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Summarised Report from first Catchment Level Meetings (on Requirements regarding DSS in Water Management) and interpretation of outcomes

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PP	Restricted to other programme participants (including the Commission Services)	X
RE	Restricted to a group specified by the consortium (including the Commission Ser-	
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Part I: Summary and interpretation of consultation results

1. Introduction

1.2 Purpose of this task

The aim of work package 9 is to develop the knowledge and expertise collated in WPs 1-7 into a range of tools and guidance for decision makers at the European, national and catchment scale, including a catchment scale Decision Support Tool (DSS). These will assist decision makers to achieve effective management of catchments under current policy requirements and societal pressures when subject to global change.

For Euro-limpacs as a whole and especially as input for the development of the DSS it is most important to learn about

- the role of Climate Change (CC) issues in the implementation process of the WFD
- problems authorities face in terms of decision making for implementing the WFD
- models already used for the decision making process
- the role of Decision Support Systems (DSS) for potential end-users, including
 - current use of DSS and willingness to use DSS in the future
 - preconditions for using DSS
 - important issues for a DSS
 - necessary or helpful formats of information
 - requirements regarding contents, user interfaces etc.

In addition to these issues responses are important on how the participation requirements in § 14 WFD are interpreted and how the decision making process is organised. These questions and answers can already be seen as transition to task 2 (policies). On the other hand for the developers of the DSS it is of interest whether and how the DSS might play a role in the participation process.

1.2 Methodological remarks

In order to ensure that tools meet the true requirements of end-users it is necessary to engage (potential) end-users at the European, national and catchment levels. The consultations at national/catchment level have been exercised by respective Euro-limpacs scientists in the following catchments¹:

- Tamar (UK),
- Danube sub-basin (Romania),
- Bjerkreim/Tovdal/Vannsjø-Hobøl (Norway),
- Odense (Denmark),
- Inn (Austria),
- Tordera (Spain),
- Vecht (Netherlands) and
- Cheimaditida (Greece).

which are also addressed in WPs 1, 2, 3, 6, 7 and 8. In some countries interviews have been done both at regional (catchment) level and at national level. Although no German site is part of the Euro-limpacs project additionally a questionnaire was (partly filled out) by a member of the Federal Institute of Hydrology.

In order to ensure a common approach in the engagement of end-users a questionnaire has been produced with partly „tick the box“- and partly open questions (Deliverable No. 75). However the results cannot be seen as representative mainly for following reasons:

- No pre-tests could be made with the questionnaires.
- The work of organising workshops or interviewing experts has been undertaken by different scientists which may have caused problems regarding the interpretation of the more open questions.
- Due to the great differences in the sizes of the Euro-limpacs catchments/sites the interviewees are working at different levels and are looking at problems from different perspectives.
- The total number of interviewed experts is small compared to the number of member states and administration levels.

On the other hand existing research works in this field (Hare 2005) and the discussions in the Euro-limpacs European end-users workshop (Deliverable No. 8) confirm the results on the whole.

¹ Fully documented in Deliverable 37 (Appendix)

2. Results

2.1 Responsibilities for the implementation of the WFD (Questions 4-6)

Principally in all countries the national and the regional level (e.g. the “Länder” in Germany) are involved in the implementation process. However mostly laws and guidelines (as far as not EU-given) and the general framework are produced at national level. An exception is the federal system in Germany, while in Denmark the situation is not quite clear yet. In some countries a lot of tolerance is given to the local water authorities (e.g. Netherlands). Stakeholder involvement takes place in different variations and degrees (see questions 6, 9 and 10).

Very often it will be the case that decisions – for the use of a DSS – are made at a higher policy level while the potential end-users are working at operational regional or local level.

2.2 The role of Climate Change (CC) issues in the implementation process of the WFD (Questions 7 and 8)

Generally CC issues do not play a major role so far. Only the Netherlands and Romania see an important role regarding management options. For some countries CC is principally an issue but it is not considered in any systematic way; it is not influencing the WFD implementation process. Some water managers see a future role of CC issues in connection with the monitoring of water bodies and the understanding of changes.

These results are confirmed by the EU DG Environment (Quevauviller oral 2006). Quevauviller sees a relatively poor interest to take CC issues into account at the time being. DG Environment is planning several initiatives for the next years to put more pressure on this.

Interpretation

The small role CC issues are playing in current water management is probably due to following reasons:

- **Separated responsibilities for water management and CC issues**

Water management is done by authorities with long traditions and within a clearly defined system of national to local responsibilities. On the other hand Climate Change is a relatively new issue which up to now has not very much been dealt with from a management perspective. The focus lies on strategic aspects and on the reduction of climate-relevant emissions. In all consulted countries the responsibility for CC issues lies at the national level, only in the Netherlands the “provinces” play an additional role (see question 8).

This may at least partly explain why there is a lack of communication between water managers and people who deal with problems of Climate Change.

- **Concentration on mandatory WFD requirements**

Since 2000 water management authorities are busy fulfilling the mandatory WFD requirements and cannot afford to take up any further work.

- **Knowledge gaps and uncertainties regarding CC consequences – is it really an issue?**

There still seems to be scepticism regarding CC research results. Many water managers consider it too early to take divergent prognoses into account.

2.3 Problems authorities face in terms of decision making for implementing the WFD (Questions 11 and 12)

Generally the answers show a very heterogeneous situation with differences both between and within the countries. Nutrient input is a problem for all countries although with regional differences: e.g. in Austria's alpine regions (where the Inn-catchment lies) diffuse N- and P-pollution does not play a major role, in contrast to the eastern rural parts of the country.

Due to the relatively high importance of nutrient input most countries have developed or use models to calculate N- and P-pollution.

Point pollution through industrial effluents or inefficient sewage treatment was named by Catalanian and Romanian interviewees

Acidification seems to be a bigger problem in Greece and in Norway, while water abstraction plays a role on one hand in mountainous regions (water power in Norway and in the Alps) and due to limited water availability in mediterranean regions on the other. Latter also suffer from salinisation. In Alpine regions changes on hydromorphology (river training, weirs) have deteriorated the ecological status of surface waters. In the Netherlands the canalisation process is made responsible for increased discharge velocities, causing draught upstream and floods downstream.

Generally there is a lack of data and assessment methods regarding socio-economic aspects. In some countries fundamentals do exist.

2.4 Models already used for the decision making process (Questions 13-14)

Most countries have a number of different models at their disposal, most of them produced by scientists in academia. Nitrate flow models are of great importance: the German-based MONERIS is also used in Austria and Spain, models of the "INCA-family" are used in several countries, but none of the models is used area-wide. Many models have a regional relevance.

2.5 The role of Decision Support Systems (DSS) for potential end-users

2.5.1 Current use of DSS and willingness to use DSS in the future (Questions 13 and 18)

Generally there is a positive attitude towards DSS, only in Austria (Inn catchment level) the necessary measures were considered so obvious, that no DSS would be needed – at least for the moment. Most of the interviewees agreed to a statement saying that DSS could facilitate the decision making process in the field of water administration. In Catalonia a DSS is explicitly seen as an instrument to support elaborating, implementing and monitoring the progress of WFD river basin programmes of measures. But there is a range of opinions as to where the main field for a DSS would lie. Some water managers expect better management plans, while others emphasise on a strategic level and the development of scenarios.

In the UK the most important role is seen for a DSS that operates at a site level and can help with individual local decisions.

Austrian water managers at national level see advantages of DSS in potentially better transparency and reproducibility and a chance for reduction of personal cost.

Obviously answers depend very much on the level the consulted water managers are working at and on the specific organisation of the implementation process.

In several countries DSS are running for test and demonstration purposes:

- Elbe-DSS (<http://elise.bafg.de/servlet/is/3283/>), Werra-DSS and others in development stage.
- WEDSS (Wetland Decision Support System developed in the EU project EVALUWET) experimentally used at test sites Cheimaditida Catchment (Greece) and Tamar (UK).
- Custom DSS made by LEQUIA (University of Girona, <http://lequia.udg.es>) to support planning (wastewater treatment plants, industrial effluent treatment).

2.5.2 Preconditions for using DSS / principal requirements (Question 18b)

Again, answers seem to be depending on the level the consulted water managers are working at. E.g. the requirement “simple to use and quick to apply” does not play a big role for Austria and Germany where the interviewees saw the DSS more as an instrument for a strategic level, while it is important for those working at management level.

The most important precondition is to show confidence limits of results and provide transparency. This includes “health warning” to use the DSS only for defined purposes and scales.

Although only mentioned explicitly in two countries it seems to be very important to have good examples of working DSS in order to convince more water managers.

2.5.3 Issues for a DSS / models to be integrated (Question 19)

Not all interviewees answered this question. Taking into account the problems named in question 11 and 12 and the models already used (question 13), the main issues which have to be incorporated are:

- Generally socio-economic questions are important and respective models should be incorporated.
- In all countries (although not in each catchment/region) **nutrient concentration and diffuse pollution** are a problem.
- **Point sources, changes in hydromorphology, abstraction** can be of high importance in certain regions.

2.5.4 Necessary or helpful formats of information (Questions 20 to 23)

The DSS should

- be GIS based,
- work with data bases,
- be compatible with data and systems already used.

2.5.5 Accuracy (Question 21)

The DSS should not be too detailed, especially given the limits of the input data and the uncertainties from the models. For most of the interviewees 5 step scales would be detailed enough. The opinion of the Catalonian water managers may serve as an example according to which the DSS should provide as a minimum:

- Qualitative assessment of expected trends,
- Cause identification,
- Priorisation of measures to be applied.

2.6 Participation and role a DSS might play (Questions 5, 6, 10, 13, 18, 22b, 23b)

Generally stakeholders and NGOs are engaged in the implementation process of the WFD, while the engagement of the general public is more or less an exception as yet. Some countries are planning participation at a broader level in the next years.

Information provision and consultation is common while active involvement and shared decision making are part of the implementation process in some countries, occasionally done or planned in others.

Regarding the use of DSS for facilitating the participation process there is not much experience as yet. But some water managers see a possible role if certain preconditions are full-

filled. Austrian water managers said, stakeholders would consider models to be unsuitable. In Greece there seems to be scepticism, too. The use of models/DSS might confuse stakeholders more as it would demand extra “skills” to apply. Norwegians see a solution for this problem in hiring consultants to run the DSS.

There has been little response regarding concrete features a DSS should provide to play a role in participation. Important requirements were the following:

- Visual attractiveness,
- Clean, clear intelligible reports for communication with stakeholders,
- Different (graduated) presentation levels for different user groups,
- Reliability,
- Accessibility (for third parties),
- Model verification and uncertainty assessment.

2.7 General relevance of information provided by Euro-limpacs from catchment managers’ and from a national point of view (Question 17)

Although there is no general willingness to engage in the development of a DSS, all of the water managers showed a principal interest in the results of the Euro-limpacs project. Nearly all of them were interested in climate change scenarios and the influence of climate change on surface water, groundwater, biodiversity, economy and hydromorphology.

References:

Hare, M. (2005): The Use of Models to Support the participatory elements of the Water Framework Directive: Creating a Dialogue between Policy Makers and Model Makers. Report on the Elicitation Strategy of the Project 4-6th October 2004, Osnabrueck. Harmoni-CA Document : HCA-WP5-2004-Re04/Final Version. Seecon Report Seecon07/2004.

Part II: Tabular overview on results²

A Meta data

Questions 1 and 2 are dealing with the information on the interviewees/workshop participants, their institutions and the circumstances of the consultations. Details are visible in the individual questionnaires in Deliverable 37 (appendix).

Question 3: How is information acquired?

	AU	DK	ES	GR	NO	NL	RO	UK
• workshop	X			X		X	X	
• individual interviews	X	(X)	X	X	X	X	X	X
• questionnaires			X				X	
• internet investigation	X		X			X	X	X

B “End-user mapping”

Question 4: Who is responsible for implementing the WFD?

	AU	DK	ES	GE	GR	NO	NL	RO	UK
National Level	X	X*	X	X	X	X	X	X	X
Regional Level	X	X*	X	X	X	X	X	X	X
Local level				(X)			X		

*Situation is not clear yet

² The summary has been reviewed by the interviewers who in some cases made minor changes. The results of the original questionnaires can be seen in Deliverable 37 (Appendix)

Question 5: How is the decision making process (regarding water management plans) organised?

AU	national level: general framework prepared, implementation of the WFD, implementation of major projects; distribution of information via internet and/or exhibitions. All affected parties should be involved asap regional (state) level: execution of federal water act, river engineering, water supply, hydraulic engineering
DK	This might be subject to changes over the next year.
ES	See attached document
GR	As described in the recent law L. 3199, Official Gazette A', 280/9-12-2003 Regional Board of Waters comprise: Secretary General of the Regional Authority, the Head of Dir. of Waters of the Regional Authority, a representative of each Prefecture within the Regional Authority, a representative of each Municipality, a representative of Management Body when there is a Natura2000 site, a representative of Water, Sewage local companies, a representative of farmers' unions a representative of environmental NGOs a representative of Land Reclamation Organisation
NL	National level: Guidelines etc. the province coordinates local level implementation which is a task of the local water authorities.
NO	A regulation document will probably be completed around summer 2006. Many issues are presently delegated to a Directorate-group, containing of 9 directorates and led by the Pollution Control Authority (SFT)
RO	General Management Plan at hydrographic basin level. 11 regional management plans. Information on the nat. level through internet and/or workshops and other info sources
UK	(Decision process) carried out by EA through stakeholder consultation process

6. Which other parties are engaged in that process?

	AU	DK	ES	GR	NO	NL	RO	UK
• (stakeholders, NGOs)	X	X	X	X	X	X	X*	X
• General public		X**	***	-	X		X*	X

*through water basin committee

**involved in 2008

***It is planned. There is occasional consultation, but not in a systematic, organised way

C Correlation between implementation of WFD and climate change

Question 7. Which role do climate change issues play in the implementation process of the WFD?

AU	Not a big role so far (work capacity problems, unclarity regarding the general meaning of climate change). Monitoring plays an indirect role: changes in natural circumstances can show the effects of climate change
DK	The Ministry of Environment (Miljøstyrelsen (Danish Environmental Protection Agency)) is currently working on the Climate Strategy, which will also include water and the link to the WFD, which has not been very strong until now.
ES	Not a burning issue; priority lies in the implementation of the WFD
GE	Internal scenarios are developed, but no official methodology exists regarding the WFD
GR	-
NO	Nat.: Has played a minor role so far. Will be considered later. Reg.: Not considered so far in the implementation process
NL	Additional measures are required as a consequence of predicted impacts of climate change. CC thus plays an important role in the implementation process in the Netherlands at the moment. CC impacts have been taken into account in setting water policy at the national level.
RO	Climate change does play an important role in the managerial option regarding WFD implementation. Climate change could give different results in the quality monitoring process.
UK	Climate change is principally an issue from the perspective of its impact on flood risk. Climate change per se is not influencing the implementation process of the WFD Climate change issues will be considered later with regard to monitoring status of water bodies and understanding changes

Question 7 : summarised tabular overview

	AU	DK	ES	GE	GR	NO	NL	RO	UK
No role as yet	X		X	X	X	X			X
Principally an issue but not considered in any systematic way, not influencing the WFD implementation process			X						X
Will be considered later		X				X			
Important role regarding management options							X	X	
Will (might) play a role in connection with monitoring	X							X	X

Question 8: Who is responsible for integrating questions regarding climate change into the implementation process of the WFD?

AU	<ul style="list-style-type: none"> Federal Ministry for Environment, Water etc. Federal Environmental Agency
DK	<ul style="list-style-type: none"> Ministry of Environment (Miljøstyrelsen (Danish Environmental Protection Agency))
ES	<ul style="list-style-type: none"> Climate change impacts on WFD implementation are not considered in any systematic way as yet
GR	<ul style="list-style-type: none"> Ministry of Environment
NO	<ul style="list-style-type: none"> Nat.: The Directorate-group Reg.: No specific institution/ person
NL	<ul style="list-style-type: none"> Guidelines are prepared at the national level the provinces
RO	<ul style="list-style-type: none"> Ministry of environment and water administration National Meteorological Administration
UK	<ul style="list-style-type: none"> DEFRA, EA (national level)

D Correlation between implementation of WFD and climate change

Question 9: How are the participation requirements in § 14 WFD interpreted?

Participation is done as ...	AU	DK	ES	GR*	NO Nat./reg.	NL	RO	UK
• Information provision	X	X	X	X	X	X	X	X
• Consultation	X	X	X*	X	X	X	X	X
• Active involvement	*	X	**	X	Probably*/**	*	X	X
• Shared decision making	**	X	X	?	Probably*/**	**	X	X
• Awareness raising	Part-ly		X	?	Probably*/**	X	X	X

AU: * Is being strived for ** at present not being considered

ES: * As yet occasionally; ** planned

GR: * As described in Article 6 of Law 3199, Official Gazette A', 280/9-12-2003

NL: * In some cases at regional – local level ** In some cases at local level

NO: * Will to a large extent be up to regional water authorities **Important to involve local municipalities

Question 10: Participation: who is (should be) involved? to what extend?

	AU	DK	ES	GR	NO Nat./reg. level	NL	RO	UK
• Administration, public bodies	X	X	X*		X*	X	X	X
• Stakeholders (key persons, NGO's)	X	X	X**		X*/X	X	X	X
• Affected persons/organisations	X							
• Open to the general public			X***		X**/X		X	X

ES: * current: administration; planned: both. ** In particular cases, planned. *** Under way, with diff. degrees that still need to be worked out.

NO: * to a large extent ** to a certain extent

E Problems and Priorities

Question 11: What problems do authorities / decision makers have to solve in terms of decision making for implementing the WFD?

Missing data (left column), missing assessment methods (right column)										
Priority of problem (highest=5; no problem =0) [] = reg. level in Norway										
	AU		ES	GR		NO		NL	RO	UK
calculating acidification (N + S deposition)	1	0		4	0	2	0-2 [4-5***]	0	1	1
calculating nutrification (N-/P- pollution)	0		X	3	0	4	4[3]	1	5	5
calculating water abstraction	3	0	X	2	1	2*	2*[4]	0	5	2
faunistic and floristic assessments	*		(X)	0	0	3**	4**[4]	0	5	1
Data and assessments regarding economic aspects	4	4**		4	2	2	3[3]	2	5	3
salinization			X	3	0				5	0

AU: * fundamentals do exist

** first elaborations exist regarding 4 core issues

NO: * Water power purposes: Good documentation./ Irrigation purposes: Poorer documentation

** Await data/tools from the REBECCA Projekt (EU FP6)

*** Have used very simple tools. Need better tools for the next phase.

Question 12 (a): Typical problems in the catchment

	AU	ES	GR	NO	NL	RO	UK
Diffuse pollution (N/P, esp. agriculture)	(X)*			[X]		X	X
Point pollution							
- industrial effluents, in particular organic loads		X				X	X
- inefficient sewage treatment, sewer overflows		X					
Discharge consents to water bodies						X	X
(predicting) land use changes							X
canalisation process has increased discharge velocities, causing drought upstream and floods downstream. CC impacts are expected to increase the frequency and intensity of such events					X		
Hydromorphology (river training, weirs etc.)	X						X
Forestry practises		X					

AU: *Diffuse entries through agriculture (nutrients, partly pesticides) are only found locally in the more intensively farmed areas in the east of Austria, no problem for Inn catchment

ES: Answers for La Tordera; for Catalan watersheds in general see problems in question 11

GR: Typical problems such as: Agriculture as a diffuse source of N, P, chemicals/ Untreated municipal waste water/ Uncontrolled water abstraction/ Management options/solutions/ Shift to less water-consuming agriculture/ Strict measures for water "stealing"

Question 12 (b) Typical ranges of possible responses (management options, solutions)?

	AU	ES	GR	NO	NL	RO	UK
Introduction of norms for good agricultural practice						X	X
Limitation of water discharge by increasing water storage capacity in upstream areas.					X		
· Restoration of meandering brooks							
· Increased ground water levels							
· Designated controlled flooding areas							
Reconstruction measures (river banks, meandering, removal of weirs etc.)	X						X
Guarantee of sufficient water flow	X						X

F Status quo of models/DSS Use

It is necessary to get a picture of the current use of models and Decision Support Systems in the different countries/catchments. Are they used at all? What kind of models?/To what extent?

Question 13: Kinds of models used for the decision making process?

	AU*	ES	GE	GR	NO*	NL	RO	UK
• Scientific models/tools for internal use, Models for part/sub problems e.g.			X	-	Reg: *	Great deal of information available		
- Nitrate flow/influx	X	*		-			X	X
- hydraulic models	X	X		-				X
- groundwater models		X						X
- fish population model	X			-				
- river habitat models		X						
• Tools/models to be used by participants (stakeholders/ general public)	**	-	-	-	(same) Reg: *	All data accessible via internet	Not yet considered	interested
• integrated Decision Support Systems (DSS)	-	X**	Elbe-DSS, Werra-DSS and others in development stage	WEDSS experimentally used at test site Cheimaditida Catchment	-	-	-	WEDSS experimentally used at test site Tamar Catchment?

AU: Comment: most of the interviewees were not the ones working with models but rather users of model outputs

AU: * Models hardly used in connection with analyses, but for developing measurements. There are a number of hydraulic and hydrologic models, decisions regarding their actual use are made on the regional (State) Level

** Stakeholders will consider models to be unsuitable

ES: * some efforts for pollution (inc. nutrients) under way with MONERIS and INCA.

** custom DSSs made by LEQUIA (University of Girona, <http://lequia.udg.es>) to support planning (wastewater treatment plants, industrial effluent treatment);

also ACA collaborated in the development of STREAMES, a DSS prototype for stream reach management

NO: * Not used by decision makers themselves. Await more simple tools

Question 14. Which models exactly are used in different fields?

<ul style="list-style-type: none"> Tools/models for calculating acidification (N + S deposition) 	<p>NO: SSWC (Steady State Water Chemistry Model). Critical loads model run by NIVA</p>
<ul style="list-style-type: none"> Tools/models for calculating nitrification (N-/P- pollution) 	<p>AU, GE: MONERIS (comment th: this is also used for the German Elbe DSS)</p> <p>NO (Nat): TEOTIL (simple nutrient export model)</p> <p>NO (Reg): - OSRES (P-model for lakes)</p> <p>- GIS-Avløp (nutrient export from sparsely populated areas)</p> <p>- „Jordsmonn-risiko tool“ (Assessment tool for Soil Erosion Risk and Nutrient Loss Risk)</p> <p>ES: MONERIS, INCA (still in calibration state)</p>
<ul style="list-style-type: none"> Tools/models for calculating water abstraction 	<p>NO: HBV? (run by the Norwegian Water Resources and Energy directorate)</p> <p>ES: HEC-RAS, MIKE 11, MIKE 21</p>
<ul style="list-style-type: none"> Tools/models regarding faunistic and floristic assessments (biodiversity) 	<p>AU: FAME (fish pop.)</p> <p>ES: RHABSIM, RIVER-2D</p> <p>GE: MOVER, Canodat</p> <p>UK: PHABSIM</p>
<ul style="list-style-type: none"> Rainfall runoff 	<p>ES: Sacramento, NAM</p>
<ul style="list-style-type: none"> Groundwater 	<p>ES: MODFLOW</p>
<ul style="list-style-type: none"> Water management 	<p>ES: AQUATOOL, SIM-5</p>
<ul style="list-style-type: none"> Tools/models regarding economic aspects 	<p>AU: First steps have been made without covering all necessary aspects</p> <p>ES: initial contacts</p> <p>GE: CBA</p>

Question 15. Who produced / produces models used in different fields?

	In-house developments	Scientists in academia	Consulting companies
general	X	X	
<ul style="list-style-type: none"> UK 		Most of the models	Commercial models tend to be used for decisions relating to capital intensive projects
<ul style="list-style-type: none"> Austria 	Hardly any	Prerequisites: Useability\ availability through the appointed enterprise (practical applicability, licences).	mainly institutes/ companies are commissioned
<ul style="list-style-type: none"> Tools/models for calculating acidification (N + S deposition) 		NO(Nat), ES	
<ul style="list-style-type: none"> Tools/models for calculating nutrification (N-/P- pollution) 		NO, ES	
<ul style="list-style-type: none"> Tools/models for calculating water abstraction 		NO(Nat), ES	ES
<ul style="list-style-type: none"> Tools/models regarding faunistic and floristic assessments (biodiversity) 		AU, ES NO(Nat)	AU, ES
<ul style="list-style-type: none"> Tools/models regarding economic aspects 	ES	NO, ES	NO, ES

Question 16: How would you assess the various products regarding ...

(5= very good to 0 = very poor)	In-house develop-ments	Scientists in aca-demia)	Consulting com-panies
Ability to produce solutions			
• N (Reg):		FOSRES: 4 Jordsmonn: 5 GIS-Avløp: 4	
• E:	3	4	3
Value for money			
• NO (Reg):		FOSRES: 4 Jordsmonn: 5 GIS-Avløp: 4	
• ES:	5	4	4
Userfriendliness	n.a.	n.a.	n.a.
Adaptability to new tasks	n.a.	n.a.	n.a.

(all others: no answers)

G End-users' requirements and suggestions

Question 17: General demand for information relevant for respective catchment management provided by euro-limpacs

In this case it is important to take into account not only the regional/catchment point of view. Some issues might be more relevant for the national level (r = regional level, n=national level)

	AU	ES	GE	GR	NO	NL	RO	UK
Climate change scenarios / models / information	r	r	n	n/r	n/r	r	r	r
Influence of climate change on ...								
• Surface water	r	r	n	n/r	n/r	-	r	r
• Groundwater	r	r	n	n/r		-	r	
• Biodiversity	r	r	n	n/r	n	n/r	r	r
• Economy	r	n/r	n	n/r	n	n/r	r	r
• hydromorphology	r		n					r

Question 18: General willingness to use Decision Support Systems

a) Role a DSS might play in the administrative work

	AU	ES	GE	GR	NO	NL	RO	UK
Generally positive	*			X*	X*			X
Development of scenarios, Strategic considerations			X					
DSS that operates at a site level and can help with individual local decisions								X
better management plan (support)		X				X	X	
facilitating decision making process in field of water administration	X	X*				X	X	X
facilitating the access/exchange to information for public and "interested economic agents".				**	(X)**	X	X	
Transparency/reproducibility	X							X
Reduction of personal cost	(X)							

AU: In general the necessary measures are so obvious, that no DSS is needed. In the future however this will become more important

ES: * Support of elaborating, implementing and monitoring progress of WFD river basin programmes of measures

GR: * There is a basic willingness to use DSS, but the preconditions have to be met first

** Might confuse them more as it would demand extra "skills" to apply. However local authorities realise the usefulness of such a tool as extra means of claiming support from the central government.

NO (nat.): * If the preconditions below are fulfilled.

(reg.): ** Might be an option to hire consultants to run the DSS.

Question 18 (b): Preconditions for using DSS/models ...

	AU	ES	GE	GR	NO	NL	RO	UK
• must be simple to use and quick to apply		X			X	X		X
• must be based on good data and a good knowledge base		X						
• should have clear objectives		X						
• should be able to link to the agency's databases and GIS			X					
• must give confidence limits on the results / transparency	X	X	X			X		X
• must give the correct result	X							X
• compromise between the volume of data and the quality of the results							X	
• Examples of working DSS	X						X	
• flexibility						X		
• reflect what local stakeholders experience in their daily lives.						X		

• “Health warning” (only to be used for defined purposes)	X							
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H Detailed Requirements regarding Models/DSS

Question 19: What kinds of models/ regarding which issues are needed?

	AU	ES	GR	NO	NL	RO	UK
• faunistic/floristic assessments	X	X				X	
• nutrient concentration	X	X				X	X
• diffuse pollution	X	X				X	X
• point sources	X						X
• hydromorphology	X						X
• debits across a water course (discharge ?), abstraction	X	X				X	
• Economic models (costs + social impacts)	X	X	X	X		X	X

Question 20. Which kinds of information (formats) would be helpful for solving each of the problems?

	AU	ES	GR	NO	NL	RO	UK
Graphical, map/GIS based	X					X	X
electronic format (databases)						X	
• A “suit of different presentation tools”					X		
• Water quality and quantity data			X				
As a minimum		X					
• Qualitative assessment of expected trends		X					
• Cause identification		X					
• Priorisation of measures to be applied		X					

Question 21: What kind/accuracy of output of the DSS is useful for end-users?

	AU	ES	GR	NO	NL	RO	UK
• 5 step scales are detailed enough	X	X	X			X	X
• Questions concerning accuracy and uncertainties are not that important as long as the DSS is able to rank two or more different management options (I agree absolutely = 5, I don't agree at all = 0)		(4)	4	Nat.2/ reg. 4			

Question 22: Requirements regarding user interface, layout

a) End-user requirements

	AU	ES	GE	GR*	NO	NL	RO	UK
Databases, GIS interface		X	X		Well arranged, easy-to-use			X*
content must have complete information for support of DSS. (must be correct)	X						X	
Open, scalable System		X						
Access to see/edit knowledge base by authorised users		X						

GR: * All parties should be satisfied! They don't really have an opinion/care about the layout at this point.

UK: *should be compatible with already existing systems (ArcView/Mapinfo)

b) Requirements for stakeholder participation

	AU	ES	GR	NO	NL	RO	UK
• No requirements for stakeholder participation with user interface				Well arranged, easy-to-use			X
• The information needs to make (sense?) for each stakeholder.						X	
• Different (graduated)presentation levels for different user groups	X						
• Visual attractiveness		X					
• Clean, clear intelligible reports for communication with stakeholders		X					

Question 23: Requirements regarding databases

a) End-users' requirements (Formats, links)

	AU	ES	GR	NO	NL	RO	UK
• No specific requirements			X	Reg: Should be compatible to National IT-tool developed for the characterisation process.			X
• Possibility to exchange data between database and GIS		X (Oracle, MS Access)				X	

b) Requirements for stakeholder participation

	AU	ES	GR	NO	NL	RO	UK
• No comment	X						
• No specific requirements			X				X
• Option to publish interactive content on the web (e.g. via a GIS map server)		X					

Question 24: Suggestions on how to improve the participation process (with the help of a DSS)

	AU*	ES	GE	GR	NO	NL	RO	UK
• Reliability / clarity of results and interpretations	X	X	X				X	X
• Availability	X	X					X	X
• Accessibility (for third parties)	X	X					X	X
• accuracy								X
• clear confidence intervals								X
• model verification and uncertainty assessment		X	X					
• Transparency of used models and data (esp. regarding climate scenarios);			X					

AU: * The answer aims more generally on the use of models rather than on participation

Question 25: Further comments:

<p>AU</p>	<ul style="list-style-type: none"> • There is scepticism concerning DSS because the system is extremely complex. On the other hand it might be helpful to have if it worked. • A DSS might not come too late because the first Management Plans won't be much more than a framework. • The expectation is to get something to compare alternatives on a higher (national) level • The system should be used for a couple of cases to show its plausibility
<p>NL</p>	<p>We found the questionnaire difficult to complete. Some questions were unclear but our main problem was that we already completed many of the interviews and workshops and could not ask all the questions listed in the questionnaire. Despite this we hope our results are helpful</p>
<p>RO</p>	<ul style="list-style-type: none"> • The climate changes have influences for flood causes; • Public participation is a requirement of WFD but for the moment it is possible just engagement of water users in the implementing of WFD; • A series of methodologies and models for the assessment of impacts (ex: nutrient loading, evolutions of debits across water course, impacts of pressures on aquatic ecosystems, evaluation of economic impact, cost-benefits analysis, etc.) are necessary; • The rising of reliability of stakeholders in future decisional models by accessibility, availability and truthfully of information provided.
<p>UK</p>	<p>Users are not expecting DSS to answer their questions. Definitely saw them as needing a user that can think about and understand the process of applying the DSS. The DSS should be for structuring and guiding the decision making process.</p> <p>Users are interested to know how far down the modelling route it was necessary to go before a sound decision could be reached. Aware that it is not necessary to have 100% understanding and accuracy or complex models to make a sound decision.</p>
<p>GE</p>	<p>Transparency of used models and data (esp. regarding climate scenarios); clarity of results and interpretations</p>
<p>ES, NO, GR</p>	<p style="text-align: center;">-</p>

Part III (Appendix1): Results from individual questionnaires

See Deliverable 37