

ESAWADI Policy Paper

Scope of the project - WFD articles targeted

The ESAWADI project (Utilising the **Ecosystem Services Approach for Water Framework Directive Implementation**) has analysed the added-value of the Ecosystem Services Approach (ESA) for decision making and public participation processes supporting the implementation of the Water Framework Directive (WFD), and in particular its economic requirements. The project has built on the experiences of the first management cycle of the WFD.

Therefore, the WFD articles targeted were:

- Art. 14: focussing on the communication and stakeholders' participation in relation with WFD decision process;

As well as the main articles related to the economic analysis:

- Art. 11: estimating the cost-effectiveness of measures and sets of measures at different scales in order to reach the WFD objectives;
- Art. 4: assessing the proportionality/disproportionality of costs associated with proposed measures in order to justify potential exemptions from the WFD environmental objective of achieving good surface water status by 2015;
- Art. 9: assessing and improving the cost-recovery level of water services (including environmental and resource costs) as well as the adequate contribution of different water uses/service users to these costs;
- Art. 5: analysing existing water uses, impacts and pressures, for the French case-study;
- In addition some partners looked at a most debated and related question: payment for ecosystem services.

Nevertheless, in the early stages of the project, it appeared that it will be more fruitful to enlarge the perspective to the different sustainable integrated watershed management instruments which exist at national and regional levels and which provide additional opportunities for implementing ESA. Several reasons led to this decision, which was highly supported by the project European Steering Committee: 1) WFD has to build on and stimulate the use of these instruments; 2) this decision triggered a higher interest among local players in the ESA; and 3) it allowed to show how ESA can contribute to a better integration of the different European and national policies (Natura 2000, Floods Directive, etc.).

Key words

Ecosystem Services Approach, Water Framework Directive, Sustainable Watershed Management, ecological processes, stakeholder participation, decision-making, economic analysis.

Description of the project

Emphasizing the importance of “real life experience”, the ESAWADI project adopted a case study approach, based on a shared “Framework of Analysis” (Blancher et al 2011, see list of deliverables below), with three real-time but otherwise different experiments. It allowed the development of a variety of tools and methods for implementing the ESA. Table 1 below summarises the case studies with regard to scale, local issues under consideration and methodology.

Table 1: Summary of differences among the three case studies

	Study scale	Local issues
France	<i>River Basin District:</i> Adour-Garonne <i>Sub-basin:</i> Dordogne catchment <i>Study focus:</i> Middle stretch of the Dordogne river <i>Study sub-area:</i> 13 municipalities within that area	<i>Issue 1:</i> Trade-offs between hydro-peaking and sustainable river management and effects on ecosystem services <i>Issue 2:</i> Effects of river mobility restoration on ecosystem services
Germany	<i>River Basin:</i> Ems <i>Sub-Basin:</i> Hase <i>Study sub-area:</i> Oxbow in the Town of Bramsche, Lower Saxony	<i>Issue:</i> Linear and lateral river continuity and ecological health
Portugal	<i>River Basin:</i> Mondego <i>Sub-basin:</i> Lower Mondego <i>Study sub-area:</i> Mondego Estuary	<i>Issue:</i> Sustainable integrated management of estuarine water resources given a range of pressures, in particular water pollution

Policy focus

The ESAWADI focus is mainly operational (field based) with a strong scientific component and considerations for policy-making needs at the European level. The analysis and recommendations are mainly targeted at water managers and other stakeholders who aim to implement ESA as a supportive tool for IWRM schemes. The project allowed to: 1) identify regional and local stakeholders’ expectations, fears and barriers regarding an actual ESA implementation¹; 2) learn from the testing of different tools and methods; and 3) elaborate lessons and recommendations.

The paragraphs below and the last chapter of the synthesis report (chapter 7) are structured around these outputs.

¹ It is worth underlining that if the perception of some barriers to implementation were a result of the very nature of ESA, others were related to a lack of knowledge, experience and misconceptions of ESA.

Policy milestones and relevant project key outputs

A. Ecosystem services assessment as a concept

Regional and local stakeholders' expectations, fears and barriers

Through different projects (Millennium Ecosystem Assessment, TEEB, etc.), ESA has been developed to ensure that the value of natural assets is taken in full consideration. Nevertheless, ESA faces ideological criticism related to its anthropocentric and utilitarian approach and because of the perception that it “commodifies” nature. Some see the risk of it becoming a tool for seeking the maximisation of some highly valued services at the expense of others and the integrity of ecosystems.

ESAWADI team's experience

A good part of the discussion within ESAWADI team and with local partners was devoted to the very concept of ESA. During the implementation of ESAWADI, the project team promoted an ESA which was neither merely anthropocentric (i.e. solely focused on human benefits maximisation) nor ecosystem-centred (i.e. conservation without taking human needs into consideration).

The experience of the ESAWADI team was that the ESA may ensure that a comprehensive and consistent approach is used to highlight the linkages between uses and ecosystem functions, thereby identifying the full range of ecosystem services (potential or existing services), and thus facilitating the design of relevant policies. It can prevent the selection of measures with a narrow and short-term perspective (such as a measure which maximizes the benefits to one group at the expense of other stakeholders).

Lessons and guidelines

- Whereas the ESA is often only considered as a way to quantify and monetize benefits from biodiversity, it should be emphasized that the core and principal strengths of the ESA lie in its structured and systematic approach to describing the way functioning ecosystems provide benefits to society.
- Consistent with the WFD's stringent demands with respect to “Good Environmental Status” (GES), the ESA should be seen as a systemic approach to optimal ecosystem integrity protection and the sustainable provision of the various services in the long term.
- On-going scientific debates and the continued development of the concept of ecosystem services and other related concepts are still very important. For the operational implementation of the ESA in relation to IWRM schemes, it would be useful to translate these debates into further research issues. In this way, the richness of the concept will support fruitful local assessments and investigations whether through a detailed framework of analysis or simple educational documents which highlight the main elements of the concept.

B. Characterization of ecosystem services and implementation of the ESA

Regional and local stakeholders' expectations, fears and barriers

The comprehensiveness of the ESA has raised expectations. However, assessing all ecosystem services in a watershed presents a huge operational challenge: water managers expect that this is too complex and requires too much work. Institutional barriers such as discrepant reference scales for administration and ecosystems add to these challenges. As a consequence, it is expected that most of the ESA applications will result in oversimplifications which will lead to disappointing or deceiving results. Besides, there is a reluctance to acknowledge the added value of ESA in comparison to other integrative management tools currently applied. Several water managers doubt that the quantification and even monetization of ecosystem services are feasible or would produce relevant results; while others consider that ESA is not useful if it does not produce quantitative or monetary results.

ESAWADI team's experience

Drawing from its experience, the ESAWADI team developed a step-wise approach (see chapter 4 of the synthesis report) organised around six main tasks required for implementing ESA:

- **Analyzing the context for setting objectives and methodology of ESA (Task 1)** : The literature review and ESAWADI partners' experience shows that there are different ways to implement ESA, depending on the local context (IWRM policies and measures) manpower and financial resources, skills of people in charge of the analysis, data available and scale at which the analysis is conducted. More importantly, the chosen ESA implementation method depends on the objective of the assessment, and therefore must be adjusted together with the water managers concerned by it.
- **Identifying, characterizing and selecting relevant ecosystems services (Task 2)**: This was done through field investigation, literature review, interviews and workshops with water managers and other stakeholders including the local population (see below *Relevance of ESA as an educational tool and means of supporting stakeholder participation*). Here it is important to note that the notion of ecosystem services is neither completely synonymous with ecosystem resources (e.g. good quality of water, fertile lands, etc.) nor with socio-economic uses and practices stemming from them (e.g. swimming and drinking water supply, forestry and agriculture, etc.); the ESA is often implemented in a way where uses and practices have just been renamed ecosystem services without any added value since the link with ecosystem functions is not clearly characterised.
- **Analyzing the link between ecological functions, ecological status and ecosystem service provision (Task 3)**: This task could be considered as part of Tasks 2 and 4. However, since we

consider it as the core of ESA and involving very specific issues and difficulties, we thought important to highlight it as a specific task. This was mainly developed in the Portuguese case-study through statistical data analysis (relation between pressure trends and a simultaneous decrease in services) and, in a qualitative way in the French case-study, through diagrams and matrix showing the links between hydromorphology compartments, ecological processes and ecosystem services.

- **Valuing ecosystem services in qualitative, quantitative or monetary terms (Task 4):** A qualitative valuation was done in Germany and in France through surveys and discussions within workshops. The estimated value (or relative value) of the service was provided in all case-studies when it was easily available. None of the case studies achieved full quantification; and very little was done in terms of monetization as it was not needed in that context.
- **Using ESA in decision making (Task 5)** See below *Relevance of ESA as a decision support tool for IWRM* and *Relevance of ESA for WFD economic requirements*.
- **Organizing people/stakeholders participation (Task 6):** It is a very important component of ESA in the context of IWRM/WFD, which should be and was implemented all through the process (mainly in France and Germany), as a component of the other tasks (see below *Relevance of ESA as an educational tool and means of supporting stakeholder participation*).

These tasks were implemented to varying levels in the three case-studies. Therefore the ESAWADI project demonstrated that a thorough quantification and valuation of ecosystem services, aiming at "full monetization", is not always feasible or desirable, and that the ESA could be incorporated in IWRM/WFD scheme implementation in a qualitative or semi-qualitative way.

Lessons and guidelines

- The implementation of ESA needs further operational guidance, respecting the need for the site specificity of each social-ecological system. ESA should not be seen as a completely new approach compelling people to adopt an unfamiliar framework. The approach needs to build on existing local initiatives, plans and programmes.
- Part of the difficulties encountered while implementing the ESA may be due to typical process challenges such as a lack of clarity in the aims and objectives of the implementation of the ESA at the outset, as well as adaptation to the actual context including data limitations. Several options for simplifying the complex interactions between ecological and socio-economic river basin processes are possible, these choices need to be made with due consideration to the ESA objectives (e.g. defining goals and priorities at a larger scale,

assessing the effects of a policy or measure on ecosystem services, discussing of the value of ecosystem services with the general population, etc.).

- In any case, it is important to always keep the perspective of the river basin and to qualitatively describe the complex interrelations between the different components of the river ecosystem.

C. Relevance of ESA as an educational tool and means of supporting stakeholder participation

Regional and local stakeholders' expectations, fears and barriers

The potential role of ESA as a support for communication and environmental education is generally acknowledged. Nevertheless, the ecosystem services concept is seen as complex, not clear enough, and many water managers are not convinced of the real added value.

ESAWADI team's experience

In France and Germany, a workshop was held with stakeholder representatives to test the ESA as an educational tool and means of supporting stakeholder participation. Efforts were made to involve the participants in the identification and valuation of relevant ecosystem services and to convey a better understanding of the ecological processes providing these services.

Water managers and other stakeholders involved in the project appreciated that ESA is a good educational and participatory tool, helping to create common ground with respect to benefits of ecosystems protection and restoration, awareness raising and discussion on ecological processes and the potential new services that result from attaining GES. They considered the representation of cultural ecosystem services as a true added value of the ESA.

Lessons and guidelines

- The positive essence of ESA – namely, that ecosystems provide benefits for human society, and that it helps understand the impacts of ecosystem deterioration or restoration – can be well communicated and discussed with stakeholders and the general public.
- Educational efforts have to be made to present this new approach, make the messages and concepts understandable to the general public, and integrate scientific inputs.
- Once stakeholders have grasped the meaning of ecosystem services they can contribute a lot to an accurate identification, characterisation and valuation of ecosystem services in relation with their watershed. They can provide convincing illustrations and wordings, useful for negotiations and further communication.
- However, improving communication among stakeholders and with water managers requires time and willingness from stakeholders to talk to each other, with and without ESA. It requires thorough preparation.

D. Relevance of ESA as a decision support tool for IWRM

Regional and local stakeholders' expectations, fears and barriers

As a decision support tool, several water managers would expect ESA to generate “real numbers and facts” as arguments in favour of measures or water management objectives.

From their perspective, applying the ESA in a quantitative way faces a number of barriers, namely: (a) the large amount of work (and therefore high costs) necessary for conducting ecosystem services assessments/evaluations on a larger scale; (b) limited knowledge and understanding of the concept by policy makers; and (c) limited robustness of most of the methodologies for quantifying ecosystem services, and therefore limited legitimacy of the results in supporting decision making. Their concern is that ecosystem services benefits will eventually not compete value-wise with benefits from activities such as hydroelectricity production or agriculture. Thus a significant barrier to the implementation of the ESA is that it “backfires” on the interests of water managers.

ESAWADI team's experience

Different methods and tools to use ESA as support to a decision-making process were tested:

- In France, the emphasis was put on a thorough description of the impacts of alternative scenarios in relation with hydropeaking management, using the so-called ecosystem services cascade (ecosystems structure → ecological processes which benefit society → ecological services → social and economic uses).
- In Germany, the “Leipzig Approach”² was adjusted and applied to the outputs of the workshop with water managers and stakeholders to test disproportionality of costs of measures which were discussed at this workshop.
- The Portuguese partners used ESA to build alternative scenarios and compared them using a multi-criteria analysis (MCA) tool (based on the MULINO software). Through the use of MULINO and depending on the conservation objective under consideration, decision makers were presented with a choice of alternatives.

Lessons and guidelines

- ESA's main contribution to decision making is to provide a broad and comprehensive (ecological and socio-economic perspective) view of the issues at stake.
- ESA is a powerful way to set the stage since it allows a systematic and thorough identification of concerned groups, possible conflicts, as well as synergies and trade-offs in terms of

² The “Leipzig Approach” was developed in 2008 by the University of Leipzig, the UFZ Leipzig and the Ecologic Institute, on behalf of the German federal states North Rhine Westphalia, Thuringia and Rhineland-Palatinate. It has been applied in Rhineland-Palatinate to assess disproportionality of costs of measures.

benefits and costs. The analysis of conflicts between ecological processes and the different uses may require a very precise identification of the places and periods of potential conflicts (to the level of detail of specific months or weeks in the year).

- A full and scientific quantification/monetization is usually not required or possible; if attempted it should be based on sufficient technical data and manpower/financial means to provide relevant results.
- In combination with traditional support tools (Cost Benefit Analysis, MCA, etc), ESA can support the production of qualitative, semi-quantitative and quantitative data through field investigations, literature review and discussions with stakeholders.
- Due to the existent uncertainty, the legitimacy of a decision needs to be the result of a participatory approach where stakeholders select/validate the options selected and trade-offs.

E. Relevance of ESA for WFD economic requirements

Regional and local stakeholders' expectations, fears and barriers

At a European and national policy-making level, great expectations are placed on the ESA to allow member states to better fulfil the WFD economic requirements. The comprehensive economic approach of the WFD provides a particular challenge to most water managers. Therefore, their main concern is that ESA will introduce more work and constraints.

ESAWADI team's experience

To assess the use of the ESA for implementing the WFD economic requirements, all case study teams first undertook a thorough literature and document survey, focusing on River Basin District planning documents, such as the RBMPs, PoMs, and attached documents. Based on the information gathered, it was determined whether existing methodologies to address WFD economic requirements could be adapted to incorporate ecosystem services, or whether methodologies already existed which did this. The German partners tested the Leipzig Approach and the Portuguese the MULINO tool in this perspective. Additionally, several interviews were performed in the German and French case studies with policy makers and water economists (from French Water Agencies and national ministries, German "Länder" representatives, and members of the LAWA Working Group "Economics") with an explicit focus on the WFD economic elements.

(See chapter 5 of the Synthesis report)

Lessons and guidelines

For the improved implementation of WFD economic requirements, the ESA may at least act as a support tool providing qualitative insights on ecosystem services and trade-offs. ESA could play this

role at the various steps of the economic analyses and at varying scales, the level of investigation and quantification being adjusted to the available resources:

- For Article 5 on the analysis of existing water uses, impacts and pressures: an analysis in terms of ecosystem services at the basin scale can improve the connection between pressure assessment, water bodies' status and water uses, thus improving the characterisation of the River Basin District and providing the data on ecosystem services required for further analysis.
- For Article 11 on identifying potential measures and Programmes of Measures: the ESA can be a useful tool to include in cost-effectiveness analyses, in so far as effectiveness is not only limited to achieving GES, but that additional benefits created through water protection measures can also be taken into account. Through the integration of ESA into such assessment, these additional benefits could be illustrated and integrated into a more comprehensive analysis of the costs and benefits of measures. In addition, ecosystem services provision can be used as a kind of "second criterion" in choosing between measures using semi-quantitative methods and/or as a purely qualitative description of ecosystem services which sets the framework under which economic analyses would be carried out.
- For Article 4 to assess the disproportionality of costs: ESA could be used to check that the full range of benefits and stakeholders concerned are identified and integrated in the analysis. Besides, ESA can be used as a second criterion to incorporate qualitative data for acquiring a broader understanding of impacts that measures would have.
- For Article 9 on cost recovery for water services: the ESA can be used as support for environmental and resource costs assessments, or at least for the identification and characterization of these costs. At the same time, since the consideration of cost recovery is restricted to water services, this excludes some of the activities that strongly impact ecosystem services provision (if, however, the definition of water services is widened, the concept of ecosystem services could be of more significance to this article).

Besides, the ESA can help demonstrate the advantages of the Programme of Measure and encourage local operators and stakeholders to implement it. The preservation or increase of services can be included in the assessment of the PoM and orient the way in which measures like Payment for Ecosystem Services are implemented.

Limitations identified by the project

Although ESA is sometimes presented as a kind of “panacea”, *per se* it does not solve any existing methodological difficulties (data availability, scale issues, complexity of ecological processes, and valuation of the impact of measures...) and therefore does not resolve any of the debates on the validity of results. Regarding economic valuation, the same challenges remain with the traditional methods (contingent valuation, hedonic pricing, willingness to pay, benefit transfers, etc.).

The ESAWADI project tested different ways of implementing ESA in a real operational context. It developed guidelines and a kind of practical global approach. Nevertheless, it could not go far on some issues like relevant scale, quantification and monetization.

Main recommendations

The development of the ESA as a tool for IWRM/WFD implementation calls for a coordinated approach where:

- Most importantly, water managers and practitioners at regional and local level test and document experiments of this approach.
- In relation with practitioners, scientists elaborate scientifically sound methods and tools to implement ESA and respond to methodological difficulties - more than extra research, the need is to assess how to do the best with existing knowledge:
 - o It is necessary to improve and/or develop tools and methodologies which do not aim at full monetization/quantification, but instead incorporate ecosystem services in a semi-quantitative way, or which combine quantitative and qualitative elements in one decision matrix, or improve on existing ones (such as the Leipzig Approach);
 - o These tools and methodologies should allow fruitful discussions and negotiations with decision-makers and other stakeholders; that is, they should be able to produce data understandable and convincing for them using tools and methodologies which can integrate their own vision.
- European and National level bodies provide orientation and guidelines and support the mainstreaming of ESA into policy making. The harmonization of concepts (potential services, environmental and ecological services...) and methods at a European level would be useful, keeping in mind that the ESA concept is still more at a “storming” and “forming” stage than a “norming” one.

Considering the implementation of WFD economic requirements:

- EU-wide exchanges and agreement on a particular type of methodology would be highly beneficial. This should provide orientation and recommendations, as well as promote good

practices, and at the same time, accommodate district level initiatives and experimentation to adjust the method to the local context.

- It is at present too late for a large-scale, comprehensive utilization of the ESA in the 2nd management cycle, but initial steps in this direction can still be taken.
- The preparatory work to incorporate ecosystem services on a larger scale at a later stage in the implementation process should start immediately. On the one hand, existing and/or new methodologies need to be adapted and improved; on the other hand, the knowledge base regarding ecosystem services and their linkage to human utilization of the water environment needs to be strengthened.
- A first step could be to include a description of the ecosystem services and their importance for the water uses/services into the upcoming (2013) revision of the Article-5 reports.

Additional technical /scientific information: related deliverables

- Blancher, P., Vignon, C., Catalon, E., Maresca, C., Dujin, A., Mordret, X., Borowski, I., Neubauer, L., Rotter, S., Interwies, E., da Conceição Cunha, M., Marques, J.-C., Pinto, R., Roseta Palma, C., (2011), *ESAWADI Framework of Analysis*, 70 p + annexes.
- Blancher, P., Catalon, E., Wallis, C., Maresca, C., Dujin, A., Mordret, X, Girard, L., (2013), *Ecosystem Services Assessment in the Dordogne River basin*, ESAWADI French Case Study report, 72 p. + annexes.
- Borowski, I., Neubauer, L., Rotter, S., Saladin, M., Interviews, E., Görlitz S., (2012), *Ecosystem Services Assessment in the Ems River basin*, ESAWADI German Case Study report, 56 p. + annexes.
- da Conceição Cunha, M., Marques, J.-C., Pinto, R., Roseta Palma, C., (2012). *Ecosystem Services Assessment in the Mondego basin*, ESAWADI Portuguese Case Study report, 68 p. + annexes.
- Blancher, P., Wallis, C., Dujin, A., Borowski-Maaser, I., Saladin, M., Interwies, E., Da Conceição Cunha, M., Marques, J.C., Pinto, R., Roseta Palma, C., Catalon, E., Menard, M., Maresca, B., Görlitz, S. (2013), *ESAWADI Synthesis report and policy recommendations*, 132 p. + annexes.

These documents and others including presentation made in different meetings are available on www.esawadi.eu

Further information on project:

Starting date:	July 2010
Ending date:	December 2012 for the finalization of the national case studies, May 2013 for the finalisation of the synthesis report.
Participating countries and partners:	Asconit Consultants and CREDOC (France) Intersus and Seeconsult (Germany) IMAR (Portugal)
Type of R&D:	Applied research in the fields of ecology, economics, political science, sociology
Web link	www.esawadi.eu