seine Normandie river basin, the total program of measure is estimated at 9,9 billion Euros (1,8 billions eur/year) for the period 2010-2015 or 19,4 billion Euros in total. These costs are divided between the following main sectors and measures:

    - 58% for improvement of collective waste water treatment plan, urban storm overflow, rehabilitation of wastewater networks – in particular in the Paris area- rural diffuse domestic pollution,

    - 28% for agricultural measures and mainly measures for reducing the nitrates and pesticides level in ground water bodies. To reach significant improvement only radical measures seems efficient, which explain the importance of this sector. These measures are confronted by technical and hydro-geological inertia of water bodies, which explain some exemption for groundwater.

    - Morphological measures represent only 9% of the program. However, they represent a challenge, as it is difficult to identify operators and local actors willing to take the responsibility for their implementation.

- The industrial sector has carried out significant efforts and progress which explains that the cost of measure account only for 3% of the total costs. These costs are mainly induced by measures for controlling priority substances emissions.

- In the Dutch part of the Rhine basin the total costs are presented for the years 2010 to 2015 and are estimated to be about 1.659,3 Billion Euros .For the years beyond 2015 971,2 Billion Euros are foreseen. These total costs are disaggregated to the main groups of measures (e.g. improving hydro-morphology, reducing pollution).

The issue of financing the measures is only partly addressed by the Directive, due to the issue of cost recovery under Art 9 WFD. However, cost recovery only applies to water services and the overall aspect of financing the POMs is not the focus of the Directive. Not all plans include a reference to how the POMs will be financed. For three basins some preliminary information is provided:

- In the case of NI, the costs (and benefits) of these measures were assessed prior to their introduction, and funding has either already been assigned to them through the current Programme for Government, or will be bid for through the normal Budget process for 2011-2014.

- In the case of IE, consideration is being given to establishing a supplementary budget under the Water Services Investment Programme and Rural Water Programme to finance priorities for supplementary treatment identified in Water Services Strategic Plans.

- In the case of Scotland, references are made to existing funding programmes such as Rural Development or specific investment plans (e.g. the Coal Authority is planning to invest in the construction of nine additional mine water treatment schemes in Scotland up to the end of the 2015–2016 financial year).

- In the Dutch part of the Rhine, it is stated that the financing of the POM is ensured due to the existing pricing policy which is based on the polluter pays principle.

From assessing the plans, it seems that most of the costs for implementing the POM will be covered by state budgets and private investments are limited. However, at the workshop, all representatives of the different RBs confirmed that private investments are also involved when implementing the plans.

6.5 Key messages and future challenges

The Program of Measures represents the most important part of the RBMP. It is the key for further land and water use in a basin. From the assessment and the discussions at the workshop, the following key messages and key challenges can be drawn:

- Even if the measures are structured differently in the plans, all show concrete and specific measures to address the pressures mentioned and unknown technical solutions to address a problem are only reported in a few cases. However, in some cases, the detailed selection process of the measure is not fully shown and open questions remain. A more transparent description of the selection process could reduce these questions.

- The link between measures and water body level varies widely, but in all cases, more information about where and when the measures will be implemented should be presented. Also, measures have to be linked to the improvements and benefits for the water bodies showing the kind and the magnitude of improvement. There is a need to focus on the benefits and to better explain the improvements achieved by the measures.

- Financial issues related to the POM are addressed differently in the plans. While France and the Netherlands try to show the costs of the measures, the United Kingdom and Ireland do not.

- In those cases where the total costs are clearly outlined there is a risk that public acceptance is low (e.g. In the Seine Normandie the program of measure to achieve the good status would cost 19 billion Euros which would induce an increase of 240% of current water sector investments). Therefore it is important to present the benefits for the citizens more detailed

- While most plans give an indication on how the POM could be paid, from the workshop it came clear that in the UK and Ireland, have a lower level of planning on funding/expenditure as NL has. This increases the uncertainty of addressing the problems sufficiently.

- There is uncertainty about what the POMs will look like after 2015, because the impact of the current measures is not always fully clear.

- • Certainty of funding represents a major issue and achieving this certainty in the next month represents a major issue, as there are several budget constraints and other interests, especially as there are new policy demands ahead. These new demands do not only conflict with the objectives of the Directive, they also require resources from a limited budget.

- All plans include voluntary measures. Their uptake has to be encouraged and convincing arguments (besides additional funding) should be developed (e.g. if voluntary measures do not bring sufficient improvements, then regulatory measures are needed). Otherwise there is a risk that the objectives will not be met.

7 Conclusions

The Water Framework Directive – WFD (2000/60/EC) has introduced a new, innovative and ambitious way for sustainable management of water resources across Europe. The implementation of the Directive is a considerable challenge for the Member States and EU institutions. The process of preparing the first River Basin Management Plans (RBMP) for the national and international River Basin Districts across Europe is a crucial milestone in European water management.

It is in this context SNIFFER organised a two day workshop with a focus on classification, objective setting and programs of measures 16/17 January 2009 in Birmingham. SNIFFER wants to take the opportunity at this moment in time to invite decision makers and interested parties from the Netherlands, France and Northern Ireland to this workshop to discuss strategic water management issues at stake.

Based on a first assessment and the discussions at the workshop the following key points can be identified:

Similarities between the plans

- All dRBMP assessed will not bring sufficient improvements to achieve the good status by 2015. The achievement of this target is more realistic for 2027.
- The status of several water bodies is still unknown in several cases and there is a high uncertainty in the classification in particular to biological and hydro-morphological QE. Closing these gaps is mentioned as an emerging issue in all plans.
- Classification in general is a difficult issue that is even more difficult to communicate to the general public.
- Objectives are set based on interplay between possible measures taken and environmental improvements that can be expected. Alternative objectives (HMWB and extension of the deadlines) will be applied in all cases, however the justification of these needs to be improved.
- Programs of measures are covering a wide range of different types of measures including voluntary and mandatory action. According to the Directive the most cost effective measures should be applied. However decisions were not based solely on cost-effectiveness considerations. Other issues such as acceptability and enforceability were also included

Disparities between the plans

- The approaches to classify water bodies are different and not always possible to compare. This also has an influence on the distance to the target and the need of communication to the public.
- Financing the POMs is not always ensured.

- The overall presentation of the dRMBP differs widely and either focuses on the general public or on reporting to the Commission. Thereof the level of detail provided is different.

Key issues for the future

- Several issues in the dRBMP require further efforts in the coming months in particular in the context of closing gaps. This covers the finalisation of the status assessment, further work on justifying exemptions and ensuring financing of the measures being part of the PoM.

- The dRBMP contain several gaps (e.g. understanding of biological response to morphological pressures, effectiveness of measures, cost assessment). A clear plan should be developed in order to close these issues. Thereby a clear priority setting of gaps that have to be closed more urgently should take place.

- In order to take on board the experiences made when preparing the first draft plan a systematic analysis of the preparation process should be carried out. This analysis should also look at the interlinkages and interplay of the authorities involved in the preparation of the plans in order to further streamline the decision making. Recommendations for the next cycle should be developed considering approaches and experiences from other MS.

- Environmental policy making is currently facing new challenges such as climate change or increased alternative energy demand. These challenges should be considered in the next planning cycle by developing appropriate baseline scenarios.