

EUROPEAN IWRM – RESEARCH

OUTLINE ANALYSIS OF PROJECTS’ CONTRIBUTION FOR THE PURPOSE OF SELECTING TOPICS FOR SYNTHESIS

A discussion starter to the European
IWRM platform

Report No 3 of the NeWater project -
New Approaches to Adaptive Water Management under Uncertainty

www.newater.info

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The editor wishes to thank all experts who have made the effort to provide their views and project results based on the questionnaire. It is acknowledged that this was rather difficult; though not time consuming, due to the broadness of themes and limited definitions.

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Special thanks are due to Claudia Pahl-Wostl and Joern Moeltgen for their critical review.

Finally, the editor thanks the contributing authors, Fred Hattermann, Jos Timmerman and Bea Sikorska, without whom the available information could not have been organized and put to paper.

General Notice

The information presented in this report has been collected with much care. The majority of information is retrieved from databases and the NeWater project proposal. Information on relevant products, relevant literature and opinions of experts have been based on questionnaires and further inquiries. This information, received from approximately 20 persons has been included literally, without detailed review of appropriateness of this information.

It should therefore be clear that this report is what it pretends to be: a discussion starter to the European IWRM platform, in a draft version.

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1 Introduction

1.1 NeWater – Integrated project on Adaptive Water Management

Main source: NeWater Brochure.

Rational

The complexity of current water resource management poses many challenges. Water managers need to solve a range of interrelated water dilemmas, such as balancing water quantity and quality, flooding, drought, maintaining biodiversity and ecological functions and services, in a context where human beliefs, actions and values play a central role. Furthermore, the growing uncertainties of global climate change and the long-term implications of management actions make the problems even more difficult.

NeWater addresses some of the present and future challenges of water management. The project recognizes the value of highly integrated solutions and advocates integrated water resource management (IWRM) concepts. However, NeWater is based on the hypothesis that IWRM cannot be realized unless current water management regimes undergo a transition towards more adaptive water management.

Objectives

The major goal is the development of a conceptual and methodological framework for the transition of prevailing water management regimes to adaptive ones. Based on this framework specific approaches and tools will be tested, branded and further developed for practical applications in various river basins.

Scientific Challenge

NeWater identifies key elements of current water management regimes and investigates their interdependence. Research is focused on transformation processes of these elements in the transition to adaptive integrated water resources management. Key IWRM areas where NeWater is expected to deliver break-through results include:

- **Governance in water management** - methods to arrive at polycentric, horizontal broad stakeholder participation in IWRM
- **Sectoral integration** - integration of IWRM and spatial planning; integration with climate change adaptation strategies, cross-sectoral optimisation and cost-benefit analysis
- **Scales of analysis in IWRM** - methods to resolve water resource use conflicts; transboundary issues
- **Information management** - multi stakeholder dialogue, multi-agent systems modelling; novel monitoring systems for decision systems in water management
- **Infrastructure** - innovative methods for river basin buffering capacity; role of storage in adaptation to climate variability and climate extremes
- **Finances and risk mitigation strategies in water management** - new instruments, role of public-private arrangements in risk-sharing
- **Stakeholder participation** - promoting new ways of bridging science, policy and implementation

Case Studies

The new methods of adaptive management are developed and tested in a number of case studies in Europe (Elbe, Guadiana, Rhine and Tisza), in Central Asia (Amudarya) and in Africa (Nile and Orange). The participation of stake-holders in the basins will play a crucial role in guaranteeing that the methods developed meet their demands and take into account concerns and expertise in the basins.

Project Structure

To achieve the development of concepts and tools that guide an integrated analysis and support a stepwise process of change in water management, the NeWater project is structured into six work blocks. It also adopts a management structure that allows effective exchange between innovative research on integrated water management concepts and practical applications and testing in selected river basins through a participatory process. The overall structure is visualized in Figure 1: NeWater Project Structure.

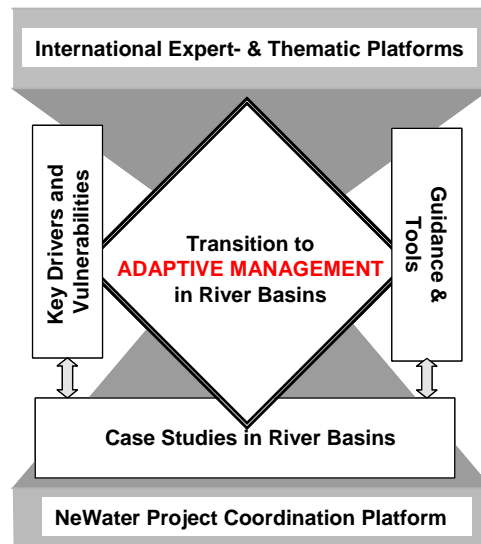


Figure 1: NeWater Project Structure

1.2 The European IWRM platform

Main source: Description of Work NeWater

NeWater includes international and thematic platforms, as is depicted in Figure 1: NeWater Project Structure. Two main platforms can be distinguished, the European IWRM Expert platform and the Global IWRM research to application platform.

The purpose of the platforms in general is to reach or contribute to the following NeWater objectives:

- Objective A: To initiate a world-wide research to application platform for effective scientific and cross policy cooperation in dealing with the high complexity and limited predictability of integrated water resources management on a river basin scale that contributes to constructive dialogues with the Global Water Partnership (GWP), World Water Council (WWC), International Union for the Conservation of Nature (IUCN) and other efforts. (NeWater objective 17)
- Objective B: To share experience and innovations in dialogues, publications and action, to further the European Research Area and to support the implementation of the Water Framework Directive and EU Water Initiative. (NeWater objective 16)
- Objective C: To assess current practice in IWRM and draw lessons for the transfer of new scientific methodologies for IWRM practitioners. (NeWater objective 18)

The European IWRM platform mainly focuses on the last objectives, and through those activities supports objectives 17 and 16. It has as key task to link the NeWater project to relevant past and ongoing EU projects, with the aim to provide an efficient mechanism

through which NeWater would be able to capitalise on existing results and achievements of these projects, minimize redundancies, and therefore further substantiate its added value to the European Research Area (ERA). NeWater dedicates a part of its budget to activate this platform through regular meetings and other forms of information exchange. This platform will also substantially contribute to overall ERA objectives of establishing a (virtual) collaborative network of EU institutions with a focus on a particular theme of EU concern (water).

The proposed tasks carried out under the umbrella of the European IWRM platform are:

Task 1 **European IWRM projects knowledge exchange forum:** The platform will bring together experts from former and ongoing EU projects relevant to NeWater. It will facilitate the direct exchange of results of from NeWater & from the scientific community outside the project. Platform members will be leaders of relevant project clusters and network. A key focus of the platform will be to consolidate and integrate activities from relevant EU networks to the implementation process of the Water Framework Directive. (NeWater task 5.1.1)

Task 2 **European IWRM projects conference forum:** The platform will organise sessions at (project) conferences, electronic conferences and dedicated workshops on particular IWRM issues. The platform sessions will focus on specific topics. These topics will be discussed from the viewpoint of science, consultancy and operational water management, to ensure applicability of the scientific findings from relevant EU FP5 projects and to direct scientific developments within the NeWater project.

Based on the outcomes of these sessions and the intermediate results from the NeWater project, additional topics will be determined for the platform. Session will include targeted presentations from different EU FP5 and other projects and discussions between participants. Selected platform members may be invited to draft a position paper as an input to a session. (NeWater task 5.1.2)

Task 3 **European IWRM projects knowledge dissemination forum:** The main findings from the sessions will be summarised in session reports that will be disseminated to the larger IWRM community, possibly for discussion in a larger electronic conference. Next to this, results of the sessions will be submitted as papers for publication in scientific journals as appropriate. In addition selected platform members can be invited to write thematic synthesis paper on topics relevant to NeWater. Results from the platform will be made available through the project website for discussion and application in the wider IWRM community. (NeWater task 5.1.3)

The proposed deliverables produced under the umbrella of the European IWRM platform are:

D 1 **Synthesis papers** from sessions at (project) conferences and dedicated (electronic) workshops on selected IWRM themes (Application of models in operational water management; Institutional arrangements and participatory processes; Transboundary regimes, others) (NeWater deliverable (5.1.1)

D 2 **Thematic sessions** of the European IWRM expert platform to build and capitalizing on the results from previous and ongoing relevant EU projects, especially from the 5th Framework program (NeWater deliverable (5.1.2)

1.3 Purpose of this document and the IWRM platform meeting

This document serves as input to the first meeting of the European IWRM platform on the 23rd of August, during the World Water Week 2005 in Stockholm.

The purpose of this first meeting is to establish the platform, to discuss a whole range of IWRM issues, and to determine and decide on the way forward.

More specifically, the objectives of the document and meeting are:

- 1) To learn about and capitalize on past and ongoing European research on IWRM.
- 2) To learn and discuss the relationship between IWRM and Adaptive Water Management
- 3) To identify relevant other initiatives concerning 'integration of IWRM research' and identification of research gaps, and discuss collaborative actions with these initiatives.
- 4) To identify candidate IWRM issues for detailed synthesis. In relation, identify key people to lead the development of these synthesis papers, and determine how the underlying document should be elaborated.
- 5) To discuss and possibly decide on input(s) to the 4th World Water Forum in Mexico, March 2006, where EU supported research on IWRM and research applications need to be presented as broad as possible.

To facilitate these discussions, the current document provides a huge amount of relevant information. It also provides a first clue on opinions of scientist regarding a number of IWRM issues.

1.4 Approach & reading guide

The summary analysis contains the overall results of the questionnaire. This questionnaire contained questions regarding the maturity of IWRM issues. The issues provided were directly related to issues addressed in NeWater, but the possibility was given to provide additional topics.

Chapter 3 'Analysis per issue' provides and discusses the maturity information on selected IWRM issues received via the questionnaire. The questionnaire allowed linking specific products of particular projects to the IWRM issues. The chapter provides readers definitions and deliverables concerning these particular topics. Several relevant publications on topics are included, based on inputs from respondents and by no means provide a complete overview of relevant (project) publications.

Chapter 4 'Reported additional issues' provides the results on the question if the questionnaire covered all relevant issues. Chapter 5 introduces three other initiatives that aim at synthesizing available knowledge: (1) EU-INCO review of water research 1994-2005, (2) The WFD implementation Gap analysis and (3) Harmoni-CA concerted action synthesis proposals.

Annexes

ANNEX I provides the available contact details of the persons that have been invited for the first European IWRM platform meeting.

ANNEX II provides abstract information on a range of European and few national projects, which are relevant to the IWRM community. In general the information has been retrieved from www.cordis.lu, www.harmoni-ca.info or the project's website.

ANNEX III presents the list of projects, which are included in the review of INCO research.

ANNEX IV is the result of a key-word match of ANNEX II. Keywords are based on the issues addressed within NeWater. This indexation is not yet fully context based, but provides another entry point to all projects included in the annexes.

2 Summary analysis

The summary analysis contains the overall results of the questionnaire. This questionnaire contained questions regarding the maturity of IWRM issues. The issues provided were directly related to issues addressed in NeWater, but the possibility was given to provide additional topics.

The next figure (Figure 2) presents the results of the questionnaire, which was returned by 17 respondents. In between brackets the number of respondents who had no opinion on a specific issue is shown.

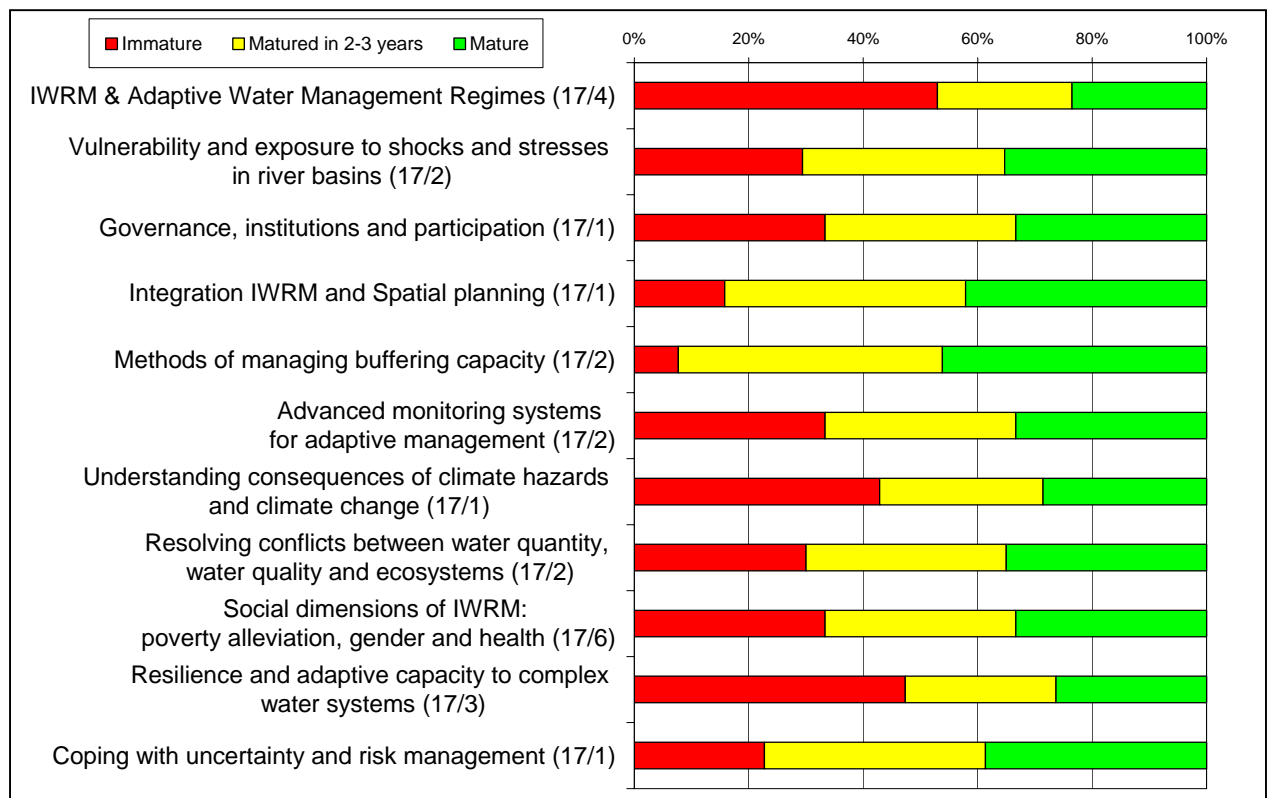


Figure 2 Results from the questionnaire

From the perspective of NeWater it is comforting to know that many respondents agree that key issues in IWRM, addressed in NeWater are not yet fully matured. But it should be noted that several respondents are (in)directly linked to the project.

On the other hand it is also clear that on many issues specialists' opinion is that much is already available and matured to practical use. For several topics the detailed analysis per issue actually shows that much is available, since respondents have brought forward numerous products and papers. But, the relevance of the products that were brought forward is disputable, since the identified issues were very broadly defined. From the specific point of view of NeWater, the identified issues are brought forward specifically with respect to 'adaptive management' and uncertainty, and this particular aspect has yet to be elaborated within the individual work packages.

It should also be noted that the results of this exercise have a lottery component. It is clear that when looking into more projects and addressing many more project managers, the load or relevant European projects and publications on IWRM issues will increase. However,

despite its preliminary character the analysis shows that key topics addressed in NeWater transcend the themes traditionally addressed by European Water Management Research.

The conclusion on availability of much relevant EU research is supported by the simple key-word matching presented in ANNEX IV. Indexing the short abstracts of the projects in the annex with key terms of the NeWater-IWRM issues has produced this annex. The results are summarized as follows:

Keyword	Projects
Adaptive	1
Climate	17
Gender	1
Governance	4
Health	6
Institution	8
Integration	30
Monitoring	14
Participation	11
Planning	22
Resilience	1
Risk	11
Scenario	19
Spatial	5
Sustainability	11
Transboundary	5
Uncertainty	7
Vulnerability	3

Though this key word search was not very much context based it is relatively trustworthy, given the fact that the summaries of projects are short and very much to the point. It should be noted that there are many other European projects that have so far not been included.

The purpose of the NeWater IWRM platform is to facilitate synthesis, for the benefit of the European IWRM science and policy communities, and if possible to support the NeWater research efforts and make sure that available knowledge is integrated. The results presented above provide a first indication on what topics synthesis of European Work may be beneficial to highlight achievements, success and failure in the transfer between research and application and identify knowledge gaps.

But, more topics have been identified which may also require a closer analysis and should be included in the discussions concerning selecting topics. Information on these topics is included in 4.

3 Analysis per issue

Chapter 3 'Analysis per issue' provides and discusses the maturity information on selected IWRM issues received via the questionnaire. The questionnaire allowed linking specific products of particular projects to the IWRM issues. The chapter provides readers definitions and deliverables concerning these particular topics. Several relevant publications on topics are included, based on inputs from respondents and by no means provide a complete overview of relevant (project) publications.

Please note "General Notice", page i.

3.1 Issue 1: IWRM & Adaptive Water Management Regimes, including methods for changing regimes.

3.1.1 Definition / Elaboration

Adaptive management deals with the ability of current management regimes to cope with uncertainties arising from global change. The topic investigates how different strategies, policies and practices can be integrated to make management regimes more flexible and responsive to endogenously generated (e.g. population growth) and exogenously imposed (e.g. impacts of global climatic change) short- and long-term changes.

3.1.2 NeWater intended deliverables

Work package 1.1 deliverables:

- Report on review of IWRM concepts and success in transferring them into practice
- Report and scientific paper on the role of management paradigms in IWRM
- Report and scientific paper on review of type and role of uncertainties in IWRM
- Report and scientific papers adaptive management framework and analysis of adaptive management regimes
- Report on experience and guidance how to manage an interdisciplinary research process

3.1.3 Contributions from completed research

Aquadapt (Paul Jeffrey, Cranfield Univ.)

- Deliverables of WP 3 "Governance and Administration" and WP6 "Analysis of co-evolutionary dynamics", See project web site (www.aquadapt.net)

EuroWater (Erik Mosterd, Tech Univ Delft)

- PARTLY: F. N. Correia (ed.) 1998, Water Resources Management in Europe: Institutions, Issues and Dilemmas, Rotterdam, Balkema, 2 volumes. Mostert, E. (1998): 'River Basin Management in the European Union: How it is done and how it should be done', European Water Management, 1(3), 26-35.

Eawareness (Stefan Kuks, Univ. Twente)

- Bressers, Hans, and Stefan Kuks (eds.) (2004). Integrated Governance and Water Basin Management. Conditions for Regime Change and Sustainability. Dordrecht/Boston/London: Springer (Kluwer Academic Publishers).
- Kuks, Stefan M.M. (2004). Water Governance and Institutional Change. University of Twente: dissertation.

FIRMA (Nigel Gilbert, Surry; Claudia Pahl-Wostl)

- Participatory assessment of flexible management strategies in water supply systems. Methodological development participatory agent based simulation. Deliverables are on the webpage.

Tisza River (Istvan Zsuffa, Vituki)

- distributed/lumped rainfall-runoff models, WQ and hydrodynamic models developed for the Tisza river basin; analyses of regime change scenarios (land use, climate) with the help of these models

Water 21 (Erik Mosterd, Tech Univ Delft)

- PARTLY: Mostert, E. (ed.) (1999): River basin management and planning; Institutional structures, approaches and results in five European countries and six international basins, Delft, RBA Centre.

3.1.4 Contributions from ongoing research

GLOWA (Frank Wechsung, PIK)

- Conflict analysis, Modelling system for impact analysis; Evaluation of management alternatives

HarmoniCoP (Claudia Pahl Wostl, USF)

- Social learning as such is part of managing change. Scientific report and papers available Autumn 2005. Recommendations for practitioners not yet. Will be continued in the context of NeWater.

HarmoniQuA Public participation (Hans Jorgen Hendriksen, GEUS)

- Guidance-monitoring-reporting software (MoST) for QA of modelling processes for seven domains (available in ½-1 year). Only minimum PP (information / consultation)

3.1.5 Other relevant (upcoming) (overview) articles

Döll, P., 2002. Impact of climate change and variability on irrigation requirements: A global perspective. *Climatic Change* 54(3), 269-293.

Global Water Partnership Technical Advisory Committee (TAC) (2000). *Integrated Water Resources Management*. Global Water Partnership. Stockholm, Sweden.

Jeffrey P. & M. Gearey *integrated water resources management: lost on the road from ambition to realisation*, Prepared for the WATERMATEX conference, Nov 2004 in Beijing, organized by the IWA special group on "Systems analysis and Integrated Assessment".

Pahl-Wostl, C. (2005). The Implications of Complexity for Integrated Resources Management. *Environmental Modelling and Software*. Key Note Paper in Pahl-Wostl, C., Schmidt, S. and Jakeman, T., (Eds.) *iEMSs 2004 International Congress: "Complexity and Integrated Resources Management"*. International Environmental Modelling and Software Society, Osnabrück, Germany, June 2004.

Pahl-Wostl, Sendzimir, (2005, in preparation), *The relationship between IWRM and Adaptive Management*, NeWater product.

Pahl-Wostl, C. 2002. *Towards Sustainability in the Water Sector - The Importance of Human Actors and Processes of Social Learning*. *Aquatic Sciences*: 64, 394-411.

Pahl-Wostl, C., Downing, T., Kabat, P., Magnuszewski, P., Meigh, J., Schlueter, M., Sendzimir, J., and Werners, S. *Transitions to Adaptive Water Management: The NeWater Project*. Submitted to *Water Policy*

Pahl-Wostl, C. *The implications of complexity for integrated resources management*. *Environmental Modelling and Software*, in press. Tillman, D.E., Larsen, T., Pahl-Wostl, C., and Gujer, W. 2005. *Simulation for strategy development in water supply systems*. *Hydroinformatics*. 7/1

3.1.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
IWRM & Adaptive Water Management Regimes	9		4	4

Though the concept of IWRM is not new, both to researchers and to practitioners, the NeWater introspection of IWRM & Adaptive Water Management is new. This is supported by the opinion of the respondents, who in general believe this issue is immature.

Within NeWater, this issue first of all has a strong scientific-conceptual component, and effort is ongoing to prepare more conceptual oriented publications.

Given the relatively limited number of respondents it is difficult to draw clear conclusions based on the contributions from other projects and the amount of overview articles. Support to the WP can mainly be found in projects concerning governance. Obviously, when applying IWRM / adaptive management many more sub-concepts and tools are relevant, thus products listed in any other chapter are potentially all useful to actual implementation of IWRM.

Whereas IWRM is common to most of the projects in the annexes, keyword indexation only revealed Aquadapt as a project which has addressed adaptive management.

3.2 Issue 2: Vulnerability and exposure to shocks and stresses in river basins

3.2.1 Definition / Elaboration

In the DPSIR framework vulnerability represents the characteristics of actors or elements of the system (their State) that exposes them to stresses and shocks (or Pressures, which are related to Driving forces) and conditions the nature and extent of Impacts. Vulnerability integrates ultimately at the scale of the social actors in a system, based on their use of natural resources, infrastructure and economic services. In one sense, vulnerability can be reduced to a set of damage functions that link hazards and impacts (such as the depth-damage curves for floods). However, understanding social vulnerability recognises that different actors are vulnerable in different ways and to differing degrees.

3.2.2 NeWater intended deliverables

Work package 2.1 deliverables:

- Framework and baseline vulnerability assessment (month 12). The first report of the WP will present a consensus working framework for vulnerability assessment and the rapid appraisal of vulnerability in each case study.
- Improved methods for vulnerability assessment (month 35). The expanded toolkit of indicator-based methods and multi-agent models will be described and compared in a monograph.

3.2.3 Contributions from completed research

Tisza River (Istvan Zsuffa, Vituki)

- Model based flood and pollution spill scenario analyses

Water 21 (Erik Mosterd, Tech Univ Delft)

- PARTLY: Mostert, E. (ed.) (1999): River basin management and planning; Institutional structures, approaches and results in five European countries and six international basins, Delft, RBA Centre.

3.2.4 Contributions from ongoing research

Floodsite (Tom Brabben/Patrick Samuels, HR Wallingford)

- The project deals with this issue.

FlumaGIS (Joern Moeltgen, USF)

- Partly addressed within FlumaGIS

GLOWA (Frank Wechsung, PIK)

- Conflict analysis, Modelling system for impact analysis; Evaluation of management alternatives

TWOLE and VERBANO (Soncini, Politechnical Univeristy of Milan)

- Prototype DSS running. Release beta in 2 years

3.2.5 Other relevant (upcoming) (overview) articles

Downing, T.E., Aerts, J., Klein, R., Ionescu, C., Hinkel, J., Mata, L., Soussan, J., Martin, N., Ziervogel, G., Bharwani, S., Purkey, D. and Moss, S. (2006) Integrating social vulnerability into water management. Climatic Change (in preparation, for special issue edited by P. Kabat, J. Alcamo R, Schulze and P. Gleick).

Kundzewicz, W.Z., Budhakooncharoen, S., Bronstert, A., Hoff, H., Lettenmaier, D., Menzel, L., Schulze, R., 2002. Coping with variability and change: Floods and droughts. Natural Resources Forum 26, 263-274

Pahl-Wostl, C. and Ridder, D. Mega Cities, Climate Change and Water - Increased Vulnerability of the Poor. Submitted to Climate Change

3.2.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Vulnerability and exposure to shocks and stresses in river basins	5	4	6	2

Opinions on vulnerability vary significantly. Supposedly, this is an effect of the wide use of the term vulnerability, which within NeWater is addressed ultimately as social vulnerability, and takes furthermore an integrative approach. Apparently, much ongoing work is working on (aspects) of vulnerability assessment, providing opportunities for project collaboration.

The keyword indexation of projects' abstracts indicates that Floodsite, Swurve and Twinbas have major 'vulnerability' research components.

3.3 Issue 3: Governance, institutions and participation, including transboundary issues

3.3.1 Definition / Elaboration

Governance styles differ in their ability to cope with global change, and in particular, extreme events such as droughts and floods. Complex aspects in this respect are differences in governance and institutions across national boundaries and how proposed management strategies resulting from these –often very different- institutional arrangements can conflict to the point of inefficiency. Citizen and stakeholder participation can enhance efforts to analyse and formulate management actions and policy. It entails among others the reasons why stakeholder and citizen participation sometimes is a risk and sometimes offers opportunities, and the role of formal and informal participatory settings in the adaptive management of river basins. This topic also addresses the role of information and data sharing.

3.3.2 NeWater intended deliverables

Work package 1.2 deliverables:

- Report on a comparative analysis of governance structure in the NeWater basins (month 6).
- Report on the applicability of different participatory methods to analyse local institutions.
- Report and scientific paper on an actor and rule-based methodology to analyse institutional change for a transition to adaptive management
- Report and scientific paper on the role of the financial sector in managing risks from extreme events.
- Report on the assessment of policy criteria / extreme events and analysing and trading off new structures and attached new policies regarding extreme events.
- Report and scientific paper on governance styles and institutional changes to support adaptive water management with specific emphasis on extreme events (contributing tasks - all)

Work package 1.3 deliverables:

- “State-of-the-art” report on the two transboundary aspects information and institutional resource regimes (Month 10)
- Common research agenda for each case study developed in common with the case study partners (Month 11)
- Report on innovative approaches for trans-boundary water management to meet the
- Requirements for adaptive management.

3.3.3 Contributions from completed research

Aquadapt (Paul Jeffrey, Cranfield Univ.)

- Deliverables of WP 3, See project web site (www.aquadapt.net)

EuroWater (Erik Mosterd, Tech Univ Delft)

- F. N. Correia (ed.) 1998, Water Resources Management in Europe: Institutions, Issues and Dilemmas, Rotterdam, Balkema, 2 volumes. Mostert, E. (1998): 'River Basin Management in the European Union: How it is done and how it should be done', European Water Management, 1(3), 26-35.

Eawareness (Stefan Kuks, Univ. Twente)

- Bressers, Hans, and Stefan Kuks (eds.) (2004). Integrated Governance and Water Basin Management. Conditions for Regime Change and Sustainability. Dordrecht/Boston/London: Springer (Kluwer Academic Publishers).

- Kuks, Stefan M.M. (2004). Water Governance and Institutional Change. University of Twente: dissertation.

MANTRA-East (Stalnacke, NIVA)

- The project has dealt with this issue.

MERIT (Hans Jorgen Hendriksen, GEUS)

- Guidelines in use of bayesian networks for active involvement (available soon)

SIRCH (Tom Downing, SEI)

- The project has dealt with this issue.

Water 21 (Erik Mosterd, Tech Univ Delft)

- Mostert, E. (ed.) (1999): River basin management and planning; Institutional structures, approaches and results in five European countries and six international basins, Delft, RBA Centre.

3.3.4 Contributions from ongoing research

Floodsite (Tom Brabben/Patrick Samuels, HR Wallingford)

- Indirect use of longterm planning framework by 2009

FlumaGIS (Joern Moeltgen, USF)

- An interactive software tool (prototypical component) allows co-operative planning. Planning measures can be virtually implemented and measure effects analysed. Beside a 2D-visualisation environment, a 3D- environment, based on a workbench technology, supplies a visualisation environment that enable a joint exploration of planning scenarios and their impacts for planners, stakeholders and other affected actors.

GLOWA (Frank Wechsung, PIK)

- The project and the model system is transboundary

HarmoniCoP (Claudia Pahl Wostl, USF)

- Scientific report and papers available Autumn 2005. Handbook for practitioners on participatory methods and role of social learning will be available October 2005

HarmoniQuA Public participation (Hans Jorgen Hendriksen, GEUS)

- Guidance-monitoring-reporting software (MoST) for QA of modelling processes for seven domains (available in ½-1 year). Only minimum PP (information / consultation)

TWOLE and VERBANO (Soncini, Politechnical Univeristy of Milan)

- Prototype running. Release beta in 2 years

3.3.5 Other relevant (upcoming) (overview) articles

All WP 1.3 partners: "State-of-the-art" report on the two transboundary aspects information and institutional resource regimes (Month 10, D 1.3.1)

All www.harmonicop.info (methodology and country reports)

Arnstein, S. (1969): 'A ladder of citizen participation in the USA', Journal of the American Institute of Planners, 8(3), 216-224.

Bressers, J.T.A. and S.M.M. Kuks, Integrated governance and water basin management, Dordrecht (Kluwer Academic), 2004.

Bressers, J.Th.A., O'Toole, L.J. & Richardson, J.J. (Eds.), Networks for water policy. A comparative perspective, London (Frank Cass), 1995.

Dicke, W.M.. (2001). Bridges and Watersheds. A narrative analysis of water management in the Netherlands, England and Wales. Amsterdam: Aksant

Dieperink, C. (2002), The clean up of the Rhine as a successful international effort, in: Ismail Al Baz, Volkmar Hartje and Waltina Scheumann (eds.), Co-operation on transboundary rivers, Nomos Verlagsgesellschaft, Baden-Baden, pp. 67-82.

Dworak, T., Kranz, N. (2005) Die EU-Wasserrahmenrichtlinie als Ansatz für ein integriertes Flussgebietsmanagement in Neubert, S.; W. Scheuman, A. van Edig und W. Huppert

- (Hrsg.) Integriertes Wasserressourcenmanagement, Baden-Baden: Nomos Verlagsgesellschaft.
- Dworak, T., Interwies, E. (2004) Linking Transboundary River Management to Water Security: the Example of Flooding in Europe, in: The Forum - Magazine of the Bellagio Forum for Sustainable Development, 11th edition, June 2004, Pages: 12-14
- Gayer, J. (2000): Participatory Processes in Water Management (PPWM); Proceedings of the Satellite Conference to the World Conference on Science (Budapest, Hungary 28-30 June 1999), Paris, UNESCO.
- Gooch, G.D. and D. Huitema, Improving Governance Through Deliberative Democracy – Initiating Informed Public Participation in Water Governance Policy Processes, paper to the Water Week, Stockholm, 15-21 August 2004.
- GWP (2005): Toolbox Integrated Water Resources Management, Global Water Partnership.
- Huitema, D. and S.M.M. Kuks (2004), The transition of local regimes in the Netherlands. The IJsselmeer and the Regge, in: Kuks, S.M.M. (ed.), Water governance and institutional change, Enschede (Twente University Press), pp. 179- 218.
- Kuks, S.M.M. (ed.), Water governance and institutional change, Enschede (Twente University Press), 2004.
- Kranz N., Interwies, E., Vorwerk A. (2005) Review on transboundary regimes: The Amudarya basin, input to the Deliverable 1.3.1 of the NeWater Project
- Kranz N., Interwies E., Vidaurre R. (2005) Review on transboundary regimes: The Orange Basin, input to Deliverable 1.3.1 of the NeWater Project
- Kranz N., Interwies, E., Vorwerk A. (2005) Governance, institutions and participation in the Orange Basin – South Africa and Lesotho, input to Deliverable 1.2.1 of the NeWater Project.
- Roe, E.M. and M.J.G. van Eeten, "Threshold-Based Resource Management: A Framework for Comprehensive Ecosystem Management," in: Environmental Management, vol. 27, no.2, pp. 195-214., 2001
- Denizen-Dick, R. (1997): 'Farmer participation in irrigation; 20 years of experience and lessons for the future', Irrigation and Drainage Systems, 11(2), 103-118.
- Mostert, E., et al. (2000): 'River basin management and planning', in E. Mostert (ed.), River Basin Management; Proceedings of the International Workshop on River Basin Management (The Hague, 27-29 October 1999), Paris, Unesco, pp. 24-55.
- Mostert, E.; "River basin planning and management: institutional structures, approaches and results in five EU countries and six international basins." In: Implementing the EU water framework directive, proceedings seminar 3, Brussels, 29 and 30 May 2001, WWF, Brussels, Belgium, 2001, p. 27-34.
- Mostert, E. (2003): 'The Challenge of Public Participation', Water Policy, 5(2), 179-197.
- Rees, J. A. (1997): Regulation and Private Participation in the Water and Sanitation Sector, Global Water Partnership. (www.gwpforum.org)
- Renn, O. and T. Webler (eds) (1995), Fairness and competence in citizen participation : evaluating models for environmental discourse, Dordrecht; Boston, Kluwer Academic, pp. 17-33.
- Ridder, D. (ed.) (2005): Learning Together To Manage Together; Improving Participation in Water Management, In preparation.
- Special issue of the Regional Environmental Change journal: The need for participatory processes and its implications for water management information. fall 2005 (in press)
- Timmerman, J.G., H.W.A. Behrens, F. Bernardini, D. Daler, P. Ross, K.J.M. van Ruiten and R.C. Ward (eds.), Information to support sustainable water management. From local to global levels, Lelystad (RIZA), 2004.
- Timmerman, J.G. and S. Langaas (eds.), 2004. Environmental information in European transboundary water management. IWA publishing, London UK.
- Webster, M., 2003. Communicating Climate Change Uncertainty to Policy-Makers and the Public. Climatic Change 61(1-2), 1-8
- Tippet, J, Searle, B., Pahl-Wostl, C. and Rees, Y. (2005). Social Learning in Public Participation in River Basin Management. Environmental Science & Policy, 8(3), 287-299.

3.3.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Governance, institutions and participation, including transboundary issues	5	6	5	1

The opinions on the maturity of this topic are quite evenly distributed. Since so much has been or is produced in research (see contributions from research) some maturity must have been achieved by now. But, within the context of adaptive management, no results have yet been reported.

The keyword indexation shows that a large amount of projects deal with governance, institutions, participation and transboundary issues

3.4 Issue 4: Integration IWRM and spatial planning

3.4.1 Definition / Elaboration

Integration of IWRM and spatial planning deals with the transition towards a better integration of IWRM and spatial planning as required for an integrated and more flexible approach to handle variability in water availability (droughts and floods). It addresses adaptation strategies for flood prevention and drought mitigation as well as for achieving Water Framework Directive goals in river basins across countries or regions that share a basin in order to see where upstream adaptations are both complementary to proposed downstream adaptations, or conflict and thus inefficient

3.4.2 NeWater intended deliverables

Work package 1.4 deliverables:

- Report - Framework for integration of spatial planning and IWRM at 3 scale levels
- Prototype - Modification and extension of the WATERWISE-model and testing in a regional pilot with stakeholders
- Prototype - Extension of a national cascade model: processes between the scale levels

3.4.3 Contributions from completed research

Aquadapt (Paul Jeffrey, Cranfield Univ.)

- Deliverables of WP1 "Strategic decision support tools for catchment planning" & WP4, "Evidence for co-evolutionary dynamics in Spain" See project web site (www.aquadapt.net)

Euwareness (Stefan Kuks, Univ. Twente)

- Bressers, Hans, and Stefan Kuks (eds.) (2004). Integrated Governance and Water Basin Management. Conditions for Regime Change and Sustainability. Dordrecht/Boston/London: Springer (Kluwer Academic Publishers).
- Kuks, Stefan M.M. (2004). Water Governance and Institutional Change. University of Twente: dissertation.

Euwareness (Stefan Kuks, Univ. Twente)

- PARTLY: F. N. Correia (ed.) 1998, Water Resources Management in Europe: Institutions, Issues and Dilemmas, Rotterdam, Balkema, 2 volumes. Mostert, E.

(1998): 'River Basin Management in the European Union: How it is done and how it should be done', *European Water Management*, 1(3), 26-35.

MULINO and follow-ups in Nostrum-Dss and Transcat (Carlo Guipponi, University of Milan)

- mDSS integrates GIS data in the planning process supported by Multi-criteria analysis methods

Tisza River (Istvan Zsuffa, Vituki)

- distributed rainfall-runoff models, WQ and hydrodynamic models GIS-based database

Water 21 (Erik Mosterd, Tech Univ Delft)

- Mostert, E. (ed.) (1999): River basin management and planning; Institutional structures, approaches and results in five European countries and six international basins, Delft, RBA Centre.

3.4.4 Contributions from ongoing research

Floodsite (Tom Brabben/Patrick Samuels, HR Wallingford)

- indirect use of longterm planning framework by 2009

FlumaGIS (Joern Moeltgen, USF)

- FLUMAGIS addresses land use in its functionality. Since land use changes have effects on water balance, runoff dynamic and matter fluxes within the different scale levels, it is applied for the implementation of specific numerical models. Furthermore, several GI-services support geo-spatial analysis. Reports (in german) and also software modules are existing. Further information on www.flumagis.de

GLOWA (Frank Wechsung, PIK)

- Partly: Land use scenarios under global change

HarmoniQuA Public participation (Hans Jorgen Hendriksen, GEUS)

- Guidance-monitoring-reporting software (MoST) for QA of modelling processes for seven domains (available in ½-1 year). Only minimum PP (information / consultation)

TWOLE and VERBANO (Soncini, Politechnical Univeristy of Milan)

- Prototype running. Release beta in 2 years

WFD Article 5 project (Yann Laurens, Seine-Normandie Water Agency)

- Seine Normandy Basin Baseline scenario in WFD Art. 5 report

3.4.5 .Other relevant (upcoming) (overview) articles

Döll, P., 2002. Impact of climate change and variability on irrigation requirements: A global perspective. *Climatic Change* 54(3), 269-293.

3.4.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Integration IWRM and Spatial planning	3	5	8	1

The respondents' opinion points towards maturity of Integration IWRM and Spatial planning for practical application in a few years. Contributions from research to this topic range from analysis and approaches, to very practical GIS based application supporting planning.

3.5 Issue 5: Methods of managing buffering capacity

3.5.1 Definition / Elaboration

New methods for managing buffering capacity investigate different approaches to enhance the natural and artificial storage capacity of basins. The provision and management of storage capacity within a basin is one possibility to reduce uncertainties in water supply, and buffer natural as well as anthropogenic variability (climatic and demand variability), in particular extreme events.

3.5.2 NeWater intended deliverables

Work package 1.5 deliverables:

- Report - Criteria to define and assess basin-scale buffering capacity.
- Case study basins database.
- Prototype - Catchment scale domain models.
- Stakeholders survey on management scenarios.
- Prototype - Rainfall simulation toolbox.
- Report - Methods to use the domain models in an adaptive management perspective.

3.5.3 Contributions from completed research

MANTRA-East (Stalnacke, NIVA)

- Stalnacke, P. 2005. Time scale in nutrient fate: examples from Eastern Europe In: Proceedings of International Workshop on 'Where Do Fertilisers Go?' ISPRA, Italy, 28-29 June 2005

Tisza River (Istvan Zsuffa, Vituki)

- model-based analysis of the impact of lateral flood retention reservoirs along the Tisza

3.5.4 Contributions from ongoing research

GLOWA (Frank Wechsung, PIK)

- Water management system

TWOLE and VERBANO (Soncini, Politechnical University of Milan)

- Prototype running. Release beta in 2 years

3.5.5 Other relevant (upcoming) (overview) articles

Grimvall, A., Stalnacke, P., Tonderski, A., 2000. Time scales of nutrient losses from land to sea — a European perspective. *Ecological Engineering* 14(4), 363-371

3.5.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Methods of managing buffering capacity	1	8	6	2

The general opinion is that managing buffering capacity is a pretty matured science, and can effectively be used in practice.

It is however also clear that from a broad perspective many computer-based tools similar to the tools presented in the deliverable section are available. However, if these are applicable in a NeWater setting is unclear.

3.6 Issue 6: Advanced monitoring systems for adaptive management

3.6.1 Definition / Elaboration

This topic addresses information needs for implementing and sustaining adaptive management strategies and identify alternative information sources in particular for data-poor regions. An integrative conceptual and methodological framework will be developed to understand the importance and interdependence of societal, cultural, economic, institutional, environmental and technological factors in the transition towards water management regimes that are more adaptive.

3.6.2 NeWater intended deliverables

Work package 1.6 deliverables:

- Report - Critical review on existing monitoring systems
- Report on data requirements and data sources for supporting adaptive management
- Report on data and information sources and methodologies
- A functional prototype of a GIS based monitoring and information system for IWRM
- Guidelines to advanced monitoring systems to support adaptive water management in river basins

3.6.3 Contributions from completed research

Euawareness (Stefan Kuks, Univ. Twente)

- PARTLY: F. N. Correia (ed.) 1998, Water Resources Management in Europe: Institutions, Issues and Dilemmas, Rotterdam, Balkema, 2 volumes. Mostert, E. (1998): 'River Basin Management in the European Union: How it is done and how it should be done', European Water Management, 1(3), 26-35.

3.6.4 Contributions from ongoing research

3.6.5 Other relevant (upcoming) (overview) articles

UNECE TFMA, 2000. Guidelines on monitoring and assessment of transboundary rivers. UNECE Task Force on Monitoring and Assessment. RIZA, Lelystad, The Netherlands. 88 pp. <http://www.iwac-unece.org>.

UNECE TFMA, 2000. Guidelines on monitoring and assessment of transboundary groundwater. UNECE Task Force on Monitoring and Assessment. RIZA, Lelystad, The Netherlands. 64 pp. <http://www.iwac-unece.org>.

UNECE WGMA, 2002. Guidelines on monitoring and assessment of transboundary and international lakes. Part A: Strategy document. UNECE Working Group on Monitoring and Assessment. Finnish Environment Institute, Helsinki, Finland. 33 pp. <http://www.iwac-unece.org>.

3.6.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Advanced monitoring systems for adaptive management	6	3	6	2

The respondents opinion varies from mature to immature, with a slight balance towards immature/mature in 2-3 years.

Though much knowledge is available in the literature on monitoring design (personal experience from the editor), it is clear that IWRM / adaptive, management may require other monitoring strategies, covering more domains than are covered traditionally.

3.7 Issue 7: Understanding consequences of climate hazards and climate change

3.7.1 Definition / Elaboration

Small changes in climate variability can be significantly amplified through the hydrological cycle and have major implications for water resource management. On a longer time frame, climate change is predicted to have a major impact on water resources, including profound effects on the magnitudes, frequencies, intensities of rainfall, on its seasonal and geographical distribution and on inter-annual variability of precipitation. This information has to be combined with driving forces like:-

- Demographic trends (population, age group distribution)-
- Economic trends (income, income gap)-
- Technology trends (high or low diffusion rates of technology)-
- Land use and land cover change ·
- Consumption patterns – type and intensity of world trade-
- Policy trends and sectoral developments including privatisation, regulation and the European Water Framework Directive

3.7.2 NeWater intended deliverables

Work package 2.2 deliverables:

- Report: Template for rapid appraisal and review of best practice for incorporating changing climatic hazards into IWRM
- Report: Techniques for regional scale scenarios of climate change, including downscaling techniques for catchment scale estimations of water and energy balance components.
- Report/Database: Analysis of precipitation time series for selected river basins, based on weather types and circulation patterns
- Prototype: Coupled catchment-scale water model and climate ensembles
- Report. Estimation of water balance uncertainties based on climate ensembles.

3.7.3 .Contributions from completed research

Aquadapt (Paul Jeffrey, Cranfield Univ.)

- Deliverables of WPs 1 & 4, See project web site (www.aquadapt.net)

MITCH (Tom Brabben/Patrick Samuels, HR Wallingford)

- The project has dealt with this issue.

SIRCH (Tom Downing, SEI)

- The project has dealt with this issue.

Tisza River (Istvan Zsuffa, Vituki)

- distributed/ lumped rainfall-runoff models, hydrodynamic river models; climate change scenario analyses

3.7.4 Contributions from ongoing research

Ensembles (Chris Hewitt, Met Office)

- In 3 years – probabilistic high spatial resolution (20km) regional climate scenarios for Europe and some site-specific climate scenarios, along with probabilistic assessments of long-term climate change impacts and impacts at season to decadal timescales

Floodsite (Tom Brabben/Patrick Samuels, HR Wallingford)

- Indirect use of longterm planning framework by 2009

GLOWA (Frank Wechsung, PIK)

- 100 realizations of climate change scenario

3.7.5 .Other relevant (upcoming) (overview) articles

Kundzewicz, W.Z., Budhakooncharoen, S., Bronstert, A., Hoff, H., Lettenmaier, D., Menzel, L., Schulze, R., 2002. Coping with variability and change: Floods and droughts. Natural Recourses Forum 26, 263-274

3.7.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Understanding consequences of climate hazards and climate change	6	6	4	1

The respondents replies to this issue are balanced. Where some find the field matured, the same number of respondents find the issue still immature.

Looking at the ongoing and completed research projects, and the long list of projects dealing with 'climate' (see project index) the potential contribution from past and ongoing projects could contribute to the issue within the NeWater. perspective.

3.8 Issue 8: Resolving conflicts between water quantity, water quality and ecosystems

3.8.1 Definition / Elaboration

Understanding of the implications of global change on river basins with respect to both water quantity and water quality is required to develop new approaches for adaptive management in order reach policy goals, for example of the WFD. Water quality is determined by the nutrient driving sources, water transport/pathways within the catchment and nutrient delivery to surface water systems.

3.8.2 NeWater intended deliverables

Work package 2.3 deliverables:

- Report: Baseline assessment of each basin
- Report: Water quality fingerprint methods and examples.
- Report: Environmental flows and ecosystem services

- Report: (Modelling) toolkit on environmental services in as related to water management
- Report/database: Contact list of experts providing support services

3.8.3 .Contributions from completed research

Euawareness (Stefan Kuks, Univ. Twente)

- F. N. Correia (ed.) 1998, Water Resources Management in Europe: Institutions, Issues and Dilemmas, Rotterdam, Balkema, 2 volumes. Mostert, E. (1998): 'River Basin Management in the European Union: How it is done and how it should be done', European Water Management, 1(3), 26-35.

MERIT (Hans Jorgen Hendriksen, GEUS)

- Guidelines in use of bayesian networks for active involvement (available soon)

MULINO and follow-ups in Nostrum-Dss and Transcat (Carlo Guipponi, University of Milan)

- The use of mDSS can contribute

Tisza River (Istvan Zsuffa, Vituki)

- Ecological wetland models, ecosystem studies on riparian wetlands

Water 21 (Erik Mosterd, Tech Univ Delft)

- Mostert, E. (ed.) (1999): River basin management and planning; Institutional structures, approaches and results in five European countries and six international basins, Delft, RBA Centre.

3.8.4 Contributions from ongoing research

Floodsite (Tom Brabben/Patrick Samuels, HR Wallingford)

- Indirect use of longterm planning framework by 2009

GLOWA (Frank Wechsung, PIK)

- Included in model setup

HarmoniRiB (Michiel Blind, RIZA)

- HarmoniRiB provides case studies including quality, quantity and ecology as proof of concept for HarmoniRiB uncertainty guidelines and tools.

TWOLE and VERBANO (Soncini, Politechnical Univeristy of Milan)

Prototype running. Release beta in 2 years

3.8.5 Other relevant (upcoming) (overview) articles

Dyson, M., G. Bergkamp, and J. Scanlon (eds.), 2003. Flow. The essentials of environmental flows. IUCN, Gland, Switzerland and Cambridge, UK.

Pahl-Wostl, C. (2005). The Implications of Complexity for Integrated Resources Management. Environmental Modelling and Software. Key Note Paper in Pahl-Wostl, C., Schmidt, S. and Jakeman, T., (Eds.) iEMSs 2004 International Congress: "Complexity and Integrated Resources Management". International Environmental Modelling and Software Society, Osnabrück, Germany, June 2004.

3.8.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Resolving conflicts between water quantity, water quality and ecosystems	6	2	7	2

Most respondents believe that methods to conflicts between quantity, quality and ecosystems will be matured in 2-3 years. This more or less coincides with the implementation of the WFD, to be more specific by 2009 River Basin Management Plans will have been drafted in which is dealt with these conflicts.

3.9 Issue 9: Social dimensions of IWRM: poverty alleviation, gender and health

3.9.1 Definition / Elaboration

Most of the target basins of the EU Water Initiative are in the regions like Africa, where poverty, gender and health are three key issues that need to be understood to be able to link IWRM within river basins to wider social and development agendas. Poverty is a complex phenomenon with different characteristics in different places. The joint agency paper (including the EU) on Poverty Reduction and Environmental Security (2002) identified three key dimensions to poverty reduction: livelihoods, health and vulnerability. This framework provides a basis for the analysis of the relationship between water management and poverty reduction, with different actions in water management addressing different dimensions of poverty. Integrating poverty reduction in IWRM can consequently be analysed within this framework.

3.9.2 NeWater intended deliverables

Work package 2.4 deliverables:

- Report: Rapid appraisal of poverty, gender and health issues in case studies (part of WP 2.1 baseline vulnerability).
- Report: Specification of mechanisms for dialogue processes on poverty, gender and health in river basins planning.
- Report: Integration of poverty reduction goals, targets and indicators into IWRM processes.
- Report: Generic tools for assessment of poverty, gender and health issues and mechanisms for dialogue processes in river basins.

3.9.3 Contributions from completed research

Aquadapt (Paul Jeffrey, Cranfield Univ.)

- Deliverables of WP 2, "Socio-cultural determinants of water utilisation", See project web site (www.aquadapt.net)

Euawareness (Stefan Kuks, Univ. Twente)

- F. N. Correia (ed.) 1998, Water Resources Management in Europe: Institutions, Issues and Dilemmas, Rotterdam, Balkema, 2 volumes. Mostert, E. (1998): 'River Basin Management in the European Union: How it is done and how it should be done', European Water Management, 1(3), 26-35.

Water 21 (Erik Mosterd, Tech Univ Delft)

- Mostert, E. (ed.) (1999): River basin management and planning; Institutional structures, approaches and results in five European countries and six international basins, Delft, RBA Centre.

3.9.4 Contributions from ongoing research

Floodsite (Tom Brabben/Patrick Samuels, HR Wallingford)

- Indirect use of longterm planning framework by 2009

GLOWA (Frank Wechsung, PIK)

- Y/N: more socio-economy related

TWOLE and VERBANO (Soncini, Politechnical Univeristy of Milan)

- Prototype running. Release beta in 2 years

3.9.5 Other relevant (upcoming) (overview) articles

- Gooch, G.D. and P. Stålnacke (eds.), 2005. Integrated Transboundary Water Management in Theory and Practice Experiences from the New EU Eastern borders. IWA publishing, London, UK. (in press)
- Global Water Partnership Technical Advisory Committee (TAC) (2000). Integrated Water Resources Management. Global Water Partnership. Stockholm, Sweden.
- Kabat, P., M.E.Hellmuth R.E.S., Veraart, J.A.,Ed. (2002). Coping with Impacts of Climate Variability and Climate Change in Water Management: A Scoping Paper. Wageningen.
- IPPC, (2001b). Climate Change 2001: Impacts, Adaptation and Vulnerability. Contributions of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. I. P. o. C. Change). Cambridge, Cambridge University Press

3.9.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Social dimensions of IWRM: poverty alleviation, gender and health	5	1	5	6

Many respondents have no opinion on this issue. This is not surprising given the target countries of this issue, and the European character of respondents who were addressed.

The general view of the other respondents is that this issue will be matured earliest in 2-3 years.

The key-word search on (separately) “poverty”, “gender” and “health” did result in respectively 0, 1 and 6 hits of projects were these terms were used in the abstract.

3.10 Issue 10: Resilience and adaptive capacity to complex water systems

3.10.1 Definition / Elaboration

A river system’s capacity to learn from and adaptively respond to stress, its adaptive capacity, emerges from interactions between biophysical and social factors that also influence the river basin’s resilience and vulnerability.

3.10.2 NeWater intended deliverables

Work package 2.5 deliverables:

- Report: Conceptual framework, appraisal protocol (including a questionnaire and methodology for surveying literature), rapid appraisal of baseline, and review of barriers and bridges to integrating concepts of resilience, vulnerability and adaptive capacity within the IWRM management culture.
- Database: Bibliography and website describing theoretical and methodological advances in understanding and managing river basin adaptive capacity and resilience.
- Prototype: Formal systems dynamics and agent-based models of interacting factors that influence the resilience and adaptive capacity of specific elements and the river basin as a whole.
- Prototype: Simulation game (based on the concept of a management flight simulator) for exploring how water management decisions influence resilience and adaptive capacity and how they in turn affect vulnerability of the river basin in the short and long term.

- Report: Final report summarising findings on how adaptive capacity, vulnerability and resilience change as functions of interacting factors in river basins.

3.10.3 .Contributions from completed research

Aquadapt (Paul Jeffrey, Cranfield Univ.)

- Deliverables of 2, 3, 4 & 6, See project web site (www.aquadapt.net)

Euwareness (Stefan Kuks, Univ. Twente)

- Bressers, Hans, and Stefan Kuks (eds.) (2004). Integrated Governance and Water Basin Management. Conditions for Regime Change and Sustainability. Dordrecht/Boston/London: Springer (Kluwer Academic Publishers).
- Kuks, Stefan M.M. (2004). Water Governance and Institutional Change. University of Twente: dissertation.

MITCH (Tom Brabben/Patrick Samuels, HR Wallingford)

- The project has dealt with this issue.

SIRCH (Tom Downing, SEI)

- The project has dealt with this issue.

3.10.4 Contributions from ongoing research

GLOWA (Frank Wechsung, PIK)

- In technical terms like reservoir and water use management and optimisation

HarmoniQuA Public participation (Hans Jorgen Hendriksen, GEUS)

- Guidance-monitoring-reporting software (MoST) for QA of modelling processes for seven domains (available in ½-1 year). Only minimum PP (information / consultation)

3.10.5 Other relevant (upcoming) (overview) articles

Global Water Partnership Technical Advisory Committee (TAC) (2000). Integrated Water Resources Management. Global Water Partnership. Stockholm, Sweden.

Grimvall, A., Stålnacke, P., Tonderski, A., 2000. Time scales of nutrient losses from land to sea — a European perspective. Ecological Engineering 14(4), 363-371

Pahl-Wostl, C. (2005). The Implications of Complexity for Integrated Resources Management. Environmental Modelling and Software. Key Note Paper in Pahl-Wostl, C., Schmidt, S. and Jakeman, T., (Eds.) iEMSs 2004 International Congress: "Complexity and Integrated Resources Management". International Environmental Modelling and Software Society, Osnabrück, Germany, June 2004.

3.10.6 Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Resilience and adaptive capacity to complex water systems	9		5	3

The common view on maturity of “Resilience and adaptive capacity to complex water systems” is that this scientific field is immature for practical application.

Of the projects included in the annexes, only the Swurve project has explicitly dealt with resilience.

3.11 Issue 11: Coping with uncertainty and risk management

3.11.1 Definition / Elaboration

The two main sources of uncertainty are inherent variability and limited knowledge. Variability relates to the randomness of the natural system but also to variability in human and societal behaviour, and may also refer to technological surprises. Limited knowledge refers to inexactness in describing a system, lack of observations and measurements and conflicting evidence. This topic deals with the general issues of uncertainty in water management and must provide concrete action to address these issues.

3.11.2 NeWater intended deliverables

This issue is not a specific topic within NeWater. Uncertainty and risk are horizontal to NeWater, that is they are addressed in all activities.

3.11.3 Contributions from completed research

MANTRA-East (Stalnacke, NIVA)

- The project has dealt with this issue.

MERIT (Hans Jorgen Hendriksen, GEUS)

- Guidelines in use of bayesian networks for active involvement (available soon)

MULINO and follow-ups in Nostrum-Dss and Transcat (Carlo Guipponi, University of Milan)

- Y/N: sensitivity analysis of mDSS can contribute

SIRCH (Tom Downing, SEI)

- The project has dealt with this issue.

Tisza River (Istvan Zsuffa, Vituki)

- experience in model building in a data and information poor environment

3.11.4 Contributions from ongoing research

Floodsite (Tom Brabben/Patrick Samuels, HR Wallingford)

- Framework for uncertainty propagation 2009

GLOWA (Frank Wechsung, PIK)

- Uncertainty analysis

HarmoniCoP (Claudia Pahl Wostl, USF)

- Work on the role of uncertainties and in particular ambiguities that arise due to different interpretations of the same type of knowledge. Behavioral simulations for practical applications to raise awareness for different perspectives.

HarmoniRiB (Michiel Blind, RIZA)

- HarmoniRiB provides various guidelines on how to deal with uncertainty in data and models in an integrated context.

TWOLE and VERBANO (Soncini, Politechnical Univeristy of Milan)

- The project deals with this issue.

3.11.5 Other relevant (upcoming) (overview) articles

Dewulf, A., Craps, M., Bouwen, R., Taillieu, T. and Pahl-Wostl, C. Integrated management of natural resources: dealing with ambiguous issues, multiple actors and diverging frames. *Water, Science and Technology*, in press.

IPPC, (2001a). Climate Change 2001: The Scientific Basis. Contributions of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. I. P. o. C. Change). Cambridge, Cambridge University Press.

Newig, J., Pahl-Wostl, C. and Sigel, K. The Role of Public Participation in Managing Uncertainty in the Implementation of the Water Framework Directive. European Environment, in press.

Refsgaard et al, Uncertainty Analysis Guidance Document (A Guidance document from Harmoni-CA WP2) Jens Christian Refsgaard, Jeroen van der Sluijs and Peter Vanrolleghem (in preparation)

Tol, R.S.J., 2003. Is the uncertainty about climate change too large for expected cost-benefit analysis? Climatic Change 56(3), 265-289.

3.11.6 .Maturity analysis

RESPONS	Immature	Mature	Matured in 2-3 years	No opinion
Coping with uncertainty and risk management	5	2.5	8.5	1

The majority of respondents believe that within 2-3 years working with uncertainties and risks will be matured. A reasonable high number of projects are completed or ongoing which deal with uncertainties and risk management.

3.12 Issue 12 Scenarios and future forces for IWRM

3.12.1 Definition / Elaboration

This issue deals with the essential point of developing scenarios for the following driving forces:

- Demographic trends (population, age group distribution)
- Economic trends (income, income gap)
- Technology trends (high or low diffusion rates of technology)
- Land use and land cover change
- Consumption patterns – type and intensity of world trade
- Policy trends and sectoral developments including privatisation, regulation and the European Water Framework Directive

3.12.2 NeWater intended deliverables

Work package 2.6 deliverables:

- Results of the rapid assessment of trends of driving forces in the case studies.
- Sources of information for the scenarios of driving forces
- Report: Trends in driving forces and scenarios for the case studies that will put pressure on water use and water management in the case studies
- Report: Comparison of the baseline vulnerability (WP 2.1) and adaptive capacity (WP 2.5) with the implications of scenarios of trends in driving forces and stresses for IWRM.

3.12.3 .Contributions from completed research

MANTRA-East (Stalnacke, NIVA)

- Gooch, Geoffrey D., Stalnacke, Per Integrated scenarios - the key for SUCCESSFUL WATER AND RIVER BASIN management? Presented at: the 7th

International Water Association (IWA) Conference on Diffuse Pollution and Basin Management (DipCon) ,University College Dublin, from 17th – 22nd August 2003.

MERIT (Hans Jorgen Hendriksen, GEUS)

- Guidelines in use of bayesian networks for active involvement (available soon)

MULINO and follow-ups in Nostrum-Dss and Transcat (Carlo Guipponi, University of Milan)

- scenario analysis is provided by mDSS

SIRCH (Tom Downing, SEI)

- The project has dealt with this issue.

Tisza River (Istvan Zsuffa, Vituki)

- Land use, climate change and pollution spill scenario analyses with the help of hydrological, WQ and hydraulic models

3.12.4 Contributions from ongoing research

Ensembles (Chris Hewitt, Met Office)

- In 3 years - applying climate and non-climate scenarios to estimate water stress in large European basins

FlumaGIS (Joern Moeltgen, USF)

- The FLUMAGIS prototype is planning support tool (PSS): It provides functionality to analyse the current status quo, to analyse deficits, to conduct a causal deficit analysis, and to virtually implement various sets of planning scenarios. A prognosis of planning effects can be executed employing an interdisciplinary knowledge-bases and simulation models.

GLOWA (Frank Wechsung, PIK)

- Scenario development for different IPCC scenarios and different management scenarios to adapt/mitigate

WFD Article 5 project (Yann Laurens, Seine-Normandie Water Agency)

- Seine Normandy Basin Baseline scenario in WFD Art. 5 report

3.12.5 Other relevant (upcoming) (overview) articles

Gooch, G.D. and P. Stålnacke (eds.), 2005. Integrated Transboundary Water Management in Theory and Practice Experiences from the New EU Eastern borders. IWA publishing, London, UK. (in press)

IPPC, (2001a). Climate Change 2001: The Scientific Basis. Contributions of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. I. P. o. C. Change). Cambridge, Cambridge University Press.

IPPC, (2001b). Climate Change 2001: Impacts, Adaptation and Vulnerability. Contributions of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. I. P. o. C. Change). Cambridge, Cambridge University Press

Varis, O., Kajander, T., Lemmelä, R., 2004. Climate change and water: from climate models to water resources management and vice versa. Climatic change, 66, 321-344.

3.12.6 Maturity analysis

Accidentally, there was no maturity review question within the questionnaire.

Many projects however address scenarios, and much could be learned.

4 Reported additional issues

Chapter 4 'Reported additional issues' provides the results on the question if the questionnaire covered all relevant issues.

The following topics were mentioned (literal copy)

1. Ability to transfer lessons across basins;
2. Identification of what good IWRM / AM looks like;
3. Real time control;
4. The social dimensions of behaviour and risk management are often poorly represented, e.g., actor strategies for negotiations, behaviour in water demand;
5. Planning of investments needed to fulfil water directives at basin scale;
6. One relevant issue that never is practically mentioned is the recent phenomenon of the SILENT REVOLUTION OF THE INTENSIVE USE OF GROUNDWATER. This new (half century old) phenomenon is very important in most arid and semiarid regions, where irrigation is 80-90 % of all the consumptive water uses;
7. Retention processes;
8. Technical development;
9. Public awareness of the problems;
10. Modelling integration / adaptation of modelling systems. Adaptive management will also require adaptive means to develop support tools (e.g. domain models), which than need further integration. The field of easy linkage between software components is maturing fast (Project: HarmonIT);
11. Scientific collaboration: One potential problem in IWRM/adaptive management is communication, not only between different stakeholders, but also between different specialists who provide information to the adaptive planning process. First attempts to at least transparently support such specialist collaboration are carried out in HarmoniQuA, for modelling purposes;
12. The ability of current policy to deal with adaptive IWRM – e.g. can adaptive management be incorporated within the currently procedural, institutional and legislative framework of the Water Framework Directive Implementation?

5 Related initiatives

Chapter 5 introduces three other initiatives that aim at synthesizing available knowledge: (1) EU-INCO review of water research 1994-2005, (2) The WFD implementation Gap analysis and (3) Harmoni-CA concerted action synthesis proposals.

5.1 EU-INCO Review of Waster research 1994-2005

With a European investment in some 50+ international S&T cooperation projects addressing integrated water resources management (IWRM) over the last 10 years, The European Commission's International S&T Cooperation Programme (INCO) wants to take stock. Integrated water resources management is a key concept of the European Water Framework Directive (WFD) that also influences water policies and management discourses in many parts of the world.

As part of its commitment to the EU Water Initiative, the European Commission has invited [10 renowned experts](#), five from Europe and five from Africa, Asia, Latin America and the Mediterranean to review what lessons can be learnt from those projects, how much research results have been used to inform practice and how this should inform future cooperation in IWRM.

Expert Name	Gender	Nationality	Function
ALLAN John Anthony	Male	United Kingdom	Rapporteur
ANTUNES Paula	Female	Portugal	Reviewer
DUDEEN Basim	Male	Palestine	Reviewer
GYAWALI Dipak	Male	Nepal	Chairman
LAUREANO Pietro	Male	Italy	Reviewer
LUISELLI Cassio	Male	Mexico	Reviewer
MONTEIRO Pedro	Male	South Africa	Reviewer
NGUYEN Khanh Hong	Female	Vietnam	Reviewer
NOVACEK Pavel	Male	Czech Republic	Reviewer
PAHL-WOSTL Claudia	Female	Germany	Reviewer

The review panel, sporting also an 'embedded' journalist, is scheduled to produce a technical report, a policy brief and a general public brochure. These products are to be presented, among others, at the 4th World Water Forum in Mexico, `6-22 March 2006.

The panel developed a scoring framework based on sustainable development principles, cultural and modernity theories and based on the following questions:

Have the principles of sustainability been properly addressed?

- Social
- Environmental
- Economic
- Political/Institutional

Have technical solutions been adequate?

- Has local knowledge been considered in the technical approach?
- Has the technical approach considered ecological conditions?
- Has the technical approach considered the socio-economic conditions?

Integration

- Did the study take a biophysical system approach?
- Did the study take an integrated approach?
- What has been integrated? (Policy)

Communication

- Policy makers
- Technical community
- Local users
- Education
- Private sector

Impact

- Has the project contributed to capacity building?
- Has project leadership and management been balanced between partners?
- Has the project been effective in advancing IWRM?
- Is the project impact on IWRM based on innovative knowledge generation?

Narrative

- Has the project reflected the understanding of IWRM, as expressed in the EU FP4, 5 and 6 work programmes?
- What was the awareness of the team of the environmental services of water?
- Has the project adopted a resource-based or an ecosystem-based approach?
- Does the project reflect an awareness of cultural and historical dimensions?

Almost all projects have been scored by at least two members of the international panel during the first week (18-22 July 2005) of work in Brussels. The panel members found that the methodology worked exceedingly well to screen the diverse INCO projects covering a wide geographical range of collaborations (Africa, Asia, Latin America, Mediterranean, Russia and the other New Independent States and Western Balkans). However, time was insufficient to consolidate the analysis by using, among others, the extensive comments made by panellists in relation to individual project score sheets. This will be done during the next stages of the review process.

The international IWRM review is intended to be complementary and synergistic with the NeWater Project work package analysing IWRM. This is ensured through mutual attendance of meetings and exchange of materials in addition to active participation of the overall NeWater coordinator in the international IWRM panel. It is expected that this coordinated approach will lead to knowledge products that are useful and influential in supporting IWRM learning process and practice.

The scientific officer in charge of the international IWRM review in DG RTD is Cornelia Nauen (cornelia.nauen@cec.eu.int). More information about this review can also be gleaned from the research website of the EUWI (terms of reference, presentation of panel members, quick overview of projects from the project database and its update etc.)

Annex III lists the INCO projects subjected to the international review process (the list is provisional and may be amended from the INCO portfolio on request from the panellists).

5.2 Water Framework Directive: Research needs.

Working Group B of the common implementation strategy of the Water Framework Directive identified the research needs for the implementation of the Water Framework Directive (Authors: Marc de Rooy, Gerard Broseliske, Manuel Menendez). Chapter 5.2 reports on these gaps and aims to relate these gaps to IWRM research issues covered in NeWater.

The objective of the activity was to identify and prioritise issues from the WFD Article 5 activity, and to identify blank spots in research. The activity was performed by means of a questionnaire sent out to and returned by all member states. The evaluation of the questionnaire gives a first overview of the possible research gaps identified during the implementation of the WFD throughout Europe.

It has to be mentioned that the two key points of the activity by Working group B were to be “quick” and “transparent”. The research tasks identified following the return of the questionnaire and listed in the table have not been changed, evaluated or ranked. As such the list represents the perceived research gaps from the perspective of people in charge of implementing the Water Framework Directive.

In contrast to previous chapter, where researchers provided their view, the results of the Working Group B exercise may help to target different NeWater activities. Furthermore the list may be helpful for any project whose aim is to bring forward research results in practical applications.

The allocation of the possible research gaps in relation to the key issues of NeWater is a very subjective one by the authors, which was meant to support and stimulate the discussion of the IWRM platform.

It is obvious that the list of research gaps identified in the questionnaire cannot claim completeness. Other research tasks, which came up in several workshops and conferences, like the possible impact of climate change on water quality, the relevance of nutrient residence times in catchments and lakes for water quality and ecology, nutrient retention in wetlands, the social dimensions of behaviour and risk management, are missing. Not all the possible research gaps mentioned in the questionnaire are addressed to the scientific world but are rather management or communication problems.

Nevertheless, some general pattern can be found when analysing the answers of the questionnaire. The overall most important driving forces and pressures mentioned are pollution from agriculture, riverbed morphology, pollution from municipal wastewater, pollution from industry and other sources of pollution like landfill, waste and mining, and flow reduction.

Table 1: The research need identified in the questionnaire of Working Group B in relation to the main issues of NeWater. “X” represents a potential NeWater contribution to reduce the gap. Note that “X” is based on the authors’ preliminary judgement and is at this stage just an example. Much additional output from NeWater Case-studies could help fill the WFD perceived knowledge gaps.

NeWater /IWRM issue

"WFD research need"

- 1 IWRM & Adaptive Water Management Regimes, including methods for changing regimes
- 2 Vulnerability and exposure to shocks and stresses in river basins
- 3 Governance, institutions and participation, including transboundary issues
- 4 Integration IWRM and spatial planning
- 5 Methods of managing buffering capacity
- 6 Advanced monitoring systems for adaptive management
- 7 Understanding consequences of climate hazards and climate change
- 8 Resolving conflicts between water quantity, water quality and ecosystems
- 9 Social dimensions of IWRM: poverty alleviation, gender and health
- 10 Resilience and adaptive capacity to complex water systems
- 11 Coping with uncertainty and risk management
- 12 Scenarios and future forces for IWRM

	1	2	3	4	5	6	7	8	9	10	11	12
Water resources and demand management												
1.1 Water saving					X							
1.2 Water saving in irrigation					X							
1.3 Water conservation					X							
1.4 Water reuse (e.g. treated wastewater)					X							
1.5 New water sources (e.g. desalination)					X							
1.6 Water management in drought prone regions	X	X	X	X	X	X	X	X	X	X	X	X
Groundwater management												
2.1 Development of common approach for quantification of diffuse pollution – expressed by nutrients and other parameters (i.e. heavy metals, specific organic pollution)								X				
2.2 Methodology for monitoring and chemical status evaluation on karstic GW bodies						X						
2.3 Treshold values to prevent deterioration of chemical status of GW bodies								X				
Knowledge on physical processes												
3.1 Interaction groundwater - surface water - sediments										X		
3.2 Trends in coastal erosion										X		
3.2 Saline intrusion; what is meant by 'significant intrusion'. Insight in intrusion mechanisms needed.										X		
Knowledge on ecological processes												
4.1 Relationship between hydromorphological and biological conditions								X				
4.3 Environmental standards for annex VIII and X substances												
4.4 Modelling tools to define reference conditions								X				
4.5 Intercalibration of assessment methods for biological quality elements												
4.6 Objectives for hydrology (minimum flow)							X					

NeWater /IWRM issue

"WFD research need"

- 1 IWRM & Adaptive Water Management Regimes, including methods for changing regimes
- 2 Vulnerability and exposure to shocks and stresses in river basins
- 3 Governance, institutions and participation, including transboundary issues
- 4 Integration IWRM and spatial planning
- 5 Methods of managing buffering capacity
- 6 Advanced monitoring systems for adaptive management
- 7 Understanding consequences of climate hazards and climate change
- 8 Resolving conflicts between water quantity, water quality and ecosystems
- 9 Social dimensions of IWRM: poverty alleviation, gender and health
- 10 Resilience and adaptive capacity to complex water systems
- 11 Coping with uncertainty and risk management
- 12 Scenarios and future forces for IWRM

8.8 The decision support systems may focus on various levels of scale (EU, region, country, river basin, smaller area etc)	X					X		X	X			X	X
8.9 Assessment of the impact of measures on the chemical and biological quality of surface and ground waters using "practical and well considered approaches"	X					X			X			X	
WFD policy questions													
9.1 Linking ecological and socio-economical models	X										X		
9.2 Tools for presentation to show the effects of different measures and scenario's												X	X
9.3 Community education and involvement in decision making				X									
9.4 Approach to evaluation of artificial irrigation canals (in period of year without water)													
Policy assessment													
10.1 Assess the effectiveness of the implementation programme. Evaluation of environmental results of implemented programmes of measures (e.g. the effects of completed wastewater programs on the chemical, ecological status of water bodies in selected sub-river basins, urban waste water directive; lessons to be learned)	X	X					X		X				
Socio-economy													
11.1 Economy - cost/benefits and cost recovery problems													
11.2 Scale of the analysis for individual elements (pressures) of the cost-effectiveness analysis													
11.3 Dealing with changes to cost recovery mechanisms as potential measures within the first POM													
11.4 Developing business as usual models and dealing with less than full application of other water policies in the cost-effectiveness analysis.													

morphology. Another issue, where according to the answers exist many problems, is socio-economy, and here especially questions of cost-effectiveness, cost-benefit and cost recovery problems. NeWater does not address economic issues in much detail.

Often mentioned are pressure-impact relations (impacts of mining industry, agriculture, hydropower plants, nutrient transport in land and water), and measure assessment (again cost-effectiveness, decision support systems). The main aspects concerning monitoring are in combination with network optimisation, ecological monitoring, data processing and modelling. Important are also water resources and demand management (irrigation, water conservation, water management in drought prone regions, salt water intrusions, scenario development) and WFD policy questions.

Another research gap, which is identified throughout the questionnaire, is related to modelling issues, and here especially modelling tools to define the reference conditions, models to investigate possible impacts under scenario conditions and ecological models. An item related to modelling and monitoring and mentioned in the returned questionnaire are uncertainty aspects like uncertainty in monitoring and modelling.

5.3 Harmoni-CA synthesis

Within the concerted action Harmoni-CA, discussions are ongoing on the selection of topics for synthesis. Harmoni-CA focuses on proper use of models and computer tools during the WFD implementation. This ranges from actual use to stakeholder involvement and participatory model development.

Currently topics are collected for which a detailed analysis will be carried out. Harmoni-CA has a responsibility towards the actual implementation of the WFD (end-user of research), but also towards the research community. The purpose of Harmoni-CA analyses may thus vary from synthesis leading to management advice, to synthesis reflecting the technical state of the art as input to research. In September 2005, it will be clear which topics will be addressed within Harmoni-CA.

For more information contact harmoni-ca.wp1@riza.rws.minvenw.nl

ANNEX I. CONTACTS

ANNEX I provides the available contact details of the persons that have been invited for the first European IWRM platform meeting.

PARTICIPANTS STOCKHOLM

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PERSONS UNABLE TO ATTEND

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Gooch Hall	Geoffrey D. Alan	Global Water Partnership	geogo@eki.liu.se alan.hall@gwpforum.org	Global Water Partnership, NeWater
Hesselbjerg Christensen Hewitt Ison	Jens Chris Ray	Danish Met. Institute (Dk) Met. Office (UK) Open University, Milton Keynes (UK)	JHC@dmi.dk chris.hewitt@metoffice.gov.uk slimcoord@open.ac.uk	No, Prudence Ensembles Slim
Jeffrey	Paul	Cranfield University (UK)	P.J.Jeffrey@Cranfield.ac.uk	Expected (Aquadapt), NeWater
Jeroen Kilsby Kuks Laurans	Aerts C.G. Stefan Yann	IVM (NL) Univerity Twente Seine-Normandie Water Agency	jeroen.aerts@ivm.falw.vu.nl c.g.kilsby@ncl.ac.uk s.m.m.kuks@utwente.nl LAURANS.Yann@AESN.fr	NeWater WP1.2 Swurve
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Vanrolleghem	Peter	University of Gent (B)	Peter.Vanrolleghem@ugent.be	Harmoni-CA WP2, CityNet cluster

ANNEX II. BRIEF DESCRIPTION OF PROJECTS

ANNEX II provides abstract information on a range of European and few national projects, which are relevant to the IWRM community.

The information has been retrieved from www.cordis.lu, www.harmoni-ca.info or the project's website. It should be noted that the information on these websites is sometimes outdated, and the contact person usually is the formal contact point of the leading organisation, and not of the actual project manager.

The section consists of:

1. Projects that were identified by the organisation team
2. Project under review in the INCO initiative
3. Projects that were proposed by the respondents of questionnaires.

A PARTICIPATORY APPROACH FOR SOIL AND WATER CONSERVATION PLANNING{ XE "PLANNING:A PARTICIPATORY APPROACH FOR SOIL AND WATER CONSERVATION PLANNING" } (NO ACRONYM)

Full name	A participatory approach for soil and water conservation planning, integrating soil erosion modelling and land evaluation, to improve the sustainability{ XE "sustainability:A participatory approach for soil and water coservation planning" } of land use
Contact	
Ending date	30/11/2000 COMPLETED
ID	IC18-CT-1997-0158
URL(s)	http://europa.eu.int/comm/research/waterinitiative/projects/ic18_ct_1997_0158_en.htm
Abstract	Soil erosion is the major cause of degradation of agricultural and non-agricultural land on the Loess Plateau in the northern provinces of China, inhibiting sustainable use of the land resources. The EROCHINA project aimed to develop alternative land use and soil and water conservation strategies for their area, focusing on reducing soil and water losses and increasing sustainability. A new participatory planning method, which integrates both soil erosion modelling and land evaluation, was used. Soil erosion can be controlled and/or reduced by a change in land use and/or adoption and application of soil conservation techniques; however, solutions cannot be found independently of land user motivation, knowledge and perceptions.

ADVISOR (ACRONYM)

Full name	Integrated{ XE "Integrated:Advisor" } evaluation for sustainable river basin governance{ XE "governance:Advisor" }
Contact	Paula Antunez, mpa@fct.unl.pt, Portugal
Ending date	31/07/2004 COMPLETED
ID	EVK1-CT-2000-00074
URL(s)	http://gasa.dcea.fct.unl.pt/ecoman/projects/advisor/
Abstract	Advisor's main objective is to provide an integrated project evaluation framework and methodology for the sustainable governance of Europe's river basins. It aims to develop a set of guidelines to implicated EU river basin authorities and agencies describing an integrated project evaluation process, establishing criteria for assessing the "sustainability{ XE "sustainability:Advisor" } quality" of an evaluation process and providing a number of practical tools to operationalise the proposed guidelines. The final outcome will be achieved through the: establishment of an integrated theory and understanding of the process of evaluation of river basin projects in the EU; development and testing of a number of practical evaluation tools and the proposal of an integrated methodology for the evaluation of river basin projects in the EU. The project aims to operationalise the principles of integrated assessment and the post-normal scientific paradigm into the solution of a "policy gap" of outmost EU importance.

ALARM (ACRONYM)

Full name	Assessing LArge-scale environmental Risks{ XE "risk:Alarm" } with tested Methods
Contact	Josef Settele, UFZ-Umweltforschungszentrum Leipzig-Halle GmbH, Germany
Ending date	01/02/2009
ID	506675
URL(s)	http://www.alarmproject.net/alarm/
Abstract	<p>Based on a better understanding of terrestrial and freshwater biodiversity and ecosystem functioning ALARM will develop and test methods and protocols for the assessment of large-scale environmental risks in order to minimise negative direct and indirect human impacts. Research will focus on assessment and forecast of changes in biodiversity and in structure, function, and dynamics of ecosystems. This relates to ecosystem services and includes the relationship between society, economy and biodiversity. In particular, risks arising from climate{ XE "climate:Alarm" } change, environmental chemicals, biological invasions and pollinator loss in the context of current and future European land use patterns will be assessed. There are an increasing number of case studies on the environmental risks subsequent to each of these impacts. This yields an improved understanding on how these act individually and affect living systems. Whereas the knowledge on how they act in concert is poor and ALARM will be the first research initiative with the critical mass needed to deal with such aspects of combined impacts and their consequences. Risk assessments in ALARM will be hierarchical and examine a range of organisational (genes, species, ecosystems), temporal (seasonal, annual, decadal) and spatial{ XE "spatial:Alarm" } scales (habitat, region, continent) determined by the appropriate resolution of current case studies and databases. Socio-economics as a cross-cutting theme will contribute to the integration of driver-specific risk assessment tools and methods and will develop instruments to communicate risks to biodiversity toned users, and indicate policy options to mitigate such risks The ALARM consortium combines the expertise of 53 partners from 26 countries (14 EU, 7 NAS, Israel, Switzerland, and 3 INCO states). ALARM encompasses 7 Sees as full partners with central responsibilities and with a share of more than 10% of the project resources.</p>

AMMA (ACRONYM)

Full name	African Monsoon Multidisciplinary Analyses
Contact	amma-eu@ipsl.jussieu.fr
Ending date	
ID	
URL(s)	http://www.amma-eu.org/
Abstract	<p>The African Monsoon Multidisciplinary Analyses (AMMA) project is an international endeavour which has set itself three main aims :</p> <p>To improve our understanding of the West African Monsoon and its physical, chemical and biological environment.</p> <p>To provide the underpinning science that relates climate{ XE "climate:Amma" } variability to issues of health{ XE "health:Amma" }, water resources and food security and defining the relevant monitoring{ XE "monitoring:Amma" } strategies.</p> <p>To ensure that the multidisciplinary research is efficiently integrated with prediction and decision making activities.</p> <p>To achieve these objectives a number of national and pan-national projects have been set up :</p> <ul style="list-style-type: none">AMMA InternationalAMMA AfricaAMMA FranceAMMA United KingdomAMMA United StatesAMMA European Union (This page) <p>These projects are coordinated through the AMMA-International structure. The international structure is also key for the developments of the links between AMMA and the World Climate Research Program (WCRP) (especially its GEWEX and CLIVAR programs) and the International Geosphere-Biosphere Programme (IGBP).</p>

AQUADAPT (ACRONYM)

Full name	Strategic tools to support adaptive{ XE "adaptive:Aquadapt" }, integrated{ XE "integrated water:Aquadapt" } water resource management under changing utilisation conditions at catchment scale: a co-evolutionary approach.
Contact	Paul Jeffrey, p.j.jeffrey@cranfield.ac.uk
Ending date	31/07/2005 COMPLETED
ID	EVK1-CT-2001-00104
URL(s)	http://www.aquadapt.net/
Abstract	The overall aim of the AQUADAPT project is to generate knowledge which supports the strategic planning{ XE "planning:Aquaadapt" } and management of water resources in semi-arid environments at catchment level under changing supply / demand patterns. The intellectual framework, which underpins the project, reflects recent thinking on the co-evolution of natural resource availability with human societies. Hence, we explicitly seek to provide a basis for the integration of water resource planning with structural, social, economic, agricultural and regional development planning. Organised in seven work packages, AQUADAPT involves thirteen academic and industrial partners from seven countries

AQUALIBRIUM (ACRONYM)

Full name	European Water Management Between Regulation and Competition
Contact	Meinhof Dierkes, Nexus - Institut Für Kooperationsmanagement Und Interdisziplinäre Forschung, Germany
Ending date	01/01/2003 COMPLETED
ID	EVK1-CT-2001-80003
URL(s)	
Abstract	Private sector participation{ XE "participation:Aqualibrium" } in <i>water</i> management generates controversy in the public. Above all, controversy questions effect the possibility of the identification of potential risks{ XE "risk:Aqualibrium" } and dangers with regard to a liberalisation of <i>water</i> markets (e.g. a reduction of quality standards, increasing consumption, the regional rule, neglect of the costly wastewater treatment) and the design and implementation of technological modernisation and information, participation of customers as well as the factor of user awareness and acceptance of new developments in this sensitive sector. In addition to this, strategies of <i>water</i> management have to consider a broad variety of tensions within socio-economic terms, as e.g. the tension between urban and rural environment, agricultural and industrial production, central and decentred organisation of supply and disposal services, productive and reproductive (household) economic conditions. Sustainable <i>water</i> management has therefore to take into consideration this variety in regard to the relevant legal, institutional and constitutional circumstances of the different countries. Considering this situation, AQUALIBRIUM will improve the state-of-the-art of information availability and discussion process by providing a multi-dimensional "map" of the current debate and the state of affairs in public-private partnership in <i>water</i> management covering all Member States of the European Union by realising two steps. First, AQUALIBRIUM will collect data and information on the current debate and national strategies for public-private partnership in respect to fundamental ideological positions, actor-specific perspectives, the pros and cons in discussion, recently taken initiatives and experiences. Second, it will organise the assessment and evaluation of these national strategies which aims to outline advantages and drawbacks, device best practices and identify topical issues and knowledge deficits.

ARAL-KUM (ACRONYM)

This project is included in the INCO review.

Full name	Desertification in the Aral sea region: a study of the natural and anthropogenic impacts.
Contact	LEGROS, Willy (Prof.) Email: recteur@ulg.ac.be; Universite De Liege, Belgium
Ending date	31/10/2003 COMPLETED
ID	I ICA2-CT-2000-10023
URL(s)	www.cordis.lu
Abstract	The state of the Aral Sea and the surrounding lands constitutes one to the worst environmental

	<p>disasters that the world has ever seen. As the lake has shrunk, as a re-salt of increasing diversion of Amu-Darya and Syr-Darya rivers for irrigation, various types of salts have precipitated on its former bed. Because most of these salts are sub-ject to wind erosion, the exposed bed of the Aral has become the major source of salt and dust storms in the region. Salt in the atmosphere being condensation nuclei have an impact on world climate{ XE "climate:Aral-Kum" } and thus the problem becomes of Worland European concern. The objective of the project is to investigate the causes of disastrous desertification in the Aral Sea Region aiming to elaborate recommendations for the most effective remedial actions to be taken to combat desertification. The project methodology includes a) monitoring{ XE "monitoring:Aral-Kum" } of the land, river and sea parameters being considered as key indicators of desertification and to contribute towards establishing a data information system b) modelling development to obtain an mathematical tool to understand Aral desertification process and to set upon environmental management of this basin.</p>
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ATLANTIS (ACRONYM)

Full name	Atlantic sea level rise : adaptation to imaginable worst case climate{ XE "climate:Atlantis" } change
Contact	Dieter Friese, University Of Hamburg, Zentrum Für Meeres- Und Klimaforschung, Germany
Ending date	30/11/2004 COMPLETED
ID	EVK2-CT-2002-00138
URL(s)	www.cordis.lu
Abstract	<p>We will adopt methodologies of risk{ XE "risk:Atlantis" } management to study adaptation to imaginable worst case Climate change. In consultation with local experts and stakeholders, we will develop rich scenario{ XE "scenario:Atlantis" }s ("future histories") of the societal implications of a 5-6 metre sea level rise, potentially caused by a collapse of the west-Antarctic Ice Sheet, on the Rhone delta, the Netherlands and the Thames Estuary. We will estimate the amount of land, buildings etc lost, but will focus on initial responses (e.g., dike building, managed retreat), their probabilities of failure, as well as the wider effects (e.g., on the economy, large-scale migration). In addition, we will perform a formal risk assessment, analyse social representations and investigate optimal control of greenhouse gas emissions under catastrophic risk. The project would add substance and seriousness to the debate of potential catastrophes that may be caused by human-induced climate change</p>

CAESAR (ACRONYM)

Full name	Cooperative applied environmental systems research of urban-rural interface - Sustainability{ XE "sustainability:Caesar" } in water management and land use in Havana-region
Contact	Baume Otfried, Institute Of Geography, Ludwig-Maximilians-Universität München, Germany
Ending date	31/08/2005
ID	ICA4-CT-2002-10019
URL(s)	http://europa.eu.int/comm/research/waterinitiative/projects/ica4_ct_2002_10019_en.htm
Abstract	<p>The Cuban way of development during the last four decades led to a special handling of nature, land use and the vitally important resources, e.g. water, particularly in regions with high settlement pressure like the urban-rural interface of Havana. Transformation processes resulted partially in a radical change in land use systems and the consumption of existing resources, causing serious geoeological and urban problems. The main aim is the development of sustainable environmental management systems for land use and water management. Guidelines will be drawn up for sustainable territorial planning{ XE "planning:Caesar" } in order to contribute to an improvement in quality of life. Activities An innovative and interdisciplinary approach integrates geoeological analysis, detailed environmental monitoring{ XE "monitoring:Caesar" } and assessment of environmental systems, enhanced by an analysis of the social, economical, medical health{ XE "health:Caesar" } related and environmental policy situations in the area. A Geographical Information System (GIS) is to be created in which geoeological and visual landscape units will be classified and evaluated. The assessment of geoeological conditions and landscape degradation of these units and the determination of their ecological capacity will lead to territorial planning recommendations. By social scientific perception methods the human ecological condition of the area will be analysed in geomedical terms. Environmental political measures, educational and awareness measures shall be elaborated to illustrate environmental problems using as well multimedia documentation. The strong cooperation with local decision-makers, governmental and non governmental organisations aims at the later implementation of the project results achieving a suitable land use planning and water management, contributing finally to an improvement in quality</p>

	<p>of life. By this project, the increased experience of the Cuban scientists and the created necessary infrastructure will help to a future application to other similar regions inside the country. Together with the transferability of the methodology on similar regions in Latin America, which will be developed and discussed finally in an international workshop, the project results so in an even more positive effect for the efforts of preserving the environment. Expected outcome</p> <ul style="list-style-type: none"> • Reports on the development of land use and water management, geocological and visual landscape units and their degradation, on environmental policy, on environmental education and environmental health conditions. • Scenario{ XE "scenario:Caesar" }s and guidelines for effective land use and water management systems and recommendations for sustainable environmental political measures and territorial planning. • Exemplary contribution to environmental education through recommendations for educational and awareness measures and for improved dealings with environmental health, illustrated by multi-media documentation. • Former contacts and new partnerships, the scientific exchange and the connection within and outside the European science can be intensified and the research infrastructure between Europe and Latin America strengthened.
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CATCHMENT2COAST (ACRONYM)

Full name	Research into and modelling of the impacts of river catchment developments on the sustainability{ XE "sustainability:Catchment2Coast" } of coastal resources, which support urban and rural economies: the case of Maputo Bay - Incomati River
Contact	Marcel Marchand, Marine And Coastal Management Department, Stichting Waterloopkundig Laboratorium (WI /Delft Hydraulics, The Netherlands
Ending date	30/09/2005
ID	ICA4-CT-2002-10059
URL(s)	http://www.catchment2coast.org/home.php
Abstract	This project takes an interdisciplinary systems approach to understand the linkages between river catchments and their associated coastal environments. It uses linked dynamic numerical models as tools to translate the impacts of human development in the river basins into cost-based consequences to rural and urban economies in the coastal domain. At the core of this research is the hypothesis that human activity in the Incomati catchment is impacting on the shrimp industry in Maputo Bay. The tools and capabilities produced from this R&D project will support the internalisation of delayed costs of upstream developments on the delivery of goods and services from coastal ecosystems. The technical and institutional training modules in this project will strengthen RTD co-operation over periods outlasting this project and ensure that project partners benefit from each other's skills and experience

CABRI VOLGA (ACRONYM)

Full name	Cooperation Along a Big River - Institutional coordination among stakeholders for environmental risk{ XE "risk:Cabri Volga" } management in the Volga basin
Contact	Rupprecht Consult - Forschung & Beratung GmbH, Germany
Ending date	2006
ID	13424
URL(s)	http://www.rupprecht-consult.de/projects/cabri.html
Abstract	<p>CABRI-Volga is an international coordination action to facilitate cooperation and to coordinate research in environmental risk management in large river basins in the EU, Russia & the New Independent States (NIS). The CABRI-Volga project is funded by the European Commission under the International Cooperation (INCO) Programme.</p> <p>The project focus is on the Volga basin, which comprises 40% of the population of Russia, 45% of the country's industry and 50% of its agriculture.</p> <p>For the Volga basin, environmental risk management is fundamental for protecting the environment, improving socio-economic conditions and promoting agricultural and industrial economies as well as the health{ XE "health:Cabri Volga" } of the Caspian Sea. Existing problems in governance{ XE "governance:Cabri Volga" } and institutional performance, deficiencies in civil society involvement as well as low levels of cooperation between academic and policymaking institutions{ XE "institutions:Cabri Volga" } have led to a situation of significant ecologic, social and economic risks in the basin.</p>

CIRMAN-ARAL (ACRONYM)

This project is included in the INCO review.

Full name	Crop irrigation management for combating irrigation induced desertification in the Aral sea basin
Contact	Pedro Manuel LEÃO DE SOUSA
Ending date	31/12/2004 COMPLETED
ID	ICA2-CT-2000-10039
URL(s)	
Abstract	The CIRMAN-ARAL project focus on developing crop irrigation management strategies for combating irrigation induced desertification in the Aral Sea Basin. Strategies concern water saving irrigation scheduling and field practices, reduction of water demand for agriculture, improved control of drainage water, and soil and water salinity. These issues should promote increased water available for natural rivers, water bodies and riparian ecosystems, and the preservation and improvement of land resources while favouring the Cir{ XE "sustainability:Cirman-Aral" } of irrigated agriculture. The project shall produce a DSS to be used by decision makers, and the conditions to implement research findings to be used in the farmers practice.

CLIMED (ACRONYM)

This project is included in the INCO review.

Full name	Effects of climate{ XE "climate:Climed" } change variability in water availability and water management practices in western Mediterranean.
Contact	Carlos Borrego, University Of Aveiro, Portugal
Ending date	31/05/2004 COMPLETED
ID	ICA3-CT-2000-30005
URL(s)	
Abstract	The main objective of the CLIMED project is to provide information on the foreseeable climatic changes in the Western Mediterranean. Through a multiple approach, which includes field hydrological databases, together with statistical models and physically based models, performing an evaluation on how fresh water resources will vary. The project address esevapotranspiration of different land uses, by measuring catchments runoff at small catchments, and performs up scaling through statistical methods directed to the analysis of extreme events, through the use of LISEM model. CLIMED has unimportant socio-economic dimension, which relates the socio-economic data with the information provided by the climate and hydrological stages, in order to produce, for the selected river catchments, an assessment of the impacts of changes on water availability. Another Clime's major goal is to build a conceptual model based on integrated management methodologies, defining guidelines to support decision-making processes and strategic paining for water resources, as well as defining policy recommendations based on combined top-down and bottom-up approaches.

COLASU (ACRONYM)

No record in Cordis.

This project is included in the INCO review.

Full name	Maintien des écosystèmes côtiers méditerranéens de lagune sous le climat semi-aride
Contact	
Ending date	COMPLETED
ID	ICA3-CT-2002-10012
URL(s)	
Abstract	

DEAD SEA (ACRONYM)

This project is included in the INCO review.

Full name	A future for the dead sea basin: options for a more sustainable water management
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Contact	Günter Koch; guenter.koch@arcs.ac.at, Arc Seibersdorf Research GMBH Austria
Ending date	31/06/2006
ID	ICA3-CT-2002-10019
URL(s)	www.cordis.lu
Abstract	The Dead Sea Basin has been affected by the economic and demographic changes of the last 50 years: a visible symptom for the degradation is that the surface area of the Dead Sea has shrunk by about 30 %. The objective of this project is to establish the scientific basis for a "more sustainable than today" water management and water-related land management in the Dead Sea Basin. The proposed research includes both the physical and social dimensions. The approach is to synthesize the available data, to analyse the interactions between natural resources and human activities, to project likely development trajectories and their impacts, and to establish strategic more sustainable development plans{ XE "planning:Dead Sea" }, and from this, to develop practical recommendations that can be used for strategic decision-making.

DSS-DROUGHT (ACRONYM)

Full name	A decision support system for mitigation of drought impacts in the Mediterranean region
Contact	Mr Giuseppe Rossi, Institute of Hydraulics and Water Management, Universita' di Catania, Italy
Ending date	31/07/2001 COMPLETED
ID	IC18-CT-1997-0169
URL(s)	http://europa.eu.int/comm/research/water-initiative/projects/ic18_ct_1997_0169_en.htm
Abstract	Objectives: a) identify the regional drought events and determine their characteristics (duration, deficit intensity etc.); b) determine the most effective irrigation scheduling under drought conditions using an appropriate crop-water simulation model; c) define the operational rules for storage facilities of the water supply system; d) analyse the institutional framework and suggest a 'Drought Watch System' for the Mediterranean.

ENSEMBLES (ACRONYM)

Full name	ENSEMBLE-based Predictions of Climate{ XE "climate:Ensemble" } Changes and their Impacts
Contact	David Griggs, ensemblesfp6@metoffice.gov.uk
Ending date	01/09/2009
ID	GOCE-CT-2003-505539
URL(s)	http://www.ensembles-eu.org/
Abstract	Prediction of both natural climate variability and human impact on climate is inherently probabilistic, due to uncertainties{ XE "uncertainties:Ensembles" } in forecast initial conditions, representation of key processes within models, and climatic forcing factors. Hence, reliable estimates of climatic risk{ XE "risk:Ensembles" } can only be made through ensemble integrations of Earth - System Models in which these uncertainties are explicitly incorporated. For the first time ever, a common ensemble forecast system will be developed for use across a range of timescales (seasonal, decadal, and longer) and spatial{ XE "spatial:Ensembles" } scales (global, regional, and local). This model system will be used to construct integrated{ XE "integrated:Ensembles" } scenario{ XE "scenario:Ensembles" }s of future climate change, including both non-intervention and stabilisation scenarios. This will provide a basis for quantitative risk assessment of climate change and climate variability, with emphasis on changes in extremes, including changes in storminess and precipitation, and the severity and frequency of drought, and the effects of "surprises", such as the shutdown of the thermohaline circulation. Most importantly, the model system will be extensively validated. Hind casts made by the model system for the 20th century will be compared against quality-controlled, high-resolution girded datasets for Europe. Probability forecasts made with the model system on the seasonal and decadal timescales will also be validated against existing data. The exploitation of the results will be maximised by linking the outputs of the ensemble prediction system to a wide range of applications. In turn, feedbacks from these impact areas back to the climate system will also be addressed. Thus ENSEMBLES will have a structuring effect on European research by bringing together an unprecedented spectrum of world-leading expertise. This expertise will be mobilised to maintain and extend European pre-eminence in the provision of policy-relevant information on climate and climate change and its interactions with society

EUROCAT (ACRONYM)

Full name	European catchments, catchments changes and their impact on the coast
Contact	Guenter Von Sengbusc , Gkss - Forschungszentrum Geesthacht GMBH, Germany
Ending date	31/01/2004 COMPLETED
ID	EVK1-CT-2000-00044
URL(s)	http://www.iaa-cnr.unical.it/EUROCAT/project.htm
Abstract	In this project we will develop a quantifiable framework of analysis for improved planning{ XE "planning:Eurocat" } and management of catchments by analysing the response of the coastal sea to changes in fluxes of nutrients and contaminants from the catchments. These changes in fluxes are caused by the implementation of regulations, management schemes and by socio-economic changes. In addition the rate of change is modified by the biogeochemical and physical properties of the catchment. To elucidate the various factors, six regional catchment studies will be carried out using a common framework of analysis (DPSIR). To link the socio-economic drivers in the catchment to the coastal response, the concept of critical loads will be extended to the catchment-coast continuum.

EUROLAKES (ACRONYM)

Full name	Integrated{ XE "integrated:Eurolakes" } water resource management for important deep European lakes and their catchment areas
Contact	Klaus Pfeiffer . Pfeiffer@hydromod.de. Hydromod Scientific Consulting Gbr. Germany
Ending date	31/10/2003 COMPLETED
ID	EVK1-CT-1999-00004
URL(s)	http://pcs0.hydromod.de/Eurolakes/index.html
Abstract	EUROLAKES aims at the improvement of planning{ XE "planning:Eurolakes" } strategies and EU regulations - in particular the EU <i>Water Framework Directive</i> - concerning sustainable <i>water</i> management of deep European lakes and their catchment areas. This includes long-term management, short-term pollution control and integrated monitoring{ XE "monitoring:Eurolakes" } approaches for these important natural drinking <i>water</i> reservoirs. Ecosystem quality targets for the integrated management and protection of those ecosystems will be established as well.

EURO-LIMPACS (ACRONYM)

Full name	Integrated Project to Evaluate the Impacts of Global Change on European Freshwater Ecosystems
Contact	Simon PATRICK, s.patrick@geog.ucl.ac.uk
Ending date	01/02/2009
ID	505540
URL(s)	http://www.eurolimpacs.ucl.ac.uk/
Abstract	Freshwater ecosystems, under stress from land-use change and pollution, face additional pressures from climate{ XE "climate:Euro-Limpacs" } change, directly and through interaction with other drivers of change. Euro-lampacs is concerned with the science required to understand and manage the ecological consequences of these interactions. It is relevant to the <i>Water Framework Directive</i> and other international directives and protocols and supports the <i>Em?s Charter on Sustainable Development</i> . The Project comprises a consortium of leading scientists to integrate{ XE "integrate:Euro-Limpacs" } river, lake and wetland ecosystem science at the catchments scale. It focuses on the key drivers of aquatic ecosystem change (land-use, nutrients, acid deposition and toxic substances) and examines their interactions with global, especially climate, change using time-series analysis, space-for-time substitution, palaeolimnology, experiments and process modelling. It considers these interactions at 3 critical time-scales: (i) hours/days, concerned with changes in the magnitude and frequency of extreme events; (ii) seasons, concerned with changes in ecosystem function and life-cycle strategies of freshwater biota; (iii) years/decades, concerned with ecological response to environmental pressure, including stress reduction and ecosystem recovery. An innovative toolkit for integrated catchments analysis and modelling will be developed to simulate hydrological, hydro chemical and ecological processes at the catchments scale for use in assessing the potential impact of global change under different climate and socio-economic scenario{ XE "scenario:Euro-Limpacs" }s. A unified system of ecological

	indicators for monitoring{ XE "monitoring:Euro-Limpacs" } freshwater ecosystem health{ XE "health:Euro-Limpacs" }, and new methods for defining reference conditions and restoration strategies will be developed. These will take into account the probable impacts of future climate change and the need for a holistic approach to restoration based on habitat connectivity.
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EUROWATER (ACRONYM)

Full name	Institutional Mechanisms for Water Management in the Context of European Environmental Policies
Contact	Erik Mosterd, e.mostert@citg.tudelft.nl
Ending date	30/04/1995 COMPLETED
ID	EV5V0137
URL(s)	www.cordis.lu
Abstract	The objective of the project is to contribute to a better understanding of the institutional framework, which governs the use of water resources in Europe taking account of national differences.

EUROWET (ACRONYM)

Full name	Integration of European Wetland research in a sustainable management of water cycle
Contact	Philippe Negrel, Bureau De Recherches Géologiques Et Minières (BRGM), France
Ending date	01/01/2005 COMPLETED
ID	505586
URL(s)	http://ica.cordis.lu
Abstract	The final goal of the EUROWET project is to integrate the substantial multidisciplinary European research in wetlands to help attain the sustainable management of the water cycle. This will be achieved by the translation of state-of-the art science developed at both national and European levels, into practical guidance for end-users. This will be achieved by a comprehensive review, expert assessment and a focussed dissemination strategy. There is considerable scientific knowledge and technical experience gained in diverse aspects of wetland science and management including hydrology, biogeochemistry, ecology restoration, socio-economic and policy analysis. However the results of research and management experience are still too fragmentary and not sufficiently orientated to problem solving or simply inadequately framed to be effectively transferred to, or used by, stakeholders and policy-makers. Simultaneously the general outcome of the scientific research has been increased awareness of the significance of wetlands in delivering goods and services important for human welfare including quality of life, biodiversity conservation and maintenance or enhancement of environment quality. Despite this wetlands continue to be degraded and lost throughout Europe without adequate consideration of the wider benefits to be achieved from this management. The new Water Framework Directive (WFD) promotes a unique opportunity to redress this problem by means of the holistic, integrated{ XE "integrated:Eurowet" } approach to water management. There is currently in preparation horizontal guidance on Wetlands apart of the Common Implementation Strategy (CIS) process. There is however work still to be done on providing more specific scientific and technical guidance on the effective implementation of the Directive with respect to wetlands. This is particularly the case in relation to Integrated River Management, the CIS cluster within which wetlands are being considered in the WFD

EUWARENESS (ACRONYM)

Full name	European water regimes and the notion of a sustainable status
Contact	Hans Bressers, j.t.a. breseers@cstm.utwente.nl
Ending date	28/02/2002 COMPLETED
ID	EVK1-CT-1999-00038
URL(s)	http://www.euwareness.nl
Abstract	The project will consider rival uses of water resources and the way in which resource regimes (property and use rights) are established to balance these rival uses in a sustainable way. To learn how regimes can be modified, also the evolution of the regimes in their political-institutional context will be analysed, in order to find triggers that are crucial for regime shifts towards sustainability{ XE "sustainability:Euwareness" }. So the project intends to get a better understanding of the dynamic relationships between various water uses, the regimes under which these uses are managed, and

	<p>factors in the political-institutional context that are generating regime shifts. By studying 12 cases in 6 different European countries, the final purpose is to assess the effectiveness of different water resource regimes and to identify ways in which they can become more effectively sustainable. The project will contribute to the newly proposed European framework for Community Action in the Field of Water Policy (Proposal for a Council Directive, COM(97)49, COM(98)76 final), where a 'good status of water' in the meaning of sustainable use of water resources has been put forward as a major principle. The researchers want to demonstrate what kinds of regime conditions are crucial to reach a sustainable status. Looking at property and use rights, the researchers are identifying users, the importance they have in using water in a certain way, the extent to which they are paying a price for it, and the extent to which they have a say or participate in managing the water resources in their river basin area. The new Council Directive is considering these elements as important keys to a sustainable status of water resources. Furthermore, the project will help to implement 'Action Line 8: The Socio-Economic Framework' which has been formulated in the document 'Freshwater: A Challenge for Research and Innovation. A Concerted European Response' (EUR 18098 - July 1998). The researchers want to clarify how resource regimes can account for externalities, such as depletion, degradation or pollution of water resources. The cases in the project will cover different regimes with arrangements for combating pollution, for rational use of water (demand reduction), for combating chronic water deficits, and for prevention or management of crisis situations. The regimes will be evaluated on their contributions to sustainability by generating technical innovations, by reducing demands, by stimulating alternative practices and by changing land (and water) uses.</p>
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FIRMA (ACRONYM)

Full name	Freshwater integrated{ XE "integrated:Firma" } resource management with agents
Contact	Nigel Gilbert, N.Gilbert@soc.surrey.ac.uk
Ending date	28/02/2003
ID	EVK1-CT-1999-00016
URL(s)	http://firma.cfpn.org/
Abstract	<p>Scientific objectives and approach</p> <p>The project is structured around three main themes:</p> <p>Methodological development of agent models that scale from individual, cognitive decision makers to institutions{ XE "institutions:Firma" } representing more aggregate behaviour. Generic methodological knowledge will be encapsulated in a set of 'core' models that will be applied throughout the project.</p> <p>The agent-based models will be demonstrated in five regions of Europe, linking the modelling and application teams in addressing real water problems. The case studies are: Thames water region, England, Limburg, The Netherlands; Barcelona, Spain; Hérault, France; Zurich, Switzerland</p> <p>Transfer of knowledge, experience and techniques, between experts on agent-based modelling and experts on water resource management and involving an interaction between the project and the wider community of policy makers.</p> <p>Expected impacts Stakeholder participation{ XE "participation:Firma" } is an essential feature of the project, starting with the formulation of questions and the design of the models. Common features and results from the regional models will be compared in order to derive conclusions to assist with the development of water resource management policy at the EU level. The project will yield insights into the social processes of water management, leading to the consideration of a wider range of aspects of the environment in decision-making. It will also result in improved water management techniques including better management of water catchments.</p>

FLOODSITE (ACRONYM)

Full name	Integrated{ XE "integrated:Floodsite" } Flood Risk{ XE "risk:Floodsite" } Analysis And Management Methodologies
Contact	Paul Samuels, Floodsite@Hrwallingford.Co.Uk
Ending date	01/03/2009
ID	GOCE-CT-2004-505420
URL(s)	http://www.floodsite.net/
Abstract	<p>The management of flood risk is a critical component of public safety and quality of life. The FLOODsiteIntegrated Project will produce improved understanding of specific flood processes and mechanisms and methodologies for flood risk analysis and management ranging from the high level management of risk at arider-basin, estuary and coastal process cell scale down to the detailed</p>

	<p>assessment in specific areas. It includes specific actions on the hazard of coastal extremes, coastal morph dynamics and flash flood forecasting, as well as understanding of social vulnerability{ XE "vulnerability:Floodsite" } and flood impacts, which are critical to improving the mitigation of flood risk from all causes. The project seeks to identify technologies and strategies for sustainable flood mitigation and defence, recognising the complex interaction between natural biophysical systems and socio-economic systems, to support spatial{ XE "spatial:Floodsite" } and policy planning{ XE "planning:Floodsite" } in the context of global change and societal advance. Several pilot studies are included in FLOOD site. These will identify lessons from recent floods (e.g. Elbe, 2002), and test the proposed operational use of methods on integrated risk management and sustainable flood defence (the Thames and Schultze Estuaries and the Ebor coastal delta) or new technology for flash flood forecasting (in France and Italy). FLOOD site will also develop common language, guidance and tools for dissemination of the project results and professional training packages. FLOOD site will build upon the previous and current European and national research and practice in river and coastal flood processes and flood risk mitigation methods to promote consistency of approach. Several of the FLOOD site project partners are identified as contributors to proposals for the virtual centre on floods and droughts identified in Para 1.1.6.3.II of the work programme; this virtual centre will complement the activities of the FLOOD site project.</p>
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FLUMAGIS (ACRONYM)

Full name	Interdisciplinary development of methods and tools for the planning process and measurement control for river basin management with geoinformation systems
Contact	Joern Moltgen , Institute for Geoinformatics (IfGI), University of Muenster, Münster, moltgej@ifgi.uni-muenster.de Germany
Ending date	
ID	
URL(s)	www.flumagis.de
Abstract	<p>FLUMAGIS aims at the interdisciplinary development of methods and DV-tools in support of the planning{ XE "planning:Flumagis" } and management of river basins. The focus will be laid on the development of an interactive tool facilitating the evaluation and (3D) visualization of river basin environments. This comprises the representation of current inshore water and landscape ecological aspects as well as of the water balance and substance balances. Editing virtual environments makes it possible to elaborate future planning and management scenario{ XE "scenario:Flumagis" }s on the basis of an interdisciplinary data and knowledge platform in accordance with the EG-WRRL. Possible alternatives and effects of various planning scenarios become transparent, can be discussed and experienced in a participatory process. Furthermore the integration of GIS services, micro- and meso-scale simulation models and the derivation of ontology based measures support the decision finding. The ontologies are developed in co-operation of experts in the domains limnology, landscape ecology, hydraulic engineering, hydrology, geoinformatics and socioeconomy. The proposals shall be presented in text and as visualizations. The consequences concerning the measures proposed can be estimated with the help of simulation model. The opinion of domain experts will be taken into consideration from the very beginning of the project. Thus the relevancy of the prototype can be guaranteed. The experts will not only bring in data and domain knowledge but also assure the realization of the methodological results and the prototypical development of tools by following the different project phases critically</p>

GLOWA ELBE (ACRONYM)

Full name	Global Water Elbe
Contact	Frank Wechsung, frank.wechsung@pik-potsdam.de, Germany
Ending date	31/11/2007
ID	
URL(s)	http://www.glowa-elbe.de
Abstract	<p>Main focus is the research of integrated{ XE "integrated:Glowa Elbe" } strategies for wiser and sustainable management of water at local levels in consideration of global ecological interactions and basic socio-economic conditions. It also aims to create a basis for the development of innovative technologies and cost-effective services for the sustainable, far-sighted management of water resources.</p>

GMES (ACRONYM)

Full name	Global Monitoring{ XE "Monitoring:Gmes" } for Environment and Security
Contact	
Ending date	
ID	
URL(s)	http://www.gmes.info/
Abstract	<p>GMES aims at designing and establishing by 2008 a European capacity for the provision and use of operational services for Global Monitoring of Environment and Security.</p> <p>Reviewing the various user needs, it was established that GMES has to support the following EU objectives and policy domains:</p> <p>Europe's environmental commitments, within EU territory and globally, by contributing to the formulation, implementation and verification of the Community environmental policies, national regulations and international conventions;</p> <p>Other EU policy areas such as agriculture, regional development, fisheries, transport, external relations with respect to the integration of the environmental dimension in the respective domains and their specific requirements;</p> <p>Common Foreign and Security Policy (CFSP), including the European Security and Defence Policy (ESDP);</p> <p>Other policies relevant to European citizens' security at Community and national levels, notably the potential exists for application to policies related to Justice and Home Affairs activities of the European Union, such as border surveillance.</p>

GOVERNE (ACRONYM)

Full name	Guidelines for the organisation, use and validation of information systems for evaluating aquifer resources and needs
Contact	Dominique Gentile, Universite De Versailles Saint Quentin En Yveline, France
Ending date	01/03/2003 COMPLETED
ID	EVK1-CT-1999-00043
URL(s)	http://neptune.c3ed.uvsq.fr/gouverne/
Abstract	<p>The project GOUVERNe will develop an implementation for selected case studies in the European Union, a user-based and scientifically validated Decision support system (DSS) for management of underground <i>water</i> resources at the catchment levels. Hydrological, spatial{ XE "spatial:Gouverne" } and economic data sets will be integrated within scenario{ XE "scenario:Gouverne" } simulation tools under a state-of-the-art information and communications technology (ICT) user interface. The product will allow robust and clear scientific support for deliberation by decision-makers and stakeholders permitting intelligent compromises, identification of novel management options and, to the extent possible, co-operative conflict resolution. The consortium unites research, information technology and <i>water</i> management partners</p>

HARMONI-CA (ACRONYM)

Full name	Harmoni-CA: Harmonised Modelling Tools for Integrated{ XE "integrated:HarmoniCA" } Basin Management
Contact	George E. Arnold, g.arnold@riza.rws.minvenw.nl, RIZA, The Netherlands
Ending date	30/09/2007
ID	EVKI-2001-00192
URL(s)	http://www.harmoni-ca.info
Abstract	<p>The overall objective of the large scale concerted action HarmoniCA is to create a forum for unambiguous communication, information exchange and harmonisation of the use and development of ICT-tools relevant to integrated river basin management, and the implementation of the WFD. Several specific tasks within the large-scale concerted action are identified: 1) The objective of the task "Establishing a communication forum / HarmoniCA Management" is to build an infrastructure for exchanging knowledge, to guide the process to harmonisation, and to report on the outcome. This</p>

	<p>task also includes organisation of conferences and workshops. Emphasis is placed on the participation{ XE "participation:HarmoniCA" } of all stakeholders. Periodic reports on the outcomes from the communication processes will be provided. 2) The objective of the task "Toolbox" is to provide easy and guided access to approved (benchmarked) ICT-tools necessary for the development of River Basin Management Plans. This leads to an open, flexible, "scientific sound" toolbox for present and future integrated, harmonised ICT-tools. Easy access is not limited to technical access to resources, but also includes training material, demo case studies, protocols dealing with conditions for utilisation, rights of ownership, intellectual property rights and finance. Access to tools will be provided through a web-site that contains (references to) ICT-tools, benchmarking reports, and a tools selection tool, which guides the user to the tools based on the issue at hand, the characteristics of the river basin, the data availability etc. 3) The "General Methodology and Guidance Documents" activity delivers science based guidance documents for the harmonised application of this methodology and available ICT-tools, at all relevant spatial scales in Europe (and beyond). The task will serve the development of a harmonised methodology for integrated river basin water management along the lines of the WFD under different circumstances across Europe with the involvement of stakeholders and other interest groups, to achieve further harmonisation of the hitherto fragmented approaches. 4) The task "Joint use of monitoring{ XE "monitoring:HarmoniCA" } and modelling" aims at to help bridging the gap between the monitoring community and the modelling community. Emphasis is put on the need for data (quality as well as quantity) for modelling in relation to the WFD and its availability and accessibility. Data uncertainty{ XE "uncertainty:HarmoniCA" } and the applicability of data assimilation techniques will be assessed. A better use of standard datasets from river basins for WFD related research studies will be facilitated. Finally, guidelines for good practise in combining monitoring and modelling will be prepared. 5) "Integrated Assessment and the science-policy interface" aims to develop and strengthen the science-policy interface across sectors and spatial boundaries to establish a dialogue on the requirements for modelling tools and participatory approaches to implement the WFD. The task will give an account of the state of the art in the representation of the human dimension in catchment modelling and river basin management planning as well as in combining stakeholder and public participation and modelling/formal approaches in river basin management. Links with established expertise in the field of Integrated Assessment will be provided in order to support the establishment of a peer review research community in the field of integrated water resources management. 6) "Co-ordination ongoing & future RTD-activities" increases the output and benefit of ongoing research, speeds-up the (re-) use of developed products, avoids large overlaps between projects and reduces the chance of duplicating activities. This will be achieved by applying a variety of activities leading to a closer co-ordinating and synchronising of ongoing and planned research. The task will consider ongoing and future projects dealing with issues relevant to the implementation of the WFD.</p> <p>WP1: Establishing a communication forum / HarmoniCA Management WP2 Toolbox WP3 General Methodology and Guidance Documents WP4 Joint use of monitoring and modelling WP5: Integrated assessment and science-policy interface WP6: Co-ordination of ongoing & future projects</p>
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HARMONIRIB (ACRONYM)

Full name	HarmoniRiB - Harmonised Techniques and Representative River Basin Data for Assessment and Use of Uncertainty{ XE "uncertainty:HarmoniRiB" } Information in Integrated{ XE "integrated:HarmoniRiB" } Water Management
Contact	Jens Christian Refsgaard, jcr@geus.dk, GEUS, Denmark
Ending date	31/03/2006
ID	EVK1-CT-2002-00109
URL(s)	http://www.harmonirib.com
Abstract	<p>The overall goal of HarmoniRiB is to develop methodologies for quantifying uncertainty and its propagation from the raw data to concise management information. The four specific project objectives are:</p> <ul style="list-style-type: none"> · To establish a practical methodology and a set of tools for assessing and describing uncertainty originating from data and models used in decision making processes for the production of integrated water management plans{ XE "planning:HarmoniRiB" }. It will include a methodology for integrating uncertainties on basic data and models and socio-economic uncertainties into a decision support concept applicable for implementation of the WFD; · To provide a conceptual model for data management that can handle uncertain data and implement it for a network of representative river basins. · To provide well-documented datasets, suitable for studying the influence of uncertainty on management decisions for a network of representative river basins and to provide examples of their

	use in the development of integrated water management plans. · To disseminate intermediate and final results among researchers and end-users across Europe and obtain and incorporate feedback on the methodologies, tools and the datasets.
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HARMONIT (ACRONYM)

Full name	HarmoniIT - IT frameworks
Contact	Roger Moore, rvm@ceh.ac.uk, CEH, UK
Ending date	31/12/2005
ID	EVK1-CT-2001-00090
URL(s)	http://www.harmonit.org
Abstract	The objective of this project is to develop, implement and prove a European Open Modelling Interface and Environment (the OpenMI) that will simplify the linking of models and hence allow catchment managers to explore the likely outcomes of different policies.

HARMONICOP (ACRONYM)

Full name	HarmoniCOP (Harmonising Collaborative Planning{ XE "Planning:HarmoniCOP" })
Contact	Claudia Pahl-Wostl, pahl@usf.uni-osnabrueck.de, University of Osnabrück, Germany
Ending date	31/12/2005
ID	EESD-ENV-2000-02-57
URL(s)	http://www.harmonicop.info
Abstract	The aim of the HarmoniCOP project (2002 -2005) is to increase the understanding of participatory river basin management planning (RBMP) in Europe. RBMP is the integrated{ XE "integrated:HarmoniCOP" } cross-sectoral planning and management of river basins if necessary across political and administrative borders. The project's objective is to generate practical information about participation{ XE "participation:HarmoniCOP" } processes in river basin management and to support the implementation of the public participation provisions of the European Water Framework Directive

HARMONQUA (ACRONYM)

Full name	HarmoniQuA - Harmonising Quality Assurance in model based catchment and river basin management
Contact	Huub Scholten, huub.scholten@wur.nl, The Netherlands
Ending date	31/12/2005
ID	EVK1-CT-2001-00097
URL(s)	http://harmoniqua.wau.nl/
Abstract	HarmoniQuA aims to provide a user-friendly computer based guidance and QA framework for use in model based river management. It will prompt users with the appropriate 'next step' in the modelling process and provide an audit trail to check previous decisions. The approach targets management at catchment and river basin scales with the overall goal of improving the quality of modelling and therefore enhancing the confidence of all stakeholders in them. HarmoniQuA attempts to serve several types of users in a series of water management domains, in jobs of varying complexity. Users working on a specific job will only be confronted with guidance relevant to them in their present context

INTERACTION (ACRONYM)

Full name	Institutional interaction - how to prevent conflicts and enhance synergies between international and EU environmental institutions{ XE "institutions:Interaction" }
Contact	R. Andreas Kraemer, Ecologic - Institute For International And European Environmental Policy, Germany
Ending date	28/02/2003 COMPLETED
ID	EVK2-CT-2000-00079

URL(s)	http://www.ecologic.de/english/interaction/inhalt.html
Abstract	<p>The project examines the interaction between international and EU environmental institutions. Such interaction affects the effectiveness of international and EU environmental policy-making. The core of the project is made up of twelve case studies analysing inter-institutional conflicts and synergies generated or suffered by a) five important international environmental regimes (climate{ XE "climate:Interaction" } change, biodiversity, protection of the North Atlantic, High Seas fisheries management, CITES) and GATT/WTO, and b) six important European environmental directives (habitats, <i>water</i> framework, IPPC, air quality framework, environmental liability and deliberate-release directives).</p> <p>Of particular concern will be the vertical interaction between international and EU instruments. Case studies will rely on a common theoretical concept. Their comparative evaluation will produce generalised knowledge on institutional interaction and specific policy recommendations.</p>

IRMA-SPONGE (ACRONYM)

Full name	Irma-Sponge Umbrella Programme
Contact	Aljosja Hooijer, Aljosja.Hooijer@wldelft.nl, The Netherlands
Ending date	
ID	
URL(s)	http://www.irma-sponge.org/
Abstract	<p>The IRMA-SPONGE Umbrella Program brings together 13 European scientific projects researching a wide range of flood risk{ XE "risk:Irma-Sponge" } management issues along the Rivers Rhine and Meuse, and is one of the largest and most comprehensive efforts of its kind. The overall aim is defined as: "The development of methodologies and tools to assess the impact of flood risk reduction measures and scenario{ XE "scenario:Irma-Sponge" }s. This to support the spatial{ XE "spatial:Irma-Sponge" } planning{ XE "planning:Irma-Sponge" } process in establishing alternative strategies for an optimal realisation of the hydraulic, economical and ecological functions of the Rhine and Meuse River Basins."</p> <p>The main objectives of IRMA-SPONGE are to A) enhance the level of scientific input to flood management, and B) promote transboundary{ XE "transboundary:Irma-Sponge" } co-operation. Specific fields of interest are:</p> <ul style="list-style-type: none"> Efficiency of flood risk reduction measures. Flood risk assessment. Sustainable flood risk management. Public participation{ XE "participation:Irma-Sponge" } in flood management issues.

IWRM.NET (ACRONYM)

Full name	Towards a European-wide Exchange Network for improving dissemination of integrated{ XE "integrated:IWRM.NET" } Resources Management Research Outcomes
Contact	Jean Antoine Faby, Office International De L'eau, France
Ending date	01/09/2004 COMPLETED
ID	FP6-SUSTDEV
URL(s)	www.cordis.lu
Abstract	

IWRMS (ACRONYM)

Full name	The development of an innovative computer based integrated{ XE "integrated:IWRMS" } water resources management system in semiarid catchments for water resources analyses and prognostic scenario{ XE "scenario:IWRMS" } planning{ XE "planning:IWRMS" }
Contact	Prof Wolfgang-Albert Flügel, Institut für Geowissenschaften, Friedrich-Schiller-Universität Jena, Germany
Ending date	14/01/2001 COMPLETED
ID	IC18-CT-1997-0144
URL(s)	http://europa.eu.int/comm/research/water-initiative/projects/ic18_ct_1997_0144_en.htm

Abstract	The main objectives were: a) classify and investigate land use, degraded areas and settlements by means of remote sensing techniques, aerial photography interpretation and linkage with GIS; b) simulate hydrological and erosion dynamics; c) develop a GIS-based management decision support system to identify competing stakeholders' water demands and to address allocation conflicts with respect to socio-economic conditions. The application of the IWRMS toolset was tested with managers in the context of regional strategic planning of catchment water resources with a view to reduce conflict among competing stakeholders and protecting water and land resources.
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LAND WATER MED (ACRONYM)

This project is included in the INCO review.

Full name	Geo-information for sustainable management of land and water resources in the Mediterranean region (Note: There is no official acronym)
Contact	CALABRE, Serge; Institut De Recherche Pour Le Développement, France
Ending date	30/04/2005 COMPLETED
ID	ICA3-CT-2000-30008
URL(s)	www.cordis.lu
Abstract	The objectives are to examine the need of the participating Mediterranean Partner Countries (Macs) for monitoring{ XE "monitoring:Land Water Med" } land and water resources, the institutions{ XE "institutions:Land Water Med" } and tools currently in use and the potential role of remote sensing as a tool for reaching a sustainable environment. The goal is to develop a co-operative process whereby the MPC institutions would have better access to up-to-date tools for land and water arrangement. The watershed is expected to be the basic unit for this management. A series of meetings will be held, involving experts on environmental monitoring techniques and those on water and land management. The first meeting will cover classification of watershed types and their problems, and the existing infrastructures and tools for monitoring land and water resources. Later meetings will deal with the details of monitoring and modelling techniques, and the development of an integrated{ XE "integrated:Land Water Med" } decision support system.

MANTRA EAST (ACRONYM)

Full name	Integrated{ XE "Integrated:Mantra East" } strategies for the management of transboundary{ XE "transboundary:Mantra East" } waters on the eastern European fringe - the pilot study of lake Peipsi and its drainage basin
Contact	Per Stalnacke, per.stalnacke@jordforsk.no , Norway
Ending date	31/01/2004 COMPLETED
ID	EVK1-CT-2000-00076
URL(s)	http://www.mantraeast.org/
Abstract	The points of departure in the MANTRA-East project is the fact that the draft EC Water Framework Directive (WFD), when it enters into force, will become the central tool for the future environmental management of transboundary river basins in Europe. To our knowledge, there are no prior integrated scientific studies of the management of international waters on a broad European scale, especially in the future EU border region. We will view the problem on the European fringe from three overlapping integrative and interdisciplinary perspectives: ecological, informational and policy-related. We will focus the research on the analysis of integrated strategies and development of appropriate tools for management of transboundary waters located in the Eastern European border region (the European fringe). The active involvement of an independent Advisory Committee will ensure the end-user perspective and the proper direction of the project.

MEDITATE (ACRONYM)

Full name	MEDiterranean Development of Innovative Technologies for integrated{ XE "integrated:Meditdate" } wATER management
Contact	N. Dorfliger, BRGM, France
Ending date	1/05/2007
ID	509112
URL(s)	http://www.brgm.fr/Fichiers/europe/MEDITATE.pdf

Abstract	<p>MEDITATE aims at the development of a water management support system at the Mediterranean catchment level, integrating the use of alternative water resources such as karst submarine springs, seawater or brackish water desalination and water reuse, for water scarcity management. Innovative technologies for submarine springs, from survey using an autonomous underwater vehicle, monitoring{ XE "monitoring:Medidtate" } at the spring level till capture prototype, will be developed mainly in this project. Economical and environmental study of submarine springs will be conducted and taken into consideration. Submarine springs study will also be used to determine the real water resource potential at the coastal karst aquifers in three Mediterranean catchments. The submarine springs could represent important alternative water resource as it has been reported during the last 30 years, but without serious scientific arguments. New technology for characterising the submarine springs will help to infirm or confirm this hypothesis. Low cost and low energy desalination plants for temporary use and salinity variability of submarine springs water will not be developed within MEDITATE, but designed based on feasibility analysis. A general analysis of desalination cost for various conditions will be taken into account in the socio- economic analysis for the management system. In the same manner, a review of water reuse will be carried out, taking into consideration environmental and health{ XE "health:Medidtate" } problems, technical and cost problems in order to have serious data to be considered in water management scenario{ XE "scenario:medidtate" }s. The water management support system will bring stakeholders in a decision-making process considering water visions for 2025. The WMSS will provide set of scenarios, giving safe water yield, based on the characterisation and hydrological modelling of four catchments. This WMSS will allow integrating different types of knowledge inclusive all social actors, in a decision making process</p>
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MEDIS (ACRONYM)

Full name	Towards sustainable water use on Mediterranean islands: addressing conflicting demands and varying hydrological, social and economic conditions
Contact	Christoph Stegtmeyer , Westfaelische Wilhelms - Universitaet Muenster, Germany
Ending date	31/01/2006
ID	EVK1-CT-2001-00092
URL(s)	http://www.uni-muenster.de/Umweltforschung/medis/summary/summary.html
Abstract	<p>MEDIS will advance a rational sustainable and equitable use of <i>water</i> on islands in the Mediterranean and will thereby contribute to the implementation of the <i>Water Framework Directive</i>. The study will be carried out on Corsica, Crete, Cyprus, Mallorca and Sicily. Based on data on hydrology, geophysics and climate{ XE "climate:Medis" } improved methodologies for the characterisation of aquifers and the monitoring{ XE "monitoring:Medis" } of <i>water</i> consumption, recharge and safe field will be developed. Improved agricultural practices aimed to conserve <i>water</i> will be specified. A stakeholder analysis and the collection and analysis of information on <i>water</i> demand by various consumers will lead to mutually agreeable <i>water</i> distribution schemes in a participatory process. This will form the basis for recommendations on equitable and sustainable <i>water</i> management regimes as derived through Multi-Criteria-analysis under current and future precipitation rates. Within MEDIS, a dialogue between scientists and stakeholders on each island as well as between principal stakeholders from each island will be facilitated thus enabling recommendations that will embrace generic solutions to a sustainable use of <i>water</i> in the Mediterranean.</p>

MEDCOASTLAND-NET (ACRONYM)

This project is included in the INCO review.

Full name	Mediterranean co-ordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean coastal zone
Contact	Cosimo Lacirignola, Istituto Agronomico Mediterraneo Di Bari, Italy
Ending date	30/09/2006
ID	ICA3-CT-2002-10002
URL(s)	www.cordis.lu
Abstract	<p>Specific objectives of the Thematic Network include the effectiveness of dissemination of research, studies and projects carried out on Land Degradation Management (LDM) in the Mediterranean coastal zone. The network aims at providing research and project reviews, indications-guidelines to implement LDM through the assessment of interactions among major factors of resources management such as soil, water, biota, human activity, cultural resources, soil erosion, land degradation. Major expected impacts will be:</p>

	<ul style="list-style-type: none"> • Better understanding or research and research needs; • Better communication structure within players involved in landscape and soil degradation management, improved accessibility to information on relevant research; • Better approach to implement real participatoryeco-system and economic-productive based land-soil degradation and conservation management.
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MEDWATER POLICY (ACRONYM)

This project is included in the INCO review.

Full name	Policy Initiative to Overcome Water Competition between the Vital Economic Sectors of Agriculture and Tourism in the Mediterranean.
Contact	Helm Peter, WIP KG, Germany - DE
Ending date	30/04/2003 COMPLETED
ID	ICA3-CT-2000-30002
URL(s)	http://europa.eu.int/comm/research/waterinitiative/projects/ica3_ct_2000_30002_en.htm
Abstract	Objective: to overcome the present, and prevent future, water competition between the vital economic sectors of agriculture and tourism in the Mediterranean area by developing a Water{ XE "transboundary:MedWater Policy" } policy initiative and an integrated{ XE "integrated:MedWater Policy" } water planning{ XE "planning:MedWater Policy" } model based on the study of selected arid regions in the area. The current water supply and demand situation, available water saving, reuse, treatment and renewable energy supply options and the socio-economic, legal and administrative framework will be taken into account. The project will investigate policy options with regard to (1) water saving, (2) water reuse, (3) water treatment and desalination, (4) energy supply for the water sector from renewable sources, (5) legal and administrative measures, (6) transboundary co-operation and (7) an integrative and locally adaptable consideration of the entire water chain.

MED-CORE (ACRONYM)

This project is included in the INCO review.

Full name	From river catchement areas to the sea : a comparative and integrated approach to the ecology of Mediterranean coastal zones for sustainable management
Contact	DELFINO, Giovanni (Prof.); UNIVERSITY OF FLORENCE
Ending date	30/11/2005
ID	ICA3-CT-2002-10003
URL(s)	
Abstract	Target systems are sand beaches and their ecosystems. The research will extend to adjacent systems influencing and/or being influenced by the defined system, contributing to coastal equilibrium. The project aims at: definition of guidelines and ecological criteria for preservation of environmental quality through the identification of functional links between elements of coastal ecosystems and influencing zones in the Mediterranean; development of early warning indicators of degradation and long-term indicators of sustainability{ XE "sustainability:Med-Core" } of coastal ecosystems; preparation of a manual regarding the application of ecological indicators of coastal quality, to be used by environmental managers and decision-makers . A transdisciplinary characterisation will be conducted at chosen sites, which share common problems of the Region, and the analysis of the property of different ecological indicators, from landscape to species and genetic levels, will be made.

MELMARINA (ACRONYM)

Full name	Monitoring{ XE "monitoring:Melmarina" } and modeling coastal lagoons: making management tools for aquatic resources in north Africa.
Contact	VICKERS, Ilse (Dr); ilse.vickers@ucl.ac.uk ; UNIVERSITY COLLEGE LONDON
Ending date	2005-11-30
ID	ICA3-CT-2002-10009
URL(s)	
Abstract	North African lagoons are vulnerable ecosystems typifying the need to reconcile environmental

	sustainability{ XE "sustainability:Melmarina" } with population growth and economic development. This proposal will develop management tools for these aquatic resources. Integrated{ XE "integrated:Melmarina" } monitoring and survey programmes will be established for hydrology, water and sediment quality and aquatic ecology. Longer-term changes will be evaluated through the analysis of extant ground data and satellite remote sensing techniques. Environmental factors controlling vegetation characteristics will be established using hydrological, hydrochemical and ecological data. A dynamic hydrological/hydraulic 2-D finite element model coupled to a eutrophication model will be applied to each key site and used to evaluate the impacts of future changes associated with sea level rise and water resource developments.
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MERIT (ACRONYM)

Full name	Management of the environment and resources using integrated{ XE "integrated:Merit" } techniques
Contact	John Bromley, jby@ceh.ac.uk
Ending date	31/05/2004 COMPLETED
ID	EVK1-CT-2000-00085
URL(s)	http://www.merit-eu.net
Abstract	Integrated management is the key to the sustainable development of Europe's water resources. But this approach means that decisions must be considered not only in environmental terms, but also in the light of their economic, social, and political impacts. The problem is to find a practical way to link these different factors together. MERIT will develop an integrated, water resource management methodology that meets this challenge. The methodology will be based on Bayesian belief networks, a type of model-based decision support system already used routinely in the fields of medicine and artificial intelligence. To track the success of management decisions a set of quantifiable water resource indicators will be incorporated into the networks. We will demonstrate the technique in 4 catchments where stakeholder groups will contribute to the design and content of each network. The result will be a computer-based, generic, management tool based

MITCH (ACRONYM)

Full name	Mitigation of climate{ XE "climate:Mitch" } induced natural hazards
Contact	Keith POWELL, hrinfo@hrwallingford.co.uk
Ending date	01/07/2003 COMPLETED
ID	EVG1-CT-2000-20001
URL(s)	http://www.hrwallingford.co.uk/Mitch/project_information.htm
Abstract	MITCH will bring together the various research institution{ XE "institution:Mitch" } and user representatives, including insurers, with a leading involvement in the mitigation of natural hazards with a meteorological cause. The aim will be to assist planning{ XE "planning:Mitch" } and management for these events, by evaluating the state of research, and to match that with both users perceptions and needs as to what the research community can provide. A primary focus of the CA will be on flood forecasting and warning, but it will also include other flood related hazards, such as landslips and debris flow. It will also look at longer-term climate hazards, such as drought, and the possible impact of climate change on the frequency and magnitude hazards. The CA will be conducted through a series of 5 workshops and an active website for exchange of views and evaluation of best practice.

MULINO (ACRONYM)

Full name	Multi-sectoral, integrated{ XE "integrated:Mulino" } and operational decision support system for sustainable use of water resources at the catchment scale
Contact	Carlo Giupponi, carlo.giupponi@unimi.it , Fondazione Eni - Enrico Mattei, Italy,
Ending date	31/12/2003 COMPLETED
ID	EVK1-CT-2000-00082
URL(s)	http://siti.feem.it/mulino/
Abstract	MULINO provides an operational Decision Support System (DSS) for the multi-sectoral assessment and simulation of human activities, to be used for the assessment and management of the sustainable use of water resources at the catchments scale. Concrete needs of end users, actively

	<p>involved in the project since the design of the proposal, have contributed to design the DSS tool, integrating socio-economic and environmental modelling with a geographic information system. The application context is twofold:</p> <p>a) the support of water management in concrete decisional cases, and</p> <p>b) the assessment of water resources in representative European catchments. The dissemination of the results envisages local and international workshops, publications, multilingual newsletters, a web site and a final CD-Rom.</p>
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NEGOWAT (ACRONYM)

Full name	Facilitating negotiations over land and water conflicts in Latin American periurban upstream catchments : combining agent-based modelling with role game playing
Contact	Ducrot Raphaelle, Territoires, Environnement Et Acteurs – Tera, Centre De Coopération Internationale En Recherche Agronomique Pour Le Développement – Cirad, France
Ending date	31/10/2005
ID	ICA4-CT-2002-10061
URL(s)	http://europa.eu.int/comm/research/waterinitiative/projects/ica4_ct_2002_10061_en.htm
Abstract	<p>In a rapidly urbanising world, population densities no longer allow for unlimited access to safe water. Competition for water, often associated with a struggle for land, is exacerbated in periurban areas. The NEGOWAT project will elaborate, structure and test a methodology combining an agent-based modelling approach and role game play as a mediating tool for facilitating negotiations over land and water management, in the context of metropolitan upstream catchments in Latin America. The research aims to provide (i) a conceptual tool that will allow to analyse land and water management in this context (ii) a methodology and computing tools (including implementation guidelines) to explore, test and discuss scenario{ XE "scenario:Negowat" }s, reinforcing the participation{ XE "participation:Negowat" } of marginalized stakeholders in all stages of the negotiation.</p>

NOSTRUM DSS (ACRONYM)

Full name	Network on gOvernance{ XE "governance:Nostrum DSS" }, Science and Technology for sustainable water ResoUrce management in the Mediterranean. The role of Dss tools
Contact	Carlo Giupponi, carlo.giupponi@unimi.it ,Fondazione Eni - Enrico Mattei, Italy,
Ending date	01/08/2007
ID	509158
URL(s)	http://www.feem-web.it/nostrum/
Abstract	<p>The ultimate aim of NOSTRUM-DSS Co-ordination Action is to contribute to bridge the gaps between science and real life, in order to provide Dss developers with insight into the language and the needs of policy makers (PMs) and stakeholders, and subsequently to provide PMs effective tools based on an integrated{ XE "integrated:Nostrum DSS" } approach for problem solving in the context of IWRM.</p> <p>The key objectives of this Co-ordination Action are:</p> <ul style="list-style-type: none"> To establish durable links between scientific institutions{ XE "institutions:Nostrum DSS" }, governments, NGOs, SMEs and other stakeholders and improve public awareness on water management; To improve scientific knowledge and applied methodologies in IWRM; To promote the development of suitable Dss tools built upon real needs of policy making in IWRM. <p>The European Union supports the development of IWRM plans{ XE "planning:Nostrum DSS" }, with stronger stakeholders' participation{ XE "participation:Nostrum DSS" }, pro-poor emphasis and gender{ XE "gender:Nostrum DSS" } sensitivity, and NOSTRUM-Dss will offer support to this policy through its emphasis on the development of useful Dss tools. In short, NOSTRUM-Dss has a strong potential to support and foster the achievement of many EU initiatives and international relation policies, especially with Partner Countries in the Mediterranean through the contribution to the Euro-Mediterranean Partnership.</p>

PEGASE (ACRONYM)

Full name	Pesticides in European groundwaters: detailed study of representative aquifers and simulation of possible evolution scenario{ XE "scenario:Pegase" }s
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Contact	Yves Caristan, c.fouillac@brgm.fr, Bureau de Recherches Géologiques et Minières (BRGM), France
Ending date	30/11/2003 COMPLETED
ID	EVK1-CT-1999-00028
URL(s)	http://www.brgm.fr/pegase/
Abstract	Pesticide concentrations greater than the accepted portability standards (0.1 µg L ⁻¹) have been reported in many European ground <i>water</i> (GW) used for drinking <i>water</i> supplies. The question of how this will evolve cannot at present be answered. This is why the hydro-geologists, soil scientists and socio-economists of PEGASE address the key processes involved in the pesticide contamination of six contrasted aquifers representative of European GW resources. A 32-months detailed field monitoring{ XE "monitoring:Pegase" }, supported by laboratory work, will be the basis for the development, calibration and performance assessment of predictive modelling tools. At the same time, alternative scenarios of agricultural practices will be established and tested with the developed tools so as to provide a socio-economic assessment of the implementations of alternative land uses and agricultural practices on GW quality.

OPTIMA (ACRONYM)

Full name	Optimisation for Sustainable Water Resources Management
Contact	Kurt Fedra, Environmental Software & Services GmbH, Austria
Ending date	1/07/2007
ID	509091
URL(s)	http://www.ess.co.at/OPTIMA/
Abstract	Water is a key resource in the Mediterranean region, and efficient use and allocation are paramount to sustainable development, in particular in the coastal zone of the South and East, undergoing fast economic development, land use and demographic change. The overall aim of OPTIMA is to develop, implement, test, critically evaluate, and exploit an innovative, scientifically rigorous yet practical approach to water resources management intended to increase efficiencies and to reconcile conflicting demands. Based on the European Water Framework Directive (2000/60/EC) the approach equally considers economic efficiency, environmental compatibility, and social equity as the pillars of sustainable development. The project also aims at building a wide dissemination network of expertise and knowledge exchange sharing its findings, generic data, and best practise examples

POLICY RESEARCH TO IDENTIFY CONDITIONS FOR OPTIMAL FUNCTIONING OF THE SENEGAL...(NO ACRONYM)

Full name	Policy research to identify conditions for optimal functioning of the Senegal river ecosystem in Mali, Mauritania and Senegal
Contact	Anne Stanneveld, Royal Tropical Institute, Department Of Agriculture & Enterprise Development, The Netherlands
Ending date	31/01/2003 COMPLETED
ID	ICA4-CT-2000-30024
URL(s)	www.cordis.lu
Abstract	In the Senegal river in West Africa ecological conditions have changed dramatically due to the construction of two major dams. As a result, dense stands of aquatic weeds have developed which cut off entire villages from open water. This dense vegetation interferes with fishing and brings about an increase in granivorous birds and water-borne diseases. So far, water management has mainly been focussed on irrigation of agricultural fields on the former floodplains, without taking into consideration other interests of the local population, such as fishing, vegetable growing, cattle breeding and human health{ XE "health:Policy research to identify conditions for optimal functioning of the Senegal..." }. The proposed action aims at water management policy, which optimally takes into consideration the different effects on the environment, also in relation to hydropower and navigability, governmental objectives yet to be implemented. Prevention of water hyacinth spreading into the Senegal River will also be included.

PRUDENCE (ACRONYM)

Full name	Prediction of regional scenario{ XE "scenario:Prudence" }s and uncertainties{ XE "uncertainties:Prudence" } for defining European climate{ XE "climate:Prudence" } change risks{ XE "risk:Prudence" } and effects
Contact	Jens Hesselbjerg Christensen, JHC@dmi.dk , Denmark
Ending date	31/10/2004 COMPLETED
ID	EVK2-CT-2001-00132
URL(s)	http://prudence.dmi.dk/
Abstract	PRUDENCE proposes to co-ordinate the analysis, and demonstrates the use, of European high-resolution climate change modelling involving 4 high-resolution Atmospheric General Circulation Models (Acmes) , 8 Regional Climate Models (ROMs) and several climate impacts models. Due to the heterogeneity of possible climate change through Europe and the impacts this may imply, European wide expertise from both climate and impacts modelling groups, as well as from within social and political sciences, is required. This will ensure a comprehensive utilisation of the entire set of climate change simulations takes place. A co-ordinated effort within one common 'end-to-end' project will enable an unprecedented quantification of the uncertainties associated with impacts of future climate changes for Europe. In demonstrating the feasibility of such a combined effort, a new standard for interdisciplinary work throughout Europe will be set .

RIVER DIALOGUE (ACRONYM)

Full name	Empowerment and Awareness Building in River Basin Management Through Focus Groups and Citizens' Juries
Contact	Geoffrey D. Gooch, geogo@eki.liu.se
Ending date	31/12/2004 COMPLETED
ID	HPRP-CT-2002-00007
URL(s)	http://www.riverdialogue.org
Abstract	<p>To identify the best approaches to increasing public empowerment and involving the public in the implementation of the EU Water Framework Directive and river basin management plans{ XE "planning:River Dialogue" } through focus groups conducted in three European river basins: the Motala Ström in Sweden, IJsselmeer - in the Netherlands and the Emajõgi River in Estonia.</p> <p>To develop best practices for increasing public participation{ XE "participation:River Dialogue" } through the refinement and organization of citizens' juries in the three countries participating in the project.</p> <p>To develop guidelines for the organization of citizens' juries and focus groups and other forms of participation as part of the development and implementation of the EU Water Framework Directive.</p> <p>To present guidelines on an interactive website (www.riverdialogue.org), an interactive CD, and a hard copy training kit that can be used by water management practitioners, scientists and general public across Europe for development and implementation of river basin management plans with public involvement components.</p> <p>To promote a two-way dialogue on the issue of public consultations and involvement in river basin management. The project will help improve the communication of scientific information from scientists to water management practitioners and the public, and will in turn increase experts' and scientists' ability to learn local knowledge from the public.</p> <p>To communicate water management science related information to a wider public, especially young people, through the project website, publications, and project presentations.</p>

RIVERTWIN (ACRONYM)

Full name	A Regional Model for Integrated{ XE "Integrated:Rivertwin" } Water Management in Twinned River Basins
Contact	Karl Stahr, Universität Hohenheim, Institute of Soil Science and Land Evaluation, Germany
Ending date	01/03/2007
ID	505401
URL(s)	http://www.rivertwin.org/
Abstract	The "RIVERTWIN" project aims to support the goals of the Global Water Initiative by

	adjusting, testing and implementing an integrated regional model for the strategic planning{ XE "planning:Rivier Twin" } of water resources management in twinned river basins. The regional model will assist planning authorities and decision makers to assess the impacts of economic and technological development, and the effects of global climate{ XE "climate:Rivertwin" } and land use changes on the long-term availability and quality of water bodies. The model is based on a Geographic Information System, which integrates ecological (water availability and quality) and economic aspects (water demand and water use) of water management in user-friendly software
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RURBIFARM (ACRONYM)

Full name	Sustainable farming at the rural-urban interface-An integrated knowledge based approach for nutrient and water recycling in small-scale farming systems in peri-urban areas of China and Vietnam
Contact	Oeborn Ingrid, Department Of Soil Sciences, Swedish University Of Agricultural Sciences, Sweden,
Ending date	31/08/2006
ID	ICA4-CT-2002-10021
URL(s)	http://europa.eu.int/comm/research/waterinitiative/projects/ica4_ct_2002_10021_en.htm
Abstract	Rapidly urbanising areas in Asia cause a growing concern about contamination of waters, soils and crops due to inappropriate use of urban wastes and agrochemicals and (wet and dry) atmospheric deposition. Objective: to contribute to participatory farming strategies that focus on effective water and nutrient recycling and stakeholders' interaction, to sustain integration between rural and urban areas. A multidisciplinary research consortium involving farmers and extensions will do this via an Integrated Knowledge Based System approach, where modelling, database development will be combined with participatory methods. Expected results: Methods for strategic applied research and secure interactions with policy makers and extension. Two sites in lowland peri-urban areas of China and Vietnam will provide contrasts and similarities as a basis for extrapolation.

SIRCH (ACRONYM)

Full name	Societal and institutional responses to climate{ XE "climate:Sirch" } change and climatic hazards
Contact	Thomas E. DOWINIG, Tom.Dowinig@Ecu.Ox.Ac.Uk The Chancellor, Masters And Scholars Of The University Of Oxford, UK
Ending date	31/12/200 COMPLETED
ID	ENV4970447
URL(s)	http://ica.cordis.lu
Abstract	

SLIM (ACRONYM)

Full name	Social learning for the integrated{ XE "integrated:Slim" } management and sustainable use of water at catchment scale
Contact	Ray Ison, slimcoord@open.ac.uk
Ending date	31/05/2004 COMPLETED
ID	EVK1-CT-2000-00064
URL(s)	http://slim.open.ac.uk/page.cfm
Abstract	<ol style="list-style-type: none"> 1. To formulate an effective interactive approach which policy-makers at different levels can work with and develop. 2. To identify what skills people may need to develop in order to use this interactive approach. 3. To provide guidance on how de-centralised units such as micro-catchments can be integrated into larger "wholes" to aid the development of river basin management plans{ XE "planning:Slim" } on a national or international level.

SMART (ACRONYM)

This project is included in the INCO review.

Full name	Sustainable Management of Scarce Resources in the Coastal Zone
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Contact	Kurt Fedra, Environmental Software & Services GmbH, Austria
Ending date	31/08/2005
ID	ICA3-CT-2002-10006
URL(s)	http://www.ess.co.at/SMART/
Abstract	<p>The coastal zones of the Mediterranean are at the same time undergoing rapid development with growing and conflicting demands on the natural resources, and at the same time subject to often irreversible degradation of these resources and thus the very basis for development.</p> <p>Water resources and the related land use issues are a key element for the sustainable development of coastal regions. They illustrate the dependency of the usually dynamic and fast growing coastal areas on their resource catchment. This project will explore methods and tools for long-term policy analysis and strategic decision support for integrated coastal development with special emphasis on water resources and land use, and the resource balance between the coastal region and inland areas.</p> <p>The approach is based on a multi-sectoral integration of quantitative and qualitative analysis, combining advanced tools of quantitative systems engineering using numerical simulation models, with methods of environmental, socio-economic and policy impact assessment using rule-based expert systems technology and interactive decision support methods.</p> <p>Water resources modelling including both quantitative and qualitative aspects will provide the framework for policy scenario{ XE "scenario:Smart" }s, exploring different development strategies, the consequences and implications of demographic, socio-economic, and technological development, and the interaction of these driving forces towards long-term sustainability{ XE "sustainability:Smart" } of the coastal regions and their hinterland.</p> <p>Aiming to support a participatory approach to policy making and impact assessment, the approach also foresees the extensive use of the Internet to facilitate broad participation{ XE "participation:Smart" } and a shared information basis to empower the various actors and stakeholders in the decision making process, contributing to the development of a civic society. The integration of advanced quantitative methods and models with qualitative assessment aggregated into policy relevant indicators of sustainable development will add scientific rigor to the interactive and participatory political process. This will make it possible to focus the debate on policy issues, objectives and values rather than the underlying physical based data and information describing better quantifiable constraints and dependencies of the physical world.</p> <p>A common methodology for policy design, evaluation, and decision-making will be developed and tested in a set of parallel case studies. in each of the participating Mediterranean countries, and compared with the corresponding EU policies. Lessons from the comparative analysis of these case studies will help to ensure a generic and generally applicable methodology, and at the same time help to foster inter-regional contacts and the exchange of experience.</p>

SPICE (ACRONYM)

This project is included in the INCO review.

Full name	Sustainable development of the Pechora region in a changing environment and society
Contact	
Ending date	31/03/2003 COMPLETED
ID	ICA2-CT-2000-10018
URL(s)	
Abstract	<p>The SPICE project assesses alternative scenario{ XE "scenario:Spice" }s for the sustainable development of the Pectoral region (Northeast European Russia), which ensure the economic and social well-being of its population and protect the unique natural environment, its high biodiversity and wilderness areas on the Barents Sea coast, the Arctic tundra and the Ural mountains. We will evaluate the present-day state of formal and informal (subsistence) economic sectors, population and employment, public opinion, and the environment and biodiversity in relation to anthropogenic impacts. Next to economic uncertainties{ XE "uncertainties:Spice" }, the region faces considerable challenges from the over-exploitation of natural resources (environmental pollution, fish stock decline, etc.) and climate{ XE "climate:Spice" } change (global warming, permafrost collapse). We will integrate scenarios of economic and demographic development with the likely impacts of excessive resource use and climate change. An important integration tool will be the implementation of a GIS. The aim is to present strategies for sustainable development of the Pectoral region, formulated in consultation with stakeholders, to regional government.</p>

SUSTAIN WATER (ACRONYM)

Full name	Thematic Network on Sustainable Policies for Promoting
Contact	Kumra Shisher, International Institute for Industrial Environmental Economics, Lunds Universitet, Sweden
Ending date	29/02/2004 COMPLETED
ID	ICA4-CT-2000-30018
URL(s)	http://europa.eu.int/comm/research/water-initiative/projects/ica4_ct_2000_30018_en.htm
Abstract	The main objective of the TN is to study the sustainability{ XE "sustainability:Sustain Water" } & unsustainability of initiatives undertaken within the water-related policies in relation to rural, urban and industrial water use and to provide the policy and decisions makers with suggestions for new models for enhancing sustainable development within the context of water quality and its availability. The project comprises 7 partners, three from Europe and four from Asia.

SWIMMED (ACRONYM)

This project is included in the INCO review.

Full name	Sustainable water management in Mediterranean coastal aquifers: recharge assessment and modeling issues
Contact	PAYA ALBERT, Rafael (Prof.); rpaya@ugr.es; UNIVERSIDAD DE GRANADA
Ending date	31/12/2005
ID	ICA3-CT-2002-10004
URL(s)	
Abstract	In this proposal, an integrated approach combining advanced computational tools (numerical modelling and optimisation) and GIS, will be developed for sustainable water resources management in Mediterranean coastal aquifers. Particular emphasis will be devoted to artificial recharge (including wastewater reuse). Six field sites are selected in for demonstration, validation and assessment purposes. Data sets are first collected and embodied within a geographic information system for easy access and search, visualisation and thematic map production. 3D Numerical models for groundwater flow, seawater intrusion and Optimisation procedures are developed and implemented. The tools are then applied for investigating field sites Southward and Northward. Scenario{ XE "scenario:swimmed" }s varying recharge location and storage capacity are simulated to assess the best control of seawater intrusion and meeting demand requirements.

SWURVE (ACRONYM) /

Full name	Sustainable wa/ter uncertainty{ XE "uncertainty:Swurve" }, risk{ XE "risk:Swurve" } and vulnerability{ XE "vulnerability:Swurve" } in Europe
Contact	C.G. Kilsby, c.g.kilsby@ncl.ac.uk
Ending date	29/02/2004 COMPLETED
ID	EVK1-CT-2000-00075
URL(s)	http://www.ncl.ac.uk/swurve/
Abstract	<p>Crucial hydrologic systems are at risk to climate{ XE "climate:Swurve" } variability and predicted change. Two problems affect assessment of their vulnerability and sustainable operation; (1) great uncertainty in future climate scenario{ XE "scenario:Swurve" }s (2) difficulty of quantifying risks from extremes in inherently variable climates. SWURVE has a dual strategy for addressing these problems in the context of planning{ XE "planning:Swurve" } for sustainable water and associated activities in Europe.</p> <p>(1) a probabilistic framework for the treatment of future scenarios and their impacts resulting in assigning probabilities of various critical outcomes and risks, rather than single central estimates; (2) a quantitative, transferable methodology for the measurement of sustainable performance using measures of reliability, resilience{ XE "resilience:Swurve" } and vulnerability. This methodology will be developed and validated by application to a set of case studies covering all aspects of water management and related sectors across Europe.</p>

TISZA RIVER (ACRONYM)

Full name	The Tisza River project
Contact	István Zsuffa, istvan.zsuffa@vituki.hu, Hungary
Ending date	31/12/2004 COMPLETED
ID	EVK1-CT-2001-00099
URL(s)	http://www.tiszariver.com
Abstract	<p>The main objective is to help solving the most critical water- and environmental problems of the multinational Tisza river basin in line with the relevant EU policy objectives. Main issues are pollution control (such as those of the dramatic accidents of the year 2000) and the protection of the unique wetland ecosystems. The project is aimed at the development of an integrated{ XE "integrated:Tisza River" } catchment model, which will be a genuine and practical application. Specific objectives are: Development of hydrological, hydraulic, water quality models and ecological models to support the analysis of novel eco-hydrological management strategies jointly with the traditional ones. The eco-hydrological objective is to control flow, point and non-point pollution in such a way as to help revitalising the high number of unique wetlands, serving simultaneously the interest of other water uses (such as flood control, fisheries, irrigation and drainage, recreation and water quality improvement) in an integrated manner.</p>

TWINBAS (ACRONYM)

Full name	Twinning European and third countries river basins for development of integrated{ XE "integrated:Twinbas" } water resources management methods
Contact	Sam Ekstrand, sam.ekstrand@ivl.se
Ending date	01/12/2006
ID	505287
URL(s)	http://ivl.dataphone.se/twinbas/
Abstract	<p>The central objective of TWINBAS is to fill gaps in knowledge and methods in order to enable implementation of a harmonised IWRM approach that addresses the European Water Initiative. By twinning five river basins, two in Europe and one each in Africa, Asia and Latin America, and tying together water researchers with key expertise on these rivers, a critical mass of experience and knowledge will be mobilised. An important part of the objective is to build the capacity to carry out IWRM in all the five river basins, building on European approaches to water resources management with the Water Framework Directive in focus, as well as on third countries expertise and experience.</p> <p>For the Swedish case, the aim of the R&D activities is at improving methods for hydrological modelling, pollution pressure analysis, public participation{ XE "participation:Twinbas" }, economic analysis and action scenario{ XE "scenario:Twinbas" }s, which are all important elements of the FWD process. The Mälaren river basin has been selected as the Swedish study area. The five river basins are Mälaren, Thames, the Okavango in Botswana-Angola-Namibia, Bío Bío in Chile, and river Nura in Kazakhstan. The role of the Thames area and the experts with experience from it, will mainly be to extract, export and use earlier results and experience to the other basins. Little development work will be carried out for the Thames areas. For the other four basins major development tasks will be executed, although partly different for the different basins due to their characteristics as well as earlier research conducted. The main tasks will be: To collect and systematise the current knowledge on hydrology, water quality, water availability, user demands, user conflicts, political structures and policies, history and earlier human activities for the five river basins, or relevant to any of the river basins. To identify the gaps in knowledge for the three third countries' basins, and to specify in detail the RTD actions needed to be performed in order to reach the strategic objective of the project. To identify, collect and describe available monitoring{ XE "monitoring:Twinbas" } data in the five river basins, to produce a list of priority substances for each of the five rivers, and to produce a complementary monitoring programme adapted to the conditions and problems of the river basin in question. To conduct monitoring during two full years, creating a first basis for characterisation, calibration of modelling and validation. A review point comparing conducted monitoring after one year with the specifications in the monitoring programme is scheduled. To develop a consistent and efficient structure for stakeholder involvement, consultation and public access to information, taking into account prevailing traditions. Furthermore, to develop process guidelines for identification of users and stakeholder water requirements that are transferable to other river basins in the regions of the case studies. To develop rainfall-run-off models for Okavango, Bío Bío, and Norrström Basins and an integrated hydrologic model for the Okavango Delta, calibrated to local conditions. For River Nura a rainfall- runoff model is not required since the only real runoff is in the spring snowmelt, and</p>

	<p>there is only a very weak correlation between snowfall and runoff. Instead corrected river flow measurements will be used to work back to naturalised flow. Further, to develop an integrated ground water model for the Okavango Delta, and simpler groundwater models for Bío Bío and Nura. The modelling aim is to produce regimes for an average year, a minimum precipitation year and a maximum precipitation year, but the possibility to reach this aim largely depends on the extent and availability of existing data which is to be investigated in WP 2. The errors in run-off calculations should be known at least at basin level and the accuracy goal is that the error for the major part of the basin should not exceed 20 % as monthly averages. For the basins where existing data do not allow calibration and validation preliminary hydrology results will be produced after one year of complementary monitoring and final results after two years of monitoring, final in terms of project results, further monitoring after the project will improve the accuracy). To assess the pollution pressure in Norrström, Bío Bío, Nura and Okavango, as well as the pollution pressure impacts on water conditions in these river basins, by acquisition of point source pollution data, modelling of area sources, improving models for the path of metals and POPs and adapting existing methods for analysis of ecological/biological effects of pollution pressure to the studied ecosystems. The water bodies will be categorised in terms of ecological status using a relative scale and examples of class boundaries identified in co-operation with stakeholders and authorities from the river basin countries. To assess the effect of climate{ XE "climate:Twinbas" } change as well as rural and urban development scenarios on the hydrological regime, on water availability and water quality using physically based scenario modelling for all five basins, and to assess the ecological, societal and economical consequences. To estimate the level of vulnerability{ XE "vulnerability:Twinbas" } for water bodies based on the modelled changes caused by climate and human development. To develop methods and structures for thorough analysis of the economy of water use, cost recovery for water services, institutional set-up for water services in the river basins, and to provide this analysis for the five river basins. This includes development of a baseline scenario and identification of gaps between this scenario and international, national or provincial goals, and the economic consequence of the gap. The economic analyses also has the objective to assess the feasibility and efficiency of different policy instruments that could be used to reach water availability, water quality or socio-economic goals, and to provide an analysis of the economic effect of changed water use related to the modelled climate and human development scenarios. To produce River Basin Management Plans{ XE "planning:Twinbas" }, i.e. integrated water use plans acceptable to all parties, including an accepted combination of actions. Alternatively, if agreements are not reachable, problem areas where no agreements can be made will be identified, and the compromises that are likely to be required described. Delivery of good quality drinking water shall be a first priority in the third countries, with poor communities in focus. In the course of developing RBMPs, a scientifically based statistical set on costs and cost-efficiency for different types of actions will be produced, and harmonised methods to analyse the effect and cost-effectiveness of actions recommended and demonstrated. The RBMPs should be regarded as examples, or drafts, to be used by local or national planning authorities in their further work to produce authorised RBMPs. It should also be noted that these management plans might not encompass all aspects or problems of water use in the case studies, due to budgetary limits.</p>
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TRABOREMA (ACRONYM)

Full name	Concepts for integrated{ XE "integrated:Traborema" } transboundary{ XE "transboundary:Traborema" } water management and sustainable socio-economic development in the cross border region of Albania, Former Yugoslav Republic of Macedonia (FYROM) and Greece
Contact	Hans Kuerz, University of Leoben, Chair of System Analysis and Environmental Engineering, Austria
Ending date	01/06/2007
ID	INCO-CT-2004-509177
URL(s)	http://www.traborema.net
Abstract	<p>The Traborema project is a specific targeted research and innovation project within the 6th EC Framework Programme in the call for specific measures in support of International Cooperation (INCO) with specific focus on Western Balkan Countries. The TRABOREMA Project is sharply focused on gaining new knowledge in the field of transboundary integrated water resource management in the Western Balkans to meet the needs of society and Community policies. A consortium comprising universities from three member states (Austria, Spain and Greece) and three partners from FYROM and Albania collaborates to analyse and assess the ecological status of the transboundary Prespa lake district as a pilot model for verifiable sustainable development in the Western Balkans. The integrated approach developed and applied within this project focuses mainly on water resources, but also includes facets of energy and waste management.</p>

TRANSCAT (ACRONYM)

Full name	Transcat - Integrated{ XE "Integrated:Transcat" } Water Management Of Transboundary{ XE "Transboundary:Transcat" } Catchments
Contact	Marco Estrela, maestrela@isq.pt Portugal
Ending date	31/01/2005 COMPLETED
ID	EVK1-CT-2002-00124
URL(s)	http://www.transcat-project.net
Abstract	<p>The main goal of the project will be to create an operational and integrated comprehensive Decision Support System (DSS) for optimal water management of catchments in borderland regions, in context of the implementation of the EU Water Framework Directive. The development of the proposed DSS will allow an integrated water management system within the scope of the transboundary catchment. It will be able to cope with the complexity of the water resources systems and the uncertainty{ XE "uncertainty:Transcat" } of decision-making. The DSS will be built around modules that allow simulation of the range of different climatic, topographic, environmental and socio-economic conditions found in various EU and candidate countries transboundary catchment areas. This will allow its application not only within Europe and European borderland regions, but also worldwide. The borderland problems in water management occur not only in Europe, they are a sensitive problem also within, e.g., Africa and Latin America, where they are achieving even the strategic importance from the point of view of socio-economic approaches of the border states in a sense of their human utilization. Certainly, an integrated DSS might be used not only within the borderland catchments between the individual states, but also for water management control at the boundary between provinces or territorial (county) regions. The DSS to be developed will focus mainly on pollution, flooding and water use issues. Another objective of the project will be the establishment of an European platform for initiating and promoting international co-operation and networking that will allow a more detailed insight to transboundary water/environment and related socio/economic problems. This will be achieved by connecting TRANSCAT with pre-existing EU Research of the FP5, in the perspective of the forthcoming FP6 and, connecting TRANSCAT with EU institutions{ XE "institutions:Transcat" } involved in the process of implementing the WFD, with specific reference to the problems of pre-accession countries. The proposed project incorporates a research program aiming to avoid the extended aquifer contamination, improvement of groundwater and aquifer quality, and reducing of flooding risks{ XE "risks:Transcat" } under the umbrella of adequate integrated water resources management (IWRM). Relevant tools will be developed and procedures defined to be able to prepare the necessary local information for selecting a most promising transboundary management scenario{ XE "scenario:Transcat" } and take decisions on it. By following up this scenario with local project development in line with certain predefined priorities, synergies can be initiated and use of funds optimised. Although member states have to take charge of the management of the programmes and financing, this procedure based on the filter of a regional development strategy can guarantee transformation of EU-policies into regional measures in a more reliable and traceable form. Results in relation to strategy and policies can be regularly monitored{ XE "monitoring:Transcat" } and measurable feedbacks used for programme optimisation (e.g. in ongoing programmes and actions like the structural funds, INTERREGIII, LEADER+, SAPARD, ISPA, CBC-PHARE</p>

TWOLE (ACRONYM)

Full name	
Contact	Rodolpho Soncini-Sessa, Italy
Ending date	
ID	
URL(s)	http://www.twole.info/ (in preparation)
Abstract	<p>Twole is a project supported by an Italian institution{ XE "institution:Twole" } (Fondazione Cariplo) with the aim of producing a DSS that can be used all over the nation for the design of plan{ XE "planning:Twole" } of measures required by WFD. The project started in May 2005 and will last 24 months</p>

VERBANO (ACRONYM)

Full name	Verbano Lake Project (Interreg II)
Contact	Rodolpho Soncini, Politecnico di Milano, Italy

Ending date	COMPLETED
ID	
URL(s)	Closed
Abstract	Verbano was an exploratory project dealing with the management of the conflict in a transboundary{ XE "transboundary:Verbano" } water system. It produced a prototype DSS and a procedure (PIP) that will be presented in two forthcoming books published by Elsevier.

WADI (ACRONYM)

This project is included in the INCO review.

Full name	WATER supply watershed planning{ XE "planning:Wadi" } and management: an Integrated{ XE "integrated:Wadi" } approach
Contact	Le Dantec Bruno. European Research Consortium For Informatics and Mathematics. France - FR
Ending date	31/03/2004 COMPLETED
ID	ICA3-CT-2000-30007
URL(s)	http://europa.eu.int/comm/research/waterinitiative/projects/ica3_ct_2000_30007_en.htm
Abstract	The WADI project focuses on the development of tools and methodologies that can be used to assist decision making in watershed management boards and water planning authorities having to determine where to locate new dams/reservoirs. The tools and methodologies will address the elements related to reservoir identification (geographic location, water volume, infrastructure cost) given the watershed characteristics (water demand requirements, water resources, MNT, etc) in an integrated manner that considers socio-economic issues as well as environmental aspects related to flood and drought risks{ XE "risk:Wadi" }. WADI will also develop advanced data processing tools for modelling and simulation related to floods, reservoir design, and optimisation of the complete planned network of a watershed. Field applications will be performed on pilot basins in Morocco and Lebanon

WAGE (ACRONYM)

Full name	Making Water Governance{ XE "governance:Wage" } Effective (WaGE)
Contact	Walmsley Nige, Hr Wallingford, International Development Group, United Kingdom
Ending date	31/07/2004 COMPLETED
ID	ICA4-CT-2002-50035
URL(s)	http://europa.eu.int/comm/research/water-initiative/projects/ica4_ct_2002_50035_en.htm
Abstract	The water crisis is mainly a crisis of governance' stated the Global Water Partnership's Framework for Action document presented at the second World Water Forum. The overall objective of the accompanying measure is to improve understanding of the challenges many African countries will face in implementing effective water governance at a local level. The measure will complement and reinforce on-going and proposed initiatives by the EC and EU Member States. Close links with the GWP will ensure the outcomes of the measure will be widely disseminated among a wide range of water professionals and decision makers

WATERSTRATEGYMAN (ACRONYM)

Full name	Developing strategies for regulating and managing water resources and demand in water deficient regions
Contact	Simos Simopoulos , National Technical University Of Athens, Greece
Ending date	30/06/2005 COMPLETED
ID	EVK1-CT-2001-00098
URL(s)	http://environ.chemeng.ntua.gr/wsm/
Abstract	The objective of the project is to develop and evaluate alternative strategies for regulating and managing water resources development of the Southern European water deficient regions. Methodology, tools, guidelines and protocols of implementation will be developed that enable decision-makers to delineate and assess a wider range of integrated{ XE

	"integrated:Waterstrategyman" } <i>water</i> management strategies. Expected results include the evaluation of existing <i>water</i> management situation in Southern Europe through a systematic typology of <i>water</i> management problematic; the development of a methodology for evaluating <i>water</i> management scenario{ XE "scenario:Waterstrategyman" }; the development of <i>water</i> resources allocation scenarios and <i>water</i> cost recovery strategies; the formulation of guidelines and protocols for integrated <i>water</i> management and training decision makers on implementing multi-objective <i>water</i> management.
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WERRD (ACRONYM)

Full name	WATER AND ECOSYSTEM RESOURCES IN REGIONAL DEVELOPMENT Balancing Societal Needs and Wants and Natural Resources Systems Sustainability{ XE "sustainability:Werrd" } in International River Basin Systems
Contact	Jan Lundqvist, The Tema Institute - Department Of Water And Environmental Studies, Linköping University, Sweden
Ending date	31/12/2004 COMPLETED
ID	ICA4-CT-2001-10040
URL(s)	http://www.okavangochallenge.com/
Abstract	The gradual escalation of water scarcity and threats against natural capital in the Okavango River Basin are widely recognised as fundamental impediments to secure socio-economic development in the region. Mounting pressure from local national and international interest groups on finite, highly dynamic and vulnerable water and ecosystem resources is a reality. Objective: model Okavango River Basin and strengthen contacts/interaction between various stakeholders and policy makers through inter-disciplinary design and through training. Apart from ordinary publishing, results will be available on an interactive home page, developed for regional ownership. A system for ongoing dissemination, feedback and participation{ XE "participation:Werrd" } for local and national stakeholders will also be developed.

ANNEX III. PROJECTS CONSIDERED DURING THE INCO INITIATIVE

ANNEX III presents the list of projects, which are included in the review of INCO research.

More information on these projects can be found on www.cordis.lu. Projects in bold typeface are also included in ANNEX II.

Project N°	ACRONYM	Status	TITLE
IC15-CT-1997-00100		Completed	Ecosystems of the Volga basin and effects on the Caspian sea - Volgama
IC15-CT-1998-00107		Completed	Large system for water monitoring and sustainable management based on ground stations and satellite images
IC15-CT-1998-00138	BIOTOOLS	Completed	Biological tools for a sustainable water management
IC15-CT-1998-00145		Completed	Sustainable water management: application of the advanced bioremediation techniques for an efficient treatment of industrial waste waters
IC18-CT-1996-0029		Completed	Change, stress and sustainability-aquatic ecosystems resilience in North Africa
IC18-CT-1996-0055		Completed	Sustainable halophyte utilisation in the Mediterranean and subtropical dry regions
IC18-CT-1996-0065		Completed	Anthropologically induced changes in groundwater outflow and quality and the functioning of Eastern African nearshore ecosystems
IC18-CT-1996-0069		Completed	Impact of climate variability on agro-ecosystems and water resources in drylands
IC18-CT-1996-0070	The Serengeti ecological unit	Completed	Impacts of land use policy on environment, wildlife, demographic and socio-economic indicators in East African savannas
IC18-CT-1996-0080		Completed	Management of aquatic vegetation in the Lower Senegal River Basin
IC18-CT-1996-0091	HYDROMED	Completed	Research on lakes in hilly areas in the semi-arid Mediterranean
IC18-CT-1996-0107		Completed	Combining systematic and participatory approaches for developing and promoting strategies for sustainable land and water management
IC18-CT-1997-0134		Completed	Interaction between migration, land and water management and resource exploitation in the oasis of the Maghreb
IC18-CT-1997-0139		Completed	Sustainable use of natural resources in rural systems of Eastern African drylands (Ethiopia, Kenya, Tanzania), strategies for environmental rehabilitation
IC18-CT-1997-0144	IWRMS	Completed	The development of an innovative computer based integrated water resources management system in semiarid catchments for water resources analyses and prognostic scenario planning
IC18-CT-1997-0152		Completed	Contribution to the design of enabling strategies for environmental management in growing multi-million cities: an integrated economic and environmental assessment of solid waste systems in Kenya and India
IC18-CT-1997-0158		Completed	A participatory approach for soil and water conservation planning, integrating soil erosion modeling and land evaluation, to improve the sustainability of land use
IC18-CT-1997-0160		Completed	Methodologies and design criteria for soil and water resources management and policy formulation in peri-urban farming systems in Southern Africa
IC18-CT-1997-0161		Completed	Developing sustainable water management in the Jordan valley
IC18-CT-1997-0162		Completed	Global change and subsistence management in Southern African resource variability, access and use in relation to rural livelihoods and welfare
IC18-CT-1997-0169	DSS-DROUGHT	Completed	A decision support system for mitigation of drought impacts in the Mediterranean region
ICA2-CT-2000-10018	SPICE	Completed	Sustainable development of the Pechora Region in a changing environment and society
ICA2-CT-2000-10023	ARAL-KUM	Completed	Desertification in the Aral Sea Region : a Study of the Natural and Anthropogenic Impacts.
ICA2-CT-2000-10039	CIRMAN-ARAL	Completed	Crop Irrigation Management for Combating Irrigation Induced Desertification in the Aral Sea Basin
ICA3-CT-2000-30002	MedWater Policy	Completed	Policy Initiative to Overcome Water Competition between the Vital Economic Sectors of Agriculture and Tourism in the Mediterranean
ICA3-CT-2000-30005	CLIMED	Completed	Effects of climate change variability in water availability and water management practices in Western Mediterranean.

ICA3-CT-2000-30007	WADI	Completed	Water supply watershed planning and management: an Integrated approach
ICA3-CT-2000-30008	LAND WATER MED	Completed	Geo-Information for Sustainable Management of Land and Water Resources in the Mediterranean Region
ICA3-CT-2002-10002	MEDCOASTLAND-NET	In progress	Mediterranean co-ordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean coastal zone
ICA3-CT-2002-10003	MED CORE	In progress	FROM RIVER CATCHMENT AREAS TO THE SEA : A COMPARATIVE AND INTEGRATED APPROACH TO THE ECOLOGY OF MEDITERRANEAN COASTAL ZONES FOR SUSTAINABLE MANAGEMENT
ICA3-CT-2002-10004	SWIMED	In progress	Sustainable Water Management in Mediterranean coastal aquifers: Recharge Assessment and Modeling Issues
ICA3-CT-2002-10006	SMART	In progress	Sustainable Management of Scarce Resources in the Coastal Zone
ICA3-CT-2002-10009	MELMARINA	In progress	Monitoring and modelling coastal lagoons: making management tools for aquatic resources in North Africa
ICA3-CT-2002-10012	COLASU	Completed	Sustainability of Mediterranean coastal lagoon ecosystems under semi-arid climate
ICA3-CT-2002-10014	WADEMED	In progress	WATER DEMAND MANAGEMENT KNOWLEDGE BASE IN THE MEDITERRANEAN
ICA3-CT-2002-10019	DEAD SEA	In progress	A FUTURE FOR THE DEAD SEA BASIN: OPTIONS FOR A MORE SUSTAINABLE WATER MANAGEMENT
ICA3-CT-2002-10029	FOGGARA	In progress	Inventory, analysis and valorization of traditional water techniques of European and Saharan drainage tunnels
ICA4-CT-2000-30018	SUSTAIN WATER	Completed	Thematic Network on Sustainable Policies for Promoting
ICA4-CT-2000-30024	SENEGAL RIVER MANAGEMENT	Completed	Policy research to identify conditions for optimal functioning of the Senegal River Ecosystem in Mali, Mauritania and Senegal
ICA4-CT-2001-10039	MANPORIVERS	In progress	Management policies for priority water pollutants and their effects on foods and human health : general methodology and application to Chinese river basins
ICA4-CT-2001-10040	WERRD	Completed	WATER AND ECOSYSTEM RESOURCES IN REGIONAL DEVELOPMENT Balancing Societal Needs and Wants and Natural Resources Systems Sustainability in International River Basin Systems
ICA4-CT-2001-10041	PRINWASS	In progress	Barriers to and conditions for the involvement of private capital and enterprise in water supply and Sanitation in Latin America and Africa: seeking economic, social, and environmental sustainability.
ICA4-CT-2001-10047	VINVAL	In progress	Impact of changing land cover on the production and ecological functions of vegetation in inland valleys in West Africa
ICA4-CT-2001-10049	HIMALAYAN DEGRADATION	In progress	An Interdisciplinary Approach to Analyse the Dynamics of Forest and Soil Degradation and to Develop Sustainable Agro-Ecological Strategies for Fragile Himalayan Watersheds
ICA4-CT-2001-10055	IRMLA	In progress	Systems research for integrated resource management and land use analysis in South and Southeast Asia
ICA4-CT-2001-10083	CLAIMS	In progress	Changes in Land Access, Institutions and Markets in West Africa
ICA4-CT-2001-10084	CO-GOVERN	Completed	Promoting Common Property in Africa: Networks for Influencing Policy and Governance of Natural Resources
ICA4-CT-2001-10096	ECOMAN	Completed	Decision support system for sustainable ecosystem management in Atlantic rain forest rural areas
ICA4-CT-2002-10005	rehydrating the earth-REAL	In progress	Systems Research on Small Groundwater Retaining Structures under Local Management in Arid and Semi-arid Areas of East Africa
ICA4-CT-2002-10017	UBENEFIT	In progress	Utilisation of wastewater for fuel and fodder production and environmental and social benefits in semi-arid peri-urban zones of sub-Saharan Africa.
ICA4-CT-2002-10019	CAESAR	In progress	Cooperative applied environmental systems research of urban-rural interface - Sustainability in water management and land use in Havana-region
ICA4-CT-2002-10021	RURBIFARM	In progress	Sustainable farming at the rural-urban interface-An integrated knowledgebased approach for nutrient and water recycling in small-scale farming systems in peri-urban areas of China and Vietnam
ICA4-CT-2002-10059	CATCHMENT2COAST	In progress	Research into and modeling of the impacts of river catchment developments on the sustainability of coastal resources, which support urban and rural economies: the case of Maputo Bay - Incomati River.
ICA4-CT-2002-10061	NEGOWAT	In progress	Facilitating negotiations over land and water conflicts in Latin American periurban upstream catchments: combining agent-based modelling with role game playing
ICA4-CT-2002-10064	ECOCITE	In progress	GESTION PARTAGEE ET DURABLE DES ESPACES

AGRICILES ET NATURELS A LA PERIPHERIE
DES CENTRES URBAINS-SHARED AND SUSTAINABLE
MANAGEMENT OF NATURAL AND AGRICULTURAL
AREAS SURROUNDING URBAN CENTERS

ICA4-CT-2002-50035 WaGE

In progress Making Water Governance Effective (WaGE)

ANNEX IV. INDEX KEYWORDS VS PROJECTS

ANNEX IV is the result of a key-word match of ANNEX II. Keywords are based on the issues addressed within NeWater. This indexation is not yet fully context based, but provides another entry point to all projects included in the annexes.

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