



Project full title:	Strategy and methodology for improved IWRM - An integrated interdisciplinary assessment in four twinning river basins
Project acronym:	STRIVER
Contract no:	037141
Topics addressed:	Twinning European / Third Countries River Basins
Website:	www.striver.no

The project in short

STRIVER used interdisciplinary methods to assess and develop tools and methods for Integrated Water Resources Management (IWRM). Based on the development of a multidisciplinary knowledge base and the first assessment (policy, social and natural sciences), and an early stage development of IWRM conceptual framework, the project undertook problem-specific IWRM research in the four selected twinned river basins covering six countries in Europe and Asia. The four case basins were: Glomma (Norway), Tagus (Spain and Portugal), Tungabhadra (India) and Sesan (Vietnam and Cambodia). The focus in these basins was on core elements and a sub-set of important issues relating to IWRM: water governance, environmental flows, water pollution, land - water use interactions, stakeholder participation and basic environmental data. Interactions between the STRIVER scientists and local stakeholders were also a key activity.

Twinning activities based on the problem issues were performed in the four case river basins:

- Glomma (Norway) - water pollution and environmental flow
- Tagus (Spain/Portugal) - water governance & land-water interaction
- Tungabhadra (2 states in India)-land-water interaction & water pollution
- Sesan (Vietnam/Cambodia) - water governance & environmental flow



Scientific objectives and approach

The STRIVER project aimed at developing interdisciplinary tools and methods to assess and implement IWRM. To achieve this, key activities have been to:

- ✓ provide stakeholder and local communities with science-based facts and figures;
- ✓ 'show-case' the benefits of an IWRM approach;
- ✓ promote the start of processes around IWRM, especially in the 3rd and developing countries;
- ✓ develop indicators for assessing IWRM status in general and governance in particular;
- ✓ develop science-based tools for objective analysis of specific problems

Based on the development of a multidisciplinary knowledge base (policy, social and natural sciences) in all case studies and an early stage development of IWRM conceptual framework, the project has assessed the IWRM status in the four selected twinned basins. This includes the interdisciplinary integration of natural, policy and social sciences, and interactions with end-users.

In addition, specific IWRM problem issues have been analysed. The problem issues are (i) water regimes in transboundary regulated rivers, (ii) environmental flow, (iii) land and water use interaction, and (iv) pollution. The research has used sub-basins of each river basin in all cases to allow more detailed studies and easier integration of all stakeholders, for transferability purposes. Moreover, there has been a strong emphasis on local stakeholder involvement and on enabling and supporting local capacity development and uptake during the STRIVER project. Several stakeholder workshops were organised for all the STRIVER basins. STRIVER The need to work closely with both stakeholders and the general public was another corner-stone in the project.

Work performed and results achieved

The major activities in the project:

- Development of a multi-disciplinary knowledge base and complementary field studies
- A comprehensive assessment of stakeholder groups and interests in the basins
- A comprehensive IWRM assessment in the four STRIVER basins and overview of IWRM methodologies
- 3 STRIVER Bulletins and local basin newsletters
- STRIVER field work in Glomma, Tungabhadra, Tagus and Sesan
- Development of an environmental flow methodology with science-stakeholder interactions (Glomma and Sesan)
- Analyses of transboundary conflicts and water governance (Tagus and Sesan)
- Pollution modelling including stakeholders (Glomma and Tungabhadra)
- Studies of land and water use interactions (Tagus and Tungabhadra)
- Stakeholder interactions (all basins)
- Dissemination (website, books, brief series, special issues, final seminar)

The stakeholder interaction and dissemination activities have been two corner stones in the project and below we give some further examples of these particular activities and its results:

Interactions with stakeholders from the onset of project

Three stakeholder workshops have been conducted within each of the four river basins: Glomma (Norway), Tagus (Spain/Portugal), Tungabhadra (India) and Sesan (Vietnam/Cambodia). The stakeholder workshops have shown that STRIVER research has been responsive to actual needs within the basins and sensitive to the importance of the involvement of stakeholders from the onset of the project. This could be illustrated by the following:

At the STRIVER-organised stakeholder meeting in Hospet, India (Karnataka) on 9-10 January 2007, the participants agreed to form the Tungabhadra Multi-Stakeholders Committee in order to see how some of the issues addressed at the meeting could be addressed through further meetings and sharing of information and data. Another success-story is the interaction with the WFD-implementation group in Hunnselva, Norway (pilot sub-basin in Glomma RB) with e.g. three meetings.



The workshops not only helped in the integration of various perspectives of stakeholders from different sectors, but also different user groups within a sector, with varied and conflicting interests. Experience showed that there was a relatively strong willingness among stakeholders to embrace the IWRM process irrespective of country, sector and/or occupational background. The workshops proved that it was possible to bring stakeholders that shared the waters for constructive dialogue, although the political, cultural and institutional context within each of the basins had a major impact on participation. Research project focused stakeholder workshops proved to be a useful tool for enabling soft negotiations on transboundary management of water resources and identifying opportunities for resolving other water use conflicts. It was also noted that projects such as STRIVER could play a “neutral role” in moderating the stakeholder workshops and motivating stakeholders with conflicting interests, by presenting ‘objective’ research findings. The stakeholder workshops further played an important role in offering insights on IWRM practice from other basins around the world and thus promoting awareness and, to some extent, also capacity building. Ultimately, the stakeholder workshops as well as the other interactions we had with stakeholders helped in fostering linkages between the STRIVER researchers, managers, end users and policymakers, and at the same time improve acceptance of project outcomes.

The STRIVER final conference - a successful science-policy bridge arena

After consortium meetings in Hyderabad (India) in 2006, in Lisbon (Portugal) , 2007, the Midterm Meeting in Hanoi (Vietnam) , in January 2008, in Arkosund (Sweden) June 2008, and in October 2008 in Zaragoza (Spain) , the final project meeting was organised as an open international conference in Brussels May 27-28, 2009. The conference attracted some 80 participants whereof some 50 were externals. In addition, the conference was broadcasted live over internet and according to statistics attracted some 70 additional participants.



The final STRIVER conference was broadcasted live over internet (left panel photo from the PRESSENSAVE homepage. Right panel show the final panel discussion at the STRIVER conference, photo by Line J. Barkved).

Web-site

The first version of the STRIVER web-site (www.STRIVER.no) was launched already at project start in July 2006. Besides general project information, the web-site has been updated regularly with 'headlines' and 'latest news' clearly visible at the opening page. It has also contained all the written project results such as the deliverables and the Bulletin and Brief series (see two next sections below).

Bulletin

Three issues of STRIVER Bulletin have been launched including examples of the cross-cutting issues, the corner stones of STRIVER and covered extracts of specific results and news from the project. In addition, the Tungabhadra team in India has produced a basin-specific newsletter in English and in Telegu. A newsletter in Vietnamese has also been produced.

STRIVER Brief Series

STRIVER has produced a Series of Policy and Technical Briefs (22 PBs and 13 TBs) with the intention to communicate the project results in an easy non-technical fashion with a clear management and policy impact message. The two series summarizes results from the project, and are aimed at an applied research audience, water managers, decision takers and policy makers. The Technical Briefs (TBs) include more technical information and in-depth description and discussion about methodologies applied on the above mentioned IWRM topics. The PBs and TBs are available online at www.striver.no

Two STRIVER Books and 2 Special issues in pipeline

Two STRIVER Books (Gooch and Stålnacke (Eds); Gooch, Rieu-Clarke & Stålnacke (Eds) and two special issues (Irrigation and Drainage Systems and SAWAS) are planned with publications in print in year 2010.

STRIVER major findings

Overall, STRIVER has demonstrated that:

- Stakeholder participation is one of the most critical elements for practical IWRM implementation. It helps not only in the integration of various perspectives of stakeholders from different sectors, but also of different user groups within a sector with varied and conflicting interests.
- Research projects such as STRIVER could act as an independent facilitator, and provide a neutral platform for stakeholder dialogue, which ultimately can facilitate the IWRM process. There was relatively a strong willingness among stakeholders to participate in the IWRM process during the workshops, irrespective of their country, sector and occupational background. Stakeholder workshops could also play an important role in capacity development initiatives.
- Cross-border cooperation was a difficult process and sensitive to address in all the three transboundary river basins and can be a hindrance to IWRM if not addressed. For example in Sesan, It was only in the stakeholder workshops STRIVER could bring together actors from different countries or provinces sharing the river waters.
- The development and show-cases of various 'tools' (e.g., environmental flow, pollution models, water pricing, Actor-Network analyses and scenarios) is of high interest and regarded of high value for the water managers. One common feature with all the applied and tested tools where that they promote dialogue and integration between different actors of IWRM as

well as between scientists and stakeholders.

- There exists a considerable number of 'IWRM-initiatives', IWRM-plans and policies in all the four basins, but practical IWRM implementation is generally lacking, except in the case of Glomma.

For the individual case basins the following was particularly noted:

- Considering livelihood issues for all sectoral and marginal groups could increase the water use efficiency and facilitate the move towards IWRM (as seen in the Tungabhadra case);
- Introduction of water pricing as a regulatory measure could help in increasing water use efficiency, provided there is a proper institutional framework in place for implementation at a basin or sub-basin level (Tungabhadra and Sesan cases)
- Implementation of a simple environmental flow method for hydropower water release could take into joint consideration all sectoral needs and demands (Sesan and Glomma cases);
- Quantifying pressure and water quality impacts with pollution models was regarded of high value by water managers in the implementation of the EU Water Framework Directive (Glomma case);
- Unregulated land use change will have a negative impact on water use and management, if not integrated with overall development in the basin (as seen in Tungabhadra and Tagus).

Contractors

To reach its objectives, STRIVER has mobilised a comprehensive, interdisciplinary and highly skilled research team from European and south-east Asian countries. STRIVER consists of 13 contractual partners:

- Norwegian Institute for Water Research (overall co-ordinator); NIVA
- Norwegian Institute for Agricultural and Environmental Research (scientific coordination); BIOFORSK
- Joint Research Centre, Ispra, Italy; JRC-EC
- Univ. of Dundee, UNESCO Centre for Water Law, Policy and Science, Scotland; UNESCO Centre Dundee
- Institute of Geography, Vietnam Academy of Science and Technology, Hanoi, Vietnam; IoG
- Agencia Estatal Consejo Superior de Investigaciones Cientificas, Zaragoza, Spain ; CSIC
- Centro de Estudos de Hidrossistemas, Instituto Superior Técnico, Technical University of Lisbon, Portugal; IST-CEHIDRO
- University of Oslo -The Centre for Development and the Environment, Norway; UiO-SUM
- The Institute for Social and Economic Change, India; ISEC
- Society for Promoting Participative Ecosystem Management, Pune, India; SOPPECOM
- Centre for Development Research, Bonn University, Germany; ZEF-Bonn
- Linköping University, Department of Management and Engineering Sweden; LiU
- Water Research Institute - National Research Council, Italy; IRSA

In addition the project has an advisory board to ensure uptake and relevance of STRIVER results. The STRIVER Advisory Board consists of international organisations, external experts and End-users and Stakeholders including the following UNESCO International Hydrological Programme (UNESCO-HELP), The International Network of Basin Organisations (INBO), Global Water Partnership (GWP), The United Nations Economic Commission for Europe (UN-ECE), Mekong River Commission (MRC), French Scientific Research Council, Institute of Environmental Technology under the Vietnamese Academy of Science and Technology (IET-VAST), Madras Institute of Development Studies (MIDS), Water Institute of Portugal (INAG), Government of Andhra Pradesh, Glomma and Laagen Water Association (GLB).

Co-coordinators contact details

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