EPI WATER

Evaluating Economic Policy Instruments for Sustainable Water Management in Europe

Second review report of EPI-Water Policy Think Tank

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Preamble

The deliverable D6.3 summarises the second round of input from the members of EPI-Water Policy Think Tank (PTT) into the EPI-Water research activities. It builds on:

- **Written reactions** by selected PTT members on a fourth consultation note prepared by EPI-Water (see Annex) for gathering reactions and feedbacks on the WP4 ex-ante case studies;
- Contributions from **PTT members who attended the Madrid Annual conference** of EPI-Water where preliminary results of the *ex-ante* assessment of WP4 case studies were presented and discussed. In particular:
    - PTT members who attended the event were asked to present their expectations vis-à-vis the EPI-Water assessments, contribute to working sessions on WP4 case studies and reflect on preliminary results during plenary sessions of the conference ;
    - Some PTT members also sent comments and contributions after the Madrid conference;

The present note summarises the different contributions from PTT Members linked to WP4 case study research, complemented by suggestions on how to bring results from WP3 and WP4 to wider policy guidance (this being the focus of WP5 activities). This note has been sent to all PTT members for comments prior to its finalisation.

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Facilitators of the EPI-Water Policy Think Tank

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1 Background

The EU-funded EPI-Water research project aims at assessing the effectiveness and the efficiency of Economic Policy Instruments (EPI) in achieving water policy goals, and identifying the preconditions under which they complement or perform better than alternative (e.g. regulatory or voluntary) policy instruments.

To guide its research activities and strengthen their policy relevance, and to facilitate the dissemination of research results to policy makers, the EPI-Water consortium has launched a dedicated EPI-Water Policy Think Tank (PTT).

Composed of representatives from Member States (MS) state administrations, stakeholder representatives and European water policy experts, the PTT has reviewed the intermediate research results and deliverables and participated in EPI-Water conferences in Berlin (see D6.2) and Madrid (for more details see further down in this document). To facilitate the PTT member's review of EPI-Water deliverables, it was proposed to develop specific PTT consultation notes raising key questions to which answers from PTT members.

2 Process undertaken since Deliverable 6.2

(Email and phone) Exchanges were pursued with EPI-Water Policy Think Tank since the finalisation of Deliverable 6.2. During the second half of 2012, the fourth consultation note focused on the research carried out in WP4 case studies was produced by WP4 case study leaders and ACTeon and submitted to PTT Members[1].

- Despite email reminders, written reactions to the fourth consultation note were limited (only a couple of members took the time to send comments and views, be it before or after the EPI-Water Madrid Annual Conference – see below);
- However, the forth consultation note helped preparing the involvement of PTT members in the second EPI-Water Annual Conference that took place in Madrid (Alcala de Henares) February 6th and 7th, 2013. Indeed, the attendance of PTT members at the Madrid Conference was good[2]. And they contributed

[1] EPI-Water Policy Think Tank. Consultation Note N° 4. Which main focus of the WP4 case studies for ex-ante assessment? October 8, 2012. (See Annex)

[2] EPI-Water PTT members who attended the conference include: Bernard Barraqué (CNRS, France); Laëtitia Bompérin (Agence de l'Eau Seine Normandie, France – as replacement of Sarah Feuillette); Eduard Interwies (InterSus, Germany & Greece); Łukasz Latała (European Commission, DG Environment); Xavier Leflaive (Organisation for Economic Cooperation & Development, France); Sergeiy Moroz (World Wide Fund for Nature, EU Freshwater Policy Office, Belgium); Juan Sagarna (Cooperativas Agro-alimentarias, COPA-COGECA, Spain – as replacement of Tania Runge); Stefan Speck (European Environmental Agency, Denmark). In

to the discussions during general EPI-Water PTT sessions[3] while participating in the working group sessions dedicated to the WP4 case studies (playing *inter alia* the role of *rapporteur* for individual working group sessions).

Deliverable 6.3 summarises the main feedbacks and suggestions made by EPI-Water PTT members following this fourth consultation note and their involvement in the Madrid Annual Conference. It also discusses practical suggestions for the involvement of PTT members in the activities to be carried out during the final year of EPI-Water, in particular to support the development of policy recommendations.

3 Feedbacks from PTT Members on research activities carried out in WP4

3.1 General feedback

PTT members stressed the importance and advantage of case studies as they help grasping practical issues, looking at potential bottlenecks and identifying solutions to overcome them. The involvement of stakeholders in the different case studies is clearly a plus. However, it was felt that **not enough attention was given to ecological issues** while these are central to the WFD implementation. Indeed, the bulk of WP4 case studies (and of discussions during the Madrid Conference) deals with water quantity and water quality issues.

Specific (more) attention should be given to the following issues, as addressing them will help strengthening the policy relevance of EPI-Water WP4 case study results:

- The **pre-conditions** for putting EPIs into practice. Particular focus should be on the political, legal[4], and institutional conditions – as the absence of some basic conditions for these different aspects might make the implementation of some EPIs difficult or impossible.

- **Putting the results of individual case studies into the wider knowledge** that exist in the literature on similar EPIs – so the validity of some conclusions to other conditions can be discussed. For example, literature on the nitrate tax (addressed in two case studies) or on PES (even if limited for European conditions) should be mobilised. Particular attention in searching for existing

addition, the representatives from the Stakeholder panels established in the WP4 case studies joined the group.

[3] In particular, sessions entitled: *Expectations on EPIs for water policy making perspective – short statements from the EPI-Water Policy Think Tank members*; *Reactions from PTT members around key questions*; and, *A last glimpse from Policy Think Tank members*.

[4] The involvement of scientists and experts in water law in EPI-Water research could help strengthening results.

knowledge should be given to acceptability issues, existing constraints, governance, incentiveness...

- Better specify, and investigate, the **time dimension of EPIs** (how fast are they put in place, and for how long), investigating potentially different implementation time frames to check whether these might influence impacts. Indeed, the EPIs investigated could be seen as short-term, medium-term or long-term EPIs depending on the current situation in different MS;

- **Understanding transition and** analysing **accompanying measures that could smooth transition**, as EPIs are likely to be implemented in an existing (fragmented and not necessarily coherent) water policy framework;

- Understanding the **synergies and integration with other policies** e.g. land-use management, agriculture policy, etc. (note: the need for other sector policies to be adapted might also be tackled under the "pre-condition" discussion);

- **Risk and uncertainty**, and how proposed instruments can help reducing risk. In fact, policy makers are likely to be interested by instruments that can "work well" under uncertainty (or under poor knowledge conditions);

- Investigating the potential role of private actors in the implementation of EPIs, and of the shared responsibilities between private and public actors (sharing water-related risks; accountability).

Some efforts have been made in two WP4 case studies to mobilise SEEAW/water accounts. However, this appears to still be at its infancy. And further work is required before the end of the project so the pros and cons of the SEEAW are clearly highlighted. One option put forward is to develop a specific process for assessing the added-value of applying SEEAW in other WP4 case studies where it is not applied yet. This would help assessing potential difficulties and limitations in applying SEEAW as input to practical recommendations (e.g. on how to adapt the framework for the future, which elements to focus in priority, etc.).

The following windows of opportunities for presenting WP4 case study results were highlighted:

- Ensuring the results are systematically presented to stakeholders of individual case studies;

- Contacting WP4 MS national bodies (ministries) for presenting and sharing results at a higher level, so feedbacks can be received;

- Feeding into the European Semester discussions.

3.2 Feedback on individual case studies

Case study 1: Flood and Excess Water – looking at the Tisza river basin in Hungary

Issues relevant to the Hungarian case study are the following:

- Working with a tendering approach appears interesting as there is limited practical experience in Europe so far.

- The suggestion to provide annual payment to land owners should be put in the context of current land tenure/management in different MS.

- Not all areas are suited for the use of storage reservoirs. This implies that a suitable geographic information system is put in place for supporting collective decisions by different land owners.

- The question of enforcement (and its impact on transaction costs) needs to be addressed.

Let's note that the approach proposed to pay for damages when flooding occurs is already implemented in Austria and in the Netherlands (e.g. Room for the River programme). Collecting some information from the Austrian experience could be useful for discussing the results of the Hungarian case.

Case study 2: Drought and Water Scarcity – looking at the combined Tagus and Segura river basins in Spain

The following issues relevant to the Spanish case study were raised:

- Because of the importance of the interaction between hydrology and economy (agriculture), some basic information on irrigated agriculture and on current water constraints should be provided so the case can be well understood.

- How to attract water users to non-conventional water sources if there are alternatives that might be cheaper? Are subsidies foreseen for water reuse?

- It is unclear whether the **drought insurance scheme** is a real "water EPI" or is it only applied to stabilize farm incomes (with no impact on water use). OECD has undertaken a recent and brief compilation of what is known about drought insurance schemes. And a quick review of this experience would put the Spanish insurance scheme into wider knowledge. In particular, these

experiences raise concerns about the capacity of the Spanish system to operate in a sustainable manner without public subsidies.

- How will **water markets** be integrated/coordinated with the development of new resources (such as desalinated water)? Are markets relevant to a product like water? How could we avoid rich farmers to purchase most of the water – and thus lead to inequity in the access to water resources? Which role water markets can have in improving the sustainability of aquatic ecosystems? At which scale could water market operate? What should be the role of the government in water markets – so "risks" of ill-functioning are limited?

The question of priorities for allocating public finances was also raised – in particular the need to allocate public resources to enforcement (controlling illegal abstractions) prior to invest in new resources (like desalination plants).

Case study 3: Biodiversity and ecosystem services investigated in the Seine-Normandie river basin in France

The combination of nitrate tax and payments for ecosystem services are seen as interesting. Issues that would need clarification or more attention include:

- Whether all fertilisers (including organic fertilisers) are targeted by the instruments;

- The potential application of a charge instead of a tax (with financial revenues being earmarked to the water system rather than going to the central budget), and the potential use of the charge financial revenues for supporting PES;

- The links and synergies between the EPIs and the Common Agriculture Policy. In particular, the difference between the PES and Agri-Environment Measures should be clearly specified.

- The importance of combining qualitative and monetary elements in assessing the value of potential services produced by changes in farming practices;

- The different aspects that need to be considered for defining the financial transaction in the PES, in particular the existing economic context, the expected reduction in farm production, the capacity to pay, etc.

- The alternatives to PES that exist locally for providing good quality drinking water (ex.: mixing water) and the costs, advantages and disadvantages of these other alternatives.

- The constraints that the current legal framework might impose on the application of PES in France.

- How to move from the PES tested at a local scale to lessons that might be relevant for the entire Seine-Normandie river basin – and which impact of "up-scaling" the instrument in particular on transaction costs?, or do we have economies of scale?

The introduction of a premium for supporting hydro-power production with positive ecological improvements is seen as an interesting instrument that could drive modernization and replacement ensuring continuity at the minimum so fish can migrate). The need to ensure that good technical solutions exist might be as important as the incentiveness of the EPI itself.

Case study 4: Macroeconomic perspective on water quantity issues of relevance of to the System of Environmental – Economic Accounting for Water (SEEAW): Water quantity in the Pinios River basin in Greece

The potential for water markets and reallocation will be investigated in the Pinios river basin. It will be crucial to look into the entire value chain (including the agro-food industry) when assessing the costs and benefits of these EPIs. Also, specific attention is required to analyse from where and to where water might be re-allocated. Indeed, taking water from some regions might exacerbate existing drought situations further. Discussions with farmers at an early stage of the application of new allocation mechanism will be essential.

Case study 5: Macroeconomic perspective on water quality issues of relevance of to the System of Environmental – Economic Accounting for Water (SEEAW): Water quality in the Odense River basin in Denmark

The comment to the Danish tax is similar to the one made for the French case. It is suggested that the pros and cons of applying a charge (with earmarking of financial revenues) instead of a tax are assessed, as this is expected to strengthen the case.

4 From EPI-Water research results to policy recommendations

4.1 Expectations from PTT members

PTT Members shared their views and expectations vis-à-vis the final product of the project that will draw policy-relevant conclusions.

- This final policy product should be a **guidance document** proposing a logical approach to designing EPIs and establishing the policy process for their implementation new EPIs, specifying inter-alia the role different actors (both public and private) should play. Whenever necessary, this guidance should distinguish between EPI development and implementation at the local, national and European scales.

- The guidance should put particular emphasis on:

    - **Pre-conditions** for EPIs to be implemented and effective;

    - The **role** of key stakeholders

    - The **combination** of EPIs and of EPI with other instruments.

    - The search for **coherence/integration with other policies**, such as agriculture, land-use, cohesion, energy, product…all accounting for the potential trade-offs

    - The **transition** from the initial situation with existing policies to the new situation with the EPI and the **sequencing** of such transition

- The guidance should address, or make specific reference to, the different **issues relevant to economic instruments identified in the EU Water Blueprint**. In particular:

    - The need to account for regional differences and the local context/conditions (in terms of water related issues, economic & social development, existing legal and institutional framework, etc.)

    - The costs (including transaction costs) and benefits expected from new EPI;

    - The stakeholder process that need to be established so stakeholders' points of view are taken into account and the acceptance of the instrument enhanced;

    - The importance of preconditions and basic rules (control of illegal abstraction, water metering, etc.) are tackled prior to proposing new EPIs;

    - The contribution of proposed EPIs to key principles stated in Article 9 of the WFD, in particular: incentive pricing, polluter-pays-principle and cost recovery;

The discussion raised future challenges in the "transferability" and "extrapolation" "and generalisation" of the case study results (from both WP3 and WP4) to wider recommendations – the main task ahead for the forthcoming WP5. This "extrapolation" step will need to build on current differences between and within MS in terms of: institutions & governance; main water management issues; socio-economic context; legal systems; culture & tradition; etc[5].

The discussions also stressed the need to review the assessment framework in light of the results of WP4 case studies, in particular for some issues (e.g. transaction costs) that are progressively gaining ground in policy discussions.

4.2 Mobilising PTT Members: initial thoughts

Mobilising PTT members outside of the two conferences themselves (Berlin 2012 and Madrid 2013) has proved rather difficult, as a result of, among others, the availability of PTT members at time of consultation and the extensive production of material by the project (despite the efforts made by the EPI-Water consortium to summarise issues and questions in the consultation notes in particular).

The Madrid conference, however, has proven very useful in collecting PTT Members' reactions and ideas, be it during the different sessions of the conference, informal talks during breaks and evenings, or in a written format right after the conference.

The development of consultation notes will continue, in particular for presenting: a) the final results of WP4 case studies; and, b) steps taken to extrapolate WP3 and WP4 results to EU-wide lessons and recommendations on the application of EPIs to water management. In addition, EPI-Water will produce in 2013 targeted policy papers that will facilitate PTT members input through their review of draft versions of these policy papers[6].

However, to effectively mobilise PTT Members in the last steps of the project prior to the final Conference, alternative mechanisms need to be proposed. These could include:

[5] Other initiatives that could provide input to this exercice include: a) the review of allocation mechanisms in several European countries, undertaken by VividEconomics for UK DEFRA; b) the EEA study on water pricing that reviewed institutional and management conditions for selected EU MS.

[6] The specific focus and the limited length (8 pages maximum) of these policy papers are expected to facilitate input from PTT Members. The first versions of two policy papers on 1) the assessment framework and 2) on the effectvieness of EPIs in achieving environmental objectives, have already been produced early 2013. And first comments on these policy papers have been received following the Madrid Conference.

- Dedicated phone or face-to-face interviews with PTT members[7];

- The organisation of web-conferences for discussing draft versions of the policy papers (in particular the key policy messages developed based on EPI-Water research);

- The organisation of a specific workshop for working with PTT members on EPI-Water research results and their policy relevance.

Such a (2-day) workshop attended by PTT Members and well-selected researchers from EPI-Water partners[8] could combine:

- Presentation of initial lessons extracted from EPI-Water research;

- Brainstorming sessions for widening these lessons and establishing priorities or a logical frame among them;

- Collective development of concrete recommendations responding to current EU policy needs – as direct input into the EPI-Water guidance proposed under WP5.

To be effective, specific "policy briefs" or targeted background documents would need to be prepared in advance for such workshop. To invite a couple of additional policy makers/decision makers (from the EC or from selected MS) that are well-known for their excellent understanding of water policy issues could also be envisaged/discussed.

Some PTT members and WP4 case study leaders responded positively to the possible organisation of a dedicated workshop – seen (in light of the experiences of the Berlin and the Madrid conferences) as an effective mechanism for mobilising the PTT Members expertise in a collective manner.

The different options available, and in particular the proposed workshop, still need to be discussed within the EPI-Water consortium, and their feasibility (including in terms of financial resources) assessed prior to taking a final decision.

[7] Face-to-face interviews could be organised informally during conferences or workshops attended by some EPI-Water researchers and PTT members.
[8] In particular WPs and WP4 case study leaders.

5 In conclusion

Overall, EPI-Water research team needs to reflect on the issues raised by the PTT members in particular for:

- Refining and finalising the *ex-ante* assessment carried out in WP4 case study ;
- Moving from case study results (from both WP3 and WP4 *ex-post* and *ex-ante* assessments) to policy recommendations. This will be the focus of WP5. And direct input from PTT members will clearly help strengthening the policy relevance of EPI-Water recommendations;
- Revising the assessment framework tested under WP3 and WP4. The assessment framework will be revised once more in light of the experience of WP4 case studies.

Additional discussions within the EPI-Water research team, and with all PTT members, are now required to agree on the best mechanism for mobilising PTT members in the development of policy recommendations.

Annex– The Consultation Note n°4 of the EPI-Water Policy Think-Tank

EPI-Water Policy Think Tank

Consultation Note N° 4

Which main focus of the WP4 case studies for *ex-ante* assessment?

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Authors	Pierre Strosser, Pierre Defrance & Andrés Garzon, ACTeon Gabor Ungvari, BCE-REKK Carlos M. Gómez, IMDEA Maggie Kossida, NTUA Massimo Pizzol, AU-NERI Alexandros Maziotis, FEEM
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Preamble

To guide the input and comments of the EPI-Water Policy Think Tank on key deliverables of the research project, dedicated **consultation notes** are prepared by EPI-Water researchers and sent to PTT members along projects' deliverables.

Each consultation note proposes a series of questions linked to issues relevant to the science-policy interface and to the effectiveness of EPI-Water research to support on policy processes. An open question is systematically included for collecting wider reactions and suggestions from PTT Members.

The answers to these questions, along with additional input and suggestions made by PTT members, will then be 1) summarised, 2) shared with all PTT members, and 3) discussed with EPI-Water researchers so they can assess their implications and propose, whenever relevant and possible, adaptation in the research protocol, the choice of pilot case studies or the delivery of specific output and their timing.

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1 Background

In 2011 the EPI-Water consortium and the associated overseas experts have completed an extensive (*ex-post*) review of some 30 economic policy instruments (EPIs) in Europe and beyond. The results of the review have been presented and discussed in the First EPI-Water Conference in Berlin in January 2012. Based on the insights gained and lessons learned so far, and to better grasp the factors influencing the design, effectiveness and efficiency of EPIs, EPI-Water dedicates now significant efforts in its WP4 by undertaking an ***ex-ante* assessment** of EPIs scenarios for carefully selected representative sites. This work, initiated in January 2012, will last for 20 months. A mid-term review is planned for February 2013 in the context of the Second EPI-Water Conference to be held in Madrid, 6-7 February 2013.

2 The main focus of the WP4 *ex-ante* assessment

In coherence with the research undertaken so far in EPI-Water, the ex-ante assessment will be structured around **seven complementary dimensions**:

- **Institutional background** and requirements for ensuring an effective implementation of the proposed EPI scenarios;
- **Environmental outcomes**, focusing on the impact on the status of aquatic ecosystems including changes in goods and services provided by ecosystems;
- **Economic outcomes** in terms of specific economic impacts (e.g. change in production of a given economic sector) and the overall net benefit;
- **Transaction costs** or the level of effort that is required for "putting the EPI scenario in practice";
- **Distributional effects** to identify who wins and who looses, as well as sub-sectors that might be specifically impacted by the EPI scenario;
- **Uncertainty** in terms of a) how the EPI scenario help addressing existing uncertainty in the water system, and b) the robustness of research results that will be obtained;
- **Policy implementability** so the assess the easiness to move from the current situation to the EPI scenario, along with possible necessary pre-conditions for the EPI scenario to be effective.

This common assessment framework developed under WP2[9] and applied for *ex-post* assessment to existing applications of EPIs[10] will facilitate the comparative analysis of assessment results (which is the main focus of its WP5) between WP4 case studies and also and between WP4 and relevant WP3 case studies that have focused on similar EPIs.

Research activities developed in individual case studies for performing the *ex-ante* assessment combine:

- A **multi-stakeholder process** for establishing a science-policy dialogue. Interviews with selected decision makers and stakeholders are complemented with dedicated stakeholder steering group at the scale of individual study areas. This ensures that: (local/national) policy demands and the local context/governance are well accounted for in designing the EPI scenarios that will be assessed; preliminary results are discussed so research activities can be adapted if deemed necessary; final results are confronted to the reality of current water management so recommendations can be drawn.

- The application of **different methods, protocols and models** (e.g. agro-economic models for assessing economic impacts, hydrological models for assessing environment impacts, etc.) for addressing the different dimensions of the assessment framework[11];

- The production of a wide range of **qualitative, quantified and monetary** research results and indicators so all dimensions of the assessment framework are addressed and presented simultaneously.

3 The case studies proposed for the *ex-ante* assessment

The WP4 case studies, selected for the *ex-ante* assessment though a series of interactions with different stakeholders and decision makers, focus on key water management issues mainly addressed by current European water legislation and

[9] The assessment framework is presented in the deliverable D 2.1 of the EPI-Water project entitled "Overall Assessment Framework" that is also accompanied by a Toolbox to support the subsequent work packages of the project in addressing the different dimensions of the framework. See http://www.feem-project.net/epiwater/docs/epi-water_DL_2-1_v1-1_prot.pdf

[10] See http://www.feem-project.net/epiwater/docs/epi-water_dl_3-2.pdf

[11] EPI-Water partnerrs do not apply a common modelling platform tackling all issues of the assessment framework in an integrated and combined manner. This is out of the scope of the EPI-Water research but may form possible follow-up research (if considered relevant by scientists, experts and policy makers involved in EPI-Water research activities).

initiatives (namely the Water Framework Directive (WFD), the Floods Directive, Water scarcity and drought, the forthcoming EU Water Blue Print but also the Climate Change Adaptation Strategy, the Europe 2020 flagship initiative on Resource Efficiency...). To meet the objectives of the research call on the relevance of the water account framework for supporting the design, implementation and design of EPIs, an additional case study on the application of water accounts for the quantitative management of water resources is also proposed. The main focus of the five case studies is presented below:

- Case study 1: **Flood and Excess Water** – looking at the Tisza river basin in Hungary (Lead partner: BCE-REKK, Hungary);

- Case study 2: **Drought and Water Scarcity** – looking at the combined Tagus and Segura river basins in Spain (lead partner: IMDEA, Spain);

- Case study 3: **Biodiversity and ecosystem services** investigated in the Seine-Normandie river basin in France (lead partner: ACTeon, France);

- Case study 4: Macroeconomic perspective on water quantity issues of relevance of to the System of Environmental – **Economic Accounting for Water** (SEEAW): **Water quantity** in the Pinios River basin in Greece (lead partner: NTUA, Greece);

- Case study 5: Macroeconomic perspective on water quality issues of relevance of to the System of Environmental – **Economic Accounting for Water** (SEEAW): **Water quality** in the Odense River basin in Denmark (lead: AU-NERI, Denmark)

The following table summarises some of the salient features of the 5 case studies. It is important to stress that all EPI-Water partners contribute to the ex-ante assessment proposed under WP4, combining their expertise for truly comprehensive and multi-disciplinary exercises. More detailed information on each case study is presented in annexes of this consultation note.

WP4 Case study	Lead partner	River basin(s)	Basic river basin characteristics	Focus of the case study including EPIs investigated	Justification(s) for the selection of EPIs
Water logging and flood risk reduction	BCE-REKK, Hungary	Tisza river basin (Hungary)	The Hungarian part of the river basin (with a total area of 156 000 km^2, also covering part of Romania, Slovakia, Ukraine and Serbia) is a mostly flat area. The river Tisza was heavily regulated in the 19th century, which resulted in a shorter length, reduced ecology and disruption of the earlier water cycle of the region. Related present problems include occasional heavy floods on the river and arid periods in part of the basin further away from the river.	EPI 1.1 - Annual payment to land owners for a contracted period in exchange for the reservoir service EPI 1.2 - Auction driven land-use change policy	EPI 1.1 - Flood storage reservoirs are being built, but the rules of operation (frequency of flooding, compensation to land owners) are not yet finalised. The most likely scenario is infrequent flooding (every 10-30 years) and compensation of crop damage to farmers. However, based on stakeholder consultation our hypothesis is that more frequent flooding in exchange for an annual fee paid by the state to the land owners for the option of flooding at any time, could improve the position of both the state and the land owners. The case study will test this hypothesis. EPI 1.2 – The heavily cultivated Marosszög area is hit by both excess water problems and arid periods. These problems can be remedied either through expensive technological solutions, or altered land use. A portion (to be determined through hydrological modelling) of the land is to be converted to alternative uses (meadows, wetlands, forests). The actual pattern of conversion is to be determined by an auction, in which farmers bid parts of their land for conversion. Converted land will receive the equilibrium price set through the auction, to be paid from funds collected from the owners of all other, unconverted land. While this EPI is rather novel in Hungary, stakeholders expressed their interest in pursuing it in hope of finding a win-win solution.
Water droughts and scarcity	IMDEA, Spain	Interconnected Tagus and Segura river basins (Spain)	Tagus RB: 55 750 km2 in Spain and 28 033 km2 in Portugal; 7.2 M inhabitants (6.2 in Greater Madrid), average consumptive water use of 2.6 trillion m3; average renewable resources of 12 trillion m3; and WEI of 0.22. Segura RB: 18 870 km2; 2 M inhabitants; average consumptive water use of 1.9 trillion m3 (85% from agriculture); average renewable resources [1940-2005] of 823 hm3/yr; average renewable resources [1990-	EPI 2.1. water trading at different scales (leasing contracts at regional inter-basin scale; local intra-basin schemes such as water use right spot market and auction system EPI 2.2 – Insurance schemes proposed as an institutional response to drought risk with risk premiums and compensations conditional to observed variables, such as rainfall, yields and farmers' incomes	These instruments are designed to align water users' individual incentives with the overall objectives of preserving water bodies and in particular to find opportunities of increasing water efficiency, provide private incentives for water saving, make room for the use of the already available non-conventional water sources as a substitute of freshwater resources and to cope with the existing prevailing incentives to use uncontrolled ground water as a buffer stock to cope with individuals drought risk. Farmers see EPIs as a way for devolution in a context in which political tensions have been a drawback for water management. The institutional setting regarding water markets needs to be

WP4 Case study	Lead partner	River basin(s)	Basic river basin characteristics	Focus of the case study including EPIs investigated	Justification(s) for the selection of EPIs
			2010] of 650-700 hm3/yr;; irrigated area of 253000 ha (14,41% of the total basin area); WEI of 2.3-2.71	EPI 2.3 - Different pricing schemes are proposed to promote the use of "non-conventional" water sources.	streamlined.
Ecosystem services and river restoration	ACT*eon*, France	Seine-Normandie river basin (France) with focus to the Bassée alluvial plain	The basin is located on the northwestern part of France. it covers 97,000 km² (18% of France territory). The population in the basin is around 17 million inhabitants. The relief is relatively flat with an average altitude o 160 m and less than 1% of the territory having an altitude of more than 500 m.	EPI 3.1 - Payment for Ecosystem Services (PES) to farmers in the flood plain of La Bassée EPI 3.2 - Introduction of nitrates tax on all fertilisers EPI 3.3 - Introduction of an premium on energy price for ecologically friendly hydropower plants (based on the German experience)	Diffuse pollution is a major issue with only 30 % of surface water and 20 % of groundwater are in good status based on the WFD criteria. The diversity of instruments (regulatory or economic) has failed up to the day to tackle efficiently this issue. The basin has one of the highest density of small hydraulic installations and counts 409 operating hydropower installations (172,174 kW). Around 40 % hydropower plants of the sites do not comply with the set minimum flow and 60 % prevent fish passage
Macroeconomic perspectives on the water quantity issues in the relevance of SEEAW methodology	NTUA, Greece	Pinios River basin (Greece)	Pinios river is located in the Thessaly plain in Central-Eastern Greece (which is the most productive agricultural region of Greece), draining in total about 9,500 km2. The main crops are cotton, wheat and maize, while grapes, olives and citrus fruits are also cultivated. Agriculture is the main water user, reaching about 1,600 hm3/year (representing the 95% of the annual water demand) while domestic water use is 70hm3/year. Mean annual precipitation is about 700 mm but its spatio-temporal distribution highly varies from about 400 mm at the central area to more than 1850 mm at the western mountain peaks, and is rare in July and August. Drought episodes are frequently experienced.	EPI 4.1 – Water markets Note that the main objectives of this "case study" is primarily a tool development objective, i.e.: • Develop a generic hydro-economic model to assess the performance and impacts of EPIs on the hydrological system • Provide a Decision Support System (DSS) tool for the optimal use of EPIs • Link the hydro-economic model to the SEEAW • Facilitate the communication of EPIs' performance to the policy-makers through the use of a quantifiable set of indicators built on the SEEAW parameters.	The intense and extensive cultivation of water demanding crops (65,000 ha are irrigated with surface water and more than 210,000 ha with groundwater) has led to a remarkable increase in irrigation water demand. The July water deficit reaches 114 hm3 (about 34% of the demand). The over-exploitation of groundwater has led to the deterioration of the already disturbed water balance and the degradation of water resources. Water quality issues due to diffuse agricultural pollution are challenging. Drought episodes are frequent in the area, while desertification is becoming an issue. Drought Management Plans or other policy instruments are lacking, and drought management is currently based on "crisis management" rather than on a pro-active and preparedness approach. Water conflict between agriculture, industry and domestic water supply are evident. The proposed EPI can facilitate the resolution of the water conflicts, by promoting a market mechanism which can create

WP4 Case study	Lead partner	River basin(s)	Basic river basin characteristics	Focus of the case study including EPIs investigated	Justification(s) for the selection of EPIs
					incentives for efficient water use and improved water allocation based on cost-benefit maximisation. Furthermore, with the proper design mechanism and enabling institutional environment the EPI can contribute to controlling illegal abstractions and reducing drought risk.
Macroeconomic perspectives on the water quality issues in the relevance of SEEAW methodology	AU-NERI, Denmark	Odense River basin (Denmark)	1050 km² (68% farmland); 246000 inhabitants. • Yearly Nitrogen load: Manure 5000 tons N; • Commercial fertilizer 6400 tons N. Surface water quality affected by: diffuse N&P load (agriculture), point source pollution (sewage treatment). Groundwater quality affected by: reduced infiltration, excess abstraction, leaching of contaminants. The current EPI-mix includes already: • A Phosphorous Tax (Agriculture) • A Water Supply Tax (5 Kr./m3, households only) • A Wastewater Tax (BOD, N, P) for sewage treatment plants.	Application of the SEEAW methodological framework (combination of economic and physical statistical data) to investigate the complex relationship between surface water quality and quantity of water abstracted by households/agriculture and assess two EPIs EPI 5.1 Tax on drinking water supply EPI 5.2 - Tax on nitrogen/nitrogen loss from diffuse sources	The case study will investigate an extension of the current tax system to account for two key water management issues and the link between quality and quantity.

4 Selected consultation questions on proposed EU case studies for *ex-post* assessment

General questions linked to the overall focus of the WP4 case studies

Question 1 –The table above summarises the focus of the key EPI-Water case studies. Are there **other EPIs** applied to specific water management issues that should have been investigated in priority? If yes, which ones, and why?

Question 2 – Out of the EPIs that will be investigated, which one(s) offer(s) **the greatest potential** in light of the priorities, recommendations and requirements of:

- Current and forthcoming EU water policy;
- Other current and forthcoming EU policies and initiatives that have a clear water-focus (e.g. adaptation to climate change, water in agriculture, resource efficiency....)

Question 3 - The **Madrid EPI-Water workshop** will focus on the presentation of results from the WP4 case studies, and there are specific steps for interacting with you/PTT members (see the draft workshop agenda in Annex provided as PDF document). Would you have specific requirements or suggestions on how the Madrid workshop agenda should look like so we provide the right format for: a) effective sharing of the main results of the WP4 case studies and; and, b) effective interaction and contribution of PTT members in the plenary debates?

Question 4 – What are other **"windows of opportunity"** (conferences, workshops, trainings, publications...[12]) in the coming 12 months where the (final or preliminary) results of EPI-Water WP4 *ex-ante* assessment could be presented and discussed?

Question 5 – Although results are not available yet, what would be from your point of view **the most interesting (policy-relevant) outcomes** that you expect and that would need to be disseminated and shared – and to whom?

Question 6 – Any **other comments, questions and suggestions** that would help guiding EPI-Water research activities and link them to on-going policy processes?

Case study specific questions

The following table presents selected questions for individual case studies.

[12] Others than the EPI-Water forthcoming conference

WP4 Case study	Main consultation questions
Water logging and flood risk reduction	Typically, the Hungarian part of the basin does not get water users to face the true costs of their activities. Economic or pricing problems therefore appear as water management problems. To remedy, political (and not only policy) barriers are to be crossed. Thus: Q1.1. Are there some best practices from some of the EU countries on how this problem is actually addressed: what processes, ideas are used to get closer to recovery of the costs associated with water services by the users of these services? Q1.2. When does the EU get to the point when member states which do not comply with the WFD or other water related directives will actually start facing serious consequences (e.g. high enough fines). Any existing evidence? Q1.3 What major risks do you foresee to implementation of the proposed EPIs? Q1.4 Do you think it is feasible to create an EPI for flood protection in an international setting, in which one country pays an up-stream country in order to implement measures (e.g. afforestation, reservoir management) that will reduce the severity of flood downstream? Any real life examples?
Water droughts and scarcity	Q2.1. From your viewpoint, what contribution may be expected from the implementation of the proposed EPIs to cope with water scarcity and drought risk? Q2.2. What suggestions do you have regarding the particular instruments proposed? Q2.3. Which of the above-mentioned instruments might be the most interesting for other water scarce and drought-prone areas in Europe? Q2.4. Would you suggest any other innovative EPI that may be tested to cope with water scarcity and droughts in Spain and other water scarce areas in Europe? Q2.5. Allowing water trading might require the recognition of private property on water use rights. Do you see any contradiction with the consideration of water as a public good that needs to be protected accordingly? Would an extensive use of water trading be compatible with the principles of water management in Europe? Q2.6. The convenience of implementing EPIs to reduce water scarcity is mostly based on efficiency arguments. Do you see any contradiction or possible conflict with other social objectives such as fairness, rural development, convergence, etc.? Q2.7. In what sense do you think advances in cost recovery and water pricing, as well as in the application of the WFD in all EU member states, will facilitate or make complex the development and effective implementation of the above proposed EPIs? Q2.8. According to your personal knowledge and experience, what are the main institutional barriers that would need to be overcome to foster the implementation of water trading in Europe? Q2.9. While effective to reduce scarcity the reallocation of water and the increase in water efficiency may lead to some negative effects, such as rural areas losing income opportunities, employment and indirect demand of inputs. Would the EU be willing to include provisions to compensate for these potential losses or to further alternative ways of rural development in these areas? Q2.10. Do you think effective contributions to reduce water scarcity can be used to argue for some exceptions to the full cost recovery principle? I.e. the use of desalinated water for allowing the recovery of an aquifer may or not be charged with a tariff lower than the financial cost of desalinated water? Is that possible within the current EU water policy? Q2.11. The implementation of EPIs can depend on some critical changes that are costly to implement, such as installing metering devices at a farm level to improve marginal pricing, building new water distribution networks to make water reallocation possible, or building a financial fund to make possible a drought insurance system with premiums affordable to individual farmers. Do you think the EU will be willing to support Member states in this purpose? How exactly are these mechanisms in place? What institutional reforms would be required?
Ecosystem services and river restoration	Q3.1. Are the proposed EPIs relevant to the current water management issues and policy debate in different countries/at the EU scale? On which EPIs and components of the assessment framework should priority be given? Why? Q3.2. How policy relevant is the question of single-service versus multi-service PES? Would you know of attempts of multiple-service PES been tested and assessed? If yes, which ones?

WP4 Case study	Main consultation questions
	Q3.3. Is the combination of a nitrate tax and a PES relevant ? Which other combinations of EPIs (or EPIs with other regulatory or voluntary/collective approaches) could be investigated instead? Q3.4. The need for « intermediary players » or brokers between suppliers and recipients of ecosystem services is currently discussed in France, in particular with regards to the possible role of public actors and its impact on both transaction costs and efficiency. Is this issue also considered in other countries? If yes, for which types of PES (water or non-water, scale…)? Q3.4 With hydro-morphology recognized as key water management problem, in addition to direct subsidies, are other EPIs for promoting river restoration that could be proposed and investigated? Are some of them already applied – and if yes, where?
Macroeconomic perspectives on the water quantity issues in the relevance of SEEAW methodology	***Questions linked to the EPI investigated*** Q.4.1. With regards to the water markets model, how should the original entitlements/rights (before trading takes place among users) be allocated? Following a simple rule (e.g. based on land property) vs. set of criteria? If we use multiple criteria and relevant scoring (e.g. users who have already implemented water efficiency measures and technologies receive some additional score, farmers who cultivate economically sustainable and high marketable products receive some additional score, etc.) could this produce counter-incentives? Does it make sense to embed multiple criteria and an associated optimization function in the allocation of water rights? And what role does the degree of exploitation on the internal water resources has to play? Q4.2. Regarding the seasonal allocation of the rights (% of entitlement available at each time step) how complicated is to adopt flexible and "updatable" approach vs. an approach where the timetable 9and volume of) released water is predefined for the whole irrigation season? Q4.3. How distributed would the solution have to be (based on your experience with water markets)? ***Questions linked to modelling and the tools developed*** Q4.4. When coupling an economic with a hydrological model (WEAP21 in our case), issues of computational time occur. It is expected that objective functions that require multiple runs of WEAP will be expensive. The economic model should be relatively computationally light. Are there suggestions towards using specific economic models vs. others to minimize the overall computational cost? Q4.5. Comment on the status of water quantity related tables in the SEEAW (asset accounts, physical supply and use, hybrid accounts), and its potential benefit for both ex-post assessments as well as a planning ahead tool for water managers and policy makers. We find the SEEAW as a constrained accounting system more suitable for organizing the physical and economic information in a coherent and harmonized way, rather than a tool useful for assessing EPIs (their effectiveness after implementation, and even less their potential for application and impact of the macro-economy). What is you view?
Macroeconomic perspectives on the water quality issues in the relevance of SEEAW methodology	***Questions linked to the EPIs investigated*** Q5.1 Do you think that these EPIs can actually be effective for water management? Q5.2 How do you see these EPIs in the context of the current country-specific policy mix (Taking into account that Denmark has a "tradition" for environmental taxation)? Q5.3 Do you see a potential extension of these EPIs in the EU context: i.e. to other EU countries? Q5.4 Do you see potential for EPI2 to have effects on other issues rather than water management? (e.g. in the agricultural sector?) ***Questions linked to SEEAW*** Q5.51. Concerning the status of water quality assessment in the SEEAW: The SEAAW method is robust regarding the accounting for water quantity, but the SEEAW approach to water quality accounting is still experimental and fragmented. Our study aims at providing useful experimental evidence and methodological knowledge to improve such section of the SEEAW. What other approaches could be used to improve it further?

WP4 Case study	Main consultation questions
	Q5.62. Concerning the relevance of the SEEAW for ex-ante assessment. Our study is inspired by the principles of the SEEAW, and combines economic and physical data/models. However, it highlights one limit of the SEEAW: it is a constrained accounting system and not a modelling tool, and therefore more adapted to ex-post assessment. What is your view on the use of the SEEAW for ex-ante assessment of EPIs?

Annex I - Water logging and flood risk reduction in Tisza river basin (Hungary)

Gabor Ungvari, BCE-REKK

1 Objectives

As a background to the Middle Tisza river case study, the river Tisza was extensively regulated during the 19th century. The expected benefits – primarily the creation of more agricultural land – were delivered, the side effects, however, were numerous and they have escalated during the last 150 years. The most detrimental consequence of the canalisation of the river is that regular, large scale floods take place. The usual response to the floods has been the elevation of the dikes along the river. Nevertheless, as time passed, the height of the floods kept rising, and the dikes needed to be raised and reinforced again and again. Modelling the likely impacts of climate change in the Carpathian basin has suggested that the trend of increased peak flood water levels will continue in the coming decades as well. Further strengthening the current flood defense system consisting of dikes is prohibitively expensive, and alternative solutions are sought. The most promising alternative is cutting peak flood waves by storing some of the flood water in emergency reservoirs along the river. The case study investigates an EPI that could potentially assist in achieving this goal.

The other consequence of river regulation is the widespread water logging in the former floodplain. Within the Marosszög, a region characterized by high quality soil and intensive agriculture, annual water availability is sufficient but its spatial and temporal/seasonal variation poses a problem for farmers. There are periods when excess water is to be diverted away, while at other times water for the purpose of irrigation is not enough. Thus, it is essential to keep some of the water in excess in the area by infiltrating it into the soil. This measure could also contribute to the improvement of the water balance for the not irrigated land. This would be achieved if some of the current intensive agriculture was turned into alternative forms of land use (meadows, forests, wetlands). Therefore, the objective of this study area is to propose an Economic Policy Instrument (EPI) in the Marosszög area that will allow the reduction in the coverage of arable land, i.e. areas with low productivity will be converted, while areas of higher productivity will remain cultivated. As a result, the proposed EPI will reduce the exposure of the remaining arable land to water extremities and enhance the mitigation capacity of the landscape through the advanced infiltration in the converted land (a service to the agricultural production).

2 Key Challenges

Most water courses in the Tisza river basin are characterized by poor ecologic status. This is mainly attributed to the river control program (to reduce the risk of floods), intensive agriculture use and deterioration in the quality of water.
As part of the major river control program to reduce the risk of floods in the Tisza, the river bends were cut and flood protection dikes were raised. The total length of the river became shorter, the water flow speed increased and much of the former flood plain area was separated from the river. Flood plain, together with the oxbows created by the river control program, became ecologically semi-isolated areas. Therefore, wetlands and natural ecosystems, characterized by water demanding vegetation, have been declining.

Moreover, the demand of agriculture to drain excess surface water creates another conflict with ecology. Costly measures are applied to pump water from low lying areas in order to channel and pump it into the rivers¿. Many wetland ecosystems within the Tisza river basin are left without sufficient water. On the other hand, agricultural areas with higher elevation regularly suffer from water shortages. Thus, while the overall volume of water within the river basin can be viewed as sufficient, its current spatial distribution is heavily skewed.

Regarding water quality, the key problem is the high organic and nutrient concentrations, indicated by the lush vegetation within the riverbed as well as the occasional mass destruction of fish populations. The pollution is attributed to insufficiently treated and untreated wastewater, excess water drained from the fields or infiltrated through surface and underground streams, already contaminated by intensive agricultural practices. Underground water bodies are over-used, partly due to a lack of proper policy-based incentives and as a result of illegal abstractions of water for irrigation. The quality of sub-surface water is also declining, mostly because of the infiltration of contaminated water from heavy agricultural use.

3 Innovative EPIs

In the Middle Tisza study site, the EPI to be tested is an annual payment to land owners for a contracted period in exchange for the reservoir service, in other words, the state acquires the option to release water to the contracted area in case there is a risk of flooding on the river Tisza. The EPI proposed for the Marosszög area is an auction driven land-use change policy.

4 Assessment of the innovative EPIs

4.1 Middle Tisza flood protection

The EPI to be tested is an annual payment by the state to land owners for a contracted period in exchange for the option to release water to the contracted area in case there is a risk of floods that exceeds the level of the dike system along the river Tisza. The land owners receive the annual payment regardless of whether the state makes use of its option, while no compensation for crop damage is paid when inundations take place. In other words, in exchange for a fixed payment farmers run the risk of flood damage to their crops, and have to make farming decisions accordingly (potentially switching crops or even changing land use), while the state is buying a special kind of insurance policy reducing the damage from floods further downstream from the reservoirs.

The technical details of the agreement need to be specified (e.g. responsibility for and sharing the costs of different activities, further use of stored water). Quite importantly, the flood risk that triggers the use of the reservoir needs to be set. The state currently wants to use the reservoir only for critical events that happen once every few decades, in this case land use may not have to be altered. Alternatively, the area may be flooded regularly (every few years) which requires a different land use pattern, and actually could sustain specific ecosystems, which would not be viable without regular inundations. The farmers within a reservoir need to agree on the price that they submit. This will be simulated through the bidding process that is to be tested within our research. The credible threat of competition among potential reservoirs should be made explicit. Once the method proves successful, it can open the way for further steps of optimization on the multi-reservoir level, but that is outside the scope of the current research.

4.2 Marosszög green auctions

If part of the Marosszög is converted from single crop agricultural use to a mosaic structure of land use, including temporary-water-cover tolerant agricultural cultivation plots or stretches of meadows, forests, and wetlands, then the excess water could be soaked up by the soil and vegetation, while also improving the water balance of the soil of the surrounding agricultural fields. For the moment, this is a working hypothesis for the case study. The extent to which this proposition truly applies will become clear after hydrological modelling of the Marosszög area, to be carried out in the autumn of 2012.

Hydrological modelling should help to determine the benefits that a given pattern of land use change will deliver in terms of improved water balance. After this the size of the water management infrastructure delivering equivalent benefits can also be established, as well as its investment and operating costs. Once several scenarios of land cover have been simulated, it becomes possible to choose the scenarios that will the basis of testing the EPI. The key element of a scenario is the proportion of agricultural land that is to be converted into alternative land use. Additional variables may also be specified, such as location of hot spots where an above average percent need to be converted, or the type of desired land-use, but this is up to the hydrological modelling and the expertise of the participating ecologists.

The EPI proposed for the Marosszög area is an auction driven land-use change policy. Farmers will bid a portion of their lands for land-use change, supplying a price tag for compensation[13]. From the bids a supply curve will be constructed showing the marginal cost of land use change. This curve will help to determine the equilibrium price of converting the required number of hectares. The farmers whose bids are accepted receive this equilibrium price for each hectare. The compensation is paid from a fund to which the owners of unconverted land have to contribute, equally after each hectare.

The owners of unconverted arable land receive a benefit in the form of improved water balance and presumably lower costs than those of the technological solutions – we will only know if the EPI will indeed deliver lower costs when the tests have finished. The owners of converted land will receive a revenue from payment through the EPI, and also fetch some land use benefit (e.g. timber if they plant a forest), possibly coupled with a CAP payment. It is expected that areas with low productivity will be converted, while areas of higher productivity remain intensively cultivated.

The actual rules of the auction are still to be designed, addressing questions such as single or multi-round bids, sealed or open bids etc. In practice, it may be wise to reach the desired land use switch ratio in several rounds encompassing a number of years so that farmers can gain experience regarding both the auction and the subsequent land use, and can also rely on the results of the previous auction(s) for price information.

5 Questions to PTT members for the case study

Typically, the state does not get water users to face the true costs of their activities. Economic or pricing problems therefore appear as water management problems. To remedy, political (and not only policy) barriers are to be crossed. Thus:

- Q1.1. Are there some best practices from some of the EU countries on how this problem is actually addressed: what processes, ideas are used to get closer to recovery of the costs associated with water services by the users of these services?
- Q1.2. When does the EU get to the point when member states do not comply with the WFD or other water related directives will actually start facing serious consequences (e.g. high enough fines). Any existing evidence?

[13] The actual portion depends on the farmer. Some farmers may offer all of their land, others may not bid at all, knowing that they will be paying someone else to change their land use instead. Farmers may bid different pieces of their land at different prices.

Annex II. Water droughts and scarcity in the interconnected Tagus and Segura river basins (Spain)

Carlos M. Gómez, IMDEA

1 Objectives

Current trends towards increasing water scarcity and drought risk in Southern European Regions pose a significant threat over riparian ecosystem sustainability and economic development. This trend is the result of many driving factors combining the still existing incentives towards increased water use and some water governance failures such as the imperfect enforcement of property rights and the preponderance of supply-side policies used to address these problems. However, environmental outcomes stemming from complex social-ecological systems is often unpredictable and the successive implementation of command-and-control policies in the Tagus and the Segura interconnected basins has resulted in higher water scarcity and uncertainty. Drought and crises are now recurrent, and the current institutional setting has left decision makers with few options other than to reinforce the current path of the system with further command-and-control policies. Decision-making became reactive and incremental as the system has become extremely vulnerable to external shocks. Therefore, the objective of this study is to propose Economic Policy Instruments (EPIs) in the Tagus -Segura interconnected river basins that, once introduced in the institutional setup, might contribute to reverse the trend towards increased water scarcity and improve collective drought risk management..

2 Key Challenges

The key challenges in the Tagus-Segura interconnected river basins are related to water scarcity and the environmental status of water bodies. To begin with, irrigation demand in the Segura River Basin (SRB) grew as water availability increased and traditional rainfed crops, such as olive tree or grapevine, were progressively replaced by more profitable irrigated lands. Soon it was evident that whatever attempt to reduce pressures over water resources had to deal with irrigation, and again the chosen policy was supply-oriented. The modernization of irrigation infrastructures has been publicly supported in the SRB during the last two decades and favoured by the positive response of farmers and irrigation communities. This modernization has been particularly intense in areas where scarcity is more evident, such as those supplied from groundwater, alternative resources and water from the Tagus-Segura water transfer.

The irrigation efficiency rates in the SRB are now amongst the highest in Spain. However, these efficiency gains, while effective to maintain water using economic activities have not led to reductions in pressures over water-providing ecosystems as

water demand has continued to increase. At the same time, attempts to tackle water shortages by new or improved infrastructures have contributed to water scarcity. These new facilities have performed below what was originally expected due to water scarcity (which reduces the amount of water stored in reservoirs) and the lack of political agreement to allow higher water transfers from less water scarce regions. In addition, the reductions in water delivery from surface water during drought seasons, although effectively enforced, have resulted in increasing incentives to extend the use of groundwater and other sources that may scape to the control of water authorities. The failure of these alternatives has led to the search for new instruments to cope with the challenge of reversing the trend towards scarcity and improve drought management. To be effective and implementable within the prevailing institutional framework these alternatives need to find the way to make individual decisions regarding the use of water compatible with the collective goal of reducing pressures over water ecosystems and make the entire social and economic system more resilient to water uncertainty.

Water scarcity, although not as severe as in the SRB, is also a relevant problem in the Tagus River Basin (TRB), especially in areas close to high demand urban areas. As in the SRB, policies have been aimed towards increasing the supply capacity of the system to satisfy increasing demands. Under some circumstances where water infrastructures are not enough to cope with increasing priority urban demand even when water resources are abundant, new infrastructures are a true need. For example, the Trujillo and Alto Tiétar urban areas, where small dams have proved to be insufficient to provide resources needed during peak demand periods. Yet, in most cases new infrastructures respond to water conflicts among different water uses which could have been more efficiently and effectively addressed via EPIs without further increasing water availability and jeopardizing environmental and even urban water demand.

Furthermore, the expansions of irrigation as well as new technological developments that allow pumping out from a deeper stratum have resulted in an estimated annual groundwater overexploitation in the SRB. The imperfect definition of water use rights makes groundwater play the role of a buffer stock and increases the risk of overexploitation in drought periods. Diffuse pollution, mainly from intensive agricultural practices, is also an important problem in the SRB. Another relevant environmental problem in the SRB is the irregular occupation of riverbanks and floodplains (which are part of the public domain by law) by urban and agricultural land uses, which have resulted in a poor ecological status and a higher vulnerability to flood events. This situation and the decrease and variability of runoff have resulted in a significant degradation of riparian ecosystems and forests.

In the TRB, environmental problems are less scattered. The most important ones are related to the pollution stemming from the densely populated and industrial metropolitan area of Madrid. In order to solve these problems, new treatment

infrastructures have been built, illegal dumping has been dealt with and industrial discharge systems have been improved. However, as demand increases, so does the need for more expensive infrastructures.
Evidence from a number of research studies shows the existence of relevant opportunities to improve the efficiency with which water is allocated among different locations and economic uses as well as to improve the technical efficiency with which water is used in agriculture and other economic activities. The real challenge consists in putting into place the policy instruments able to convert these opportunities into effective strategies to simultaneously improve or maintain the water users' income and market opportunities, for example by stabilizing rural incomes and providing higher water security for both urban and rural uses, while reducing at the same time water use and drought risk in the medium term. This is the main purpose of the EPIs proposed for this case study.

3 Innovative EPIs

In the Tagus-Segura interconnected river basins a combination of innovative EPIs will be tested. This includes water trading, insurance, and pricing schemes.
In terms of water trading, schemes at different scales are considered: regional (inter-basin) schemes are proposed to make possible the more efficient allocation of water among river basins and local (intra-basin) schemes to enhance the per drop productivity at a local level while creating incentives to save water in each particular use and place. Leasing contracts are analysed within the first level, whereas in intra-basin terms, two EPIs are considered. Firstly, a water use right spot market is proposed in order to reveal how much water could be voluntarily saved and made available for trading in areas where this potential does exist. Secondly, an auction system in the more water scarce areas will be proposed in order to allocate the additional amounts of water available. Both, the spot market and the auction scheme, are expected to provide information on the value of water required by stakeholders to agree upon signing inter-basin leasing contracts. This information will also be relevant to water authorities and other stakeholders as it might contribute to build a common understanding of the problem and the opportunities at hand as well as to promote the legal and other institutional changes required to allow the effective implementation of the proposed water trading schemes. .

The drought insurance system is being proposed as an institutional response to drought risk. So far these responses have been dominated by unplanned emergency responses from the water authority and by uncoordinated defensive reactions from water users. In fact, underground water have been used as a buffer stock and drought periods are associated with higher incentives to engage in unlawful water abstractions that might contribute to higher scarcity and increased drought risk in the medium term. This dynamic can be reversed by putting in place a formal drought insurance system able to cope with the asymmetric information and the systemic risk challenges that are in the origin of the above-mentioned drought responses. An insurance scheme, with risk premiums and compensations conditional on observed

variables, such as rainfall, yields and farmers' incomes will be designed and tested for this purpose and the needed role of government in making the implementation of this scheme feasible will be defined.
Water prices play an important role, not only in the individual decisions about the use of water but also in the existing opportunities and the performance of the other EPIs considered in the study, the water trading and water insurance schemes. Apart from strengthening this connection in the design and test of the above mentioned EPIs, a collection of pricing schemes will be proposed in order to make possible the production and use of "non-conventional" water sources.

4 Assessment of the innovative EPIs

As a first step to this process, essays on institutional designs for water markets and water pricing for irrigation will be prepared. The former includes aspects such as the conflicting views on the particular role of water pricing, its role as a cost-recovery mechanism (but not so much as a revenue collection instrument, but also allowing for the integration of the resource and environmental costs), its potential to provide scarcity signals and induce water use efficiency, the failure in allocating additional resources from massive investments in desalination plants, who should pay for alternative water sources (which are currently in excess supply), etc. Moreover, a report on the institutional transition to establish water markets in EU countries will be prepared. This report will provide additional reflections to the on-going ad-hoc comparative analysis (Australia, Chile, Spain and Western states of the USA). An additional report will discuss the asymmetric information issues in farmers' decisions, as well as scenarios and policy design regarding the CAP reform, including the role of drought insurance in the Rural Development pillar of the reform.

Furthermore, the modelling phase of EPIs will involve the development of an optimization module to run both the economic and hydrological models to forecast system behaviour in the Tagus-Segura interconnected river basin. As a next step, the assessment phase of EPIs will include reports on the economic valuation of environmental outcomes of the application of assessed EPIs in the Tagus-Segura, on institutional issues (*perceptions, acceptability, and transaction costs)* in the Tagus and on the feasibility of auctioning systems (*experiments with auctions or trading)* in the Segura basin. A final report on the policy relevance of innovative EPIs suggested for the Tagus-Segura, for instance comparison with command-and-control alternatives already in place, and the evaluation of environmental benefits and costs, will be also delivered. Finally, a land use model will be built for the Segura RB to explore the behavioural change of farmers facing drought with or without EPIs and their consequences in terms of land use change.

5 Questions to PTT members for the case study

- Q2.1. From your viewpoint, what contribution may be expected from the implementation of the proposed EPIs to cope with water scarcity and drought risk?
- Q2.2. What suggestions do you have regarding the particular instruments proposed?
- Q2.3. Which of the above-mentioned instruments might be the most interesting for other water scarce and drought-prone areas in Europe?
- Q2.4. Would you suggest any other innovative EPI that may be tested to cope with water scarcity and droughts in Spain and other water scarce areas in Europe?
- Q2.5. Allowing water trading might require the recognition of private property on water use rights. Do you see any contradiction with the consideration of water as a public good that needs to be protected accordingly? Would an extensive use of water trading be compatible with the principles of water management in Europe?
- Q2.6. The convenience of implementing EPIs to reduce water scarcity is mostly based on efficiency arguments. Do you see any contradiction or possible conflict with other social objectives such as fairness, rural development, convergence, etc.?
- Q2.7. In what sense do you think advances in cost recovery and water pricing, as well as in the application of the WFD in all EU member states, will facilitate or make complex the development and effective implementation of the above proposed EPIs?
- Q2.8. According to your personal knowledge and experience, what are the main institutional barriers that would need to be overcome to foster the implementation of water trading in Europe?
- Q2.9. While effective to reduce scarcity the reallocation of water and the increase in water efficiency may lead to some negative effects, such as rural areas losing income opportunities, employment and indirect demand of inputs. Would the EU be willing to include provisions to compensate for these potential losses or to further alternative ways of rural development in these areas?
- Q2.10. Do you think effective contributions to reduce water scarcity can be used to argue for some exceptions to the full cost recovery principle? I.e. the use of desalinated water for allowing the recovery of an aquifer may or not be charged with a tariff lower than the financial cost of desalinated water? Is that possible within the current EU water policy?
- Q2.11. The implementation of EPIs can depend on some critical changes that are costly to implement, such as installing metering devices at a farm level to

improve marginal pricing, building new water distribution networks to make water reallocation possible, or building a financial fund to make possible a drought insurance system with premiums affordable to individual farmers. Do you think the EU will be willing to support Member states in this purpose? How exactly are these mechanisms in place? What institutional reforms would be required?

Annex III. Ecosystem services and river restoration in the Seine-Normandy river basin (France)

Pierre Strosser and Andrés Garzon, ACTeon

1 Objectives

The adoption of the Water Framework Directive (WFD) has shifted the water policy debate in France but also throughout Europe from the traditional "water quantity and water quality" debate to questions of ecological status, biodiversity and restoration of the severe morphological alterations to aquatic ecosystems. Overall, the WFD has stressed the need to shift from a uniform aquatic ecosystem to a more diverse aquatic environment that would deliver highly diversified habitats for the aquatic fauna and flora. Therefore, as indicated by the River Basin Management Plan (RBMP), morphological alteration impacting on the ecological status of water bodies is one of the sources of major concern in all French river basins and needs to be tackled to achieve the environmental goals of the WFD. At the same time, the objectives of wetland restoration proposed by the forthcoming "Grenelle laws" (following the *Grenelle de l'Environnement*) apply to all river basins, although with different levels of importance. And the question of biodiversity, in particular linked to aquatic ecosystems and connected wetlands, is equally important for all river basins in France. Therefore, the objective of this study is to explore the use of EPIs in the Seine-Normandie river basin that allow the preservation of ecological status, biodiversity and restoration of the severe morphological alterations of aquatic ecosystems.

2 Key Challenges

One of the key challenges is controlling diffuse pollution, in particular nitrates and pesticides. For instance, 259 drinking water abstraction points were abandoned because of their level of nitrate (exceeding the standards of 50 mg/l) between 1993 and 2001. Furthermore, nitrates from agriculture contribute to eutrophication of the coastline and excessive growth of algae (with the indirect consequences of toxicity for bathers, wildlife and consumers of shellfish). This phenomenon remains a contentious issue. In relation to morphological issues, navigation and hydroelectricity are the main causes of the regression of species of migrating fish due to modification of riverbanks, locks, etc. (hydrological continuity of environments).

3 Innovative EPIs

The proposed innovative EPIs are related to payment for ecosystem services (PES) to farmers in the flood plain of *La Bassée* and the introduction of nitrates tax on all fertilisers purchased by farmers. The former will act as voluntarily mobilising

willingness to pay from specific water users and (potentially from beneficiaries from other wetland-related ecosystem services – flood control, etc.) to influence land use in a flood plain. The latter will be a compulsory instrument, which would be imposed on all fertilisers containing nitrates, and that would be paid by its users (i.e. farmers). It could be earmarked to finance water projects or redirected to the general budget.

An additional EPI will be tested, namely: the introduction of subsidies for ecologically friendly hydropower plants through a more favourable electricity feed-in tariff in the Seine-Normandy basin (modelled based on the German experience). This instrument will take the form of a payment of a premium for the price of electricity generated by hydro-electric operators selling electricity into the main grid engaged in investment that contributes to reaching good ecological status of water bodies. This would be an entirely new voluntary instrument in the current French institutional setting promoting hydro morphological restoration, in addition to existing subsidies for investments in hydro morphological restoration.

4 Assessment of the innovative EPIs

The assessment of the innovative EPIs will be as follows. In relation to the introduction of feed-in tariff subsidies for ecologically friendly hydropower plants, a typology of hydropower plants to be used in the assessment of the premium to hydropower operators will be prepared, followed by an estimation of the willingness to accept compensation by operators for a given restoration project. The preparation phase for PES and subsidy for hydro morphological restoration will focus on the data required and model specifications. A methodological note on the land-use model for La Bassée (PES) and the basin in general (nitrate tax) will be prepared. Moreover, another note regarding the economic part of the model to be used and data requirements to analyse nitrate tax will be presented. The modelling and assessment phase will include reports from the results of the agronomic/hydrologic and economic (cost-benefit analysis) models.

Also, an additional report will be delivered on the assessment of hydro morphological improvement measures to feed the development of assessment of the EPI on premium to hydropower operators.

5 Questions to PTT members for the case study

- Q3.1. Are the proposed EPIs relevant to the current water management issues and policy debate in different countries/at the EU scale? On which EPIs and components of the assessment framework should priority be given? Why?

- Q3.2. How policy relevant is the question of single-service versus multi-service PES? Would you know of attempts of multiple-service PES been tested and assessed? If yes, which ones?

- Q3.3. Is the combination of a nitrate tax and a PES relevant ? Which other combinations of EPIs (or EPIs with other regulatory or voluntary/collective approaches) could be investigated instead?

- Q3.4. The need for « intermediary players » or brokers between suppliers and recipients of ecosystem services is currently discussed in France, in particular with regards to the possible role of public actors and its impact on both transaction costs and efficiency. Is this issue also considered in other countries? If yes, for which types of PES (water or non-water, scale…)?

- Q3.5 With hydro-morphology recognized as key water management problem, in addition to direct subsidies, are other EPIs for promoting river restoration that could be proposed and investigated? Are some of them already applied – and if yes, where?

Annex IV. Macroeconomic perspectives on the water quantity issues in the relevance of SEEAW methodology (Pinios River basin, Greece)

Maggie Kossida, NTUA

1 Objectives

The proposed case study focuses on capturing the fragile balance between water availability and use, and modelling it in terms of an accounting system, with the overall purpose of being able to identify the drivers of imbalances, assess the state of resources, and evaluate adequate response measures, while relating the contribution of water to the economy and the impact of the economy on water resources. It is based on the UNSD SEEAW methodological framework, and opts to produce a prototype application where the impact of selected EPIs will be simulated and evaluated on a physically based catchment model, following a robust modelling approach. Water accounts are by definition primarily carried out at watershed level and are fuelled by data from watershed and administrative levels. Depending on the aggregation or disaggregation scale they can be reported both at watershed or administrative levels. The proposed study will be implemented in **Segura River Basin** and **Pinios River Basin** in Spain and Greece respectively. These areas were selected due to the increased risk of water scarcity, competence of major water uses, and inadequacy of the existing water resources management schemes.

The main objectives of the case study are:

- Develop a generic hydro-economic model to assess the performance and impacts of EPIs on the hydrological system
- Provide a Decision Support System (DSS) tool for the optimal use of EPIs
- Link the hydro-economic model to the SEEAW
- Facilitate the communication of EPIs' performance to the policy-makers through the use of a quantifiable set of indicators built on the SEEAW parameters.

2 Key challenges

Among the most important changes in agriculture was the spectacular increase of cotton cultivation due to the subsidies provided to the farmers since 1981. Within the EU, Greece has become the largest cotton producer, accounting for about 70% of the total EU cotton production. As a result of the initial favourable CAP measures (very strong incentives were provided to replace traditional non-irrigated crops like wheat with irrigated crops like sugar beet, cotton, tomatoes, etc.), cotton cultivation became gradually the primary farm activity (and source of income) for a growing number of agricultural households. Furthermore, the adopted policy by the Ministry of

Agriculture to subsidize the improvement of cultivation conditions including water management such as boring, construction of irrigation canals, etc. resulted in the water resources exploitation in Thessaly (Pinios area). During this period a dramatic increase of surface and groundwater exploitation was observed from both public and private sector. More specifically, from the 1980s to 1990s a huge number of bores were constructed legally or illegally. In parallel, a very big number of individual irrigation equipment such as high pressurised mobile rain gun systems and center pivot sprinkler systems with low-pressure sprays were obtained by farmers. Another reason that contributed substantially to water overexploitation was the replacement of non-irrigated crops such as wheat, barley and oats with water demanding crops such as corn, alfalfa, tobacco and cotton, while the area under fallow was reduced significantly.

3 Innovative EPIs

The proposed innovative EPIs are water markets that will be proposed for the Pinios river basin, based on the experience of the Tagus-Segura river basins. The paper trade will be evaluated against the physical system so physical bottlenecks that would prevent trading are identified.

4 Assessment Methodology

The core of this task focuses on the development of a hydro-economic model linking a hydrological to an economic model, which simulates the selected EPIs, in order to assess their performance on a physical based reality under different scenarios, and define optimal key parameters under a specific context. The output of the model will feed the standard SEEAW tables. This can be achieved by the development of hydrologic-economic model in the Pinios river basin.

Firstly, a robust Water Resources Management Model will be developed for the Pinios RB. The model will have a node-based architecture and will develop water balances as well as additional functionalities in order to run simulations scenarios for optimal water allocation representing the physical system. The modelling platform proposed for this work is the Water Evaluation and Panning (WEAP) system (http://www.weap21.org/), developed by the Stockholm Environment Institute's U.S. Centre.

Regarding the development of the economic model, collaboration with Tagus and Segura interconnected river basins is foreseen. The economic model to simulate the "water use right markets" in Segura River Basin will be customized and adopted for the Pinios River Basin. Further, the hydrological model and the economic model will be coupled to develop a hydro-economic model using the WEAP system. The potential of linking an additional economic model which simulates "cap and trade" will also be investigated. The hydro-economic model will be able to function as an integrated model and different scenarios (on top of the baseline) will be run to

forecast the behaviour of the EPI under different alternative futures (e.g. climate, land use). Additional scripting will be implemented in WEAP to enable a SEEAW export function, which will allow the generation of standard SEEAW to export tables (asset accounts, physical supply and use accounts, elements of hybrid accounts). The same tables will be generated for Segura RB. The results prior to and after the implementation of the EPI will be reflected in the SEEAW tables and expert judgment will be made on whether the tables can easily communicate a change in performance to the policy makers. For this purpose, policy-relevant indicators (e.g. water productivity per sector) will be compiled based on the SEEAW parameters, to assess whether they can reflect changes in the baseline scenario. Finally, a multi-objective GA will be developed as a DSS Tool linked to the hydro-economic model, in order to define optimal key parameters of the model under a specific context. This algorithm will also run in the Segura River Basin (with the necessary parameter customization). The algorithm will seek to maximize an utility function, testing the result on physical basis, and identifying the best set of solutions, which satisfy the design constraints while maximizing the defined objective function.

5 Questions to PTT members for the case study

Questions linked to the EPI investigated

Q.4.1. With regards to the water markets model, how should the original entitlements/rights (before trading takes place among users) be allocated? Following a simple rule (e.g. based on land property) vs. set of criteria? If we use multiple criteria and relevant scoring (e.g. users who have already implemented water efficiency measures and technologies receive some additional score, farmers who cultivate economically sustainable and high marketable products receive some additional score, etc.) could this produce counter-incentives? Does it make sense to embed multiple criteria and an associated optimization function in the allocation of water rights? And what role does the degree of exploitation on the internal water resources has to play?

Q4.2. Regarding the seasonal allocation of the rights (% of entitlement available at each time step), how complicated is to adopt flexible and "updatable" approach vs. an approach where the timetable (and volume of) released water is predefined for the whole irrigation season?

Q4.3. How distributed would the solution have to be (based on your experience with water markets)?

Questions linked to modelling and the tools developed

Q4.4. When coupling an economic with a hydrological model (WEAP21 in our case) issues of computational time occur.It is expected that objective functions that require multiple runs of WEAP will be expensive. The economic model should be relatively computationally light. Are there suggestions towards using specific economic models vs. others to minimize the overall computational cost?

Q4.5. Comment on the status of water quantity related tables in the SEEAW (asset accounts, physical supply and use, hybrid accounts), and its potential benefit for both ex-post assessments as well as a planning ahead tool for water managers and policy makers. We find the SEEAW as a constrained accounting system more suitable for organizing the physical and economic information in a coherent and harmonized way, rather than a tool useful for assessing EPIs (their effectiveness after implementation, and even less their potential for application and impact of the macro-economy). What is you view?

Annex V. Macroeconomic perspectives on the water quality issues in the relevance of SEEAW methodology (Odense River basin, Denmark)

Massimo Pizzol, AU-NERI

1 Objectives

The purpose of water quality aspects as related to the economy focuses on capturing the fragile balance between water quality and use and on modelling it according to the hybrid approach (economic/environmental) proposed by the SEEAW- System for Environmental-Economic Accounts for Water methodology. The assessment of water quality concerns will focus on the Odense River Basin (ORB), which is located in the Funen region of Denmark. The ORB is a physical water environment that is strongly modified by humans: many watercourses have been channelized and regulated and are under controlled maintenance. The purpose of this study is to apply the principles of the SEEAW methodology and link both economic and physical data/models in order to produce new insights regarding the potential effects of EPIs on the quality of the aquatic system of the ORB.

2 Key challenges

There are several water management–related issues in the Odense catchment, ranging from water pollution to overexploitation of groundwater. The most remarkable issue is the failure of the various types of water bodies to meet their environmental objectives. This is attributable to pollutant pressure due to loading with nutrients and hazardous substances, and due to physical pressures associated with interventions such as watercourse maintenance, land reclamation. The main issues identified are the following. In terms of surface water quality, the most relevant management challenges regard point and diffuse sources of nutrient load: extensive diffuse nitrate and phosphorus pollution originating from agriculture and point source pollution originating from sewage. The management of fertilizers and of discharges from wastewater treatment plants into water bodies are therefore the main focus in this EPI-water task. There are two sub-issues related to groundwater management. Firstly, control in the alteration of the natural transport pathways for storm water and secondly, regulation of the excess abstraction of groundwater. Finally, the water management should be synchronized and integrated with the Natura 2000 planning such that the program of measures for water bodies also contributes to the achievement of the environmental objectives of the Habitats Directive for both aquatic and terrestrial habitats.

3 Innovative EPIs

Two approaches are considered within the SEEAW methodological framework, i.e. such approaches focus on the combination of economic and physical data. The idea is to investigate the complex relationship between surface water quality and quantity of water abstracted by households/agriculture. This can be performed by designing and modelling the effect of a tax on drinking water supply similar to the Danish water supply tax. The proposed tax will be an improved version of the existing Danish water supply tax by taking environmental issued more explicitly into account. The second proposal is about modelling the implementation of an EPI that addresses nutrient load, in particular in the form of a tax on nitrogen/nitrogen loss from diffuse sources, which will allow the estimation of the benefits achievable with this EPI in terms of improved water quality via reduced concentration of nitrates.

4 Assessment of the Innovative EPIs

The assessment of water quality will be limited to one specific hazardous substance or nutrient. Data on time series for pollutant concentration and emission (load) will be retrieved and scenarios modelled based on past and expected trends. The implementation of an EPI designed as an "improved" Danish *water supply* tax, i.e. having a direct effect on water quantity, will be determined by means of an econometric model linking water price and demand. Hydrogeological modelling will be used to investigate whether the defined EPI can have an indirect effect also on water quality. The results will be used to review the SEEAW methodology and propose improvements regarding the combination of data on water quantity and quality, as well as physical with economic data (hybrid account). As far as the implementation of an EPI related to the nutrient load is concerned, the impact-pathway approach will be used to estimate the economic value of benefits from reducing the concentration of nitrates. The modelling will consider different scenarios: the baseline scenario will be defined comprising business-as-usual activities and existing policy instruments. A reference scenario will be defined for the EPI to be explored, which may eventually include adjustments in existing national level policy instruments as a policy-maker would see fit. Emitters' adjustment to modulations in EPI's will be gauged from an optimization model addressing emitter's behaviour. An emission-based multimedia fate model will be used estimate how the impacts of the EPI's will come through in terms of marginal changes in water quality. On basis of these results it will be possible to outline an extension of the UN framework for environmental accounts which addresses the quality aspects.

5 Questions to PTT members for the case study

Questions linked to the EPIs investigated

- Q5.1 Do you think that these EPIs can actually be effective for water management?

- Q5.2 How do you see these EPIs in the context of the current country-specific policy mix (Taking into account that Denmark has a "tradition" for environmental taxation)?
- Q5.3 Do you see a potential extension of these EPIs in the EU context: i.e. to other EU countries?
- Q5.4 Do you see potential for EPI2 to have effects on other issues rather than water management? (e.g. in the agricultural sector?)

Questions linked to SEEAW

- Q5.51. Concerning the status of water quality assessment in the SEEAW: The SEAAW method is robust regarding the accounting for water quantity, but the SEEAW approach to water quality accounting is still experimental and fragmented. Our study aims at providing useful experimental evidence and methodological knowledge to improve such section of the SEEAW. What other approaches could be used to improve it further?
- Q5.62. Concerning the relevance of the SEEAW for ex-ante assessment. Our study is inspired by the principles of the SEEAW, and combines economic and physical data/models. However, it highlights one limit of the SEEAW: it is a constrained accounting system and not a modelling tool, and therefore more adapted to ex-post assessment. What is your view on the use of the SEEAW for ex-ante assessment of EPIs?

Annex VI. Draft agenda of the Second EPI-Water Conference to be held in Madrid, 6-7 February 2013

Programme - Day 1	
09.00 – 09.30	**Registration & Breakfast**
S1 · Opening Session	
09.30 – 09.40	Welcome to the Second FP7 EPI-Water Conference
09.40 – 09.50	FP7 EPI-Water Project in a nutshell: progress since Berlin 2012
09.50 – 10.00	Workshop Objectives
S2 · Key policy questions at the forefront	
10.00 – 10.20	The Blueprint to safeguard Europe's Waters and what it expects from EPI-Water
10.20 – 10.40	Zooming in: the expected role of EPIs to address water policy challenges in Spain
10.40 – 10.50	Expectations on EPIs for water policy making - Statements from EPI-Water PTT members
10.50– 11.00	**Questions & Discussion**
11.00- 11.30	**Coffee Break**
S3 · *Ex-ante* assessment of innovative EPIs	
11.30 – 12.00	Introduction: setting the scene. Innovative EPIs as a response to key policy questions
12.00 – 12.20	Round-table discussion: Case-study innovative EPIs at a glance: scope, objectives and challenges
12.20 – 12.40	**Questions & Discussion**
12.40 – 13.00	Key messages from WP4 case studies: synthesis of results
13.00 – 14.15	**Lunch Break**
S4 · Working groups (WG) sessions (chair or wrap up by PTT & IBE members)	
14.15 – 16.00	Working group 1: Innovative EPIs for floods and excess water
14.15 – 16.00	Working group 2: Innovative EPIs for drought and scarcity management
14.15 – 16.00	Working Group 3: Innovative EPIs for ecosystem services and biodiversity conservation
14.15 – 16.00	Working group 4: Water accounts and EPIs (Water quantity and quality)
16.00 – 16.30	**Coffee Break**
S5 · An interactive panel discussion between experts from the Inspiration Beyond the EU (IBE) group, the EPI-Water consortium and participants	
16.30 – 17.40	Brief inputs from all IBE members
17.40 – 17.50	**Questions & Discussion**
17.50 – 18.10	**Time out: soft drinks and water**
S6 · From research outcomes to policy messages	
18.10 – 18.20	Introduction and key questions to be addressed
18.20 – 18.45	Reactions from PTT members around these key questions
S7 · Closing session	
18.45 – 19.00	Summary of discussions
20.30	**Dinner**

Programme - Day 2	
09.00 - 09.30	**Breakfast**
S8 · Opening of session of day 2	
09.30 – 09.40	Description of objectives for Day 2
S9 · Key results of the *ex-ante* assessment of innovative EPIs for water management (progress to date)	
09.40 – 10.10	How would EPIs perform? Reporting from WG sessions
10.10 – 10.30	**Questions & Discussion**
10.30 – 10.45	**Time out: soft drinks and water**
S10 · Mainstreaming issues: EPIs from a wider perspective	
10.45 – 11.00	EPIs and governance
11.00 – 11.15	**Questions & Discussion**
11.15 – 11.30	Combining EPIs, command & control and voluntary approaches: which opportunities within EU water policy?
11.30 – 11.45	**Questions & Discussion**
11.45 – 12.00	EPIs as an instrument for policy coordination (water, energy agriculture, etc.)
12.00 – 12.15	**Questions & Discussion**
12.15 – 12.45	EPIs: how acceptable they are?
12.45 – 13.45	**Lunch**
S11 · A tour d'horizon of IBE members' views	
13.45 – 14.15	Round-table with IBE members
14.15 – 14.45	**Questions & Discussion**
14.45 – 15.00	**Time out: soft drinks and water**
S12 · Putting research results in the policy context - last thoughts from PTT members	
15.00 – 15.15	A last glimpse from PTT members
15.15 – 16.15	**Questions & Discussion**
S13 · Moving Forward, next steps in EPI-Water	
16.15 – 16.35	General Presentation
S14 · Closing Session	
16.35 – 16.45	Key Messages from the Conference
16.45 – 17.00	Closing Words and acknowledgement by the Conference Organizers
17.00	**End of the Conference**

Highlights of PTT members' participation in the Second FP7 EPI-Water Conference.

The following summarized agenda is meant to highlight your participation as PTT member in the Second EPI Water besides all other contributions you may wish to do during the rest of the sessions. See shaded activities.

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	CS meeting (optional)	CS meeting (optional)	S1 · Opening Session	S8 · Opening of session of day 2	PSC meeting
			S2 · Key policy questions at the forefront	S9 · Key results of the *ex-ante* assessment of innovative EPIs for water management (progress to date)	
			S3 · *Ex-ante* assessment of innovative EPIs	S10 · Mainstreaming issues: EPIs from a wider perspective	
	Lunch	Lunch	Lunch	Specific PTT Lunch	Lunch
PM	CS meeting (optional)	**PTT dinner**	S4 · Working groups sessions	S11 · A tour d'horizon of IBE members' views	CS meeting (optional)
			S5 · An interactive panel discussion between experts from the Inspiration Beyond the EU (IBE) group, the EPI-Water consortium and participants	S12 · Putting research results in the policy context - last thoughts from PTT members	
			S6 · From research outcomes to policy messages	S13 · Moving Forward, next steps in EPI-Water	
			S7 · Closing session	S14 · Closing Session	
			Social dinner	End of the conference	