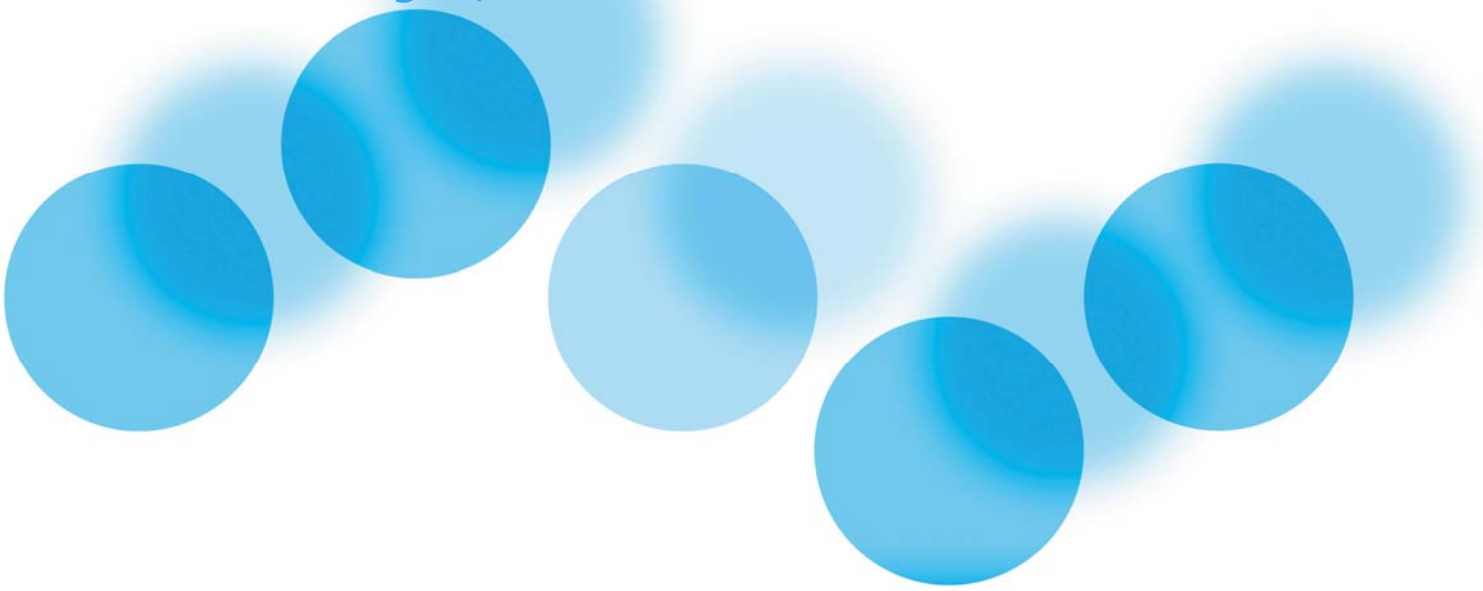
UNDP I GEF
DANUBE
REGIONAL
PROJECT

March 2007

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

Bosnia and Herzegovina, Croatia, Serbia and Montenegro, Slovenia



UNDP GEF

WORKING FOR THE DANUBE AND ITS PEOPLE

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PREFACE

The UNDP/GEF Danube Regional Project (DRP) supports and complements the activities of the International Commission for the Protection of the Danube River (ICPDR) to provide and sustain a regional approach to the development of national water management policies and legislation in the DRB.

The pilot project for the development of a Pragmatic Sava RBM Plan constitutes an activity (Component 1.1-9) within the DRP's objective regarding the "Creation of sustainable ecological conditions for land use and water management". The actual assignment is based on the outputs and outcomes of Phase 1 (April 2003 to February 2004) in which important data and information on water management and socio-economic issues of the WFD have been collected in Slovenia, Croatia, Bosnia & Herzegovina and Serbia & Montenegro.

Phase 1 has provided a first overview in quality and quantity of data gaps on WFD implementation, strongly varying from country to country and depending on the innovative character of a specific WFD subject, compared with the level of water management and economic data bases in Sava countries in the past 15 years. Even though several efforts by the Sava countries were undertaken in 2004 and 2005 to fill in these gaps (partly with support of the ICPDR and UNDP/GEF-DRP), many gaps do still exist and some can be filled in the course of this GEF-DRP support (i.e. by February 2007).

Therefore, in **Phase 2** this GEF component rather focused on sustainable capacity building of national institutions but not on simply delivering a package of upgraded data by an outside Consultant team.

The **objective** of this Phase 2 assignment was to support the development of a Pragmatic Sava RBM Plan until February 2007, while in the long-term (by 2009) a Sava RBM Plan completely in line with EU WFD requirements and ICPDR guidance should be completed by Sava countries (facilitated by the Sava Commission). This RBM Plan, together with the related national RBM plans, will serve as the main instruments to start concrete actions with regard to transboundary issues in the Sava river basin and will also constitute the basis for future investments by international and bilateral donors.

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ABBREVIATIONS

BA	Bosnia and Hercegovina
CARDS	(EU) Community Assistance for Reconstruction, Development and Stabilisation
CS	Serbia and Montenegro (*existed until June 2006*)
DRB	Danube River Basin
DRP	Danube Regional Project
EC	European Commission
EG	Expert Group
EU	European Union
GEF	Global Environment Facility
GIS	Geographic Information System
ICPDR	International Commission for the Protection of the Danube River
ISPA	(EU) Instrument for Structural Policies for Accession
HMWB	Heavily Modified Water Bodies (according to WFD)
HR	Republic of Croatia
KWI	Key (transboundary) Water Management Issues (WFD)
PEG	Permanent Expert Group
PoM	Programme of Measures (WFD)
PP	Public Participation
RBMP	River Basin Management Plan
RR	Roof Report
SC	Sava Commission
SI	Republic of Slovenia
SRB	Republic of Serbia
ToM	Topics for PoM (WFD)
ToR	Terms of Reference
UBA	Umweltbundesamt GmbH (Austrian Federal Environment Agency)
UNDP	United Nations Development Programme
WFD	EU Water Framework Directive

EXECUTIVE SUMMARY

This report presents activities and results of a pilot project supporting the development of a Pragmatic Sava River Basin Management Plan. The project was commissioned by the UNDP/GEF DRP and carried out by a team of international and local consultants between November 2005 and April 2007.

The objective of the project was to support the capacities the Sava Basin countries Slovenia, Croatia, Bosnia & Herzegovina and Serbia & Montenegro in river basin management planning in line with Water Framework Directive (WFD) requirements. The project was carried out in close cooperation with the Secretariats of the International Commission for the Protection of the Danube River (ICPDR) and the newly established Sava Commission (SC). Links to other relevant projects in the region were established to make best use of available resources, to avoid overlaps and to harmonise ongoing activities.

During an extended Inception Phase, the up-to-date individual status and needs in WFD capacity building were assessed and used to agree on the best possible Consultants service to the Beneficiaries within the limited UNDP/GEF DRP time and budget.

Task 1: As a first step the most important information and capacity gaps for WFD implementation in the Sava basin countries were identified and discussed with the Beneficiaries. Results can be found in the Report on WFD Gap Analysis in Appendix 1. Specific assistance was provided on selected WFD issues in a number of workshops (in part jointly with the related CARDS-Sava project) and via the electronic workshop-follow-up for national government experts.

Task 2: The most important subjects of transboundary relevance in the Sava basin (Key Water Management Issues) for improving basin-wide water management in line with the WFD were identified in a consultation process (locally filled-in template and regional workshop). This included also an assessment of current water governance and institutions in the Sava basin.

Task 3: A non-exclusive list of Topics of Measures was commented and discussed. Different approaches to select the most cost-effective combination of measures were presented. A cross-check with the preliminary transboundary key water management issues as defined in Task 2 was provided.

The joint report of Tasks 2 and 3 can be found in Appendix 2.

Task 4: Building on Tasks 1-3 a draft structure of the future Sava RBM Plan and draft Road Map, both in line with that of the Danube RBM Plan, were developed (see Appendix 3). The Road Map will serve as a basis for further agreement in the Beneficiary countries and the Sava Commission when preparing the RBM Plan. Attached to the Road Map is a Sava Basin Public Information and Consultation Plan and an assessment of the current status and needs of the the Sava Basin Public Participation Strategy.

It has to be pointed out that, due to the early state of WFD implementation in the Sava Basin and the fact that currently a Sava Basin Analysis in line with the WFD is not yet available, the results of the UNDP/GEF DRP Component are of a preliminary character. They are intended to contribute to and facilitate ongoing discussions and WFD activities by the countries and in the new Permanent River Basin Management Group of the Sava Commission.

The work plan of the project could be fully executed within the given time and budget frame and all outputs were agreed with and endorsed by the Beneficiaries.

1. FRAMEWORK CONDITIONS FOR EXECUTION OF WORK

The start of this UNDP/GEF DRP Component in mid November 2005 (contracting by the DRP office) was challenged by various dynamic aspects of ToR-related issues and stakeholders, which made it necessary for the chosen Consultants Team to respond with great flexibility:

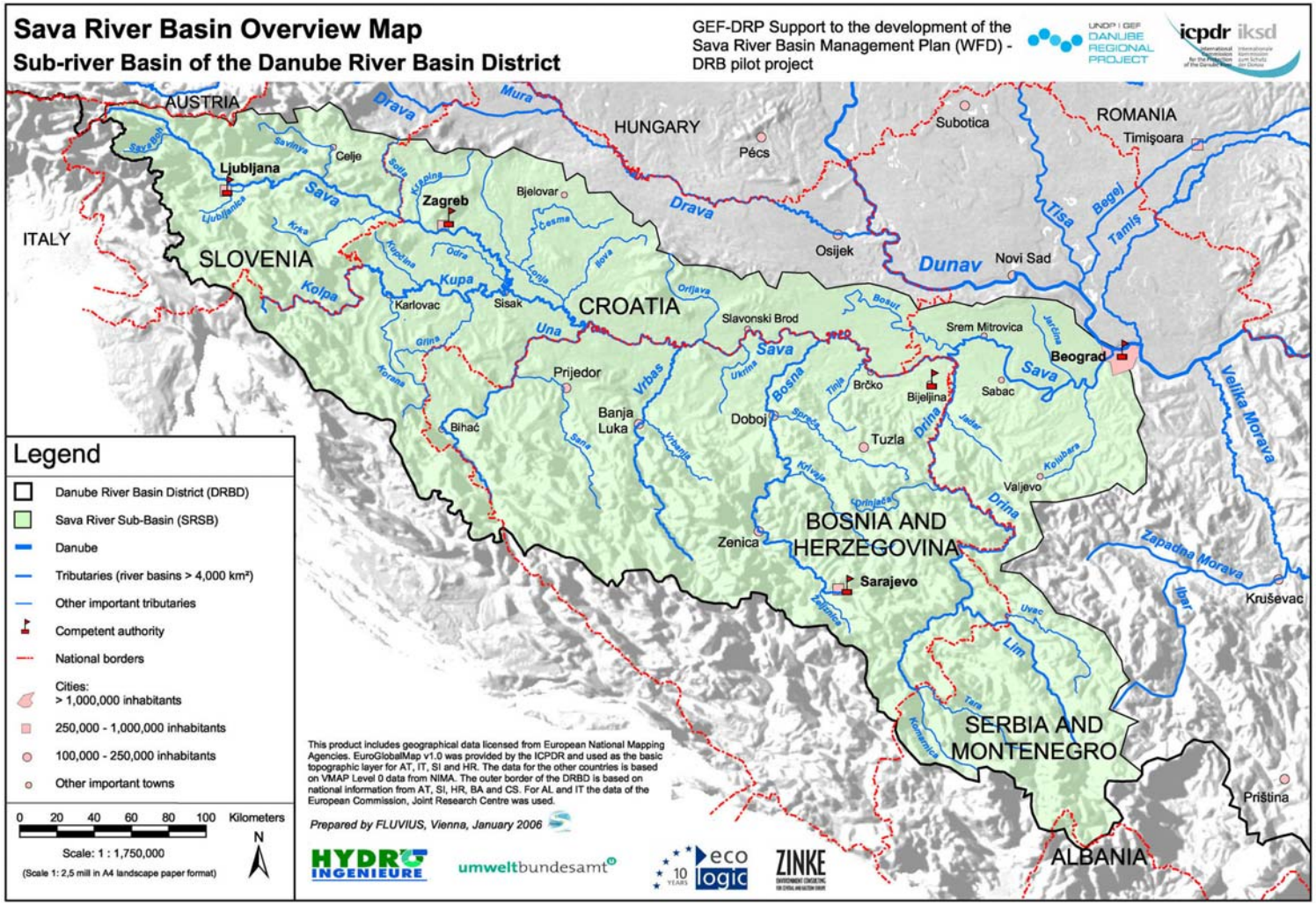
- Due to the delayed start of this Component work (mid November 2005), a substantial time gap existed between the end of Phase 1 (February 2004) and the start of Phase 2;
- The Sava Commission (SC) as one key Beneficiary started to officially exist only in July 2005, and its Secretariat as its executive representative started to become established only from January 2006 on. The SC Sava Expert Groups – notably the one on RBM - became operational only from November 2006 on or even in 2007, i.e. when this UNDP/GEF DRP Component already achieved various work. All these bodies have been important counterparts of this GEF Component.
- This UNDP/GEF DRP Component had to link and coordinate with other donor projects. The most important one was the CARDS Regional Sava project (11/2004 to 10/2007) which also aims at supporting the national and SC Secretariat capacities in WFD implementation (partly through local pilot implementation projects), and with which several joint activities were organised. Other relevant support projects contacted were in Bosnia & Hercegovina and Croatia (CARDS national programme), Slovenia (ISPA pilot implementation project), and in Serbia & Montenegro (projects by the European Agency for Reconstruction). Some link was also established to the UNDP/GEF DRP Component 3.1. NGO Small Grants Programme, where in 2006 a new regional grant was implemented by NGOs from all Sava countries (leader: Green Action, Zagreb).
- Changed assistance needs with respect to the WFD and the river basin cooperation were related to various national progresses made by Sava basin governments, as the main Beneficiaries. This refers to the organisation and capacity-building of water management as well as in their preparedness to implement the WFD (e.g. inputs into Danube Roof Report chapters, current drafting of national WFD reports).
- After the splitting of Montenegro from Serbia in June 2006, an important part of the Sava basin was not covered anymore in this project (see Figure 1). Efforts to involve the Montenegrin government since August 2006 failed (no response received).
- Last but not least, it was crucial to closely link and communicate the planned Sava activities (under Tasks 1-4) with the work going on at ICPDR level, especially with the RBM Expert Group (EG) and its Technical Expert from the Secretariat. They coordinate the work on the Danube Basin Analysis (WFD Roof Report 2004 with information gaps from Sava countries) and the upcoming Danube Basin RBM Plan 2009: Among other outputs, the RBM EG had released in December 2005 a "Road Map for the development of the Danube RB District MP 2005 to 2010", including steps for the Programme of Measures (PoM) development at sub-basin and Danube basin level, in 2006 Danube key issue papers on Hydromorphology, Organic and Nutrient Pollution, and Hazardous Substances; a "basic structure" of the Danube RBMP etc. Such coordination was also important with the second pilot basin next to the Sava, i.e. the Tisza where the drafting of a RBM Plan had already started: The adapted transfer of the drafted Tisza templates for WFD reporting to the Sava basin within the GEF Sava Component was of special interest for the ICPDR RBM EG.

It was therefore agreed with the UNDP/GEF DRP Office

1. to **invest more time** than originally planned **for the Inception Phase** to verify and revise the planned activities in response to the current needs and to specify the most beneficial activities under the given work Tasks 1-4 of the ToR. This has also resulted in small adjustments of the Project and Task titles (see below).
2. to have a **small core team from the Consultants consortium, supported by both Local Consultants in the Sava countries** (not in Montenegro) **and a large group of ad-hoc WFD experts** who were involved during project execution according to the specific and later developed Beneficiaries' needs.

The geographical scope of this project is the entire basin of the Sava river, extending over large areas of Slovenia, Croatia, Bosnia & Herzegovina and Serbia & Montenegro (since June 2006 Montenegro and Serbia). A general map of the Sava basin is given in Figure 1.

Figure 1 Sava River Basin: Working Area of the UNDP/GEF DRP Component 1.1-9



Note: At the start of this Component in November 2005, Montenegro was still a joint state with Serbia (separated since June 2006),

2. EXECUTION OF TASKS

The following section provides an overview of the preparatory work, the methodological approach and all activities undertaken by the Consultants to successfully achieve the agreed Tasks and Outputs.

2.1. Results of the Inception Phase

2.1.1. Results of meetings and missions

Right upon their awarding, the Consultants hold their first meeting on 16 November 2005 with the UNDP/GEF DRP Office and the ICPDR Secretariat. This served to agree on the first contacting of Beneficiaries, the preparation of the Kick-off meeting and the overall organisation of work. A few days later, the Consultants distributed an excerpt of their offer to the DRP to all key stakeholders (Sava basin governments, CARDS Regional Sava project, CARDS water quality project in BA, SC Secretariat).

The official **Kick-off meeting** (13 December 2005) right after the ICPDR Annual Conference served the DRP Office and the ICPDR Secretariat to present the new Consultants team who then explained their draft execution concept to the Beneficiaries. This meeting also served to learn about the local expectations and to agree on the next steps of the Inception Period. The Consultants then also met with the Team Leader of the CARDS Sava project to assess fields of cooperation and possible overlapping.

The **Inception Mission (Zagreb, Sarajevo and Belgrade: 17-20 January 2006)** served to present to national water management authorities and experts in HR, BA and CS the planned content of the DRP Component, and to identify and specify the concrete content of the project and to learn more about the assistance needs in Croatia, Bosnia & Hercegovina and Serbia & Montenegro. The mission also served to discuss a previously distributed table of potential issues for support within the WFD.

Three Consultants met during this mission with some ten national representatives in each city and jointly concluded their findings. Side meetings were held with the Team Leaders of the CARDS Regional Sava projects, the Bosnian CARDS projects on Water Quality (Programme 2003) and Water Institutions capacity building (Programme 2002). Another meeting was held with the European Agency for Reconstruction regarding their Serbian support activities (monitoring, WFD twinning).

The most important mission results were as follows:

- There were a lot of activities promoting and supporting WFD implementation in the Sava countries, most with assistance of international projects (especially from EC-CARDS and EC-ISPA). It was therefore crucial to avoid duplication of work, and to carefully assess and address the gaps.
- The pool of relevant national experts dealing with WFD implementation in all Sava countries was relatively small, and they worked both on national water management tasks as well as on international tasks (input into ICPDR work, Sava Commission, international assistance projects).
- Additionally, Croatia had started its pre-accession negotiations with the EC which could address inter alia potentially new transition periods for the fulfilment of EU

legislation (including water management regulations): This led to uncertainties on the HR capacity to present all WFD-related capacity and information gaps.

- Thus, all relevant institutions were confronted with a very heavy work load, linked with limited resources available for any new activity.
- On the other hand, this GEF Component was welcomed to support the countries in completing the Danube River Basin Roof Report and in developing the main transboundary key issues, the preliminary Program of Measures and the structure of RBM plan for the Sava.
- Further, this GEF assistance focused on the development of a RBMP in accordance with the WFD came with good timing, not only for the finalisation of Danube RR and CARDS Sava pilot projects, but also for a good start of the Sava Commission and its Secretariat. Regular supervision of activities and close coordination with the ICPDR was secured through the GEF Component's Steering Committee (named "*GEF Sava Working Group*")
- In order to prevent misunderstandings or wrong expectations, the following adjustments to the overall title of the UNDP/GEF Component and its tasks were agreed with the Beneficiaries, reflecting the specific content of activities:

  Old Component title:

  Development of the Sava River Basin Management Plan – pilot project

  Revised Component title**:**

  "Support to the development of the Sava River Basin Management Plan (WFD) – DRB pilot project"

  Revised Task titles:

  - **Task 1: *"Gap analysis for the completion of the Danube RR and assistance to current WFD activities"***
  - **Task 2: *"Support to the description of key transboundary issues (Pressures and Impacts)"***
  - **Task 3: *"Support to the development of topics for a Programme of Measures"***
  - **Task 4: *"Structure of the Sava River Basin Management Plan"***

Therefore, it was important for the UNDP/GEF DRP Component to:

- Provide assistance closely related to the institutions' current work and most pressing WFD activities (Task 1)
- Produce, with the support of Local Consultants, a concise, up-to-date Gap Analysis based on the recent work performed in the countries (Task 1)
- Help preparing the next steps of WFD implementation (transboundary issues, selection of Measures, structure of RBM Plan) closely linked to the upcoming needs at the Sava basin level (Tasks 2-4)

The **Inception Workshop** on 22 February 2006 in Zagreb served to agree on the Inception Report and related future activities. Thanks to the participation of all key stakeholders (representatives of the 4 Beneficiary countries, Sava Commission Secretariat, ICPDR, UNDP/GEF DRP office, Cards Regional Sava project, NGO "Green Action as well as the International and Local Consultants), this workshop agreed on the overall work plan and all pending issues. Important items were the actual work under Task 1.1 (the new Sava templates will first be circulated for comments and later filled in with *meta data*), Task 1.2. (linking the identified gaps with the assistance subjects also in the CARDS Sava workshops) and on the role of the Sava Commission and its new RBM Expert Group with respect to this DRP component management.

The workshop *Minutes* and the finalised Inception Report were circulated and endorsed in March 2006 for publication at the UNDP/GEF DRP webpage.

2.1.2. Methodological approach

Based on the above results and agreements, the methods applied used the following approach:

- The UNDP/GEF-DRP time and budget constraints limited the capacity to provide support to the Beneficiaries or to work on a similar level like e.g. the CARDS Regional Sava project. Compromises included to focus on a few priority subjects (WFD issues), on a small number of travels/meetings/workshops, on short-time assistance with limited preparation and reporting.
- In Task 1, the assistance was - as good as possible – to meet current assistance needs of Beneficiaries and link to other WFD support activities, notably the CARDS Regional Sava project, and to the ICPDR work.
- In Tasks 2-4, the GEF assistance was to initiate and support the needed preparation works aiming at a Sava RBM Plan. This assistance was to produce a structured outline for a RBM Plan but with agreed strategic elements (transboundary key issues, topics for a Programme of Measure, structure of the future Sava RBM Plan).
- Complementing specific assistance issues raised at the CARDS project had been considered as a positive contribution of this project, esp. since the expert group targeted is similar;
- While the GEF assistance focused on three (HR, BA and CS) of the four Sava countries, Slovenia was to be invited to attend and actively participate into all regional workshops in order to assure Sava basin-wide view, assessments and results.

2.1.3. Work Plan for execution

The Inception Phase succeeded to specify the content, timing and outputs of all tasks of the project based on interactions with and needs of the different Beneficiaries. This has resulted in the agreed activities presented below, which were also based on the TOR given by UNDP/GEF-DRP and on the Technical Proposal of the International Consultants team.

2.1.3.1. Task 1: Gap analysis for the completion of the Danube RR and assistance to current WFD activities

Task 1.1.: Gap Analysis for WFD implementation in the Sava RB

Objective: *Identify the most important gaps of information and capacity to implement the WFD, specifically the Danube Roof Report and the upcoming Sava Roof Report*.

Execution: The Gap Analysis was to start already during the Inception Phase, assessing the quality of national information received for the Danube Roof Report at the ICPDR Secretariat in 2004 and 2005 as well as from the UNDP/GEF-DRP Phase 1 results, and indicate first gaps.

This was to be further discussed with Beneficiaries, making use of a simple overview table comparing the WFD implementation chapters in HR, BA and CS and agreeing on those issues that should receive priority assistance (*quality analysis*). The first result was a list of priority issues for assistance:

- **Groundwater** (including classification, delineation esp. in karst situations, risk assessment, information gaps);

- **Surface water** (point and diffuse pollution, hydro-morphological alterations, HMWB, reference conditions, risk analysis);
- **Economic analysis** of water use for the RR reporting;
- **Socio-economic aspects** for the preparation of the RBMP in the transboundary context (HMWB and other exemptions, new modifications - navigation), cost-effectiveness of measures, cost recovery

Other issues of potential assistance were:

- European experiences with the fulfilment of **relevant EU Directives** / possibilities and limitations for the beneficiary countries: Urban waste water, drinking water etc.]
- European experiences with the **setup of water management institutions**: competencies and reporting, both horizontal (between ministries) and vertical (centralized – decentralized).

In the second step, the Tisza WFD Report templates were to be transferred to the Sava basin and used for an extended *gap quality analysis*. These Tisza templates have been developed in 2005 by the Tisza countries and the ICPDR RBM EG, and served as models for the Sava. In communication with the ICPDR Secretariat, the International Consultants were to adjust them to the Sava level. The completion of the templates was to be performed by the Local Consultants and focus on the clear indication related to the *availability and quality* of WFD-required data and information (*meta data*). Differences from outputs already reported on the DRB Roof Level and the newly developed information were to be identified and assessed. The contents and filling-in of the new Sava templates were to be closely coordinated with the Beneficiary authorities.

The filled-in Sava template meta data further facilitated the International Consultants in communication with the Local Consultants and the Beneficiaries to conclude the Gap Analysis and to specify more exactly the assistance to be provided in Task 1.2.

Outputs: A Gap Analysis for each Sava country, including the filled-in WFD templates for the Sava RB (limited to *meta data*). These can be further used by the Beneficiaries and Sava Commission for future development.

Task 1.2.: Assistance on selected WFD Issues

Objective: *Support the three Sava countries in their concrete WFD reporting, addressing selected issues and using different assistance tools*.

Execution: Based on the main topics of assistance identified, prioritised and specified during the Inception Phase and through the Gap Analysis, the International Consultants were to offer assistance in three ways:

Task 1.2.1. Transfer of international experience with WFD reporting via **in-situ working sessions** closely linked to the CARDS Sava project: Relevant **Technical CARDS workshops** were planned for

- May and October 2006 (on Pressures, Economic Analysis, Socio-economic aspects)
- May and October 2006 (on Hydromorphological Alterations, HWMB).

Plan was to make use of these CARDS workshops where relevant national experts were present (i.e. prevent organising a similar event) and to complement the CARDS project with those WFD fields where the DRP project can contribute to the preparation of WFD reports.

At the UNDP/GEF DRP working sessions, presentations were to be given by International Consultants on how to address identified specific WFD topics in national and regional WFD reports. This was to include discussions with the national government experts, who were then asked to report from their specific problems and to comment on the international advises. The contents/presentations were to be coordinated with the CARDS consultants and look rather from the ICPDR view to the Sava region. The exact topics of DRP presentations and the allocation of available capacities of International Consultants within the CARDS workshops were to be agreed on the base of the gap analysis. These joint workshops were to reduce the number of regional meetings that all participants were asked to attend within the EU and GEF assistance, i.e. in order to save time and costs.

Two International Consultants were to attend one day each and provide the described assistance. UNDP/GEF-DRP funds were to further cover an extra day involvement into the workshops but neither the costs of local participants (extra night, catering) at the two workshops nor their travel (agreed cost sharing between GEF and EU funds).

Task 1.2.2. Transfer of international experience with WFD reporting via **interactive working sessions in Vienna** (at UBA - Federal Environment Agency). Here a small group of national government experts were to be invited to stay for some 3 days to present their reporting problems to a number of different EU experts available in Vienna. This action was to allow more detailed expert discussions as well as reflections how to best cooperate at Sava basin level with the WFD reporting.

Working Sessions were planned for June, with days 1 and 5 being travel days and days 2 to 4 providing the working sessions (small group presentations, personal discussions to assess the concrete problems). Topics of these sessions were to depend on the results of the detail gap analysis (see Activity 1.1.), but would probably include groundwater, GIS, institutional set up.

UNDP/GEF-DRP funds were to cover the costs of up to 12 local participants (incl. per diem, travel) from HR, BA and CS. More experts could attend at their own costs.

Task 1.2.3. As another assistance tool, the International Consultants offered an **electronic Workshop Follow-up** to the national government experts. This was meant as a communication service where the items and procedures presented and discussed in workshops and meetings before could be checked and improved in the following months (all governments plan to finish their national WFD reports in December 2006 to the ICPDR). This interactive support (i.e. mails with questions) was based on the completion of draft national WFD reports (in English), on interim results in the CARDS pilot projects and on some recent insights of the International Consultants into the national reporting situation. It was to be provided without travel and personal meetings and at a tentative volume of two working days of International Consultants per Beneficiary country.

Outputs: A short report describing the various WFD subjects addressed and the related assistances provided, including – to the extent possible – an evaluation of the success.

2.1.3.2. Task 2: Support to the Description of Key Transboundary Issues (Pressures and Impacts)

Objective: Initiate and support the agreement on key transboundary issues for the Sava RB.

Execution: This activity should be the first step into preparing the Sava RBM Plan and is very important for the further work at the Sava level and especially for the Sava Commission. It was

to be based on similar work done in other river basins (e.g. Rhine, Meuse, Tisza), and make use of documents developed at the ICPDR level (incl. GEF-Danube Pollution Reduction Programme - Transboundary Analysis 1999).

Based on international experience on developing key transboundary issues, the International Consultants were to ask (via a template) the Local Consultants to discuss and develop an initial list of key transboundary issues with the national government experts. The results were to be assessed and merged by the International Consultants for discussion and agreement at a regional workshop, in Sarajevo (as day 1 of a 2.5 days workshop addressing also Task 3). This process was to make use of the Danube key issues (see the related new RBM EG issue paper) at the Sava level.

The regional workshop was to conclude preliminary key transboundary issues for the Sava basin and was linked to the workshop under Activity 3.5.

Output: A short report on agreed list of preliminary key transboundary issues for the Sava basin.

2.1.3.3. Task 3: Support to the Development of Topics for a Programme of Measures

Objective: Initiate and support the agreement on the topics (strategic priorities) of the future Programme of Measures.

Execution: Taking into account the early stage of WFD implementation in 2006 (compared to the need to prepare an RBMP by 2009), it was agreed with ICPDR and the Beneficiaries that in this GEF Component focus should be on the topics of such Measures that are expected to best contribute to achieve the WFD objectives in the Sava basin in the future. Therefore, the focus of this Task was to be on a regional discussion and agreement on the types of such Measures that are best suitable for addressing the key transboundary issues of the Sava region. Again, the development of this Activity was to be based on international experience, i.e. the International Consultants were to ask (via a template) the Local Consultants to discuss and develop an initial list of types of Measures with the national government experts. The results were to be assessed and merged by the International Consultants for making concrete proposals for criteria and contents of the PoM (discussing sub-basin WFD objectives), which then were to be discussed and finalised at a regional workshop in Sarajevo.

The execution of Task 3 was linked to that of Task 2 (Activity 2.6) to make best use of the available time and funds of all experts to be involved (day 2 of a 2.5 days workshop).

Output: A short report on agreed list of preliminary priority types of Measures for the Sava basin. General recommendations on how to develop Sava basin objectives based on Danube basin experience.

2.1.3.4. Task 4: Structure of the Sava River Basin Management Plan

Objective: Initiate and support the agreement on the structure of the future Sava RBM Plan.

Execution: Taking into account the early stage of WFD implementation in 2006 (compared to the need to prepare an RBMP by 2009), it was agreed with ICPDR and the Beneficiaries that in this GEF Component a structure for the Sava RBM Plan should be produced. This was to be based on the EU (CIS) and ICPDR (Road Map) guidances but also to reflect the current Sava results and consultations, i.e. what character/content and quality of such a Plan can be expected by 2009.

The International Consultant were to also prepare a draft "Road Map" for the Sava RBM Plan, tuned with the new Danube RBMP Road Map. Even though this was not foreseen in the ToR, it was found useful by the Beneficiaries and the Sava Commission to have such a document available for further discussions.

The draft Sava RBMP structure as well as the proposed Road Map were to be presented and discussed at a final, 2-days regional workshop (tentatively in Belgrade, eventually held in Zagreb). This meeting should also serve to summarise and conclude the overall results of the UNDP/GEF DRP Component.

As regards the aspect of **public participation**, it was agreed that, different to the ToR, the general PP strategy for the Sava basin prepared by the REC (Regional Environmental Center) should be reviewed, taking into account the strategy already developed for the Danube basin. The findings of the review on the Sava PP strategy were to be presented at the final workshop.

Output: A short report on agreed RBMP structure and related Road Map as well as the findings of the reviewed PP strategy for the Sava basin.

2.1.3.5. Timing and outputs of tasks and activities

The timing and relations of all Tasks and activities is summarised in Figure 2 below.

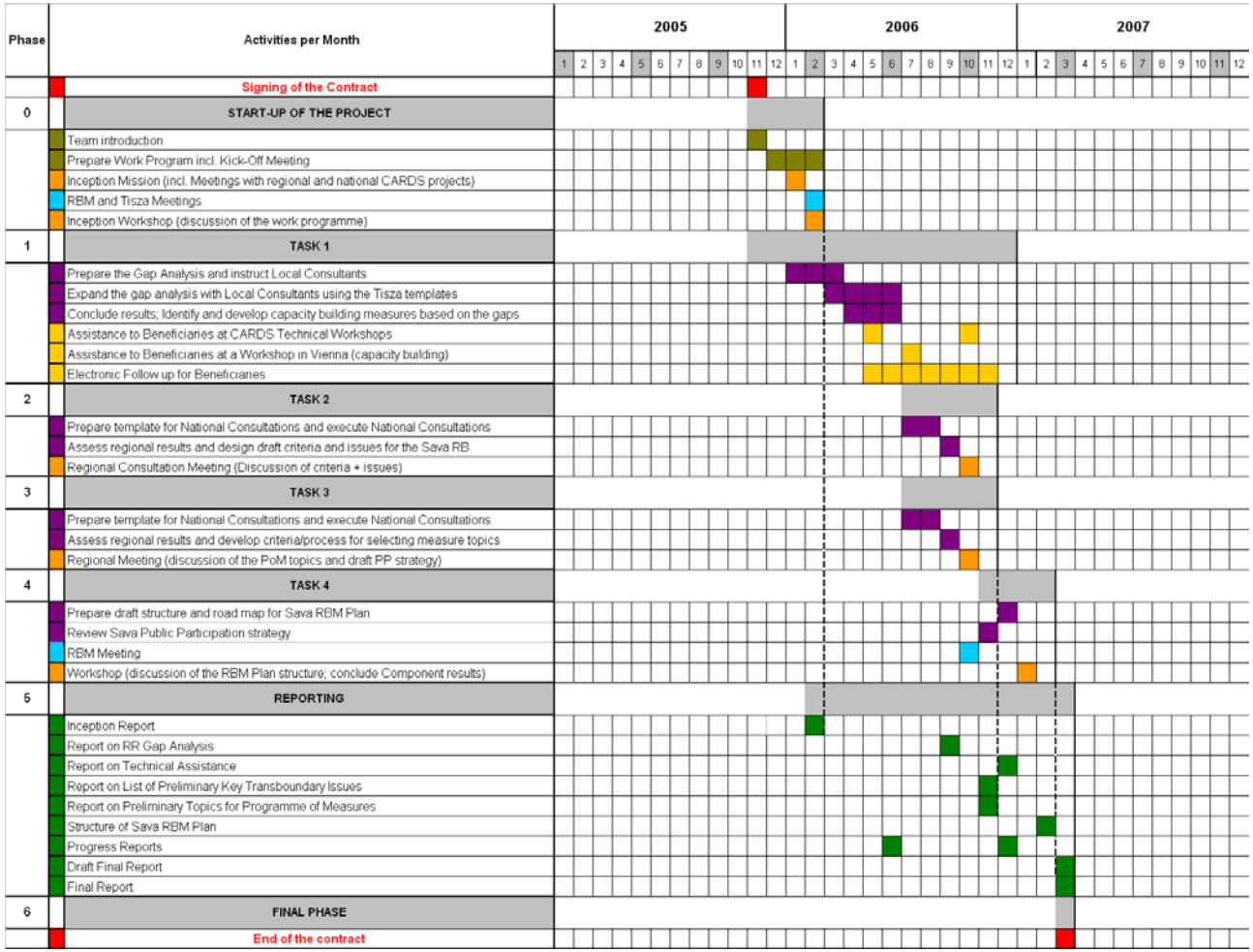
The project activities were undertaken in close cooperation with the relevant ICPDR expert groups (in particular RBM EG), the Sava Commission Secretariat, the Sava CARDS project and national authorities coordinating the implementation of the WFD.

The main steering body supervising the execution of this assignment was the **Sava Working Group**. It included representatives from the following bodies:

- The Beneficiary countries (HR, BA, CS and SI)
- The Sava Commission Secretariat
- The ICPDR
- The UNDP/GEF-DRP

Meetings of the Sava Working Group were organised to coincide with the planned regional Component workshops in February (Inception Workshop) and October 2006 (Task 2&3 Workshop) and in January 2007. (Task 4 Workshop)

Figure 2 Timing and milestones of Tasks and related activities (status: February 2006)



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2.2. General results

The execution of all planned activities was successful and met all expectations formulated during the Inception Phase.

In the course of the activities, the following meetings and capacity building workshops were undertaken:

Table 1. Number of participants at UNDP/GEF DRP Sava Component workshops

DRP Sava-related event	Time, location	Number of participants	No. of attending Beneficiaries
Kick-off meeting	13 December 2005, Vienna	21	9
Inception Workshop*	22 February 2006, Zagreb	22	15
CARDS Workshop	31 May – 2 June 2006, Belgrade	20	14
Inter-active Working Sessions	27-29 September 2006, Vienna	24	12
CARDS Workshop	3-6 October 2006, Sarajevo	54	43
Regional Workshop Tasks 2&3*	13-14 November 2006, Sarajevo	28	21
Regional Workshop Task 4*	24-25 January 2007, Zagreb	29	18
Total		**198**	**132**

* This event also served as meeting of the Sava Working Group (supervisory of the UNDP/GEF DRP Sava Component)

2.3. Results of Task 1

2.3.1. Task 1.1.: Gap Analysis for WFD implementation in the Sava RB

Objective of Task 1.1 of this GEF Component was to identify the most important gaps of information and of capacity for WFD implementation in SAVA basin countries (HR, BA, CS). This gap analysis was worked out in two steps. A first screening of capacity gaps and issues for assistance took place during the Inception Phase.

Then, while using adopted Tisza WFD reporting templates, but limiting the relevant information for the SAVA River Basin to meta data, SAVA Templates were prepared by the Consultants team in April 2006, and were filled in May and June 2006 by local consultants together with national experts from the water authorities from Bosnia & Herzegovina, Croatia and Serbia & Montenegro.

The details about the templates and the results of the gap analysis, divided into Part I Water Management, and Part II Socio-economics, are available in the "**Report on WFD Gap**

Analysis". This was disseminated in the agreed final version to the Beneficiaries on 31 July 2006 and is attached in Appendix 1.

Most of the gaps identified in this UNDP/GEF DRP analysis for the 3 Sava countries could be addressed during several activities within this DRP Component. In particular these are:

- **Groundwater** (1st joint workshop with CARDS Sava project): delineation of Water Bodies, Risk Assessment, information gaps;
- **Surface water** (1st joint workshop with CARDS Sava project, Vienna workshop): hydromorphological alterations, point and diffuse sources (data management, pressure analysis, Risk Assessment, fulfillment of relevant EU Directives - Urban Wastewater Dir.);
- **GIS** (Vienna workshop): Preparation of basis data, Water Body delineation, Risk Assessment, presentation of results.

2.3.2. Task 1.2.: Assistance on selected WFD Issues

Objective of Task 1.2 was to s*upport the three Sava countries in their concrete WFD reporting, addressing selected issues and using different assistance tools.*

The UNDP/GEF DRP assistance was sub-divided into the following 3 sub-tasks:

2.3.2.1. Task 1.2.1. Transfer of international experience with WFD reporting via two in-situ working sessions closely linked to the CARDS Sava project:

First Workshop by the EC Regional CARDS project "Pilot River Basin Plan for the Sava River Basin" and UNDP-GEF "Sava project" from 31 May – 2 June 2006 in Belgrade

The workshop was jointly organized together with the CARDS project. Two DRP Consultants (Eleftheria Kampa, Ecologic, and Andreas Scheidleder, Umweltbundesamt) participated as international experts from the GEF Component. The main topics of this workshop were

- Groundwater body delineation and characterisation - with special focus on karstic aquifers
- Hydromorphological risk assessment and AWB/HMWB provisional identification

On 1 June, E. Kampa and A. Scheidleder gave comprehensive presentations and played an active role during the workshop discussions.

Second Workshop by the EC Regional CARDS project "Pilot River Basin Plan for the Sava River Basin" and UNDP-GEF "Sava project" on the Preparation of WFD Characterisation Report (3 – 6 October 2006 in Sarajevo)

UNDP/GEF DRP Consultants Eleftheria Kampa (Ecologic) and Franko Humer (Umweltbundesamt) participated as international GEF Component experts. The main topics of this workshop were:

- Groundwater (risk assessment-isotopes karst)
- Reporting issues for the provisional identification of HMWB

On 5 October, E. Kampa and F. Humer presented and discussed the above listed topics.

The **Mission Reports** and Lists of Participants for both workshops are included within Appendix 1.

2.3.2.2. Task 1.2.2. Transfer of international experience with WFD reporting via Interactive Working Sessions in Vienna (Federal Environment Agency) on 27 – 29 September 2006 in Vienna.

Upon invitations sent out in July, 12 Experts from the Beneficiary countries and one colleague from the ICPDR Secretariat were nominated and participated at these working sessions. Different to the big CARDS workshops, these sessions were designed for a small group of national government experts staying for 3 days in Vienna to present their problems (e.g. reporting) to and discuss with a number of different EU experts available at UBA. This venue form allowed more detailed expert discussions as well as reflections how to best cooperate at Sava basin level with the WFD reporting.

The participants' accommodation and travel costs were covered by this UNDP/GEF DRP project budget.

Based on the Sava Gap Analysis (Task 1.1) and resulting agreement with the Beneficiaries, the interactive working sessions were mainly divided into two groups of topics

- GIS in water management and
- Pollution - point and diffuse sources

The sessions were held in an interactive way, including many discussions and bilateral exchange of information and experiences.

The feedback from the participants was very positive, especially regarding the interactive character of the workshop

The **Working Sessions Summary** including the List of Participants and the Agenda are attached in Appendix 1.

2.3.2.3. Task 1.2.3. Electronic Workshop Follow-up to the national government experts

This communication service was designed after various feed-back from Beneficiaries during the Inception Phase in order to secure more sustainable benefits of Consultant expertise beyond the workshop presentations and discussions. It should allow a more individual communication for specific problems or issues. This service was announced and offered at every meeting (CARDS workshops in Belgrade and Sarajevo, Vienna Working Sessions) but used until the end of November 2006 by the national government experts only in three cases. The answers were given by UBA experts A. Scheidleder (on groundwater), F. Humer (on sampling procedures) and A. Rauchbüchl (on risk assessment in Austria):

2.4. Results of Tasks 2 and 3

2.4.1. Methodology and character of results

The work under Task 2 Assessment of Key Transboundary Water Management Issues (KWI) and Task 3 Assessment of Topics of Measures (ToM) followed up on the results from Task 1 of this UNDP/GEF DRP Component, namely a regional Gap Analysis on national capacities for WFD

reporting in BA, HR and CS[1]. It was agreed to address Tasks 2 and 3 in a joint activity and to start with a **national consultation process** that used a questionnaire template. This **template** (see Appendix 2) has been developed in summer 2006 in close co-operation between the ICPDR Secretariat and the international Consultants. The template integrated the EC Guidance on implementing the EU WFD, the GEF Transboundary Diagnostic Analysis (TDA) approach as well as the expertise of the Consultants. The finalised template has then been sent out to the Beneficiary Countries and the Local Consultants of the Consortium in late August 2006. The government representatives involved in this consultation process are listed in Appendix 2 of this Report.

In the next step, the international Consultants have used the national responses to prepare a **Discussion Paper** for the Sarajevo workshop (Sava basin level), which summarised the draft results and underlined those points that should be jointly discussed and concluded in Sarajevo. Upon agreement with the UNDP/GEF DRP Office and the ICPDR Secretariat, this Paper refrained from comprehensively quoting the national templates, because some of the responses delivered gave reason to first jointly assess in Sarajevo the template questions and to then allow a review of national responses. Further, the Sarajevo workshop was always designed to assess possible regional results and to limit discussions of individual responses from each country.

The result does not want to provide a complete overview of transboundary issues relevant to the Sava Basin, but it highlights the most important subjects that were identified in this UNDP/GEF DRP consultation process by government experts and Consultants. In other words: *Key Sava Issues* are those having the most important transboundary relevance for improving basin-wide water management, as stipulated by the WFD. At this stage (i.e. with only a weak data base available) the raised **Sava basin Key Issues have still preliminary character** and few may still have to be reconciled among the Sava Countries. Some results still need to be brought to a more detailed assessment and common understanding, before the Sava basin states can endorse them at Sava Commission level.

The annexed Tasks 2 & 3 Report is a synthesis of the information, which has been provided and jointly assessed by the Sava countries but provides also the individual country statements, compiled in September 2006 and slightly revised later on. It also contains international views used for the discussions at the regional workshop held on 13-14 November 2006 in Sarajevo.

The listed **Topics of Measures** (ToM) are in a similar way an outcome of the national and regional consultations. More than the KTI, the proposed ToM represent a – not necessarily complete - **long list of possible Measures** that the Sava states should be considering in future water management. The workshop in Sarajevo provided examples of methods for selecting Measures following EC Guidances and experiences from other European river basins. Neither the workshop nor this Final Report can provide a list of few Measures that perfectly address specific Sava issues, as the Sava River Basin Analysis has not yet been produced by Sava countries and SC. Due to the special Sava database in terms of water management and socio-economics, only rough recommendations can be given in terms of applying certain Types of Measures that were found to be suitable for other European river basins and might also be effective in addressing key Sava issues.

[1] While Task 1 and the overall DRP Component ToR were still referring to Serbia and Montenegro (CS), the DRP Sava activities since the summer of 2006 are limited to the new Republic of Serbia (SRB). Even though invited in August 2006, the new state of Montenegro did yet not express any interest in this DRP assistance project. Tasks 2 and 3 are therefore not addressing (the Sava basin area located in) Montenegro.

2.4.2. Task 2: Key Water Management Issues (KWI) for the Sava Basin

Agreement was achieved on the description of preliminary Key Water Management Issues (KWI) in terms of transboundary impacts in the Sava Basin, underlying that:

- The identified KWIs of the Sava DRP process are based on expert judgement.
- The Key Water Management Issues which have been identified in the Danube Basin Roof Report are also considered as preliminary KWIs in the Sava Basin, i.e.
  - **Organic pollution**
  - **Nutrient pollution**
  - **Hazardous Substances pollution**
  - **Hydromorphological alterations**

Additional Key Water Management Issues for the Sava river which have been agreed at this workshop are:

- **Flood issues**
- **Invasive Species**
- Future impacts caused by **hydro-engineering structure development**, including navigation
- Unregulated solid and mining **waste disposal**
- **Water demand management**
- **Drinking water supply**
- **Sediment management** (quality and quantity)

It was also concluded that some issues need further investigations within the frame of the Sava Basin Analysis. These are:

- Pollution concerning **impact and emergency preparedness**
- **Hydromorphological** alterations in terms of:
  - *Morphological Alterations* such as the longitudinal continuity as well lateral connectivity
  - *Hydrological Alterations*: collection of information on abstractions (agricultural, water supply, hydropower operation, etc.)

Recommendations of the Tasks 2&3 workshop

It was agreed by the workshop participants that the following issues should be included in the Sava Basin Analysis (SBA):

- **Economic** aspects / **socio-economic** issues (should include baseline scenarios)
- **Future infrastructure** development (hydropower, navigation, agricultural development, flood protection etc.)

The work on the Sava Basin Analysis should start as soon as possible to finish it by end 2007. This SBA should be based on the DRB Roof Report and on the experiences gained in the Tisza River Basin and other relevant projects (e.g. Sava CARDS, ISPA Krka Pilot Project, 6th Framework Project SARIB, CARDS Kupa Pilot Project).

The SBA should use the Danube GIS for data collection/upload and evaluations in order to have a harmonised approach with the Danube level.

The Consultants and government experts have developed a rough assessment of 15 KWIs for the Sava basin. The following Table 2 gives a simple overview of national responses, which of the potential issues are considered as relevant for the Sava basin.

Table 2: Summarised assessment of Water Management Issues relevant for the Sava river basin (national responses)

SAVA Key Water Management Issues (WFD relevant)			Country			
SAVA KWI Summary			SI	HR	BA	SRB
Pressures & Impacts	Pollution	**Nutrient loads**	**no**	**yes**	**yes**	**yes**
		Hazardous substances	**yes**	**no**	**yes**	**yes**
		Organic	***no***	***yes***	***yes***	***yes***
		Emergency preparedness			***yes***	
		Thermal	no	yes	no	no
	Hydromorpho-logical alterations	**Longitudinal connectivity**	**no**	**no**	**yes**	**yes**
		Lateral connectivity	no	no	no	no
		Hydrological alterations (water abstraction, excessive withdrawals of surface and/or GW for human uses, residual water)	**no**	**yes**	**yes**	**no**
		Drinking water supply			***yes***	
		Sediment management			***yes***	
		Changes in freshwater availability (drinking water supply	no	no	no	no
		Habitat and community modification – loss of ecosystems or ecotones	yes	yes/no	yes	no
Exploitation of Fisheries and other living resources		Over-exploitation	no	no	no	no
		Excessive by-catch and discards	no	no	no	no
		Decreased viability of stocks through contamination and disease	no	no	no	no
		Impact on biological and genetic diversity	yes	no	yes	no
Floods		**Use of natural retention areas**	**yes**	**yes**	**yes**	**yes**
		Technical flood management	**yes**	**yes**	**yes**	**yes**
		Emergency preparedness	**yes**	**yes**	**yes**	**yes**
Invasive Species / Neobiota		**Introduced species**	**yes**	**yes/no**	**yes**	**no**
		Introduced diseases	no	yes/no	yes	no
Socio-economic Issues	significant changes with respect to transboundary water	Decrease or Increase of Population	no	yes	no	no
		Industrial production (e.g. decrease or increase of abstraction and sewage)	no	yes	no	no

SAVA Key Water Management Issues (WFD relevant)		Country			
SAVA KWI Summary		SI	HR	BA	SRB
management	**Development of the agricultural sector** (e.g. changes in irrigation)	**no**	**yes**	**yes**	**yes**
	Tourism (e.g. in water consumption)	no	no	no	yes
Other	***Waste disposal***			***yes***	
	New hydro-engineering structures			***yes***	

Legend:

Bold: Agreed Key Water Management Issues (KWI)

Italic letters and a joint answer of all countries reflect the results of the Workshop in Sarajevo

2.4.3. Assessment of Water Governance and Institutions in the Sava Basin

The Tasks 2&3 template then asked for an overview of water governance in the Sava countries. This can be very useful for further developing the basin-wide cooperation, and should further be assessed at national or international political level.

This addressed the national status of

- legal and institutional framework for transboundary cooperation
- transboundary monitoring
- data and information management (exchange, public access).

The UNDP/GEF DRP Consultants provided for each issue some suggestions to stimulate further discussion and reflection.

2.4.4. Task 3: Topics of Measures (ToM) for the Sava Basin

In the third part of the questionnaire, national experts were asked to comment a **non-exclusive list of Types of Measures** (ToM), according to the categories proposed by the WFD, which could be chosen (i.e. are available) to address Key Transboundary Issues identified in the first part of the questionnaire.

Responses received pointed to the current status with a view to the respective instruments in the individual Sava basin countries as well as to indications on the further development of individual measures and their applicability in the Sava Basin. The results were briefly discussed during the Sarajevo workshop, when, however, it was not possible to assess the most appropriate set of Measures for each of the preliminary Key Water Management Issues. The Consultants were asked to also provide in their report a first overview of the suitability of certain Types of Measures to effectively address the Sava Issues.

The Sava countries' responses and the discussions in Sarajevo have indicated that there is yet limited knowledge about the application of these instruments in Sava countries and about the possible effects that different measures can have at transboundary scale. The Consultants

stressed that some new types of measures could be more taken into account when developing water management policies at local, national and transboundary level.

Selection of Measures

In order to reach the environmental objectives of the Water Framework Directive (WFD), each Member State (MS) shall ensure by 2009 the establishment of a Programme of Measures for each river basin district (or for the part of an international river basin district within its territory). These programmes should help to bridge the current gaps in water status (i.e. bring all water bodies up to the level of a "good status").

Carrying out such a selection process calls for **interdisciplinary** work, an aspect inherent to the entire WFD implementation process. It requires close co-operation between economists assessing the **costs** of measures, and technical experts who have to provide the relevant information about the **effectiveness** of measures to be tested and compared.

Due to the large variety of pressures and impacts on water bodies, a wide range of measures must be applied at different levels (from local to river basin level), and therefore several **different approaches to select the most cost-effective combination of measures** are currently under discussion within EU Member States. For illustration, examples from Germany and Austria were presented at the Sarajevo workshop; they are given in Appendix 2.

Suitability of Types of Measures to address the preliminary Sava KWIs

As at the Sarajevo Workshop there was not enough time to assess the suitability of the proposed Types of Measures in relation to their effectiveness to address the just agreed Sava preliminary Key Issues, the International Consultants agreed to provide a first indicative list of those Types of Measures that could best tackle the KWI.

The result of this simple cross-check is given in the following Table 2 but should be further assessed in its applicability in the Sava Basin Countries. It is evident that this table can not prevent a more detailed investigation as proposed in the previously given examples.

Due to the early state of WFD implementation in the Sava basin and the lack of a thorough Sava Basin Analysis, the results are of **preliminary character** and shall be used in the upcoming discussions and assessments at the level of the River Basin Management Expert Group (PEG RBM) of the Sava Commission (SC) as well as by the CARDS Regional Sava project.

Table 2 Suitability of Types of Measures to address the preliminary Sava Key Water Management Issues

Non-exclusive list of Types of Measures (WFD) which can be chosen to address Sava Key Water Management Issues

	Types of Measure to address Sava Key Water Management Issues	Nutrient Pollution	Organic Pollution	Hazar-dous Substanc es	Hydromor-phological Alterations	Flood Manage ment	Inva-sive Species	Future Hydro-enginer. Structur es	Waste Disposa l	Water Demand /Drinkg Water	Sedi-ment Mgmt.
4.1.	Legislative instruments (e.g. the EU Directives)	**	**	**	**	**	?	**	**	**/**	*
4.2.	Administrative instruments (bilateral agreements e.g. …)	*	*	*	*	**	*	**	*	**/*	*
4.3.	Economic or fiscal instruments	**	**	**	*	**	no	**	**	**/**	**
4.4.	Negotiated environmental agreements	*	*	**	*	*	*	**	**	**/	**
4.5.	Emission controls (permit)	**	**	**	no	no	no	no	**	/*	?
4.6.	Codes of good practice	**	**	**	**	**	**	**	**	*/**	**
4.7.	Abstraction controls	no	no	no	**	*	no	*	no	**/**	*
4.8.	Demand management measures	**	**	**	**	**	**	**	**	**/**	**
4.9.	Changes in land use	**	*	no	*	**	*	no	no	**/**	*
4.10.	Efficiency and re-use measures, i.a. promotion of water-efficient	**	**	**	*	**	*	**	**	**/**	*

	Types of Measure to address Sava Key Water Management Issues	Nutrient Pollution	Organic Pollution	Hazar-dous Substanc es	Hydromor-phological Alterations	Flood Manage ment	Inva-sive Species	Future Hydro-enginer. Structur es	Waste Disposa l	Water Demand /Drinkg Water	Sedi-ment Mgmt.
	technologies in industry and water-saving										
4.11.	Irrigation techniques	no	no	no	**	no	no	**	no	**/*	no
4.12.	Construction projects (e.g. dams, treatment plants)	**	**	*	C	**		**	**	**/**	C
4.13.	Rehabilitation projects (e.g. renaturation)	*	*	no	**	**	**	C	**	/*	**
4.14.	Educational projects (e.g. training, advisory services)	**	*	**	*	**	**	**	**	**/*	*
4.15.	Research, development and demonstration projects	**	**	**	**	**	**	**	**	**/**	**

****** very suitable
***** suitable
no not relevant
C Conflict
? unclear at the moment

2.5. Results of Task 4

Task 4 had the objective to initiate and support the agreement on the **structure of the future Sava RBM Plan**. Task 4 constitutes the final part of the DRP Component and builds upon the previously addressed Task 1 - 3. Within Task 4, the International Consultants also prepared a **draft "Road Map"** for the Sava RBM Plan, tuned with the new Danube RBMP Road Map. Even though this was not foreseen in the ToR, it was found useful by the Beneficiaries and the Sava Commission during the Inception Phase to have such a document available for further discussions.

Further a review of the Public Participation strategy of the REC (2005) and of the ICPDR (2003) was executed, resulting in a **Sava Basin Public Information and Consultation Plan** which is attached to the draft Sava Road Map. The plan aims to ensure public participation when implementing the EU Water Framework Directive on the basin-wide level.

Methodology

For the preparation of the Sava RBM Plan (**SRBMP**) *Structure* and *Road Map*, various key documents were considered, such as WFD (particularly Annex VII), the ICPDR Road Map for the DRB Management Plan, the preliminary Reporting Sheets from the CIS Process.

The first draft of the SRBMP Structure, the Road Map and the Public Information and Consultation Plan was prepared in December 2006 in co-ordination with the ICPDR Permanent Secretariat and the UNDP/GEF DRP office.

In their approach, the International Consultants took the various documents and aspects into account, such as the legal requirements as set in the WFD, the current (different) statutes/levels of WFD implementation in the Sava countries and the approach taken by the ICPDR so far.

In a second step a draft **Discussion Paper** with the draft RBMP Structure and Road Map was sent for comments to the Beneficiaries and the members of the Sava Commission's Permanent Expert Group RBM (PEG RBM). Comments received were circulated in form of a revised Discussion Paper and discussed at the UNDP/GEF DRP Sava Component's regional workshop on 24-25 January 2007 in Zagreb. On request of the Sava Commission, this workshop was relocated and directly connected to the 2nd Sava PEG RBM Meeting (25-26 January 2007) in Zagreb. This allowed PEG members to be closely connected to the workshop discussions and be prepared for the follow-up work at PEG level.

During the regional workshop, the review of the Public Participation strategies and the needed Sava Commission steps to meet the WFD (draft Sava Public Information and Consultation Plan) were presented, and there was opportunity for clarification and further comments on all Task 4 issues. The results of this process are presented in the Task 4 Report (see Appendix 3).

Workshop Results

The Consultants emphasized that both the **draft structure** of the **future Sava RBM Plan and the Road Map** are living documents, that have to be updated regularly (e.g. to follow the updates of the EC WFD reporting sheets). The participants of the benefiting countries agreed on and accepted the draft structure and Road Map. Some specific comments of participants were directly included into the final version of the Sava RBM Plan structure (see Appendix 3). The more general discussion concentrated on two main issues, the timing of deadlines (e.g. urgent

steps such as the Sava Basin Analysis need to be executed already in 2007), and the limited availability of resources on the national level to provide the outputs needed. It was concluded that the Sava Commission has to very soon clarify the responsibilities and the share of work.

The **Review of the Public Participation Strategy** and the **Sava RBMP Public Information and Consultation Plan** revealed that PP is still not addressed by the SC, and that the PP strategy and the related Sava Plan need to be urgently adopted by the Sava Commission, including its implementation plan. Both documents were welcomed and accepted by all Beneficiaries (the final version is also given in Appendix 3). The workshop results were presented by some participants at the subsequent PEG RBM meeting and accepted.

3. CONCLUSIONS

The Work Plan to implement this UNDP/GEF DRP Sava Component, as designed in the Inception Phase, could be fully executed within the given time and budget frame, and all outputs were agreed and welcomed by the Beneficiaries.

The objective to improve the WFD-related capacities of the Beneficiaries, i.e. of government experts and the Sava Commission Secretariat, was reached both through inter-active training and discussions, joint assessments and development of strategic documents for transboundary river basin management, and through concrete and innovative working tools that will ease the future cooperation of all stakeholders at Sava basin level.

The cooperation with the CARDS Sava project succeeded in executing joint and mutually complementing activities. NGOs were also involved in this UNDP/GEF DRP work and are now an accepted partner for Sava governments.

An agreement was reached on the draft outline of the RBMP and its correlating Road Map as well as on the Public Participation Plan, even if it will be necessary to discuss their deadlines and resources in more details at the SC.

The focus of the upcoming SC work should be on the Sava Basin Analysis and on its organisation of work and clarification of responsibilities. All the available resources should be used for this, such as the Sava CARDS project for template evaluation and the water quality part of the Sava Basin Analysis. The writing of the Analysis until the end of 2007 could be organised as a joint task: Each Sava country should sign up for a specific chapter and thus take responsibility for writing it. Existing data, reports and maps should be used as a starting point.

Montenegro, having a share of 6000 km² of the Sava basin, must be involved into the SC (by adopting the Sava Framework Agreement) and into this WFD reporting process.

The process of developing the Sava RBMP has already started. However, there is no doubt that additional resources at country level are needed in order to finalise the work within the proposed time-frame. Possible external resources should thus be investigated.

In order to gain experiences from outside the Sava Basin and to find answers to common questions when implementing the WFD, a close exchange with other international River Basins, such as the Danube, Tisza, Rhine or the Odra, should be envisaged. Such networking "across Europe" would not only be beneficial for people implementing the WFD in the Sava Basin; it would also allow integrating the experiences gained in the EU.

APPENDIXES

APPENDIX 1	Report on TASK 1: WFD Gap Analysis and Assistance (December 2006)
APPENDIX 2	Report on TASKS 2 and 3: Key Transboundary Issues and Topics of Measures (December 2006)
APPENDIX 3	Report on TASK 4: Structure of the Sava River Basin Management Plan (February 2007)

UNDP I GEF
DANUBE
REGIONAL
PROJECT

APPENDIX 1

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Report on TASK 1:
WFD Gap Analysis and Assistance

Vienna, December 2006

HYDRO INGENIEURE

umweltbundesamt

10 YEARS eco logic

Task 1: Gap analysis for the completion of the Danube RR and assistance to current WFD activities

Task 1.1.: Gap Analysis for WFD implementation in the Sava RB

Objective of Task 1.1 of this GEF Component was to identify the most important gaps of information and of capacity for WFD implementation in SAVA basin countries (HR, BiH, SRB). This gap analysis was worked out in two steps. Already during the Inception Phase, a first screening of capacity gaps and issues for assistance took place.

Then the gap analysis was making use of the adopted Tisza WFD reporting templates, but it was agreed at the Inception Meeting that for the SAVA River Basin only meta data of the relevant information needed for implementation of the WFD will be collected.
These SAVA Templates were prepared by the Consultants team in April 2006, and were filled in May and June 2006 by local consultants together with national experts from the water authorities from Bosnia & Herzegovina, Croatia and Serbia & Montenegro.

The details about the templates and the results of the gap analysis, divided into Part I Water Management, and Part II Socio-economics, are available in the "**Report on WFD Gap Analysis**" attached in the Annex 1 (Part I , Part II), which was disseminated in the agreed final version to the Beneficiaries on 31 July 2006.

Task 1.2.: Assistance on selected WFD Issues

Objective of Task 1.2 was to s*upport the three Sava countries in their concrete WFD reporting, addressing selected issues and using different assistance tools.*
The DRP assistance was sub-divided into 3 sub-tasks for the Consultants:

Task 1.2.1. Transfer of international experience with WFD reporting via two in-situ working sessions closely linked to the CARDS Sava project:

First Workshop by the EC Regional CARDS project "Pilot River Basin Plan for the Sava River Basin" and UNDP-GEF "Sava project" from 31 May – 2 June 2006 in Belgrade

DRP Consultants Eleftheria Kampa (Ecologic) and Andreas Scheidleder (Umweltbundesamt) participated at this first joint workshop as international experts from the GEF Component.

The main topics of this workshop were

- Groundwater body delineation and characterisation - with special focus on karstic aquifers
- Hydromorphological risk assessment and AWB/HMWB provisional identification

All over 1 June, E. Kampa and A. Scheidleder gave comprehensive presentations and played an active role during the workshop discussions.

Presentations:

A. Scheidleder:

- General DRP Project introduction
- Delineation and Characterization of GW-bodies in Austria
- ICPDR Roof Report Structure and Gaps

E. Kampa

- Hydro-morphological risk assessment and provisional identification of Artificial Water Bodies (AWB) and Heavily Modified Water Bodies (HMWB)
    - Experience on the ICPDR level
    - Selection of European experience with the use of assessment criteria
    - Reporting on hydro-morphology and AWB/HMWBs in the Sava basin.

At the end of the workshop (2 June), the electronic follow-up service was addressed and agreed. The short **Mission Report** and the List of Participants are attached in Annex 2.1.

Second Workshop by the EC Regional CARDS project "Pilot River Basin Plan for the Sava River Basin" and UNDP-GEF "Sava project" on the Preparation of WFD Characterisation Report (3 – 6 October 2006 in Sarajevo)

DRP Consultants Eleftheria Kampa (Ecologic) and Franko Humer (Umweltbundesamt) participated at this second joint workshop as international experts from the GEF Component.

The main topics of this workshop were

- Groundwater (risk assessment-isotopes karst)
- Reporting issues for the provisional identification of HMWB

On 5 October, E. Kampa and F. Humer presented and discussed the above listed topics as follows:

F. Humer

- Isotopes in karst groundwater risk assessment

E. Kampa

- SRB Report - "Identification of AWB and provisional identification of HMWB" - comments on inquires/questions received from Beneficiary experts

The **Mission Report** and the List of Participants are attached in Annex 2.2.

1.2.2. Transfer of international experience with WFD reporting via Interactive Working Sessions in Vienna (Federal Environment Agency) on 27 – 29 September in Vienna.

Upon invitations sent out in July, 12 Experts from the Beneficiary countries and one colleague from the ICPDR Secretariat were nominated and participated at these working sessions. Different to the big CARDS workshops, these sessions were designed for a small group of national government experts staying for 3 days in Austria to present their reporting problems to and discuss with a number of different EU experts available in Vienna. This venue form allowed more detailed expert discussions as well as reflections how to best cooperate at Sava basin level with the WFD reporting.

The participants accommodation and travel costs were covered by the project budget.

Based on the Sava Gap Analysis (Task 1.1) and resulting agreement with the Beneficiaries, the interactive working sessions were mainly divided into two groups with the topics

- GIS in water management and
- Pollution - point and diffuse sources

The sessions were held in an interactive way including many discussions and bilateral exchange of information and experiences.
The feedback from the participants was very positive, especially about the interactive character of the workshop

The **Working Sessions Summary** including the List of Participants and the Agenda are attached in Annex 2.3.

1.2.3. Electronic Workshop Follow-up to the national government experts

This communication service was designed after various feed-back from Beneficiaries during the Inception Phase in order to secure more sustainable benefits of Consultant expertise beyond the workshop presentations and discussions. It should allow a more individual communication for specific problems or issues. This service was announced and offered at every meeting (CARDS workshops in Belgrade and Sarajevo, Vienna Working Sessions) but used until the end of November 2006 by the national government experts only in three cases. The answers were given by UBA experts A. Scheidleder, F. Humer und A. Rauchbüchl:

Andreas Scheidleder *(18 July 2006 to Senad Ploco and as copy to selmamerdan@hotmail.com; Naida Andjelic; Miodrag Milovanovic; rdvode@eunet.yu; Jovanka Ignjatovic; Karmen Cerar; Sanja Barbalic; Velinka Topalovic; Roko Andrièeviæ; Jovan Despotovic; geoins@rstel.net)*:

Groundwater: Problems identified for the CARDS Sava project and the Danube Roof Report:

- Delineation
- Characterization
- Protection and Protected Areas
- Databases
- Monitoring

Franko Humer (*14 November 2006 to Senad Ploco)*:
Link provided to the IAEA internet site and information about sampling procedure.

Alfred Rauchbüchl (*29 September 2006 to Milena Damjanovic)*:
Method paper on WFD Risk Assessment in Austria – Surface water chemistry.

ANNEX 1: Report on WFD Gap Analysis

UNDP | GEF
DANUBE
REGIONAL
PROJECT

UNDP/GEF Danube Regional Project

Component 1.1-9

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT
RER/03/G31/A/1G/31
Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

TASK 1.1

Report on WFD Gap Analysis

Vienna, 31 July 2006

HYDRO INGENIEURE

umweltbundesamt

10 YEARS eco logic

PART I

WFD templates - meta data analysis: Water Management

PART II

WFD templates - meta data analysis: Socio-economics

PART I

WFD templates - Meta data analysis

Water Management

Evaluation Report of SAVA WFD Meta data templates

1 General Aspects

The objective of Task 1 of this GEF Component is to identify the most important gaps of information and capacity for WFD implementation. This gap analysis is worked out in two steps. Part one started already during the Inception Phase as first screening gaps and issues for assistance.
Phase two of the gap analysis is based on the use of the adopted Tisza WFD report templates for collecting meta data of the relevant information needed for implementation of the WFD in the SAVA River Basin. These meta data templates were filled in by national consultants together with national experts from the water authorities from Bosnia & Herzegovina, Croatia and Serbia & Montenegro.
The templates list contact (authority and person), data production, data management, data quality, reporting contact. Further more it contains information if there is a change of data availability since national information was provided to the ICPDR Danube Roof Report 2004.
Despite monitoring is explicitly not part of this project related meta data were collected. The information is provided in the original templates as well as in the summary in Annex I. With focus on assistance within this project monitoring is not part of further evaluation.
Based on the results of the assessment of the meta data templates the issues for the assistance provided in Task 1.2 will be worked out and discussed with the national consultants and the Beneficiary Countries.

2 Evaluation of WFD SAVA Meta data (Templates)

In the following the response of the templates of the Sava countries is summarised. A structured summary is provided in Annex I.

2.1 Bosnia & Herzegovina

For Bosnia & Herzegovina two Templates were provided. One was worked out for the Federation of Bosnia & Herzegovina and the second was delivered for Republica Srpska
The information provided by the national consultants for both parts was held on a general level.

It was pointed out that the Danube Roof Report Part B is being finalised and a first draft will be ready by the end of June 2006. For many tasks it is indicated that some information will be prepared for this Report. The river catchment size for which data are available is 4000 km². For defining river reference conditions, a research work will be done soon. Subsequent to the defining reference conditions the Risk Assessment will be worked out. Information on point sources is available from the data collection for EMIS inventory.

Additional to the templates, proposals for capacity building measures were provided.

2.2 Croatia

For Croatia detailed information about the situation regarding data availability for the WFD implementation process was delivered. In addition to the filled in templates a separate paper with explanations on the existing data collection was provided.

On national level, the groundwater characterisation in study format has been prepared. The preliminary Risk Assessment is foreseen in 2006/2007, but. the final Risk Assessment for surface and

groundwater bodies will be finished in 2009. For HMWB and AWB information is partly available. The missing data on this will also be produced during 2006/2007. Defining reference conditions for rivers is under development. Some information on used methods is already available. Some partly information for nutrient pollution, hazardous substances, hydromorphological alterations are already available. Data about Water Bodies (river) are partly available. Information on pressures is partly missing. For reservoirs data are available. Regarding hydromorphology data, especially for hydropower plants, are being collected. Data for point sources are partly available. Completion of this data is foreseen for 2008.

2.3 Serbia and Montenegro

For Serbia and Montenegro also a detailed information about data availability was provided. The structure of the templates was already known from filling in the Tisza templates.
Data on groundwater are available. These data are updated annually. For HMWB and AWB data are available for rivers. For lakes general data are collected. Lake typology and reference conditions are under processing. Information on river Water Bodies is available. Water Bodies for lakes are not defined up to now. Data about reservoirs are available without indication of their status. Information on hydro morphology is partly available. Data about point sources are still under preparation.

3 Summary of Gap analysis and outlook on further activities

The results of the two parts of this Gap Analysis will lead to the selection of the topics for assistance within this DRP Component. In particular the issues for the workshops in cooperation with the CARDS SAVA Cards project and the workshop in Vienna in September will be based on these results. During the Inception Phase, the following *preliminary list* of topics was elaborated together with the Beneficiary Countries.

Priority issues for assistance identified during the Inception Phase (Step 1 of the Gap Analysis)
Groundwater : including classification, delineation esp. in karst situations, risk assessment, information gaps
Surface water: point and diffuse pollution, hydromorphological alterations, HMWB, reference conditions, risk assessment
Economic analysis of water use
Socio-economic aspects for the preparation of the RBMP in the transboundary context (HMWB and other exemations, new modifiations - navigation, cost-effectiveness of measures, cost recovery
Other issues of potential assistance
Fulfilment of relevant EU-Directives (Urban waste water directive , Drinking water,…)
Setup of water management institutions

Step 2 has now allowed to further verify the status of data and information in each of the three target countries. It is herewith proposed that within this GEF Component the following activities will address the identified gaps.

3.1 Workshops in cooperation with SAVA Cards project

The first joint workshop together with the CARDS SAVA project was held at the end of May in Belgrade. The main topics were Groundwater and Hydromorphology.

The second joint workshop is planned for October; its topics are still to be agreed.

3.2 Workshop in Vienna

As highlighted during the Inception Phase an important tool for the whole WFD implementation process across all specific topics is GIS. Therefore it is suggested to put GIS as one of the main topics on the agenda of the workshop in Vienna.

Based on the evaluation of the WFD specific topics during the Inception Phase and from the Sava meta data templates it is proposed to further focus on Point and Diffuse Source Pollution (with consideration of the Urban Waste Water Directive) and on Risk Assessment.

The work programme for the Vienna Workshop is proposed as follows:

GIS: practical examples of WFD implementation
Point and diffuse sources:
Data management (including fulfilment of Urban Waste Water Directive)
Pressure analysis
Risk Assessment

The Vienna workshop is planned for September 2006. A specific date and an invitation will be sent out by the end of June 2006.

3.3 Electronic Workshop follow-up

This is meant as a communication service, where the items and procedures presented and discussed in the previous workshops and meetings can be further checked and improved during this DRP component period.

4 Conclusions

Most of the gaps identified in this GEF/DRP analysis for the 3 Sava countries will be addressed during several activities within this project. In particular these are:

Groundwater (1st joint workshop with CARDS Sava project): delineation of Water Bodies, Risk Assessment, information gaps

Surface water (1st joint workshop with CARDS Sava project, Vienna workshop): hydromorphological alterations, point and diffuse sources (data management, pressure analysis, Risk Assessment, fulfillment of relevant EU Directives (UWWD))

GIS (Vienna workshop): preparation of basis data, Water Body delineation, Risk Assessment, presentation of results.

The topics of the 2nd joint workshop with the CARDS Sava project are not arranged yet. The above list will be finalised after determining the programme of this 2nd joint workshop.

5 Annex I : Summary of SAVA WFD Templates

Croatia:

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
1-Lakes	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Data available; reference year 2001 Lake typology is under development until the end of 2007.	data are held centrally; available only as paper reports	total spatial coverage for lakes > 0.5 km²	Level of details	
2,3-Groundwater	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Aquifer characterisation on national level available (reference year 2003 – next update 2006/2007); no data about transboundary GWB, Risk Assessment – data production is foreseen in 2006/2007	data are held centrally; available as paper reports and as GIS-data	No full spatial coverage; no information about the level of detail	Not in DRR	
4-HMWB-Lakes	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Only lake name and size available; all other data will be produced in 2007				All lakes < 100km²
4-HMWB-AWB-Rivers	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Data about location and partly about description of HMWB and AWB are available (e.g. indication of HMWB and AWV and main uses). Reference year is 2002. No information available on significant physical alterations and reasons for risk to reach GES. These data will be produced in	data are held centrally; available as paper reports, partly in MS-Excel and as GIS-data	No full spatial coverage; level of detail: >4000km²	No change to DRR	Provisionally given for DRR

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
			2006/2007.				
5-Refconds-Lakes	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	No information provided Establishing reference conditions is under development.				
5-Refconds-Rivers	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Establishing reference conditions is under development. Information on used methods to establish reference conditions is partly available for Saprobity index of Benthic Invertebrates.				
6-RiskAssess	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	The Risk Assessment will be finished in 2009, some information is available for reference year 2002 on nutrient pollution, hazardous substances and hydromorphological alterations	data are held centrally; available only as paper reports	No full spatial coverage; level of detail: >4000km²		
7-Typology Rivers	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Data on Ecoregions and Typology from the year 2004/2005 are partly available. System B is applied but the whole process is still under development until 2007	data are held centrally; available as paper reports, in MS-Excel and partly as GIS-data	No full spatial coverage; level of detail: >4000km²		
8-WB_Lakes	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	No data available at the moment. The data will be produced in 2006/2007				
8-WB_Rivers	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Data on Water Bodies are available from the year 2003. No data are available on Pressures	The available data are held centrally; available as paper	No full spatial coverage; level of detail:	No change to DRR	Provisionally for DRR

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
				reports, partly in MS-Excel and as GIS-data	>4000km²		
9-Reservoirs	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Data available; reference year 2003, next update in 2006/2007	data are held centrally; available as paper reports, partly in MS-Excel and as GIS-data	No full spatial coverage; level of detail: >4000km²	No change to DRR	
10-Monitoring	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	For quantity and quality monitoring of rivers are data available; reference year for quality monitoring is 2000; little information about groundwater monitoring is given Waste water quality monitoring and water use monitoring are carrying out.	data are held centrally (data bases); available as paper reports, in MS-Excel and as GIS-data	No full spatial coverage; level of detail: >4000km²	No change to DRR	Monitoring is not part of this GEF Component
11-Hydromorphology	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Data are available, especially for hydropower plants; reference year 2002 und 1999/2000	Most of the data are held decentrally in paper reports	No full spatial coverage; level of detail: >4000km²	Yes, partly	
12-Point Sources	Ministry of Agriculture, Forestry and Water Management	Ms. Karmen Cerar	Data are partly available; the missing data will be provided by 2008	Data are mainly in paper reports available	No full spatial coverage; level of detail: >4000km²		

Serbia & Montenegro

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
1-Lakes			Only general data available at the moment. Lake typology is under process.				
2,3-Groundwater	Ministry of Agriculture, Forestry and Water Management, Directorate for Water	Jovanka Ignjatovic	Required Data are available with an annual update;	Data are stored decentrally in all kind of data management tools, (MS EXCEL, Database, GIS)	Total spatial coverage of Serbia. The dataset contains all important GWBs	There are more detailed data available as in DRR 2004	
4-HMWB-Lakes			Only general data at the moment. Lake typology is under process.				
4-HMWB-AWB-Rivers	Ministry of Agriculture, Forestry and Water Management, Directorate for Water	Jovanka Ignjatovic	Required Data are available with an annual update;	Data are stored decentrally in all kind of data management tools, (MS EXCEL, Database, GIS)	Level of detail: Catchment size > 500 km²; only coordinates cover size level of RR 2004	There are more detailed data available as in DRR 2004	
5-Refconds-Lakes			Lake typology and referent conditions establishment is under process.				
5-Refconds-Rivers	Ministry of Agriculture, Forestry and Water Management,	Jovanka Ignjatovic	Information only for Benthic Invertebrates provided – status: under		Level of detail: Catchment size > 500 km²;		

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
	Directorate for Water		development until 2007				
6-RiskAssess	Ministry of Agriculture, Forestry and Water Management, Directorate for Water	Jovanka Ignjatovic, Olivera Antic	Required data are available with an annual update;	Risk Assessment as MS Excel available, other information also in GIS	Risk Assessment available only for rivers with catchment size greater than 4000 km² (RR 2004 rivers).	At the required time data were not available for DRR 2004.	
7-Typology Rivers	Ministry of Agriculture, Forestry and Water Management, Directorate for Water	Jovanka Ignjatovic	Most of required data are available; Status 2006	Ecoregions and river typology is available as paper report and in GIS; Data according location and description of rivers are available in MS Excel, database formats and GIS	Spatial coverage of the Republic of Serbia and of transboundary rivers between Republic of Serbia and Montenegro	Some adoptions of DRR 2004 data have took place	
8-WB_Lakes			Only general data at the moment. Lake typology is under processing, so Lake WBs are not identified yet.				

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
8-WB_Rivers	Ministry of Agriculture, Forestry and Water Management, Directorate for Water	Jovanka Ignjatovic	Required Data are available with an annual update;	Data are stored decentrally in all kind of data management tools, (MS EXCEL, Database, GIS)	Level of detail: Catchment size > 500 km²;	There are more detailed data available than in DRR 2004	
9-Reservoirs	Ministry of Agriculture, Forestry and Water Management, Directorate for Water	Jovanka Ignjatovic	Data for rivers are available with an annual update; Data for reservoirs are available without indication of status and updating	Data are stored decentrally. Reservoir data are only as paper report available			
10-Monitoring	Republic Hydrometeorological Service of Serbia	Dragan Jankovic (River quantity monitoring and groundwater monitoring); Miksa Jovanovic (River quality monitoring)	Data are available without indication of status and updating	Data management in MS Excel and database	Data available for Serbia		
11-Hydromorphology			Data about hydro power peaking, residual discharge, disruption of river continuum are not available.				
12-Point Sources			Data on point sources are still under preparation				

Bosnia and Herzegovina

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
1-Lakes	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	No lakes > 100 km²	Data will be available in GIS	Lakes >100 km²		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director			Data collection will have full spatial coverage; level of detail will be > 100 km²		
2,3-Groundwater	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	No data available yet. No significant transboundary GWB identified in FBiH	Data will be available in GIS	GWB-size > 10 km²		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Data available; one large GWB has been identified	Data available in GIS and as paper reports			

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
4-HMWB-Lakes	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	No data available; First draft of data / report will be available by end of June 2006				Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director					
4-HMWB-AWB-Rivers	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Data are available; First draft of data / report will be available by end of June 2006	Data will be available in GIS	Catchment size>4000km²		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director		Data available in MS Excel, GIS and as paper reports			
5-Refconds-Lakes	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Activity regarding research work for reference conditions-lakes is not planned				Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Start of work on Reference Conditions is planned for 2006-2007				
5-Refconds-Rivers	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Research work about reference conditions is foreseen for 2006		Catchment size > 4000 km²		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Start of work on Reference Conditions is planned for 2006-2007				
6-RiskAssess	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Subsequent to the defining of reference conditions the Risk Assessment will be done		Catchment size > 4000 km²		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Data are not available. Data production is foreseen for a later stage (end of year ? 2006)				
7-Typology Rivers	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	No data available yet		Catchment size > 4000 km²		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Data will be available by end of June 2006	Data available in MS Excel, GIS and as Paper reports			
8-WB_Lakes	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	No Lakes >100 km²				Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director					

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
8-WB_Rivers	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Data will be available by end of June 2006	Data available in MS Excel, GIS and as Paper reports	Catchment size > 4000 km²		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director					
9-Reservoirs	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	No identified reservoir on rivers with catchment area more than 100 km2.				Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Data will be available by end of June 2006	Data available in MS Excel, GIS and as Paper reports	Reservoirs on main tributaries		

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
10-Monitoring	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Occasional measurements of qualitative and quantitative characteristics of inland waters started in October 2005 on 33 profiles. Measurements are planned 4 times a year. There are results for the first series of measurements. The data have not been publicized yet.				Monitoring is not part of this GEF Component
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Data availability is expected in the end of June 2006				

Template	Contact	Contact person	Data production	Data management	Data quality	Differences Danube Roof Report (DRR)	Remarks
11-Hydromorphology	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Data will be available by end of June 2006		Catchment size >4000km2		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Data available only for major hydraulic facilities by the end of June 2006				
12-Point Sources	Federation BiH: JP za «Vodno podrucje slivova rijeke Save» Sarajevo/ Public Enterprise Watershed of the River Sava;	Mr. Mehmed Buturovic – Director	Data available with status 2005,		No complete spatial coverage Level of Detail: Emission Inventory 2002		Roof Report Part B (National Report) is under development. First draft is expected by the end of June 2006
	RS: Republicka direkcija za vode Bijeljina/ Republic Directorate for Water;	Mr. Branislav Blagojevic – Director	Data available with status 2005; annual update		Level of detail: Emission Inventory 2003 for public water supply companies and for 2005 for some industrial polluters		

PART II

WFD templates - Meta data analysis

Socio-economics

Socio-Economic Analysis at the Sava Level – Identified Gaps and Potential Capacity Building Activities

1 Aim of this report

This report is based on four scoping reports conducted by national consultants from Bosnia & Herzegovina, Croatia and Serbia & Montenegro on the availability of data for implementing the economic aspects of the EU Water Framework Directive (WFD) in the Sava river basin. [1] The scoping reports are based on a standardised template provided by the international consultants of this project. Next to the availability and quality of information on key indicators for implementing the economic aspects of the WFD, the scoping reports investigated the scale of data collection and the periodicity of data updates. Furthermore, institutional aspects such as available personnel capacities, the responsibility for data collection and the maintenance of databases were considered.
The following cross-country assessment highlights priority gaps in information, methodologies and capacities for the future implementation steps of the economic aspects of the WFD in the Sava river basin, and proposes starting points for corresponding capacity building activities.

2 National Scoping Reports on "Meta Data Collection – Socio-Economic Analysis at the Sava Level"

The following sections briefly summarise the main information/data gaps and implementation difficulties identified in the national scoping reports for Bosnia & Herzegovina, Croatia and Serbia & Montenegro.

2.1 Bosnia & Herzegovina

For Bosnia & Herzegovina, two scoping reports have been prepared by national Danube Regional Project (DRP) consultants.[2] With regard to the **economic importance of water uses**, information on general socio-economic indicators is publicly available and collected at national and municipal level on an annual basis. For assessing the characteristics of water services, however, particular difficulties relate to data on self-supply, irrigation water supply and wastewater services. On the characteristics of water uses, information on navigation, fish farming and leisure fishing is only partly available and mainly upon request. Restructuring data according to hydrological boundaries was considered to pose problems for the majority of indicators.
In general, distortions of data-sets have to be expected in the case of Bosnia & Herzegovina due to the war and post-war time period (e.g. in the case of infrastructural systems, wartime damages, as well as post-war reconstruction activities, are not fully captured by the existing datasets, (regional)

[1] This report forms part of Task 1.1. of the UNDP/GEF Danube Regional Project (DRP) Component 1.1-9 „Development of Sava River Basin Management Plan – Pilot Project, Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia" (RER/03/G31/A/1G/31). It is coordinated with the ICPDR, specifically the RBM Expert Group and its Tisza Working Group (supervising and executing similar Danube sub-basin activities like on the Sava).

[2] The two scoping reports for Bosnia & Herzegovina have been prepared by Haris Alisehovic (from the Institute for Water Management in Sarajevo for the Federation of BiH) and Slobodan Cubrilo (from the Institute for Water Management in Bijeljina for the Republica Srpska).

population figures are imprecise[3], etc.). Furthermore, as official (un)employment statistics reflect the importance of the "shadow economy" only imprecisely, and fail, for example, to capture outstanding wages, available (national and international) estimates of indicators may differ substantially. Another key difficulty for efficient data collection and management highlighted in the national report relates to the dispersal of responsibilities and the lack of effective cooperation among different ministries within and among the BiH entities.

The available information base for conducting the **baseline scenario** was judged as incomplete. While projections on exogenous drivers and specific sectors (such as agriculture, transport and industry) are available, further investigations will be required to suit all WFD intended purposes of the baseline scenario.

On the **assessment of cost recovery**, the national reports for Bosnia & Herzegovina stress that present water pricing systems are not yet in line with WFD requirements. Statistical data collections do not allow for extracting information on subsidies and cross-subsidies to a sufficient level of detail. However, households have historically contributed to lower industry water prices and different levels of government subsidise the provision of water services and the investment in and maintenance of the infrastructural system. While important difficulties relate to the assessment of environmental and resource costs, Bosnia & Herzegovina already operates different fees and charges for their partial internalisation.[4] The national report stresses the need for improved coordination in data collection, as data from different sources often lacked coherence. Finally, many parameters are only available at the company level, which may raise important confidentiality issues for the assessment of cost recovery.

In order to prepare for the **cost-effectiveness analysis** and to assess the available information base, information on a number of ongoing and planned projects in the water supply and wastewater sector was provided. Generally, only information on investment costs is available, while data on the projects' operation and maintenance costs, economic impact or related environmental costs could not be extracted.

2.2 Croatia

The national scoping study for Croatia is based upon an earlier scoping exercise within the DRP prepared by Željka Kordej-De Villa in 2003[5] and was updated within this DRP Component by Mladen Petričec (Croatian Waters) and Roko Andričević (University of Split) in April and May 2006. It highlights in the assessment of the **economic importance of water uses** that available data are of diverse quality and can not easily be restructured according to hydrological boundaries. On the characteristics of water services, data are in part only available upon request and not stored in a transparent and accessible way. The ongoing project "Water Information System" may however improve this situation over the next few years. Similar to Bosnia & Herzegovina, particular difficulties relate to data on self-supply and irrigation water supply.

For conducting the **baseline scenario**, projections are available and reported for all four areas investigated by the template (i.e. projections on exogenous drivers, water policies and investments, macro-economic policies and global policies). However, the national report highlights that the development of projections has been marked by insufficient co-operation between the

[3] The last population census dates back to 1991. It is estimated by the United Nations High Commissioner for Refugees (UNHCR) that about 60% of the pre-war population has been displaced. Accordingly, all data dealing with or drawing on population figures are subject to considerable error.

[4] These instruments include special charges and fees exist for water abstraction; gravel exploitation; self-supply for business activities, irrigation and fish farming; hazardous substances and wastewater discharges.

[5] The original national scoping study "Applying EU Economic Guidelines for the Economic Analysis to the DRB - National Scoping Study for Croatia" was prepared by Željka Kordej-De Villa in 2003 as part of the UNDP/GEF Danube Regional Project, Project Output 1.1, Activity 1.1-1.3. „Applying EU Economic Guidelines for the Economic Analysis to the Danube River Basin".

different ministries or institutions involved, which may lead to problems of coherence between existing projections. Furthermore, intra-sectoral consequences of changes in one specific sector on another sector are often not considered in the projections, rendering the applicability of obtained results questionable.

Regarding the **assessment of cost recovery**, the main difficulties relate to a lack of information on water prices for the agricultural sector, as well as to insufficient and opaque statistics on subsidies. Information on environmental and resource costs is available at the project/case study level, however, to what extent this project based information or data could be generalised to serve WFD reporting needs remains to be seen. Finally, the national report for Croatia argues that the lack of dissemination of statistical information between different ministries and other government institutions constitutes an important hindrance to an effective implementation of Article 9 of the WFD.

In preparation of the **cost-effectiveness analysis**, only information related to financial costs of "traditional" construction measures could be gathered from available publications. Information on the projects' environmental costs or economic impact could not be accessed, except for selected qualitative assessments. This is also related to the general lack of a coherent methodological approach for assessing environmental costs.

2.3 Serbia & Montenegro

The written assessment provided in the national report for Serbia & Montenegro, prepared by the DRP consultant Slobodan Petkovic (Belgrade University), is not as extensive as in the parallel reports conducted for Bosnia & Herzegovina and Croatia. Due to the existence of two political entities in the State Union Serbia & Montenegro, the institutional arrangements for water management are complex and characterised by a lack of coordination, which made this scoping exercise particularly challenging.

On the **economic importance of water uses**, data are generally publicly available but judged to be of diverse quality. Similarly to the other countries in the Sava river basin, particular difficulties relate to the availability of information on self-supply, water demand, irrigation water supply and leisure fishing.

In preparing the **baseline scenario**, important difficulties relate to the assessment of the overall socio-economic development of Serbia & Montenegro due to uncertainties inherent in ongoing political processes: the evolution of the State Union Serbia & Montenegro, as well as the potential accession process to the European Union. Projections for the development of economic sectors are only available for selected sectors, as only two ministries have prepared strategic documents and national action plans. As a consequence, intra-sectoral effects are not considered.

For the **assessment of cost recovery**, it is highlighted that present pricing systems are not yet in line with WFD requirements. While water tariffs have been increased over the last years, collected revenues are insufficient for covering even operation and maintenance costs. Information on subsidies, cross-subsidies and environmental and resource costs is not available. The revenue collection efficiency from households is particularly low, as water is considered a public good, which is free of charge. Accordingly, affordability of water tariffs is a major concern of politicians. Further increases in water prices are therefore considered as requiring institutional reforms and improvement of the collection efficiency.

In preparation of the **cost-effectiveness analysis (CEA)**, it is assessed that little information is available that can serve as a basis for the implementation of CEA. Scant historic data exist even on "traditional" construction measures, as investments in the water sector have been hindered by the wars and were mainly limited to minor reconstructions of existing infrastructural systems. Non-traditional measures (such as the agricultural programmes to reduce diffuse pollution, wetland restoration etc.) have not been implemented in recent years. Accordingly, information on costs can

only be derived from planned future measures. However, in the Sava river sub-basin, only a few larger investments are foreseen.

3 Identified Priority (Cross-Country) Gaps

The analysis of the three national scoping reports has demonstrated the possibilities and limitation of the collection and analysis of socio-economic data in the Sava river basin. Since certain methodological difficulties are shared by the three countries (e.g. defining and calculating subsidies for cost recovery assessment, assessing the environmental effects of measures, restructuring information according to hydrological boundaries), combined activities (workshops, studies) to improve knowledge and capacities could lead to shared methodological developments, even though national adaptations may be required. Furthermore, concerted activities would help to increase the comparability of national data and information and simplify the compilation of assessments at the Sava basin level for WFD implementation.

Figure 1 illustrates priority gaps for the four areas of investigation of the national scoping reports, which are elaborated on in the following chapter.

Figure 1: Main Gaps and Difficulties derived from the National Scoping Reports

Main gaps / difficulties	Bosnia & Herzegovina	Croatia	Serbia & Montenegro
Economic importance of water uses	▪ Lack of reliable (historic) data, in particular on general socio-economic indicators (population, (un)employment, GDP, etc). ▪ Data on self-supply, irrigation water supply and wastewater services; navigation, fish farming and leisure fishing. ▪ Restructuring data according to hydrological boundaries.	▪ Diverse quality of available data. ▪ On characteristics of water services: partly data only upon request, not stored in a transparent and accessible way. ▪ Restructuring data according to hydrological boundaries.	▪ Diverse quality of available data. ▪ Data on self-supply, water demand, irrigation water supply and leisure fishing. ▪ Restructuring data according to hydrological boundaries.
Baseline scenario	▪ Available projections insufficient for future WFD intended purposes of the baseline scenario. ▪ Insufficient co-operation between involved ministries / institutions	▪ Insufficient co-operation between involved ministries / institutions ▪ Intra-sectoral consequences not considered.	▪ Important difficulties related to assessment of overall socio-economic development. ▪ Sector specific projections limited. ▪ Intra-sectoral consequences not considered.
Cost recovery	▪ Present water pricing system not in line with WFD requirements. ▪ Insufficient / no information on subsidies and cross-subsidies. ▪ Assessment of environ-mental & resource costs. ▪ Incoherence of data from different sources. Scattered data. ▪ Confidentiality of data	▪ Lack of information on agricultural water prices. ▪ Insufficient / opaque statistics on subsidies. ▪ (Limited) information on environmental & resource costs only at project level. ▪ Lack of dissemination of statistical information between different ministries hindrance to	▪ Present water pricing system not in line with WFD requirements. ▪ No information on subsidies, cross-subsidies and environ-mental & resource costs. ▪ Low revenue collection efficiency from households.

Main gaps / difficulties	Bosnia & Herzegovina	Croatia	Serbia & Montenegro
		Art. 9 implementation.	
Cost-effectiveness analysis / Selection of measures	▪ Very limited information available. ▪ No information on projects' operation and maintenance costs, economic impact or related environmental costs. ▪ No coherent methodology for assessment.	▪ Only (limited) information related to financial costs of "traditional" construction measures. ▪ No information on projects' operation and maintenance costs, economic impact or related environmental costs. ▪ No coherent methodology for assessment.	▪ Very limited information available. ▪ Little historic data even on "traditional" construction measures. ▪ No information on non-traditional measures. ▪ No coherent methodology for assessment.

Source: Authors own compilation based on the national scoping reports.

It should be noted that the scope of this gap analysis report only allows for advocating areas for future capacity building activities. On this basis, it will be important to further specify concrete activities in Task 1.2 (Assistance on Selected WFD Issues) of this DRP component.
Following the summary analysis presented in Figure 1 above, capacity-building on socio-economics both within this GEF/DRP Component and within other donor activities (e.g. CARDS Sava project) should address the following priority gaps.

3.1. Information and Data related Gaps[6]

One reason for the present lack of systemised data of sufficient quality is related to an accompanying lack of personnel and equipped institutions to adequately process certain data. Outdated information bases (e.g. on population indicators) add further difficulties to the estimation of missing data. National financial resources for further data collection are expected to be very limited. In some cases, expert estimations based on available historical data, comparison with similar regions, or field work aimed at identifying changes in relation to the last verified and valid datasets may offer a preliminary solution. As the three countries share these difficulties in data and information availability, concerted activities involving the pooling of resources could offer a useful solution, simultaneously increasing coordination and transparency on data definitions and collection.

3.2. Institutional and Administrative Arrangements

The national scoping reports have shown that the resources and capacities available for conducting the economic analysis may be insufficient. It is necessary to increase the number and skills of people assigned for compiling the relevant information, for developing the necessary tools and methodological approaches and for co-ordinating the different activities. Furthermore, as outlined above, the level of transparency with regard to available data and collection procedures and co-operation between different government agencies and other entities responsible for data collection/maintenance is insufficient. Interdisciplinary working national and Sava basin groups

[6] Due to the limited resources available for conducting the national scoping report, the assessment of the quality of information is (in most cases) based on expert judgement only, and is thus subjective. These judgements could be inaccurate and thus misleading (even "official" data can be of low quality due to e.g. a large shadow economy). Accordingly, indicators that have not been identified as highly problematic in the national reports may, nevertheless, pose severe problems to the actual implementation of the economic analyses due to insufficient data reliability.

could be formed that define procedures for sharing and disseminating (statistical) information between different ministries and prioritise further research needs.

3.3. Hydrological Data Restructuring

Due to the WFD's river basin management approach, key units for reporting are derived from hydrological boundaries. However, only a very small percentage of the data necessary for conducting the economic analyses is currently available in accordance with hydrological boundaries. Existing data collection systems are normally conceptualised on the basis of administrative entities and data are gathered at the municipal, regional, state or national level. To make these data applicable to WFD reporting, they have to be restructured, depending on the particular indicator, for example according to river basin districts, (sub-) river basins, (sub-) catchments or water bodies. As all of the three countries outlined major difficulties with this restructuring process, supporting activities would be valuable, such as capacity building.

3.4 Projection Techniques

Further activities will be required in all of the three countries under investigation, in order to make use of the baseline scenario's potential for supporting future WFD implementation steps (e.g. the selection of measures, for giving a first indication for exemptions under Article 4 and for delivering a relevant input to the implementation of Article 9). A workshop aimed at exchanging information and training experts in the relevant techniques for scenario building may further enhance available capacities and facilitate the development of adapted baseline scenarios. Integrated projections should be aimed at, which directly address priority issues identified in the Danube basin Roof Report. Broad-scale projections, which may be of limited value for informing the measures selection process, should be avoided. National research institutes and stakeholder groups may offer an important source of knowledge and experience and should thus be included in the process.

3.5. Assessment of Environmental and Resource Costs

In all of the three countries studied, systematic estimations of environmental and resource costs are currently not available; only very limited, fragmented and often inconsistent information can be obtained. Existing internalisation instruments should be reviewed (e.g. in the case of Bosnia & Herzegovina) in order to evaluate their incentive setting capacities and to assess the need for modifications. To a certain degree, the present information deficit on environmental and resource costs can be accounted for by a general lack of an overall approach and established methodologies for conducting this assessment. Integrating and using economic as well as technical expertise will be key to overcoming this problem and concerted activities may further the development of appropriate and adapted methodologies for the Sava river basin.

3.6. Subsidies and Cross-Subsidies

The three countries highlighted that present water pricing systems are not yet in line with the principles of Article 9. In particular, the issue of subsidies and of cross-subsidies between different user groups warrants further clarification. As the present statistical data collections do not allow for extracting this type of information to a sufficient level of detail, the need for further data collections will also have to be considered. Exchange on required reforms for achieving cost recovery by 2010 would be valuable, as similar problems are encountered in the Sava river basin. A common platform could offer valuable insights and simultaneously pave the way for more coherent and thus transparent procedures at river basin level.

3.7. Preparing for the Cost-effectiveness Analysis

Anticipating future WFD implementation steps and Task 3 of this project component ("Support to the development of topics for a Programme of Measures"), the preparation for the cost-effectiveness analysis should be a priority. At present, only very limited information is available even on traditional measures. Information on costs of measures is not collected comprehensively within the countries and there is a lack of data on individual measures (e.g. on the required timeframe, the geographical coverage or the different categories of costs, etc.). Information on non-traditional measures (such as agricultural programmes to reduce diffuse pollution) and assessments of the environmental impact of measures hardly exist. A common framework for gathering information on costs of measures could be valuable and would allow for making best use of the limited information available in the three countries. In order to effectively support the work on Task 3 of this project, work on such a database of measures would have to be started soon, in order to ensure a meaningful database volume by the time it is actually needed. In this regard, it could also be valuable to assess the applicability of existing databases from other European Member States (e.g. Sweden, Austria, the Netherlands).

4 Conclusions

The analysis of the four national scoping reports for Bosnia & Herzegovina, Croatia and Serbia & Montenegro has shown that important difficulties remain for completing the required economic analyses in the course of WFD implementation. While some gaps will require further efforts at national level, others can more effectively be addressed at the Sava river basin level or may even warrant coordination at the Danube river basin scale. Coordination would allow taking advantage of possible spill-over effects due to concerted actions and increase the comparability of national data and information.

Based on this gap analysis, efforts at the **national level** should concentrate on:

- Prioritising and filling information and data gaps;
- Addressing institutional needs, e.g. improving data (collection) transparency, increasing the number of staff to work on economic issues; enhancing cooperation between different government agencies and other entities responsible for data collection/maintenance;
- Improving transparency on the present pricing system; assessing and adapting incentive setting structures of existing instruments; gathering further information on (cross-) subsidies.

Concerted capacity building activities at the **Sava river basin level** would be particularly valuable on the following issues, which could be addressed in targeted sessions during a 3-days workshop (not budgeted within this GEF/DRP Component!).

- One workshop session should be directed at providing assistance on how available data could be restructured and new data collections should be conceptualised in accordance with hydrological boundaries (keeping future monitoring requirements in mind).
- The baseline scenario may act as an important facilitator for other economic implementation steps. In order to facilitate the development of adapted and integrated projections, one session of the workshop should be aimed at exchanging information and training experts in the relevant techniques for scenario building. This would also allow for building a network of experts to exchange on future difficulties.
- As the implementation of Article 9 by 2010 raises similar difficulties in the three countries, a common platform could offer valuable insights and simultaneously pave the way for more

coherent and thus transparent procedures at river basin level. The main hindrances to an effective implementation of Article 9, which should be studied closer in national activities (see above), should form the basis for the conceptualisation of this workshop session.

- With regard to the assessment of environmental and resource costs, possible methodological approaches and procedures could be discussed with local experts and reviewed for their applicability to the Sava river basin. Agreement on a common procedure would facilitate future WFD implementation steps (Programme of Measures, Article 9, exemptions), make optimal use of limited resources and avoid double work.
- The national preparations for the cost-effectiveness analysis have shown great deficits in all of the Sava river basin countries investigated in this study. A common framework for gathering information on costs and effects of measures could be valuable and would allow for making best use of the limited information available in the three countries. This workshop session should be conceptualised in light of the planned activities during Task 3 of this project component ("Support to the development of topics for a Programme of Measures"). A preparatory analysis of available data will be required in order to allow for targeted discussions.

Within the UNDP / GEF Development of Sava River Basin Management Plan – Pilot Project a link between Task 3 "Elaboration and selection of preliminary criteria for identification of measures" and the issue of cost effectiveness of measures should be established. This could also include a specific session on selecting cost effective measures at the capacity building workshop under Task 2.

ANNEX 2.1:

UNDP/GEF Consultants Mission 31 May – 2 June 2006, Belgrade

EC REGIONAL CARDS PROJECT "PILOT RIVER BASIN PLAN FOR THE SAVA RIVER" AND UNDP-GEF "SAVA PROJECT"

Report by Consultants Elefteria Kampa (Ecologic) and Andreas Scheidleder (Umweltbundesamt) on the Workshop "Groundwater and Hydro-morphological Alterations"

31 May

Introduction by Senad Ploco (Team Leader of the CARDS Sava project)
Presentation of GW and HyMo by country representatives
Overall impression:

- Very well prepared presentations. To be available at www.savariver.net for download.
- GW: HR, CS have a lot of information already available, it is supposed that this is not only limited to the pilot river basins but also for the whole country.
- GW: Data availability in BA is a bit more limited but, according to Senad, they made a lot of progress within short time.
- GW: the delineation of karstic GW-bodies was of major interest to the Sava experts which are afraid to start working on these issues as they fear not to have enough information and knowledge. The presentations and the discussion showed that the available information is quite a good basis for starting the delineation and characterisation process.
- HyMo: All countries are on a level where they can start working on the HyMo risk assessment and the provisional identification of HMWB (issues of HMWB designation and HyMo mitigation measures were not discussed, as they were not focus of this workshop). BA and CS use the methodology developed at the ICPDR level as a main basis to start. HR has taken some more steps on a more national-specific approach (in the context of the principles applied on the ICPDR level).

1 June

The day was devoted to the presentations of the UNDP/GEF Consultants, combined with discussions on specific problems raised by the Sava country experts on groundwater and HyMo.

Overall impression:

- Active participation of the audience (with comments and questions) during the presentations.
- The "Questions and answers" part between Sava country experts and the UNDP/GEF Consultants showed the motivation by the Sava experts and the whole exchange was seen as a valuable input to the CARDS project, as it was expressed by the Sava experts.
- The GEF experts were asked to provide presentations and links to further useful documents to Senad who will upload them to their Sava website.
- Impression after the workshop indicates more confidence of the Sava experts to start with the implementation.

- GW: The gaps in the ICPDR Roof Report were recognised but it was clearly stated by CS and HR that these projects are not the proper platform to do any further gap filling and harmonization, as there is no political bilateral agreement to do this. On Monday there was an ICPDR groundwater TG meeting where it was also stated by country representatives that gap filling of the Roof Report is not of major importance at the moment, and country representatives reported on request that there are no issues of gap filling to the Roof Report to be performed.

- HyMo: The ICPDR criteria for provisional identification of HMWB were clarified in detail where there was uncertainty on how to apply them. Discussion took place on some general unclear issues on HyMo risk assessment and HMWB. For the future harmonisation of HyMo criteria in the Sava basin, it was proposed to take this issue up when an RBM EG of the Sava Commission is established.

2 June

Conclusions by Senad Ploco:

- Intention to further harmonise the activities of the Sava CARDS and Sava GEF projects and to clarify how the co-operation will look like in the future.
- Electronic workshop follow-up: GEF Consultants offered the service to reply on questions via email. It was proposed by Senad that Sava CARDS experts will formulate a list of questions on groundwater and HyMo only which may arise during the preparation of the 1st draft RBC report until 15 June (GW: 20 June). It was also remarked that the resources of the GEF Consultants are rather limited in this respect.
- Next CARDS WS will take place in Oct/Nov (tbd). It might be useful to discuss at this next WS further arising unclear issues on both topics (groundwater and HyMo), but this is still open.
- Senads proposal of cross-checking by the GEF Consultants of the draft RBC reports prepared within the CARDS projects until Oct must be discussed on the level of the project leaders. Remark by Eleftheria and Andi: Cross-checking reports is a quite sensible and time consuming exercise and not part of the offered services.
- The Vienna UNDP/GEF workshop was announced. It will probably take place in September and will focus on GIS; another focus will depend on the reply of Sava country experts after contacting their authorities.

CARDS PILOT RIVER BASIN PLAN FOR SAVA RIVER

REGIONAL WORKSHOP No.7

BELGRADE, May31st-June 6th 2006

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ANNEX 2.2

Mission Report by the UNDP/GEF DRP Sava Component Consultants Elefteria Kampa (Ecologic) and Franko Humer (Umweltbundesamt) about the

Regional Seminar No 4 "**Preparation of WFD Characterisation Report**" of the EC Regional CARDS Project „Pilot River Basin Plan for the Sava River"
and the DRP Sava Project
04 - 06 October, 2006, Sarajevo-Ilidza, Bosnia and Herzegovina

4 October

Presentations of Sava country representatives (HR, BiH, RS[7]) on their work and reporting progress on the following issues of the pilot RBC reports of the CARDS Sava project:

- GW characterisation
- pressures and impacts analysis
- provisional HMWB and AWB
- economic analysis
- scenario and risk assessment

RS representatives (from Belgrade) only reported on the working progress in Serbia. There were no delegates from Montenegro and their potential future role was not discussed at the workshop.

There were no representatives present from Slovenia. But, in the information reported on WB characterisation in the Kupa basin, there was also information on identified WBs in Slovenia, indicating certain transboundary information exchange on this issue.

Our overall impression on the specific issues of GW and provisional HMWB and AWB was:

Groundwater

- Croatia has already finished their work according to Annex IV. Their only open question is the aggregation of groundwater bodies to groups of groundwater bodies.
- Bosnia and Herzegovina is still working on its initial characterisation according to Annex II, using their existing data. Because they had no data concerning measurements of pumping sites, no monitoring at all and no list of polluters, it was not possible for them to begin with their impact analysis until now. They even do not have one joint data base.
- Serbia did its initial characterisation according to Annex II, still there are data gaps and uncertainties in some areas concerning geological borders and hydrodynamics. A mass balance is missing for all groundwater bodies. Because of these uncertainties they delineated only four big groundwater bodies in their pilot river basin (Kolubara) and put them all at risk because of uncertainty. This approach would be followed by enormous costs. For that reason it would be

[7] RS is used here as the provisional abbreviation of the new Republic of Serbia. The former state of Serbia and Montenegro (CS) ceased to exist in the summer of 2006. As a result of this and the geographical situation, most Sava issues are dealt with by the Serbian government.

better to divide those big groundwater bodies into smaller sub-units. This approach was a matter of discussion.

- Concerning the analysis of pressures and impacts the outcome was that Croatia and Serbia have already finished their identification of pressures. The representative of Bosnia and Herzegovina pointed out that they have no possibility to provide more data than they have now. All three countries have identified lists of pressures.

Provisional identification of HMWB and AWB

- HR, BiH and SRB gave well-prepared presentations on their progress of work in identifying pHMWB and AWB. All in all, substantial progress was noted in the identification of provisional HMWB and AWB compared to the status of work in the previous Regional Sava CARDS Seminar (Belgrade, May 2006).

- Regarding the methodological approach used, BiH and SRB have largely used the pHMWB criteria developed at the ICPDR Danube level. SRB has also made some proposals for adapting these criteria for use in their pilot river basin of Kolubara. HR has used mainly the step-by-step approach of the CIS Guidance on HMWB/AWB, which it will further develop and refine in the near future.

- The data presented by BiH on the Vrbas river are a great step forward, considering that no data on HWMB were included in the Danube RR from BiH. The HR data on the Kupa river also enrich the data included in the Danube RR, where no information on HMWB of the Kupa river was included.

5 October

The day was devoted to presentations from external experts of the CARDS Sava project (on WB characterisation, pressures and impacts analysis, hydro-morphological assessment and risk analysis, hydro-morphological inventories) and from the two DRP Consultants.

- The external CARDS experts dealt with the following issues: Their presentations on WB characterisation, hydro-morphological inventories and hydro-morphological assessment illustrated relevant methodological approaches and research results from the Danube level and from several European countries (including Austria, Germany, Bulgaria). The presentation of pressures and impacts analysis in Sweden was a critical presentation of the Art. 5 reporting effort in Sweden from the perspective of an academic.

The presentations of the two UNDP/GEF Consultants dealt with:

- **Groundwater (risk assessment-isotopes karst)** (*Franko Humer, Austrian Environment Agency*).
- **Reporting issues for the provisional identification of HMWB** (Eleftheria Kampa, Ecologic): The focus here was less on hydro-morphological assessment methods and more on strategic/procedural issues which should be considered when identifying and reporting on provisional HMWBs according to WFD and European reporting principles (for WFD Art. 5 reports).

Important issues, which were brought up in the presentations and/or were made obvious in the ensuing discussions, on GW and provisional HMWB were the following:

Groundwater

- The presentation of Franko Humer discussed the advantage of using isotopic data especially in the field of karstified areas and the national approach of Austria concerning risk assessment. According to the use of isotopes a focus was put on the isotopic network in precipitation. There were interests in the Global Network of Isotopes in Precipitation (GNIP) which is run by the IAEA especially in the measured parameters and the availability of the data. Moreover there were questions about where the sampling sites of the Austrian Network of Isotopes in Precipitation (ANIP) are situated and about the costs of the network. About the groundwater monitoring in Austria there were mainly questions about the standard sampling procedure.

- In conclusion the overall level of groundwater body characterisation is rather satisfactory, even though Bosnia and Herzegovina as well as Serbia do not have enough data until now. Croatia is in advantage compared to the other countries because of more available data.
- Our role now should be to provide practical insights for the countries, so that they know how to go on. Therefore Senad Ploco asked if the DRP Consultants could provide information about the standard sampling procedure in Austria. Franko Humer agreed to forward this information after the workshop, along with the link to the IAEA isotope homepage.

Provisional HMWB and AWB

- In the presentation of Eleftheria Kampa on pHMWB (provisional HMWB), feedback was given to the main relevant problems faced by the three Sava countries.
- Lack of data is noted on HyMo changes in all three Sava countries, which is connected to the lack of HyMo inventories according to the WFD requirements.
- Additionally, there are no definitive thresholds set yet to assess the "significance" of HyMo changes, which is an explicit assessment step in the HyMo risk assessment and provisional identification of HMWB.
- There is lack of biological data to assess biologically-related risk from HyMo changes, but this is a problem also noted in many other European countries. It was emphasised that at this stage, indirect physical criteria and expert judgement can be used for HyMo risk assessment, which should however be biologically validated as soon as possible.
- It was emphasised that, for the purpose of assessments and reporting, all HWMB have first to be assessed as "at risk due to HyMo changes", before they can be provisionally identified as HMWB. More work is needed on HyMo risk assessment in all three Sava countries, to make a stronger case for the identified pHMWB. SRB stated that it has not discussed HyMo risk assessment in detail on its national level yet.
- Discussions showed that there is still a need to emphasise the overall issue of going through the steps of the provisional identification of HWMB "in the right order" (see CIS Guidance Document), i.e. WB identification -> pressures and impact analysis -> risk assessment -> provisional identification as HMWB.
- In the presentation, it was pointed out that WBs which are "to-be-affected" by planned structures cannot be identified as pHMWB yet (first the new modifications should take place). In the presentation, it was proposed to include information on planned structures in a separate chapter of the Pilot RBC reports, while the WFD conditions which have to be met for "new modifications" were also reminded. There was ensuing discussion on the issue of planned structures, the requirements of the SEA directive especially in Croatia linked to their EU Accession procedures, etc. The BiH rivers, which are included in the CARDS pilot RBC report could be affected by new structures, are the Vrbas and its tributary Pliva. BiH agreed not to include planned structures in the pHMWB chapter of its pilot RBC report but to include them in the Annex. Serbia also mentioned some planned structures in the Kolubara basin, for which concessions have already been given.
- General recommendations were given on good reporting principles:
    - SRB reports should be as transparent as possible
    - Methodologies, criteria and assumptions used should be clearly presented
    - Data gaps and uncertainties should be emphasised.

6 October

Senad Ploco's conclusions relevant to the UNDP/GEF DRP Sava project:

- UNDP/GEF DRP Consultants offered their post-seminar availability to reply to questions via email, on issues of GW and the provisional identification of HMWB. It was agreed that the UNDP/GEF DRP Consultants are available for limited on-line consultations on the content of their presentations, on the provisional identification of HMWB and on GW.
- Senad asked whether Consultants from the UNDP/GEF DRP Sava project can participate in further seminars and workshops of the CARDS Sava project. This was noted as an issue to be

internally clarified within the UNDP/GEF DRP Sava project. Upcoming CARDS WS will take place in Zagreb on WB identification (Nov 2006, tbc) and another one on economic analysis by the end of 2006 (date and place tbc). These workshops will focus on issues specific to the drafting of the CARDS pilot RBC reports. More workshops of the CARDS Sava project will take place in 2007.

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Annex 2.3 Minutes from the Vienna Working sessions

UNDP/GEF Danube Regional Project
Component 1.1-9
DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT
RER/03/G31/A/1G/31
Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Interactive working sessions in Vienna – WFD Reporting

Working Sessions Summary

Date*:* 27 – 29 September 2006
Venue: Umweltbundesamt Wien, Brigittenauer Lände 52

Participants

First name	Last name	country	Institution
Participants - Beneficiary countries & ICPDR			
Amra	Ibrahimpasic	Bosnia & Herzegovina	PC Wat. A. Sarajevo
Hajrudin	Micivoda	Bosnia & Herzegovina	PC Wat. A. Sarajevo
Aleksandra	Kovacevic	Bosnia & Herzegovina	RS Directorate for water management
Stojanka	Jankovic	Croatia	Hrvatske Vode
Sanja	Barbalic	Croatia	Hrvatske Vode
Lidija	Kratofil	Croatia	Hrvatske Vode
Arijana	Senic	Croatia	Hrvatske Vode
Zoran	Pavlovic	Croatia	Hrvatske Vode
Dragana	Ninkovic	Serbia	Jaroslav Cerni Institute
Milena	Danjanovic	Serbia	Jaroslav Cerni Institute
Dusan	Dobricic	Serbia	Directorate for water management
Olivera	Antic	Serbia	Directorate for water management
Milica	Duric	Serbia	ICPDR Permanent Secretariat
International Consultants team			
Georg	Windhofer	Austria	UBA Wien, Surface water unit
Katharia	Lenz	Austria	UBA Wien, Surface water unit
Michael	Nagy	Austria	UBA Wien, Surface water unit
Karin	Weber	Austria	UBA Wien, Surface water unit
Gabriela	Vincze	Austria	UBA Wien, Groundwater unit (Water GIS)
Cordula	Göke	Austria	UBA Wien, Groundwater unit (Water GIS)
Ulrich	Schwarz	Austria	Fluvius
Ingrid	Roder	Austria	UBA Wien, IT-GIS
Alfred	Rauchbüchl	Austria	Bundesamt für Wasserwirtschaft
Bettina	Schwarzl	Austria	UBA Wien, Terrestrial Ecology
Martin	Edthofer	Austria	Hydro-Ingenieure

Execution

The participants were hosted in hotel Albatros in Vienna and all their travel costs covered.
The interactive working sessions were mainly divided into two groups with the topics

- GIS in water management and
- Pollution - point and diffuse sources

The sessions were conducted in an interactive way with many discussions and bilateral exchange of information and experience.
The tour trough the UBA laboratories and about the data management of ICPDR were held as joint sessions.
At the beginning participants from the Beneficiary countries presented the current status of their WFD activities focused on the topics of these working sessions.
The work programme within the groups was slightly adapted to the wishes and questions from the participants.

Raised issues/problems and discussions

GIS:

- River network – how to deal with Polygon rivers (impoundments) in the dataset – lines missing in river network
- How to fill in DRB GIS templates
- How to create Metadata for DRB GIS
- Coordination transformation

Pollution:

- Emission limit values (Austrian waste water ordinances)
- Environment quality standards
- Specific coefficients for WWTP operation (spec. operational costs, manpower,...)
- Risk assessment – dangerous substances
- ICPDR-EMIS data template – how to fill in
- UWWTD (91/271/EEC): Definition of agglomerations, UWWTD concept and structure

Conclusion

The feedback given by the participants was very positive. Especially the interactive way of working within small groups and the flexibility to address and to discuss the raised questions in a sufficient extend was highlighted.
The remaining open questions were answered after the necessary information was available and prepared. At the end of November 2006, only the point "Specific co-efficients for WWTP operations" is still under preparation.

AGENDA:

Tuesday 26 September 2006

Individual arrival of participants at hotel

Wednesday 27 September 2006

8:30

Pick-up from hotel lobby (guided transport to UBA)

09:00 – 10:15

Opening Session
• Welcome • Short introduction of the current state of the DRP/GEF Component "Development of Sava River Basin Management Plan – Pilot Project" in relation to the WFD implementation (ICPDR) • Overview of results of TASK 1 – Sava basin countries' Gap Analysis and on working session programme • General expectations for the working sessions by Sava countries' participants

10:15 – 10:30

- Coffee break

10:30 – 12:00

• Presentation of Beneficiary Countries on their status of WFD-related GIS activities (data availability and preparation, map presentation,…) and pollution (point and diffuse source data management, Risk Assessement,…) – each 10-15 minutes including a list of those questions which should be addressed and discussed during the workshop. o Croatia o Bosnia & Herzegovina o Serbia o Montenegro • Discussion

12:00 - 13:30

- Lunch

13:30 – 14:45

Group Pollution	Group GIS
• Identification of relevant substances according to Water Framework Directive and Dangerous Substances Directive *Michael NAGY,(UBA)* • Discussion	• Water Framework Directive requirements on GIS *Gabriela VINZCE, (UBA)* • Discussion

14:45 – 15:00

- Coffee break

15:00 – 17:00

Joint Session
• Visit of UBA Laboratories with focus on water analyses (WFD): Presentation of work strategy, daily practice and special programmes *Philipp HOHENBLUM, Christina TRIMBACHER (both UBA)* • Discussion

19:00 Invitation dinner at Heurigen (typical Viennese wine inn)
Joint departure from hotel (travel by tramway)

Thursday 28 September 2006

09:00 – 10:15

Group Pollution	Group GIS
• Point and diffuse source pollution (Significance criteria, Data management, …) – Austrian Emission Register on Surface Water (EMREG-SW) *Georg WINDHOFER,(UBA)* • Discussion	• GIS Working Groups EU • WISE / EEA Reporting *Gabriela VINZCE, Cordula GÖKE (UBA)* • Discussion

10:15 – 10:30

- Coffee break

10:30 – 12:00

Group Pollution	Group GIS
• Point and diffuse source pollution – Link to other EU-Directives and international reporting obligations: o UWWD o EPER / PRTR o OECD/EUROSTAT *Georg WINDHOFER, Katharina LENZ and (Daniela WAPPEL) (UBA)* • Discussion	• GIS – Support tool for water management issues I *Cordula GÖKE (UBA), Ulrich SCHWARZ (Fluvius)* • Discussion

12:00 - 13:30

- Lunch

13:30 – 15:00

Group Pollution	Group GIS
• EURO Harp From the point of view of the catchment owner / data holder *Bettina SCHWARZL, Elisabeth SCHWAIGER (UBA)* • Discussion	• GIS – Support tool for water management issues II o Water body delineation o River network, CCM *Gabriela VINZCE, Cordula GÖKE (UBA)* • Discussion

15:00 – 15:15

- Coffee break

15:15 – 17:00

Group Pollution	Group GIS

• MONERIS - Austria
  ○ Input data
  ○ Results
Georg Windhofer (UBA)
• Discussion
	• GIS → Reporting
	  ○ Austrian Art. 5 Report
	  ○ ICPDR Roof Report
	Gabriela VINZCE, Cordula GÖKE (UBA) and Ulrich SCHWARZ (Fluvius)
	• Discussion

Friday 29 September 2006

09:00 – 10:15

Group Pollution	Group GIS
• Risk Assessment of specific chemical pollutants *Alfred RAUCHBÜCHL,(BAW)* • Discussion	• DANUBE GIS *Ingrid RODER (UBA)* • Discussion

10:15 – 10:30

- Coffee break

10:30 – 12:00

Joint Session
• ICPDR Data management (EMIS, DABLAS,…) *Ulrich SCHWARZ (Fluvius), Georg Windhofer (UBA)* • Discussion

12:00 - 13:00

Closing session
• Results and conclusions of the working sessions

13:00

- Lunch

Departure of participants

UNDP I GEF
DANUBE REGIONAL PROJECT

APPENDIX 2

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Report on TASKS 2 and 3

Key Transboundary Issues and Topics of Measures

Vienna, December 2006

HYDRO INGENIEURE
umweltbundesamt
eco logic

Table of Contents

1 INTRODUCTION

The Report is prepared within Phase 2 of the Sava component of the Danube Regional Project (**DRP**), supporting and complementing the activities of the International Commission for the Protection of the Danube River (**ICPDR**) to provide and sustain a regional approach to the development of national water management policies and legislation in the Danube Basin. This Report is a synthesis of the information, which has been provided and jointly assessed by the Sava countries but provides in the Annex also the individual country statements, compiled in September 2006 and slightly revised lateron. It also contains international views used for the discussions at the regional workshop held on 13-14 November 2006 in Sarajevo.

This Report concludes the first (= preliminary) assessment of Key Transboundary Water Management Issues (**KWIs**) for the Sava Basin, and of Topics of Measures (**ToM**) as a result of consultations with the national water management authorities in each country and of the regional workshop discussions from Sarajevo. This Report presents the methodology applied by all stakeholders involved, the international experience presented and the results achieved at national and regional level.

Due to the early state of WFD implementation in the Sava basin and the lack of a thorough Sava basin analysis, the results given in this Report are of **preliminary character** and shall be used in the upcoming discussions and assessments at the level of the River Basin Management Expert Group (PEG RBM) of the Sava Commission (SC) as well as by the CARDS Regional Sava project.

2 METHODOLOGY

The work under Tasks 2 (KWI) and 3 (ToM) followed up on the results from Task 1 of this DRP Component, namely a regional Gap Analysis on national capacities for WFD reporting in BiH, HR and S&M[1]. It was agreed to address Tasks 2 and 3 in a joint activity and to start with a **national consultation process** that used a questionnaire template. This template (see Annex 2) has been developed in summer 2006 in close co-operation between the ICPDR Secretariat and the international Consultants (Ecologic, UBA Vienna, Hydro-Ingenieure). The template integrated the EC Guidance on implementing the EU WFD, the GEF TDA approach as well as the expertise of the Consultants. The finalised template has then been sent out to the Beneficiary Countries and the Local Consultants of the Consortium in late August 2006. The government representatives involved in this consultation process are listed in Annex 1 of this Report.

In the next step, the international Consultants have used the national responses to prepare a **Discussion Paper** for the Sarajevo workshop (Sava basin level), which summarised the draft results and underlined those points that should be jointly discussed and concluded in Sarajevo. Upon agreement with the DRP Office and the ICPDR Secretariat, this Paper refrained from comprehensively quoting the national templates, because some of the responses delivered gave reason to first jointly assess in Sarajevo the template questions and to then allow a review of national responses. Further, the Sarajevo workshop was always designed to assess possible regional results and to limit discussions of individual responses from each country.

[1] While Task 1 and the overall DRP Component ToR were still referring to Serbia and Montenegro, the DRP Sava activities since the summer of 2006 are limited to the new Republic of Serbia (SRB). Even though invited in August 2006, the new state of Montenegro did yet not express any interest in this DRP assistance project. Tasks 2 and 3 are therefore not addressing (the Sava basin area located in) Montenegro.

This Report does not want to provide a complete overview of transboundary issues relevant to the Sava Basin, but it highlights the most important subjects that were identified in this DRP consultation process by government experts and Consultants. In other words: *Key Sava Issues* are those having the most important transboundary relevance for improving basin-wide water management, as stipulated by the WFD. At this stage (e.g. weak data base) the raised **Sava basin Key Issues have still preliminary character** and few may still have to be reconciled among the Sava Countries. Some results presented here still need to be brought to a more detailed assessment and common understanding, before the Sava basin states can endorse them at Sava Commission level.

The **Topics of Measures** (ToM) provided in this Report are in a similar way an outcome of the national and regional consultations. More than the KTI, the proposed ToM in this Report represent a – not necessarily complete - **long list of possible Measures** that the Sava states should be considering in future water management. The workshop in Sarajevo provided examples of methods for selecting Measures following EC Guidances and experiences from other European river basins. Neither the workshop nor this Report can provide a list of few Measures that perfectly address specific Sava issues, as the Sava RB Analysis has yet not been produced. Due to the special Sava database in terms of water management and socio-economics, only rough recommendations can be given in terms of applying certain Types of Measures that were found to be suitable for other European river basins and might also be effective in addressing key Sava issues,.

3 REGIONAL WORKSHOP 13–14 NOVEMBER 2006 IN SARAJEVO

3.1 Minutes of the Workshop

The workshop was organised by the Consultants Consortium and held at hotel Grand in Sarajevo. 28 government experts from Bosnia & Hercegovina, Croatia, Serbia and Slovenia, representative from international bodies and NGOs as well as Local and International Consultants attended (the List of Participants is given in Annex IV). The workshop was opened on 13 November at 9 am and ended on 14 November at 1:30 pm.

In the **Opening Session**, welcome words were expressed by the Bosnian host, Mr Almir Prljaca (Federal Ministry of Agriculture, Water Management and Forestry), the representatives from the ICPDR (Ms Birgit Vogel) and Sava Commission Secretariats (Mr Samo Groselj). Ms Vogel related this DRP Component to the ongoing WFD implementation at Danube basin level (e.g. Road Map and Issue Papers) and stressed the need to produce a Sava sub-basin analysis by the end of 2007 as the next step, beside discussing Key Sava Issues and Topics of Measures as well as the Sava RBM Plan structure and Road Map. The many ongoing activities and initiatives in the Sava sub-basin need to be coordinated and linked.

The workshop chair, Mr Alexander Zinke (Consultants Consortium), then gave an overview of the entire DRP Component. The specific results of TASK 1 (Sava countries' Gap Analysis, Vienna working session and electronic follow-up) were presented by Mr Robert Konecny (UBA), followed by an introduction into the Regional Workshop (TASKS 2 and 3) by Mr Zinke.

The **first day** of the workshop was then focusing on Key Transboundary Issues:

Ms Nicole Kranz (Ecologic) and Mr Konecny (UBA) first presented a summary of the **Discussion Paper** on national responses on KTI and ToM templates, that had been circulated prior to the workshop. Later, both Consultants showed examples of ongoing transboundary river basin cooperation from several river systems from Germany and Austria. The discussions then

assessed various contents of the Discussion Paper and identified some new Key Issues, which were jointly concluded (see chapter 3.2). The lack of reliable data (i.e. a Sava basin analysis) made it difficult to come up with a sound prioritisation of issues. Mr Zinke stressed that all participants are present as experts, whose conclusions have no binding character or political dimension.

During the discussions the Sava Commission stated that warning systems for pollution incidents are extremely important and should be added to the templates. The discussion on hydro-morphological alterations for the Sava river showed that only few problems seem to exist in terms of longitudinal and lateral connectivity, while factual information on hydrological and morphological alterations, impacts by navigation, agriculture and industry or invasive species is weak at the moment and should be some of the core subjects of the Sava Basin Analysis 2007. This will also have to define what are a "transboundary issue" and a "key transboundary issue" for the Sava basin.

It was stressed that certain issues which are not seen as very important in the national context may be important at transboundary scale and therefore become a Sava key issue.

All countries agreed that pollution, flood protection, navigation and future impacts caused by hydro-engineering structures are most important issues within the Sava Basin.

Recommendation was made to link Sava work with the ISPA project on the Krka basin (SI), which produces important experience for WFD implementation.

The day ended with a participants dinner in a restaurant overlooking the city.

On the **second day** Topics of Measures were addressed. Experiences from the rivers Rhine and Morava concerning the development and implementation of a transboundary River Basin Programme of Measures were first presented by Ms Kranz and Mr Konecny, followed up by a long discussion aiming at a prioritisation of the Sava Key Transboundary Issues but not leading to the planned result. A lot of time was spent with assessing various measures and illustrating the needed selection process.

In the closing session, Consultants were asked by Beneficiaries to provide more recommendations on the suitability of measure types to address the Sava issues.

3.2 Workshop Conclusions on Key Water Management Issues

Agreement was achieved on the description of preliminary Key Water Management Issues (KWMI) in terms of transboundary impacts in the Sava Basin, underlying that:

- The identified KWMIs of the Sava DRP are based on expert judgement.
- The Key Water Management Issues which have been identified in the Danube Basin Roof Report are also considered as preliminary KWIs in the Sava Basin, i.e.
  - **Organic pollution**
  - **Nutrient pollution**
  - **Hazardous Substances pollution**
  - **Hydromorphological alterations**

Additional Key Water Management Issues for the Sava river which have been agreed at this workshop are:

- **Flood issues**
- **Invasive Species**
- Future impacts caused by **hydro-engineering structure development**, including navigation
- Unregulated solid and mining **waste disposal**
- **Water demand management**
- **Drinking water supply**
- **Sediment management** (quality and quantity)

It was also concluded that some issues need further investigations within the frame of the Sava Basin Analysis. These are:

- Pollution concerning impact and **emergency preparedness**
- Hydromorphological alterations in terms of:

  Morphological Alterations such as the longitudinal continuity (collection of longitudinal hindrances like dams, hydropower plants, etc., map production) as well lateral connectivity

  Hydrological Alterations (fill in the gaps present in the DRB Roof Report) Hydrological alterations: collection of information on abstractions (agricultural, water supply, hydropower operation, etc.)

Recommendations

It was agreed by the workshop participants that the following issues should be included in the Sava Basin Analysis (SBA):

- Economic aspects / socio-economic issues (should include baseline scenarios)
- Future infrastructure development (hydropower, navigation, agricultural development, flood protection etc.)

The work on the Sava Basin Analysis should start as soon as possible to finish it by end 2007. This SBA should be based on the DRB Roof Report and on the experiences gained in the Tisza River Basin and other relevant projects (e.g. Sava CARDS, ISPA Krka Pilot Project, 6th Framework Project SARIB, CARDS Kupa Pilot Project).

The SBA should use the Danube GIS for data collection/upload and evaluations in order to have a harmonised approach with the Danube level.

4 JOINT ASSESSMENT OF KEY TRANSBOUNDARY WATER MANAGEMENT ISSUES:

The following section assembles the water management aspects of Key Transboundary Issues (KTIs) that have been raised by the consulted parties (refer to Annex I), using a template developed by the Consultants (Annex II).

4.1 Pressures and Impacts

The Danube Basin Analysis Report 2004 (prepared for compliance with the WFD) identified four issues at a basin level: Organic pollution, nutrient pollution, hazardous substance pollution and hydro-morphological alterations. It is expected that, at least, these four issues would be considered to be of relevance also in the Sava river basin.

4.1.1 Pollution

- **Nutrient loads** are of **transboundary relevance** in the Sava Basin. The presence of nutrient pollution is attributed to different causes: the existence of large cities and towns in the basin (i.e. municipal waste waters) is the most frequently mentioned cause; nutrient load deriving from agriculture is also mentioned as a cause. Periodically large concentrations of phosphorus occur in the lower Sava River.
- **Hazardous substances** are considered to be a **transboundary issue**, of which the importance increases downstream. Industrial, and in particular chemical, installations are present in the basin. Heavy metals and phenols are recorded periodically in lower Sava waters. The Drina would also present frequent occurrence of ammonium and periodical occurrence of phenols, according to the same source.
- **Thermal pollution** due to power plants is first identified as a transboundary issue (e.g. for Croatia and Serbia), but the Sarajevo Workshop agreed that it is no basin issue.
- **Organic Pollution** was not addressed in the template but was assessed during the workshop and agreed to be a **key Sava issue**.
- **Emergency preparedness** was not addressed in the template but was assessed during the workshop and agreed to be a **key Sava issue**.

4.1.2 Hydromorphological Alterations

- **Longitudinal connectivity** was only evaluated as a transboundary issue by Serbia (e.g. dams on the Drina river).
- **Lateral connectivity** was not indicated as a transboundary issue.
- **Hydrological alterations** are a transboundary issue, specifically the lowering of the river bottom due to gravel extraction (for building material and for navigability) and a decrease in "deposit quantities" (sediment input?) of the basin. Hydropower plants (existing and

planned) are considered as having a significant influence in the future on the water regime in the Upper Sava.

- **Water abstraction** from the Sava for human uses could be a transboundary issue in times of catastrophic droughts.
- **Changes in freshwater availability** were not indicated as a transboundary issue.
- **Habitat and community modification** – Loss of ecosystems or ecotones is a transboundary issue of minor importance, nevertheless due to road constructions, urbanisation and past agglomeration, a reduction of small wetland areas is observed.

Suggestions for further discussion:

- *How far are assessment methods on eco-morphological quality/hydromorphological alterations developed, and when can the above statements be verified by such methods?*

4.1.3 Exploitation of Fisheries and other Living Resources

(e.g. overexploitation, excessive by-catch and discards, Decreased viability of stocks through contamination and disease, Impact on biological and genetic diversity)

These issues have not been addressed significantly, only the **Impact on Biological and Genetic Diversity** is mentioned as of transboundary relevance. This category could become more important in the future.

4.1.4 Floods

- **Flood control** was agreed to be a Sava basin Key Issue.
- **Natural retention areas** of the flood control system are fundamental to flood protection.
- **Technical aspects** of flood management, including hydropower plants, levees along the Sava, water reservoirs and retention areas, are a transboundary issue.
- **Emergency preparedness** is a KTI: There is a need of co-ordination, integration and data exchange for the whole basin. This includes co-ordination of operations in the Sava basin's retention areas and water reservoirs to avoid the coincidence of flood waters as well as the maintenance of high flow conditions in the Sava and Drina. National emergency plans, flood forecasting and intervention plans are essential in case of accidents.
- **Droughts** and **Demand management**: It was agreed to delete these subjects from this part of the templates and to address them only under Agriculture (see 4.1.6.2).

4.1.5 Introduced Species and Diseases

There is a need for further research on the effects that introduced species and/or diseases could have in the Sava basin. In this respect especially fishes could be of transboundary relevance. Based on more detailed information, this transboundary issue has to be further discussed in the future.

4.1.6 Socio-economic Issues

4.1.6.1 Decrease or increase of population and industrial production

This issue may be relevant in terms of a decrease or increase of abstraction and sewage. The national consultations did not give evidence that this would be an important issue at the transboundary scale. The issue however should be considered in connection with other issues such as pollution prevention or flood control.

4.1.6.2 Future development of the agricultural sector

Improvements and increase in the extent of irrigated agricultural areas are expected to become a **KTI** in the Sava Basin. Water abstraction could become of even greater importance in periods of catastrophic droughts (demand management). Also emissions (e.g. nutrients and/or pesticides) from agricultural land can be an effect by increasing agricultural activities.

4.1.6.3. Tourism development

This is not considered a key issue in terms of water management.

4.1.7 Other Transboundary Issues

- Unregulated solid and mining waste disposals.
- Existing and future hydropower plants
- Navigation: Development of the waterway.

Table 1: Summarised assessment of Water Management Issues relevant for the Sava river basin (national responses)

SAVA Key Water Management Issues (WFD relevant)			***Country***			
SAVA KWI Summary			SI	HR	BiH	SRB
Pressures & Impacts	Pollution	**Nutrient loads**	**no**	**yes**	**yes**	**yes**
		Hazardous substances	**yes**	**no**	**yes**	**yes**
		Organic	***no***	***yes***	***yes***	***yes***
		Emergency preparedness	***yes***			
		Thermal	no	yes	no	no
	Hydromorpho-logical alterations	**Longitudinal connectivity**	**no**	**no**	**yes**	**yes**
		Lateral connectivity	no	no	no	no
		Hydrological alterations (water abstraction, excessive withdrawals of surface and/or GW for human uses, residual water)	**no**	**yes**	**yes**	**no**
		Drinking water supply	***yes***			
		Sediment management	***yes***			
		Changes in freshwater availability (drinking water supply	no	no	no	no
		Habitat and community modification – loss of ecosystems or ecotones	yes	yes/no	yes	no

SAVA Key Water Management Issues (WFD relevant)			***Country***			
SAVA KWI Summary			SI	HR	BiH	SRB
Exploitation of Fisheries and other living resources		Over-exploitation	no	no	no	no
		Excessive by-catch and discards	no	no	no	no
		Decreased viability of stocks through contamination and disease	no	no	no	no
		Impact on biological and genetic diversity	yes	no	yes	no
Floods		**Use of natural retention areas**	**yes**	**yes**	**yes**	**yes**
		Technical flood management	**yes**	**yes**	**yes**	**yes**
		Emergency preparedness	**yes**	**yes**	**yes**	**yes**
Invasive Species / Neobiota		**Introduced species**	**yes**	**yes/no**	**yes**	**no**
		Introduced diseases	no	yes/no	yes	no
Socio-economic Issues	significant changes with respect to transboundary water management	Decrease or Increase of Population	no	yes	no	no
		Industrial production (e.g. decrease or increase of abstraction and sewage)	no	yes	no	no
		Development of the agricultural sector (e.g. changes in irrigation)	**no**	**yes**	**yes**	**yes**
		Tourism (e.g. in water consumption)	no	no	no	yes
Other		***Waste disposal***	***yes***			
		New hydro-engineering structures	***yes***			

Legend:

Bold and coloured: Agreed Key Water Management Issues (KWI)

Italic letters and a joint answer of all countries reflect the results of the Workshop in Sarajevo

5 ASSESSMENT OF GOVERNANCE AND INSTITUTIONS

This sector of transboundary cooperation was also assessed through the Templates but the limited workshop time in Sarajevo allowed only to address some of these subjects. This overview of water governance can be very useful for further developing the basin-wide cooperation, and should further be assessed at national or international political level than by consultants. Still, the Consultants provide for each sub-chapter some suggestions to stimulate further discussion and reflection.

5.1 Transboundary Co-operation

5.1.1 Legal and Institutional Framework

Name of Agreement/ Institution	Parties
Higher level multilateral agreements/ institutions that pertain to the Sava Basin	
UNECE Convention on the Protection and use of Transboundary Watercourses and International Lakes (done in 1992, entered into force in 1996)	35 countries (all among UNECE member states) including Slovenia, Croatia, Bosnia-Herzegovina, and Serbia and Montenegro and the EC.
Convention on Co-operation for the Protection and Sustainable Use of the River Danube (1996)	Riparian states to the Danube
Multilateral agreements/ institutions at Sava Basin scale	
Sava Basin Framework Agreement signed in 2002	Slovenia, Croatia, Bosnia-Herzegovina, and Serbia and Montenegro
Sava Commission established in June 2005	
Bilateral	
Bilateral sub-commission for the Sava Basin (as part of the Black Sea basin)	Croatia and Bosnia-Herzegovina
Bilateral commission for water management	Slovenia and Croatia
Bilateral agreement	Between Serbia and Montenegro there exists an agreement dating from 1955, a new agreement is under preparation but not yet negotiated
Bilateral agreements under preparation	
	Serbia and Croatia
	Serbia and Bosnia-Herzegovina
Other agreements and commissions that are not directly related to the Sava Basin	
Agreement on water engineering issues related to boundary and transboundary systems and watercourses (1955)	Hungary and former Yugoslavia

Joint Hydrotechnical Commission, established on the basis of the above agreement. The main tasks of the commission are related to the Danube and Tisza river basins	Hungary and former Yugoslavia
Agreement on water engineering issues related to boundary and transboundary systems and watercourses, signed in Bucharest in 1955.	Romania and former Yugoslavia
Joint Hydrotechnical Commission established on the basis of agreement. The main tasks of the commission are related to the Danube and Banat river basins	Romania and former Yugoslavia
Agreement on water engineering issues related to boundary and transboundary systems and watercourses in the Timok and Nisava river basins, signed in 1958. The agreement is still in force but since 1982 no longer operational	Bulgaria and former Yugoslavia

Suggestions for further discussions:

- *Do the existing transnational and bilateral agreements provide a base for a clear institutional framework? How could this be improved?*
- *Which "lessons learned" can be drawn from agreements and/or transboundary institutions in the region that are not directly related to the Sava Basin?*

5.1.2 Mechanisms for Transboundary Co-operation

Transboundary co-operation takes place at different levels, the following have been stated by the consulted parties.

- Bilateral agreements that cover the issues of information exchange, water quantity and quality, flood protection and alterations of the river bed
- Within the existing river basin commissions, namely the Sava Commission, the bilateral Sub-Commission for the Black Sea, and the ICPDR
- transboundary co-operation takes place in the informal meetings and exchange of information that is supported by the ICPDR and its expert groups.

Suggestions for further discussions:

- *Which institution/arrangements are best suited for transboundary co-operation in the Sava Basin?*
- *How can the integration of the different governance levels (ICPDR, Sava Commission, sub-commissions under bilateral agreements) be improved?*
- *What competences should be attributed to these different governance levels?*

5.2 Transboundary Monitoring

5.2.1 Where does transboundary monitoring exist and how is it co-ordinated?

At the moment there is no programme for transboundary monitoring that operates specifically in the Sava Basin. In the framework of the ICPDR, however, an integrated programme of water quality monitoring in the Danube River has been established.

Provisions for transboundary monitoring at the national level are as follows:

Bosnia and Herzegovina – Federacija Bosna & Hercegovine:

All profiles significant for monitoring of the quality of the surface waters are in the area of RS, except in the area of Sarajevo field, on the source of river Bosna. FBiH has set up a system of automatic monitoring of the quality and quantity parameters of the waters in the upstream areas.

Bosnia and Herzegovina – Republika Srpska:

Based on EU WFD requirements, in the B&H-Republika Srpska there is monitoring on measuring profiles on water currents, with 12 measurements/year (control on monthly basis) of water quality; four of these are part of the international monitoring network for Danube river basin.

Those profiles are:

1. Una river, profile U-7, downstream Kozarska Dubica city,
2. Sava river, profile Gradiska,
3. Vrbas river, profile V-7, Razboj,
4. Bosna river, profile B-12, downstream of Modrica city.

Besides the four above mentioned profiles there is monitoring of water quality (on monthly basis-twelve times annually) on two other profiles that are not in Danube river basin international monitoring network:

1. Sava river, Raca profile,
2. Drina river, D-1 Badovinci profile.

The proposal of Republika Srpska to ICPDR is to introduce the two profiles above to the Danube river basin international monitoring network.

Besides these measuring points, there are 28 measuring profiles in total in Republika Srpska, where control of water quality is performed by four measurements/year.

In parallel with water sampling, on most of the profile there is flow-rate measuring. Exception to this are the profiles Una U-7 and Sava river-Gradiska profile, where measuring of the flow is not performed "due to undefined inter-state relation between Republic of Croatia and B&H."

Croatia:

Monitoring stations included in the Transnational Monitoring Network (TNMN) are a component of the national monitoring programme. Within the Sub-commission for water quality of the Permanent Croatian-Slovenian Commission for Water Management, systematic water quality monitoring of transboundary watercourses is carried out. The Sub-commission has developed a water quality monitoring programme, which is included in its rules of procedure.

The goal of the monitoring programme is to:

- determine water quality,
- determine water quality trends,
- determine procedures for action in case of accidental pollution.

Serbia:

The Serbian Hydrometeorological Institute is responsible for measurements of hydrologic and water quality parameters at the border station Jamena (between Serbia and Croatia) on the Sava river, and at several gauging stations along the Drina river.

Slovenia

On the border: Jesenice na Dolenjskem

Suggestions for further discussion:

- *What are the main subjects for transboundary monitoring in the Sava Basin?*
- *Which level of detail would be suitable for transboundary monitoring?*
- *How should transboundary monitoring be organised in the Sava Basin?*

5.2.2 Main Actors in Transboundary Monitoring

Bosnia and Herzegovina – Federacija Bosna & Hercegovine:

JP za "Vodno područje slivova rijeke Save"- Sarajevo B&H Federalni meteorloški zavod Sarajevo METEO B&H.

Bosnia and Herzegovina – Republika Srpska:

Institute for Waters, Bijeljina, B&H-Republika Srpska, MoAFWM, RDW.

Croatia:

Ministry of Agriculture, Forestry and Water Management (MoAFWM), Croatian Water, Meteorological and Hydrological Service.

Serbia:

Serbian Hydrometeorological Institute.

Slovenia:

Agency for environment

Suggestions for further discussions:

- *Is there a coherent approach to monitoring within the riparian states of the Sava Basin?*
- *Are the national institutions involved in monitoring activities equivalent in nature? Is the framework for institutional co-operation good?*

5.2.3 What kind of data is exchanged on what interval?

Data on water quality and water quantity are reported to the ICPDR once per year by all the four countries. In addition, *Bosnia and Herzegovina* (Federacija and Republika Srpska) report to the CARDS Sava River project. *Croatia* also states that, within the Sub-commission for water quality of the Permanent Croatian-Slovenian commission for water management, results of analyses are exchanged and compared in digital format at 6 months intervals.

Suggestions for further discussions:

- *Does the existing data provide for a sound basis for cooperation and decision-making in transboundary water management? (E.g. does it contribute to clear information to the parties and/or mutual understanding in interstate negotiation processes?)*

5.3 Information Exchange

Information exchange occurs in the following contexts:

- Sava Commission
- Bilateral Sub-commission
- Role of national governments: national authorities regulate information exchange
- Expert Groups of the ICPDR
- Bilateral agreements provide for information exchange.

Suggestions for further discussions:

- *What information should be exchanged at the transboundary level?*
- *Does the existing data provide for a sound basis for cooperation in transboundary water management? (E.g. does it contribute to clear information to the parties and/or mutual understanding in interstate negotiation processes?)*
- *How could information management be improved at the transboundary level in the Sava Basin?*

Integration of information management at the local level with information management at the transboundary level

Suggestions for further discussion:

- *What information at the local level is relevant to transboundary water management?*
- *How should this data be processed?*
- *What mechanisms are needed for the exchange of such information?*

5.4 Public Information

Only Slovenia and Croatia have official regulations to inform the public.

Suggestions for further discussion:

- *Which are the main actors/stakeholder in the Sava Basin that should be informed and which actors/stakeholders should be involved in management planning?*
- *Which platform would be the most appropriate for public information and participation?*
- *Are there any examples for public information and/or public participation from other sectors in the region that could serve as a good example?*
- *What ideas exist for improving public information and participation?*
- *Which are the main issues for public information and participation?*

6 TYPES AND TOPICS OF MEASURES

In the third part of the questionnaire, national experts were asked to comment a non-exclusive list of Types of Measures (ToM), according to the categories proposed by the WFD, which could be chosen (i.e. are available) to address Key Transboundary Issues identified in the first part of the questionnaire.

Responses received pointed to the current status with a view to the respective instruments in the individual Sava basin countries as well as to indications on the further development of individual measures and their applicability in the Sava Basin. The results were briefly discussed during the Sarajevo workshop, when, however, it was not possible to assess the most appropriate set of Measures for each of the preliminary Key Water Management Issues. It was agreed that the Consultants will also provide in this Report a first overview of the suitability of certain Types of Measures to effectively address the Sava Issues. This table is given in chapter 6.3.

6.1 Proposed Types of Measures

As indicated before, several Types of Measures have been listed in the Templates, and the Sava countries' responses are given in Annex III. These and the discussions in Sarajevo have indicated that there is yet limited knowledge about the application of these instruments in Sava countries and about the possible effects that different measures can have at transboundary scale. Some new types of measures could be more taken into account when developing water management policies at local, national and transboundary level.

6.1.1 Legislative Instruments

This comprises any written legal document such as a certificate, a deed, a will, an Act of Parliament or a law passed by a competent legislative body. Legislative instruments with relevance at the transboundary level:

- Convention on the Protection and Use of Transboundary Watercourses and International Lakes,
- Danube River Protection Convention,
- EU Directives,
- National water laws as the basis for the implementation of the WFD and harmonisation on transboundary level.

6.1.2 Administrative Instruments

Administrative instruments are formal ways of co-operation. They determine how different institutions (e.g. administrative bodies) organise their common work.

- Bilateral agreements regarding the sustainable management of transboundary water management systems and watercourses (operation and management of reservoirs, power plants, pumping stations etc.),
- Joint commissions,
- Establishment of a national authority for water management (also responsible for transboundary water management),

- Administrative instruments at the national level which are established by the national water law (e.g. river basin units).

6.1.3 Economic or Fiscal Instruments

Economic instruments encourage sustainable development by charging a price for the use of an environmental resource, such as water.

- Implementation of the "user pays" and "polluter pays" principles,
- Establishing economic pricing mechanisms for water use aspects
- Existing instruments need to be harmonised with WFD requirements.

6.1.4 Negotiated Environmental Agreements

Negotiated agreements are arranged between public authorities and industry wherein both parties commit themselves to realise the environmental goal stated in the agreement or a 'contract between two or more parties'. They furthermore include 'unilateral commitments or initiatives by industry recognised by the public authorities'. A typical example is the production and selling of phosphate-free detergents by the industry.

- Establishment of environmental agreements

6.1.5 Emission Controls

Emission controls limit the discharge of pollutants

- Preparation of more systematic regulation to control emissions (point sources and diffuse emission)
- Strengthening the monitoring and data exchange for significant polluters along the Sava.

6.1.6 Codes of Good Practice

Codes of Good Practices have to be seen as a broad framework of goals and commitments to guide production, management, transportation, storage, and use or disposal of certain products.

Establishment of codes of good practice in e.g. agriculture (according to the Nitrate Directive), flood protection, industry (BAT) in all Sava countries.

6.1.7 Abstraction controls

Abstraction controls regulate or limit the use of water abstracted from a water body.

- Significant abstractions should be verified and agreed on at bilateral or multilateral level
- Monitoring of morphological changes in the Sava river bed due to water abstraction
- Abstraction control in periods of catastrophic droughts,
- Water taxation, concessions/water right permits.

6.1.8 Demand management measures

Demand management is the purposeful and beneficial manipulation of the level and timing of water usage. Demand management deploys various techniques for conserving water and improving its efficient use by end users. Good water quality keep the costs low for its purification (e.g. for drinking water use).

- In future, all significant demands should be verified and agreed on at the bilateral or multilateral level
- A framework for the analysis of respective needs could be provided by the RBM plans,
- Water pricing
- Harmonisation of the respective national priority list with those provided by the WFD.

6.1.9 Changes in land use

- Changes in land used planned in the river basin in the future should be considered and discussed in the joint commission of all riparian states.
- Better control and monitoring of the status and the maintenance of natural retention areas for flood protection along the Sava riverbed. This would include the determination of the water balance for these areas, including the minimum amount of water necessary for maintaining biological functions as well as water supply.

6.1.10 Efficiency and re-use measures, inter alia, promotion of water-efficient technologies in industry and water-saving

The relevance of promoting, but also monitoring and enforcing such technologies is generally acknowledged throughout the region. However, no comprehensive approach has been initiated so far. The discussion is expected to gain in momentum following the implementation of the IPPC Directive.

6.1.11 Irrigation techniques

The privatisation and new development of intensive agriculture may soon lead to high water consumption. The introduction of modern irrigation techniques and the careful adaptation to available water amounts is expected to significantly decrease the pressure of forthcoming extension of irrigation areas.

6.1.12 Construction projects (e.g. dams, treatment plants)

- There are a number of new schemes (dams, treatment plants) planned on the Sava and some tributaries. A joint estimation of the riparian state (within the Sava Commission) of the possible impacts is needed for dams with a significant installed capacity.
- Agreement of construction projects in multilateral agreements
- Treatment plants in all agglomeration over 10,000.
- The role of RBM plans and water management plans for determining individual investments.

6.1.13 Rehabilitation projects (e.g. renaturation)

- Reconstruction of flood protection embankments,
- Life Nature programme, Natura 2000 management plans,
- Pilot projects.

6.1.14 Educational projects (e.g. training, advisory services)

- Establishment of concrete educational projects for all aspects of water use.

6.1.15 Research, development and demonstration projects

- Launching of projects with the purpose of applying new technologies in certain sectors (industrial water consumption, waste water collection and treatment, river corridor maintenance, nature protection.

6.2 Selection of Measures

In order to reach the environmental objectives of the Water Framework Directive (WFD), each Member State (MS) shall ensure by 2009 the establishment of a Programme of Measures for each river basin district (or for the part of an international river basin district within its territory). These programmes should help to bridge the current gaps in water status (i.e. bring all water bodies up to the level of a "good status").

Carrying out such a selection process calls for **interdisciplinary** work, an aspect inherent to the entire WFD implementation process. It requires close co-operation between economists assessing the **costs** of measures, and technical experts who have to provide the relevant information about the **effectiveness** of measures to be tested and compared.

Due to the large variety of pressures and impacts on water bodies, a wide range of measures must be applied at different levels (from local to river basin level), and therefore several different approaches to select the most cost-effective combination of measures are currently under discussion within Member States.

At EU level there is no cost-effectiveness assessment (CEA) methodology available in Europe at this time allowing the integration of both "multi-sector" (household, agriculture,…), and "multi-parameter" dimension (diffuse pollution, hydromorphological changes,….). Nevertheless, some Member Stats have already developed "partial" methodologies, others will do that in 2006-2007, and others will use the methodologies coming from other countries. Some countries have forecasted to refine the methodology after 2009 in order to integrate the lessons coming from the first RBMP.

So, at the moment many different approaches are taken in the Member States, aiming to **identify the best procedures for the selection** of measures.

In order to give examples the Germany and Austrian methodology were presented at the Sarajevo workshop and are briefly outlined below.

6.2.1 German Methodology

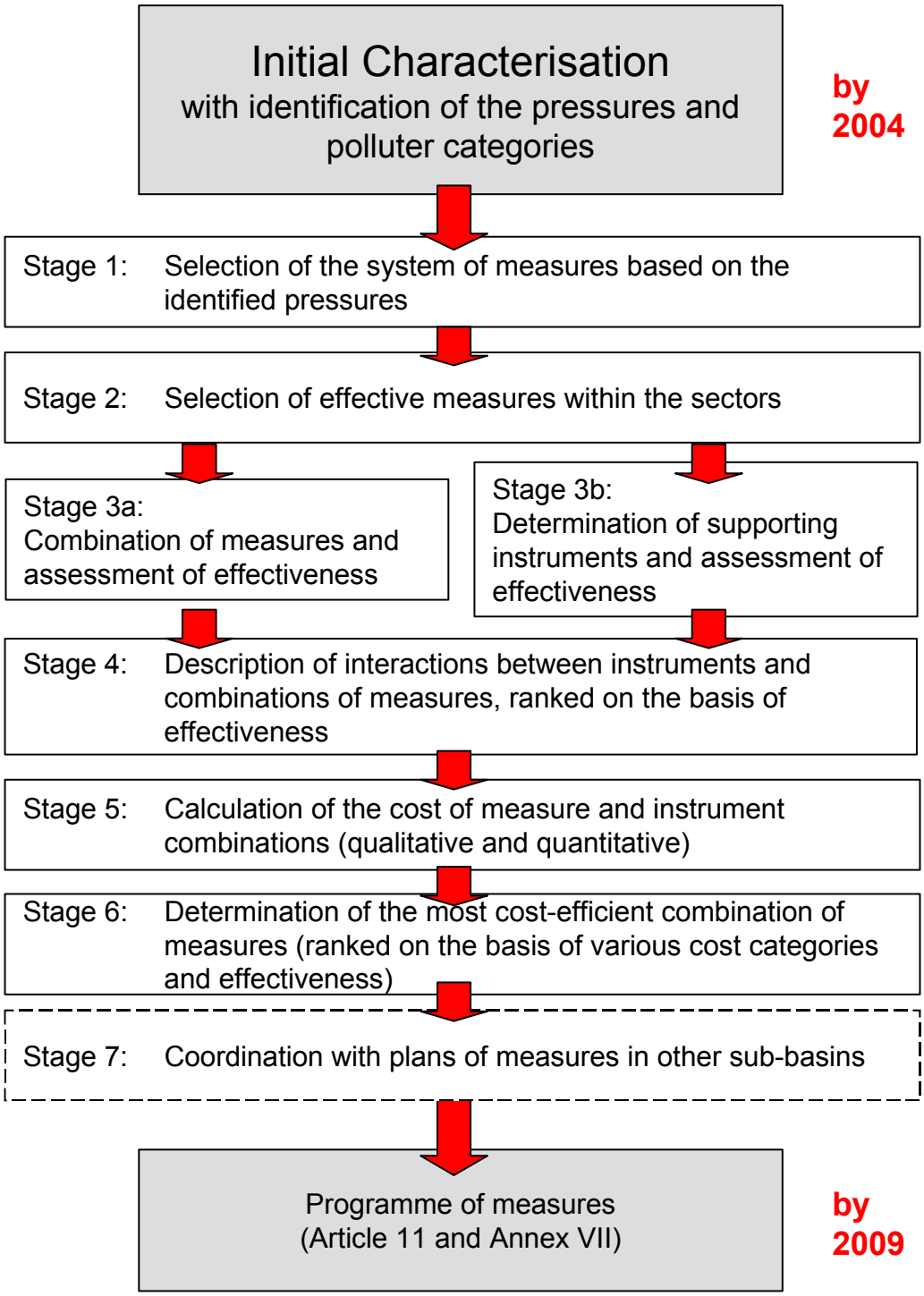
The German methodology was developed as guidance for water managers and is the result of a long discussion process. It represents a systematic approach for the combination of the required work stages and the information that needs to be available.

The German methodology is based on a classification of occurring impacts on water bodies according to certain pressure categories (point sources, diffuse sources, water abstractions, flow control, morphological changes), the identification of the respective polluters and the actual pressure types.

Following this categorization of the impacts, measures are then assigned to the respective pressures. In addition to the rather technical measures, the German approach furthermore

includes supporting instruments which are of administrative, economic or advisory quality and support the implementation of the measures.

German Methodology for the Selection of Measures



Stage 1: Identifying potentially effective measures based on pressures

In order to prepare the process of selecting measures, all information available on the water quality in a specific river basin is collected and reviewed. Based on the information of relevant sources and polluters (municipalities, agriculture, industry and others) for each of the possible pressure categories, such as point and diffuse source pollution, water extraction, flow control and morphological alterations, the most relevant parameters are identified, which then indicate the respectively applicable technical measures in order to tackle the existing pressures.

Stage 2: Identifying effective measures

The technical measures selected in the first step based on the results of the status reports then need to be prioritised according to their effectiveness in the context of the specific river basin.

Stage 3a: Combining measures

Assuming a typical pressure scenario, which most likely entails several concurrent pressures, the combination of two, three or more technical measures might be necessary to achieve the best possible improvements in a river basin.

Stage 3b: Determining supporting instruments and assessing their effectiveness

The potentially applicable combinations of measures chosen in the previous step are now supplemented by supporting instruments. The data sheets on measures contain information on generally suitable instruments. It needs to be considered, however, that instruments usually have a function of supporting the 'technical' measures in the background and often only become relevant after a longer period of time or in an extended time frame. In many cases, they are also intended to prevent the causes of pollution pressures and thus have a pre-emptive effect. In the long run, they constitute an effective alternative to technological measures, although gauging the effectiveness of instruments is usually subject to greater uncertainties.

Stage 4: Describing interactions between instruments and combinations of measures

This phase combines the results of stages 3a and 3b by assessing the relationship between the selected sets of measures and the supporting instruments. The results are then optimised with respect to effectiveness, scope and efficiency. The data sheets also contain information in support of this assessment. It is possible to distinguish between contrary, neutral and complementary effects in these relationships.

Stage 5: Determining costs

The direct as well as indirect costs, which are to be expected when the selected sets of measures and instruments are applied to achieve the water quality targets, are determined in the following step. To support this assessment, guidelines for estimating costs of measures and instruments are provided by the methodology. Additionally, the determination of direct costs as well as problems involved in assessing indirect costs is discussed in greater detail.

Stage 6: Identifying the most cost-effective sets of measures and instruments

The final step in selecting the most cost-effective set of measures should be considered as a multi-step evaluation process. Thus, the primary intention is not to identify a single ideal combination with the lowest cost, but rather to adequately present the criteria to be weighed up against each other in the evaluation process. The weighting of the individual criteria needs to be approved in a dialogue with all relevant stakeholders in a river basin. The results of the previous steps of the methodology serve as a basis for this process.

The evaluation process is based on the following criteria:

A) Probability of achieving WFD target by 2015,
B) Ecological effectiveness of measures/instruments,
C) Time scale until combination of measures becomes effective,
D) Direct costs,
E) Indirect costs.

In the context of the proposed evaluation process, the effectiveness of the sets of measures with respect to the objectives of the WFD will be assessed first. Therefore, criteria A (probability of achieving WFD target by 2015), B (ecological effectiveness of measures/instruments) and C (time scale until combination becomes effective) play a vital role in assessing this effectiveness.

Stage 7: Co-ordinating programmes of measures across different river basin districts

The last step of the process is devoted to co-ordinating programmes of measures within a river basin and beyond. This step should be integrated into the entire process right from the beginning, since measures and instruments may affect neighbouring river basin districts as well (e.g. issue of upstream-downstream areas).

In particular, it should be assessed whether more efficient solutions can be found when all proposed measures and instruments of the entire river basin are taken into consideration. This phase also offers an opportunity for ensuring compatibility and comparability with programmes of measures for different river basins. An early co-ordination of such efforts should lead to greater effectiveness and more efficient decisions. This task, however, is not the responsibility of individual water managers, but needs to be co-ordinated at the national or even international level.

6.2.2 Austrian Example

The Austrian experience concerning the **selection of measures** is based on two INTERREG projects currently under way at the Morava river (in cooperation with the Slovak Republic) and its tributary, the Dyje river (in cooperation with the Czech Republic).

For both river systems a step-wise approach for the ecological assessment and the development of a plan of measures was performed:

The first step was the assessment and harmonisation of the requirements of EC-Regulations according the implementation of CD 2000/60/EC, CD 79/409/EEC and CD 92/43/EEC. This phase also served to develop and agree the key transboundary water management issues for this river sections, such as hydro-morphology, flood and biodiversity protection.

The **assessment** of the ecological status was done bilaterally, using biological quality elements (macrophytes, algae, macro-invertebrates, fish) and results from recent monitoring at Morava and Dyje rivers and other available data. The assessment of the chemical status and the analysis of the sources of the N and P loads were done by using the Austrian monitoring data sets and the interpretation of MONERIS data sets for the Morava catchment.

A scenario analysis was the next important step in the planning process in order to proceed from the assessment of the current state towards the "Leitbild" (vision) and the connected selection of measures.

The main objectives to be taken into account in the different scenarios were:

> Good ecological status or good ecological potential according WFD

> Favourable conservation status according FFH-D and Birds-D

> Improvement and no deterioration of the flood protection status

> Consideration of existing and planned infrastructure (e.g. bridges, border crossings).

In a decision-making process the different scenarios were discussed in bilateral meeting on expert level, together with the public and stakeholders. .

Development of the Catalogue of Measures:

The development of the Catalogue of Measures is based on the assessment of all pervious river engineering measures, which have been developed in the frame of several river restoration projects between 1995 and 2005, and considering the outcome of the monitoring thereafter and the technical experiences gained during the construction phase. Those measures which proofed to be successful will be kept; while those which did not well meet the objectives will be improved or replaced by others. Aim is to develop a set of measures which are specifically made for the Morava and Dyje river system. Finally all management activities need to consider both the river and the floodplain area.

Main criteria for the selection of Measures were:

- Effectiveness and technical feasibility of the measures
- Effects and benefits for the environment

The following **Types of Measures** have been defined:

I. **River-engineering Measures** having wetland restoration effects:

1. Measures influencing the river dynamics: Development of the river line by extending and expanding of river section (based on historical research)
2. Measures to improve the river bed profile
3. Measures to improve the lateral connectivity (re-connection of side-arms)
4. Measures to re-integrate former river meanders
   - Partial re-integration of meanders (e.g. at the lower end)
   - Full re-integration of meanders
   - Initiation of new meanders;
5. Measures to improve river bed structures of the low water level
6. Measures to ecologically improve the bank fixation
7. Measures for improving flood protection (e.g. in urban areas)
8. Measures for improving water quality (treatment plants, BAP in agriculture).

II. **River and Floodplain Management Measures**:

- river bed maintenance

- management of the floodplain and connected land: management of wetlands (e.g. uptake of nutrients), meadows (e.g. more extensive use), floodplain forests (e.g. elimination of neophytes), etc.

III. **Administrative Measures**:

- new definition of the state border line (to allow certain river dynamics)
- nature protection (Natura 2000, protected areas management)
- spatial planning (spatial plans, traffic concepts, public infrastructure)
- agriculture (via the Water Law authorisation of installations, national water management: e.g. quality standards, protection status).

These Types of Measures from the Catalogue will be used in the **Plan of Measures** for the lower Morava and Dyje rivers as a response to the existing pressures, indicating the impacts on the ecosystems, and aiming to achieve the WFD objectives and quality standards. The Plan of Measures has to be agreed by the responsible administrative authorities in a bilateral way.

In order to gain the best acceptance for these activities and the results of the project in the public, the following activities for public participation were foreseen:

1. **Workshops with local stakeholders**

- *Phase 1*: Background information on the aims of the project, invitation to express user interests
- *Phase 2*: Presentation and discussion of the scenarios; taking into account the concrete stakeholders comments in the planning of measures
- *Phase 3*: Presentation of the results of the planning process.

2. Establishment of a **project web-page** for continued public information. .

Within the framework of these two INTERREG projects the overall task is to discuss, define and bilaterally agree on the future state and condition of the Morava/Dyje river system. The bilaterally harmonised Plan of Measures has to also contain the objectives that neighbouring countries will follow in the fields of ecology, flood protection and the various uses which are relevant for both river systems.

This planning process ends in early 2007 and will be followed by a new implementation project (2007-2012).

6.3 Suitability of Types of Measures to address the Sava Key Water Management Issues

At the Sarajevo Workshop there was not enough time to assess the suitability of the proposed Types of Measures in relation to their effectiveness to address the just agreed Sava preliminary Key Issues. The International Consultants were therefore asked to provide a first indicative list of those Types of Measures that could best tackle the KWMI.

The result of this simple cross-check is given in the following table and should be further assessed in its applicability in the Sava Basin Countries. It is evident that this table can not prevent a more detailed investigation as proposed in the previously given examples (chapter 6.2.)

Suitability of Types of Measures to address the preliminary Sava Key Water Management Issues

Non-exclusive list of Types of Measures (WFD) which can be chosen to address Sava Key Water Management Issues

	Types of Measure to address Sava Key Water Management Issues	**Nutrient Pollution**	**Organic Pollution**	**Hazardous Substances**	**Hydromor-phological Alterations**	**Flood Management**	**Invasive Species**	**Future Hydro-engineer. Structures**	**Waste Disposal**	**Water Demand / Drinkg. Water**	**Sedi-ment Mgmt.**
4.1.	Legislative instruments (e.g. the EU Directives)	**	**	**	**	**	?	**	**	**/**	*
4.2.	Administrative instruments (bilateral agreements e.g. …)	*	*	*	*	**	*	**	*	**/*	*
4.3.	Economic or fiscal instruments	**	**	**	*	**	no	**	**	**/**	**
4.4.	Negotiated environmental agreements	*	*	**	*	*	*	**	**	**/	**
4.5.	Emission controls (permit)	**	**	**	no	no	no	no	**	/*	?
4.6.	Codes of good practice	**	**	**	**	**	**	**	**	*/**	**
4.7.	Abstraction controls	no	no	no	**	*	no	*	no	**/**	*
4.8.	Demand management measures	**	**	**	**	**	**	**	**	**/**	**
4.9.	Changes in land use	**	*	no	*	**	*	no	no	**/**	*
4.10.	Efficiency and re-use measures, i.a. promotion of water-efficient technolo-gies in industry and water-saving	**	**	**	*	**	*	**	**	**/**	*
4.11.	Irrigation techniques	no	no	no	**	no	no	**	no	**/*	no
4.12.	Construction projects (e.g. dams, treatment plants)	**	**	*	C	**		**	**	**/**	C
4.13.	Rehabilitation projects (e.g. renaturation)	*	*	no	**	**	**	C	**	/*	**
4.14.	Educational projects (e.g. training, advisory services)	**	*	**	*	**	**	**	**	**/*	*
4.15.	Research, development and demonstration projects	**	**	**	**	**	**	**	**	**/**	**

****** very suitable ***** suitable **no** not relevant **C** Conflict ? unclear at the moment

7 FURTHER STEPS

This report constitutes the main output of Tasks 2 and 3 of this DRP Component. As already stated in chapter 1, it will be important in the coming months to further assess and agree on the Sava Key Issues at the level of the Sava Commission.

Under Task 4 of the ongoing DRP project, the structure of Sava RBM Plan and a related Road Map will be developed in the coming weeks. This will be done in coordination with ICPDR and UNDP/GEF DRP experts and based on the results of Tasks 2 and 3 (this report). Task 4 will focus on another regional workshop (planned at the end of January 2007), where the proposed Sava RBMP structure and Road Map will be discussed. Task 4 and all activities under the DRP Sava Component will end in a draft Final Report, planned for submission in February 2007.

The outcome of this project should serve as background and basis for the further Sava RBM Plan development and implementation process over the next years. The documents produced during this project are especially relevant for the Sava Commission with its Secretariat and RBM Expert Group as the main coordinating bodies of water management issues within the Sava Basin. It is assumed that the CARDS Regional Sava project will also provide some assistance following up on this DRP assistance.

ANNEX I CONTACTS OF GOVERNMENT PERSONS AND LOCAL CONSULTANTS

The following tables list the names of the national government experts and the Local Consultants of the Consortium, their institutions and addresses (in alphabetic order of the countries):

1) Bosnia and Herzegovina, Federacija Bosne i Hercegovine

Template Contact Person (Government person who filled in this template)	
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Template Contact Person (national consultant)	
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3) Croatia

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ANNEX II TEMPLATE OF KEY TRANSBOUNDARY ISSUES AND TOPICS OF MEASURES

UNDP I GEF DANUBE REGIONAL PROJECT

UNDP/GEF Danube Regional Project

Component 1.1-9

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

RER/03/G31/A/1G/31

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Template for

Key Transboundary Issues (Task 2)

and

Topics of Measures (Task 3)

August 2006

HYDRO INGENIEURE umweltbundesamt 10 YEARS eco logic

Analysis of Key Transboundary Issues (Task 2) and Topics of Measures (Task 3) in the Sava basin

Aim of this analysis:

The main aim of this assessment is to identify the Key Transboundary Issues (KTI) and the structure of current transboundary water management within the SAVA Basin as well as to identify the measures needed to deal with these issues

Based on the national assessments, a SAVA-Basin wide evaluation will be carried out. As a result, a summary report will be produced as a basis for further discussion at the regional meeting, foreseen for mid November.

How to fill in the Template:

National Consultants are asked to discuss this Template and the filled in information with their beneficiary governments before sending it back.

A) **General Information**

Please fill in the country name and the personal data for the person who filled in the template.

B) **Key transboundary issues**

- Water management

What are the Key Transboundary water management Issues from national point of view?

Please work through the list below and for identified KTI give a short explanation of the reasons for identification and a short description of the situation.

If there are other relevant KTI in your country, please add them in the category "other".

- Governance and Organisation

This section is focused on the institutional and organisational framework in your country dealing with Key Transboundary Issues in the SAVA Basin. The answers should include a short description of the current situation.

If issues are missing in the list, please add them under the category "Others", and include a short description.

C) **Possible measures to meet KTI**

The relevant EU Directives and supplementary measures listed in Annex VI WFD should give a guideline for identifying measures to address the relevant KTI.

Please give a short explanation for the proposed measures (if and how are resp. could be applied?). If there are measures which are not covered by this list, please add and give a short explanation.

Please return the filled in questionnaire by 30 September 2006 at the latest to

georg.windhofer@umweltbundesamt.at and dworak@ecologic.de

Contact: For any questions related these templates please contact:

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ECOLOGIC Berlin

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A. General Information

Country	

Template Contact Person (Government person who filled in this template)	
Name:	
Institution:	
Address:	
Phone:	
e-mail:	

B. Key Transboundary Issues (Task 2)

- **Water management issues**

Categories			yes/no	if yes → explanation
Pressures & Impacts	Pollution	nutrient loads		
		hazardous substances		
		thermal pollution		
	Hydromorpho-logical alterations	longitudinal connectivity		
		lateral connectivity		
		hydrological alterations (water abstraction, excessive withdrawals of surface and/or groundwater for human uses, residual water)		
		changes in freshwater availability		
		habitat and community modification - loss of ecosystems or ecotones		
Exploitation of Fisheries and other living resources		overexploitation		
		excessive by-catch and discards		
		decreased viability of stocks through contamination and disease		
		impact on biological and genetic diversity		
Floods and Droughts		use of natural retention areas		
		technical flood management		
		emergency preparedness		
		demand management		
Invasive Species/Neobiota		Introduced species		
		Introduced diseases		
Socio-economic Issues	significant changes with respect to transboundary water management	Decrease or Increase of Population		
		industrial production (e.g. decrease or increase of abstraction and sewage)		
		Future development of the agricultural sector (e.g. changes in irrigation)		
		Tourism (e.g. increase in water consumption)		
Other				

- Governance and Organisation

Categories		explanations
Transboundary Co-operation	Apart from the Sava Basin Framework Agreement, which transboundary agreements on water management exist (within Sava/Danube basin!), which are actively executed (e.g. which transboundary commissions work)? Specify sub-basins and countries.	
	What is the current status of transboundary co-operation in the area of information management in these basins?	
Transboundary Monitoring	Where does transboundary monitoring exist and how is it co-ordinated?	
	Who are the main actors in this respect?	
	What kind of data is exchanged at what interval?	
	Is there a clear transboundary communication of the interpreted data? E.g. joint report	
Information Exchange	Is there an exchange of information between national governments and transboundary commissions, how does it work?	
	Is there an integration of information management at the local level with information management at the transboundary level?	
Public Information	Is information regularly disseminated to the general/organised public?	
Other		

C. Topics of Measures (Task 3)

Non-exclusive list of types of Measures (WFD) which can be chosen (i.e. are available) to address Key Transboundary Issues)

Types of Measure to address KTI	**Explanation**
Legislative instruments (e.g. the Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC), the Nitrates Directive (91/676/EEC), the Urban Waste-water Treatment Directive (91/271/EEC)	
administrative instruments	
economic or fiscal instruments	
negotiated environmental agreements	
emission controls	
codes of good practice	
abstraction controls	
demand management measures	
Changes in land use	
efficiency and re-use measures, inter alia, promotion of water-efficient technologies in industry and water-saving	
irrigation techniques	
construction projects (e.g. dams, treatment plants)	
desalination plants	
rehabilitation projects (e.g. renaturation)	
artificial recharge of aquifers	
educational projects (e.g. training, advisory services)	
research, development and demonstration projects	
other relevant measures	

ANNEX III NATIONAL RESPONSES TO THE TEMPLATE

Annex III.1 Template filled in by Bosnia & Hercegovina

Annex III.2 Template filled in by Croatia

Annex III.3 Template filled in by Serbia

Annex III.4 Template filled in by Slovenia

ANNEX III.1 Bosnia & Herzegovina

UNDP I GEF DANUBE REGIONAL PROJECT

UNDP/GEF Danube Regional Project

Component 1.1-9

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

RER/03/G31/A/1G/31

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Template for Key Transboundary Issues (Task 2) and Topics of Measures (Task 3)

Bosnia and Herzegovina – Republika Srpska
Ministry of Agriculture, Forestry and Water Management
Republic Directorate for Waters (RDW**)**

and

Bosnia and Herzegovina – Federacija Bosna & Hercegovine
Ministry of Agriculture, Forestry and Water Management
Public Enterprise Watershed of the River Sava

November 2006

HYDRO INGENIEURE umweltbundesamt eco logic 10 YEARS

A. General Information

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Template Contact Person (Government person who filled in this template)	
Name:	Ms. Velinka Topalovic
Institution:	Ministry of Agriculture, Forestry and Water Management - Republic Directorate for Waters - Vrbas River Basin Office
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Country	**Bosnia and Herzegovina, Federacija Bosne i Hercegovine**
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Remarks:

- These templates should be considered **as compilation of the preliminary screened elements of those water-management-related issues** that could serve as a basis for the future discussions regarding identification of KTIs. We assume that the **criteria needed for identification of KTIs should be established and agreed by all riparian countries** (within RBM expert group of Sava commission).
- The upcoming efforts in **Bosnia and Herzegovina will** be **focused primarily on preparation of parts of Sava River Basin Characterization Report** where these templates and other (interim)results of this project could be used as useful inputs.

B. Key Transboundary Issues (Task 2)

• Water management issues

Categories			yes/no	if yes → explanation
Pressures & Impacts	Pollution	nutrient loads	YES	Due to the fact that almost all settlements in the river basin on the territory of Bosnia and Herzegovina are without waste water treatment plants, nutrient pollution can be addressed as a transboundary issue.
		hazardous substances	YES	There are industrial installations on the river basin (chemical, steel and similar industrial installations).
		thermal pollution	NO	
	Hydromorpho -logical alterations	longitudinal connectivity	YES	There are three high dams on the river Drina (water border between Bosnia and Herzegovina and Serbia), and therefore this category can be considered as transboundary issue.
		lateral connectivity	NO	
		hydrological alterations (water abstraction, excessive withdrawals of surface and/or groundwater for human uses, residual water)	YES	Along the Sava river there are settlements that are supplied with water either directly or by drainage from Sava, so there is necessity for water abstraction control in the period of catastrophic droughts. There are no significant demands for irrigation on the river Sava nor on its tributaries at present.
		changes in freshwater availability	NO	
		habitat and community modification - loss of ecosystems or ecotones	YES	There is no data concerning this item but on the basis of the expert judgement, due to the urbanization, road construction and similar activities, this could be claimed as a KTI.
Exploitation of Fisheries and other living resources		overexploitation	NO	
		excessive by-catch and discards	NO	
		decreased viability of stocks through contamination and disease	NO	
		impact on biological and genetic diversity	YES	Disable unilateral actions that can have impact on biological and genetic diversity. This could become an important KTI in the future.

Categories			yes/no	if yes → explanation
Floods and Droughts		use of natural retention areas	YES	Existing flood protection systems that foresee natural retention areas in various countries of Sava river basin are of significant importance for flood protection and can not be replaced and/or endangered by other system.
		technical flood management	YES	There are certain number of dams on the tributaries that are primarily constructed for hydropower production but can be used as a retention areas in the time of flood.
		emergency preparedness	YES	On the basis of the previous experiences with early warning system on the Sava river (which is destroyed during the war) it can be concluded that it is necessary to provide an appropriate data exchange system in the time of flood.
		demand management	YES	There is a necessity to establish the list with priorities considering the demand management in the river basin (on the international level) during the droughts.
Invasive Species/Neobiota		Introduced species		Note: There are no data regarding this category and there is no information about problems of the breach of the ecosystem, as a result of the introduction of new species, but on the basis of the expert judgment, this could be considered as a KTI in the future.
		Introduced diseases		Note: There are no data regarding this category and there is no information about problems of the breach of the ecosystem, as a result of the introduction of new diseases, but on the basis of the expert judgment, this could be considered as a KTI in the future.
Socio-economic Issues	significant changes with respect to transboundary water management	Decrease or Increase of Population	NO	
		industrial production (e.g. Decrease or Increase of abstraction and sewage)	NO	
		Future development of the agricultural sector (e.g. changes in irrigation)	YES	Nowadays, the significant state-owned irrigation systems are not in function. After its privatization and development of intensive agriculture water abstractions for irrigation purposes are going to become most dominant water consumers (especially in the downstream regions). By implementation of modern irrigation techniques this pressure can be significantly decreased.
		Tourism (e.g. increase in water consumption)	NO	
Other				

- **Governance and Organisation**

Categories		explanations
Transboundary Co-operation	Apart from the Sava Basin Framework Agreement, which transboundary agreements on water management exist (within Sava/Danube basin!), which are actively executed (e.g. which transboundary commissions work)? Specify sub-basins and countries.	– Agreement on bilateral cooperation between BiH and CRO. – For now there are following commissions: ○ Sava Commission (ICSRB), Sava river sub-basin: Slovenia, Croatia, B&H and Serbia and Monte Negro. ○ International Commission for the Protection of the Danube River (ICPDR), 13 countries
	What is the current status of transboundary co-operation in the area of information management in these basins?	Cooperation is implemented through the work of those above mentioned commissions
Transboundary Monitoring	Where does transboundary monitoring exist and how is it co-ordinated?	There are 4 transboundary monitoring sites within the Danube TNMN network and all of them are located in the area of RS. Those sites are: i. Una river, profile U-7, downstream Kozarska Dubica city, ii. Sava river, profile Gradiska, ii. Vrbas river, profile V-7, Razboj, v. Bosna river, profile B-12, downstream Modrica city, with monitoring frequency 12 times a year. Coordination is performed via ICPDR.
	Who are the main actors in this respect?	Institute for Waters, Bijeljina, Ministry of Agriculture, Forestry and Water Management, Republic Water Directorate, Bijeljina, RS-BiH
	What kind of data is exchanged at what interval?	Reports toward ICPDR once in a year for TNMN sites.
	Is there a clear transboundary communication of the interpreted data? E.g. joint report	There is a joint report ICPDR "YEARBOOK", as a compilation of the data collected within TNMN network.
Information Exchange	Is there an exchange of information between national governments and transboundary commissions, how does it work?	Yes, via ICPDR and Sava Commission and its experts groups as well as via bilateral commission between BiH and CRO.
	Is there an integration of information management at the local level with information management at the transboundary level?	National activities related to the implementation of WFD are reported to ICPDR.
Public Information	Is information regularly disseminated to the general/organised public?	N/A
Other		

C. Topics of Measures (Task 3)

Non-exclusive list of types of Measures (WFD) which can be chosen (i.e. are available) to address Key Transboundary Issues

Types of Measure to address KTI	**Explanation**
Legislative instruments (e.g. the Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC), the Nitrates Directive (91/676/EEC), the Urban Waste-water Treatment Directive (91/271/EEC)	New Water Laws in Republika Srpska (Official Gazette of RS, Nr. 50/06) and in the Federation BiH (Official Gazette of FBiH, No. 70/06) are harmonized for entire Bosnia and Herzegovina and with WFD requirements and other directives. Water Laws with its water acts create base for consistent implementation of WFD.
administrative instruments	Establishing of the Sava river basin Agency (for both entities, RS and FBiH) with belonging offices for sub-basins creates good base for efficient implementation of WFD, using river basin as basic unit for water resources management.
economic or fiscal instruments	Implementation of "User pays" and "Polluter pays" principles and establishing the economic price for water use aspects.
negotiated environmental agreements	There are no negotiated environmental agreements but it could be a good base for future reduction of transboundary pollution (e.g. introduction of the phosphate free detergents).
emission controls	Implementation of supervising monitoring for significant polluters.
codes of good practice	Implementation of measures whose efficiency is acknowledged through long practice. E.g. flood protection plan as well as the application of new and tested metods in similar areas.
abstraction controls	Control of morphological changes in Sava river bed, and abstraction control in period of catastrophic droughts.
demand management measures	
Changes in land use	Control of status and of maintenance of natural retentions for flood protection and status of riverbanks and inundations along the Sava riverbed.
efficiency and re-use measures, inter alia, promotion of water-efficient technologies in industry and water-saving	Strengthening of supervising and operational monitoring network. Implementation of the clean technologies during the country reconstruction.
irrigation techniques	Irrigation systems in the area of FBiH are not in function, and all the planned systems should be synchronised with the available quantities of water in dry periods. Water abstraction control measures are needed in the period of catastrophic droughts.

Types of Measure to address KTI	**Explanation**
construction projects (e.g. dams, treatment plants)	Joint estimation of possible impacts for dams with significant installed capacity. Making a balance of water for particular water discharges and determining the biological and water supply minimum on certain areas.
desalination plants	N/A for Sava (Danube) river basin
rehabilitation projects (e.g. renaturation)	Reconstruction of flood protection embankments
artificial recharge of aquifers	N/A, no significant artificial recharge of aquifers.
educational projects (e.g. training, advisory services)	To establish concrete educational projects to promote public awareness for all aspects of water management, as well as training and advisory services for officials in water sector
research, development and demonstration projects	To launch projects with the purpose of introduction, promotion and application of new technologies in certain sectors.
other relevant measures	

ANNEX III.2 Croatia

UNDP I GEF DANUBE REGIONAL PROJECT

UNDP/GEF Danube Regional Project

Component 1.1-9

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

RER/03/G31/A/1G/31

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Template for

Key Transboundary Issues (Task 2)
and
Topics of Measures (Task 3)

Republic of CROATIA

November 2006

HYDRO INGENIEURE umweltbundesamt eco logic 10 YEARS

A. General Information

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***Remarks:**

The Project beneficiary reviewed the Template for Key Transboundary Issues and Topics of Measures and do not have objections on this version of template as a project result. It does not represent the official position of the competent Ministry for further concrete actions due to the following facts:

1. unestablished Key Transboundary Issues criteria,
2. non existence of necessary analysis,
3. 4 Sava countries did not agreed on joint criteria.

B. Key Transboundary Issues (Task 2)

• Water management issues

Categories			yes/no	if yes → explanation
Pressures & Impacts	Pollution	nutrient loads	Yes	Nutrient pollution is present. Investigations should determine nutrient loads on state borders and river mouths of the large tributaries of the Sava River.
		hazardous substances	No	
		thermal pollution	Yes	The greatest impact on temperature increase of the Upper Sava water is caused by the nuclear power plant Krško, which is located in the Republic of Slovenia.
	Hydromorpho-logical alterations	longitudinal connectivity	No	
		lateral connectivity	No	
		hydrological alterations (water abstraction, excessive withdrawals of surface and/or groundwater for human uses, residual water)	Yes	In the Sava River the lowering of the river bottom has been observed, which is due to gravel extraction (building material and/or regulation of navigable water way) and also due to a decrease in deposit quantities from the basin. It is estimated that the construction of 5 HPPs (4 are already finished) on the territory of the Republic of Slovenia will have a significant influence on the water regime in the Upper Sava. It is necessary to carry out joint investigations for quantification of these impacts.
		changes in freshwater availability	No	
		habitat and community modification - loss of ecosystems or ecotones	Yes/No	Only in places there are structure changes of the bank area, particularly flood plains. It has not been determined whether these changes are local in character, or caused by transboundary pressures.
Exploitation of Fisheries and other living resources		Overexploitation	No	
		excessive by-catch and discards	No	
		decreased viability of stocks through contamination and disease	No	
		impact on biological and genetic diversity	No	

Categories			yes/no	if yes → explanation
Floods and Droughts		use of natural retention areas	Yes	The Central Sava system (natural retention storages, relief canals and distribution structures) significantly reduces the flood risks (size of flood waves) in the Lower Sava, all the way to its confluence with the Danube River. This has an impact on the solution of the flood protection systems in Croatia, Bosnia and Herzegovina and Serbia.
		technical flood management	Yes	It is estimated that the construction of the HPPs on the Sava River in Slovenia will have a certain influence on flood risks in the greater Upper Sava area (height and velocity of flood wave). Possible consequences of these constructions (flood levels and low water levels) should be jointly investigated and applied to technical parameters of flood management system.
		emergency preparedness	Yes	In Croatia, there exist national regulations for taking measures in case of occurrence of flood waves or extremely dry periods.
		demand management	No	
Invasive Species/Neobiota		Introduced species	Yes/No	Data are not available. There is a research project under way entitled "Ecological research of terrestrial surface waters in Croatia according to the criteria from the Water Framework Directive", whose development started in June of this year. As part of the project, data on introduced species are also expected.
		Introduced diseases	Yes/No	Data are not available.
Socio-economic Issues	significant changes with respect to transboundary water management	Decrease or Increase of Population	yes	Decrease in population in the Sava River basin in Croatia according to 1991 and 2001 censuses.
		industrial production (e.g. Decrease or Increase of abstraction and sewage)	Yes	Decrease in the scope of industrial production (chemical and metal processing) caused a decrease in pollution.
		Future development of the agricultural sector (e.g. changes in irrigation)	yes	Water use in the Sava River basin for irrigation is very low. In 2005, Croatian government adopted the "National project of irrigation and management of agricultural land and water", which anticipates improvement and increase in irrigated agricultural areas in the Sava river basin.
		Tourism (e.g. increase in water consumption)	No	
Other		Waste disposals		Transboundary impact of the unregulated solid waste water disposals on the Sava water quality should be determinated.

- **Governance and Organisation**

Categories		Explanations
Transboundary Co-operation	Apart from the Sava Basin Framework Agreement, which transboundary agreements on water management exist (within Sava/Danube basin!), which are actively executed (e.g. which transboundary commissions work)? Specify sub-basins and countries.	Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki Convention, 1994). Convention on Co-operation for the Protection and Sustainable Use of the River Danube (1996). Framework Agreement on the Sava River Basin and the Protocol on the Navigation Regime. Bilateral agreements on the Sava River Basin with the Republic of Slovenia and Bosnia and Herzegovina. Bilateral agreement with the Republic of Serbia is under preparation.
	What is the current status of transboundary co-operation in the area of information management in these basins?	Based on bilateral agreements, there is exchange of **some** information about the water quantity and quality and changes in the river bottom, as well as cooperation in flood protection.
Transboundary Monitoring	Where does transboundary monitoring exist and how is it co-ordinated?	Within the International Cooperation on the Protection of the Danube River (ICPDR), integrated programme of water quality monitoring in the Danube River has been established. Monitoring stations included in the Transnational Monitoring Network (TNMN) are a component of the national monitoring programme. Within the Sub-commission for water quality of the Permanent Croatian-Slovenian commission for water management systematic water quality monitoring of transboundary watercourses is carried out. The Sub-commission has developed a water quality monitoring programme, which is included in its rules of procedure. The goal of the monitoring programme is to: ○ determine water quality; ○ determine water quality trends; ○ determine procedures for action in case of accidental pollution.
	Who are the main actors in this respect?	Ministry of Agriculture, Forestry, and Water Management (MoAFWM), Croatian Water, Meteorological and Hydrological Service.
	What kind of data is exchanged at what interval?	Data on water quality and quantity from the TNMN monitoring stations are sent to the ICPDR once per year. Within the Sub-commission for water quality of the Permanent Croatian-Slovenian commission for water management results of analyses are exchanged and compared in digital format at 6 month intervals.

Categories		Explanations
	Is there a clear transboundary communication of the interpreted data? E.g. joint report	Yes. Within the ICPDR, a report is prepared annually, entitled: Report: Water quality in the Danube River Basin, TNMN – Yearbook. Within the Sub-commission for water quality of the Permanent Croatian-Slovenian commission for water management the report entitled: Annual report on the quality of transboundary watercourses is prepared separately by each party, for each year. The report contains all results of monitoring and interpretations of these results.
Information Exchange	Is there an exchange of information between national governments and transboundary commissions, how does it work?	Yes. Information is exchanged in the course of work of expert groups of the ICPDR. Transboundary issues of water and water management are coordinated and solved in the frameworks of bilateral agreements with Slovenia and Bosnia and Herzegovina, with presently no such agreement with Serbia, and have been so far best solved with Slovenia. Information is exchanged within the Permanent Croatian-Slovenian commission for water management, whose work scope includes water management relations, measures and works on border watercourses, on watercourse intersecting the state border between Croatia and Slovenia and their river basins to the demarcation line between terrestrial waters and the sea. Although a bilateral agreement with Bosnia and Herzegovina has been signed and a sub-commission established, joint monitoring and more systematic exchange is still forthcoming.
	Is there an integration of information management at the local level with information management at the transboundary level?	Yes. Information management is performed within the Water Information System (WIS) developed by the MoAFWM and Croatian Water. The WIS will enable reporting to all levels – local, national and international. The WIS has the task to establish, in line with user needs and national and EU legislation, a thematic information centre for waters in Croatia, with the aim to support water management in all its segments: planning, investigations, research, design, construction, maintenance, monitoring and informing.
Public Information	Is information regularly disseminated to the general/organised public?	At the national level, there is a regulation which obligates all state administration bodies to regularly inform about their activities (active reporting) and provide information upon parties' requests. To this end, public relations offices have been established. The majority of published information is available in Croatian language. For a part of hydrological stations of importance to flood protection, data are published in real time on the internet. Croatian Water prepares annual reports on the results of water quality testing in the Republic of Croatia carried out according to the Programme of Croatian Water, which is approved by the MoAFWM.
Other		

C. Topics of Measures (Task 3)

Non-exclusive list of types of Measures (WFD) which can be chosen (i.e. are available) to address Key Transboundary Issues

Types of Measure to address KTI	Explanation
Legislative instruments (e.g. the Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC), the Nitrates Directive (91/676/EEC), the Urban Waste-water Treatment Directive (91/271/EEC)	Through accession negotiations with the EU, the Republic of Croatia has determined the dynamics and deadlines (2008) for the harmonization of the national legislation with the relevant EU directives. The implementation of measures from so called "investment-heavy directives" will be a subject of negotiations with the European Commission.
administrative instruments	Administrative instruments are identified at the national level by the Water Act (OG 107/95; 150/05) and the Water Management Financing Act (OG 107/95; 150/05), while transboundary relations are governed by intergovernmental and international agreements quoted in the section Transboundary Co-operation.
economic or fiscal instruments	Water Management Financing Act (OG 107/95; 150/05) regulates the funding of water management
negotiated environmental agreements	Existing legislation anticipates EIA for all construction. Legislation under preparation anticipates introduction of SEA.
emission controls	According to legislation in force, control of point sources of emission is carried out through issue of water rights permits for wastewater discharges as well as by control of fulfilment of discharge terms by the water rights inspection. Diffuse emissions are not controlled as such, apart form issue of water rights permits for chemical substances which could get into water. Under way is the preparation of regulations which will solve this problem in a more systematic manner.
codes of good practice	According to the Nitrate Directive, the codes of good agriculture practice are under preparation.
abstraction controls	According to legislation in force, control of water abstraction is carried out by means of awarding of concessions and issuing of water rights permits for water use for different purposes. Control of proscribed terms is carried out by water rights inspection.
demand management measures	Analysis of needs and manner of their fulfilment will be determined in RBM plans.
Changes in land use	Land use is defined by physical plans.

Types of Measure to address KTI	Explanation
efficiency and re-use measures, inter alia, promotion of water-efficient technologies in industry and water-saving	Some activities have been initiated, but a comprehensive solution is expected through the implementation of the IPPC directive.
irrigation techniques	In 2005, the "National project of irrigation and management of agricultural land and water" was adopted, in which the development of irrigation in the Republic of Croatia is planned.
construction projects (e.g. dams, treatment plants)	They are generally listed in the «Strategy of Water Management», and RBM plans and Water Management Plans (annual investment plans of Croatian Waters) will determine individual investments.
~~desalination plants~~	
rehabilitation projects (e.g. renaturation)	At present, they are not planned.
artificial recharge of aquifers	At present, there is no need.
educational projects (e.g. training, advisory services)	The majority of projects financed by the EC and other international funds include education component (training, advisory services).
research, development and demonstration projects	Bodies in charge of water management closely cooperate with scientific institutions by funding projects and research necessary for water management.
other relevant measures	

ANNEX III.3 Serbia

UNDP | GEF DANUBE REGIONAL PROJECT

UNDP/GEF Danube Regional Project

Component 1.1-9

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

RER/03/G31/A/1G/31

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Template for Key Transboundary Issues (Task 2) and Topics of Measures (Task 3)

Republic of SERBIA

September 2006

HYDRO INGENIEURE umweltbundesamt eco logic 10 YEARS

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B. Key Transboundary Issues (Task 2)

INTRODUCTION

Serbian part of the Sava river basin encompasses several transboundary rivers. The most signifiant transboundary rivers are as follows:

- **Sava river.** The downstream reach of the river belongs to Serbia (from the mouth into Danube, in Belgrade, to Jamena, at the border of Serbia and Croatia), with the distance of 209 km. Along the section between the mouth of the Drina river (km 189 from the mouth of Sava river) and Jamena (km 209), Sava river is the border between Serbia and Bosnia and Herzegovina (B&H).

- **Drina river.** This river is the largest tributary of the Sava river. Drina river originates from the confluence of Tara and Piva rivers, in Montenegro. The middle and downstream reachs of Drina river belong to Serbia and B&H (Republic of Srpska). Along the reach of 245 km Drina river represents the border between Serbia and B&H.

- **Lim river.** This river is the tributary of the Drina river. The upstream reach of the river belongs to Montenegro, the middle reach to Serbia and the downstream part to B&H.

- **Bosut river.** This river is the tributary of the Sava river. The upstream reach of the river belongs to Croatia and the downstream reach (with the distance of 38 km) is in Serbia.

- **Water management issues**

Categories			yes/no	if yes → explanation
Pressures & Impacts	Pollution	nutrient loads	yes	Sava river: moderate nutrient load from municipal waste waters and agriculture areas. Periodical occurrence of larger concentrations of phenols and phosphorus. Drina and Lim rivers: low nutrient load in the rivers. In the reservoirs along the Drina river, local increase of nutrients, due to the fisheries. Bosut river: Excessive nutrient load, due to the municipal and industrial waste waters from towns Vinkovci and Djakovo and from agriculture areas in Croatia.
		hazardous substances	yes	Sava river : periodical occurrence of heavy metals and phenols. Potential risk from nuclear power plant "Krsko" at the border of Croatia and Slovenia. Drina river: periodical pollution from the mine of lead and zink in Sase (B&H), factory of raw material for aluminium in Zvornik (B&H) and chemical industry in Gorazde (B&H). Frequent occurrence of ammonium and periodical occurrence of phenols.
		thermal pollution	no	
	Hydromorpho-logical alterations	longitudinal connectivity	yes	Drina river : several dams and reservoirs in the river basin. 3 large reservoirs along the Drina river – "Zvornik" (km 91 from the mouth), "Bajina Basta" (km 199) and "Visegrad" (km 254). The largest reservoir is situated on the confluent Piva- "Mratinje". Lim river: dam and reservoir "Potpec" (in Serbia). Bosut river: dam and reservoir "Vinkovci" (in Croatia) and weir "Bosut" (in Serbia)
		lateral connectivity	no	
		hydrological alterations (water abstraction, excessive withdrawals of surface and/or groundwater for human uses, residual water)	no	

Categories			yes/no	if yes → explanation
		changes in freshwater availability	no	
		habitat and community modification - loss of ecosystems or ecotones	no	
Exploitation of Fisheries and other living resources		overexploitation	no	
		excessive by-catch and discards	no	
		decreased viability of stocks through contamination and disease	no	
		impact on biological and genetic diversity	no	
Floods and Droughts		use of natural retention areas	yes	Several retention areas exsist along the Croatian reach of Sava river. Retention areas "Lonjsko polje" and "Mokro polje" are very important parts of the flood control system of the Sava river. From the Serbian point of view, the management and operation of these retention areas must not deteriorate the natural regime of high flows of Sava river.
		technical flood management	yes	The flood control system in the Sava river basin is very complex and includes the levees along the Serbian reach of the Sava river, the reservoirs along the Drina and the retention areas along the Croatian reach of Sava river.
		emergency preparedness	yes	The hydraulic operations in retention areas along the Sava river should be coordinated and synhronized with the reservoirs operations along the Drina river, in order to avoid the coincidence of high waters of Sava and Drina rivers. For Serbia, as a downstream country, the most important condition for the flood control is the preservation of the existing regime of high flows of Sava and Drina rivers.
		demand management	no	

Categories			yes/no	if yes → explanation
Invasive Species/Neobiota		Introduced species	no	
		Introduced diseases	no	
Socio-economic Issues	significant changes with respect to transboundary water management	Decrease or Increase of Population	no	
		industrial production (e.g. Decrease or Increase of abstraction and sewage)	no	
		Future development of the agricultural sector (e.g. changes in irrigation)	yes	Future development of the agricultural sector in the Serbian part of the Sava river basin is based on two new large irrigation systems – "Macva" in the area of the confluence of Sava and Drina rivers and "Srem", southern part of Voivodina region. The water supply of these systems will be based on Sava and Drina waters.
		Tourism (e.g. increase in water consumption)	yes	Future tourism development is planned for the Sava river (protection area "Zasavica" and for Drina river (reservoirs along the river and the canyon of the Tara river).
Other		hydropower	yes	Drina is very powerfull river and represents the most important hydroenergetic resource in the Balkan region. Besides 3 existing power plants, located on the mentioned dams and reservoirs along the Drina river, it is still available the hydropotential of 2500 MW of the river. Several new dams and power plants are planned in the future. The realization of this plan depends on the multilateral agreement of Serbia, Montenegro and B&H .
		navigation	yes	Sava river is very significant potential international waterway. The navigation is now limited to the Serbian reach of the river. The development of the waterway in the upstream reach, to the town of Sisak (in Croatia) requires the large water engineering measures. The realization of this project depends on the multilateral agreement of Serbia, Croatia and B&H .

- **Governance and Organisation**

Categories		explanations
Transboundary Co-operation	Apart from the Sava Basin Framework Agreement, which transboundary agreements on water management exist (within Sava/Danube basin!), which are actively executed (e.g. which transboundary commissions work)? Specify sub-basins and countries.	-Agreement between Hungary and former Yugoslavia on water engineering issues related to boundary and transboundary systems and watercourses, signed at 1955. -Joint Hydrotechnical Commission, established on the basis of Agreement. The main tasks of Commission are related to the Danube and Tisza rivers. -Agreement between Romania and former Yugoslavia on water engineering issues related to boundary and transboundary systems and watercourses, signed at Bucharest, 1955. -Joint Hydrotechnical Commission, established on the basis of Agreement. The main tasks of Commission are related to the Danube and Banat rivers.
	After the desintegration of the former Yugoslavia, the process of establishment of cooperation, bilateral agreements and joint commissions for sustainable management of boundary and transboundary systems and watercourses, between Serbia and Croatia and Serbia and B&H has been initiated. The basic documents are prepared and the procedure for the establishment of the bilateral agreements will start in the near future. The process of establishment of cooperation, bilateral agreements and joint commissions for sustainable management of boundary and transboundary systems and watercourses, between Serbia and Montenegro has not yet been initiated.	Because the bilateral agreement with Serbia and Montenegro is dating from 1955, both parties have prepared the drafts of a new agreement that takes into consideration the provisions of the Water Framework Directive. The joint commission would be renamed as "Joint Commission for sustainable management of boundary and transboundary systems and water courses" During the year the bilateral activity is performed through specific sub commissions according to a schedule established by both parties. -Agreement between Bulgaria and former Yugoslavia on water engineering issues related to boundary and transboundary systems and watercourse is signed 1958. The agreement was fully in power till 1982. After 1982. the transboundary cooperation was only periodical, but it the agreement has not been cancelled. The main problems are related to Timok and Nisava rivers.

Categories		explanations
	What is the current status of transboundary co-operation in the area of information management in these basins?	Transboundary cooperation with Hungary (Danube and Tisza issues), with Romania (Danube and Banat rivers) and with Bulgaria (Timok and Nisava rivers) is regulated by joint hydrotechnical commissions. Transboundary cooperation with Croatia (Danube, Sava and Bosut rivers) and B&H (Drina river) is temporary regulated by informal meetings and exchange of information. This cooperation is supported by ICPDR and its expert groups. Transboundary cooperation between Serbia and Montenegro is not yet established.
Transboundary Monitoring	Where does transboundary monitoring exist and how is it co-ordinated?	Regular transboundary monitoring is not yet established. Serbian Hydrometeorological Institute is responsible for measurements of hydrologic and water quality parameters at the border station Jamena (between Serbia and Croatia) on Sava river and several gauging stations along the Drina river.
	Who are the main actors in this respect?	Serbian Hydrometeorological Institute
	What kind of data is exchanged at what interval?	Hydrological and water quality parameters.
	Is there a clear transboundary communication of the interpreted data? E.g. joint report	Joint report is not yet established
Information Exchange	Is there an exchange of information between national governments and transboundary commissions, how does it work?	Exchange of information between Serbia and Croatia and Serbia and B&H is regulated by national authorities. Exhange of information between Serbia and Montenegro is not yet established.
	Is there an integration of information management at the local level with information management at the transboundary level?	No
Public Information	Is information regularly disseminated to the general/organised public?	No
Other		

C. Topics of Measures (Task 3)

Non-exclusive list of types of Measures (WFD) which can be chosen (i.e. are available) to address Key Transboundary Issues

Types of Measure to address KTI	Explanation
Legislative instruments (e.g. the Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC), the Nitrates Directive (91/676/EEC), the Urban Waste-water Treatment Directive (91/271/EEC)	Convention on the Protection and Use of Transboundary Watercources and International Lakes. Water Framework Directive and other EU Directives Danube River Protection Convention.
administrative instruments	Establishment of bilateral agreements on sustainable management of transboundary systems and watercourses and joint commissions between Serbia and Croatia , Serbia and B&H and Serbia and Montenegro. The good example is the existing Protocol on coordinated management and operations of reservoirs and hydropower plants "Bajina Basta" Serbia) and "Visegrad"(B&H). Similar protocol on coordinated management and operations of reservoir "Vinkovci" and weir and pumping station "Bosut" on the Bosut river is needed.
economic or fiscal instruments	These instruments will be established in the bilateral agreements between Serbia and Croatia , Serbia and B&H and Serbia and Montenegro.
negotiated environmental agreements	Environmental agreements between Serbia and Croatia, Serbia and B&H and Serbia and Montenegro should be established.
emission controls	Emission controls at all sources of excessive pollution should be established. The protection of the water quality of the Sava river is very important for Serbia, regarding the fact that the part of water supply of the city of Belgrade is related to the abstraction from the Sava river.
codes of good practice	Codes of good practice should be adopted in all countries in the Sava river basin
abstraction controls	Abstraction controls was not necessary so far, because there were not excessive abstractions from Sava and Drina rivers. In the future, all significant abstractions should be verified and agreed on the bilateral or multilateral level.

Types of Measure to address KTI	Explanation
demand management measures	There is no need for demand management measures so far. In the future, all significant demands should be verified and agreed on the bilateral or multilateral level.
Changes in land use	Significant changes in land use are not expected in the near future. However, in the case of the significant change in land use, this issue should be considered in the joint commissions.
efficiency and re-use measures, inter alia, promotion of water-efficient technologies in industry and water-saving	Promotion of water-efficient technologies in industry and water-saving will be welcome in all countries in the Sava river basin.
irrigation techniques	Water-efficient technologies of irrigation will be implemented in new irrigation systems in Serbia
construction projects (e.g. dams, treatment plants)	Several new dams and power plants along the Drina river are planned in the future. The realization of this plan depends on the multilateral agreement of Serbia, Montenegro and B&H. Waste water treatment plants are planned in Belgrade and Sabac, but these plants are also necessary along the Sava river in Croatia and along the Drina river in B&H.
desalination plants	
rehabilitation projects (e.g. renaturation)	
artificial recharge of aquifers	
educational projects (e.g. training, advisory services)	Educational project CARDS alredy started, including Serbia, Croatia and B&H. Serbian representatives from the water sector participated also on several international educational trainings.
research, development and demonstration projects	Research in the water sector is based on the activities of Institute for Hydraulic Research "Jaroslav Cerni" in Belgrade. Research in the biological and ecological sector is covered by the Biological Institute "Sinisa Stankovic".
other relevant measures	

ANNEX III.4 Slovenia

UNDP/GEF Danube Regional Project

Component 1.1-9

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

RER/03/G31/A/1G/31

Key Transboundary Issues (Task 2) and Topics of Measures (Task 3)

SLOVENIA input

Prepared by dr. Lidija Globevnik

October 2006

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B. Key Transboundary Issues (Task 2)

• Water management issues

Categories			yes/no	if yes → explanation
Pressures & Impacts	Pollution	nutrient loads	NO	Under limit values
		hazardous substances	YES	Atrazin over limit value
		thermal pollution	NO	
	Hydromorpho-logical alterations	longitudinal connectivity	NO	
		lateral connectivity	NO	
		hydrological alterations (water abstraction, excessive withdrawals of surface and/or groundwater for human uses, residual water)	NO	
		changes in freshwater availability	NO	
		habitat and community modification - loss of ecosystems or ecotones	YES	Due to road construction, urbanisation and past aglomeration river network has been modified and extent of area of small wetland reduced
Exploitation of Fisheries and other living resources		overexploitation	NO	
		excessive by-catch and discards	NO	
		decreased viability of stocks through contamination and disease	NO	
		impact on biological and genetic diversity	YES	Invasive fish species
Floods and Droughts		use of natural retention areas	YES	FLODO AREAS ALONG the SAVA RIVER IN SLOVENIA ARE ACTIVE
		technical flood management	YES	SAVA RIVER IS REGULATED TO A UNIFORM CHANNEL
		emergency preparedness	YES	AS IN NATIONAL EMERGENY PLAN – FLOOD FORECASTING AND INTERVENTION PLANS IF ACCIDENTS OCCUR
		demand management	NO	
Invasive Species/Neobiota		Introduced species	fish	*Carassius auratus, Carassius gibelio, Ctenoparyngodon idella, Hypophthamichtys nobilis*
		Introduced diseases	NO	
Socio-economic	significant	Decrease or Increase of Population	NO	

Categories			yes/no	if yes → explanation
Issues	changes with respect to transboundary water management	industrial production (e.g. Decrease or Increase of abstraction and sewage)	NO	NO DISTINCT CHANGES
		Future development of the agricultural sector (e.g. changes in irrigation)	NO	MOST LIKELY NO
		Tourism (e.g. increase in water consumption)	NO	
Other				

- **Governance and Organisation**

Categories		explanations
Transboundary Co-operation	Apart from the Sava Basin Framework Agreement, which transboundary agreements on water management exist (within Sava/Danube basin!), which are actively executed (e.g. which transboundary commissions work)? Specify sub-basins and countries.	
	What is the current status of transboundary co-operation in the area of information management in these basins?	Information are exchanged through Slovenia – Croatia bilateral commission for water management
Transboundary Monitoring	Where does transboundary monitoring exist and how is it co-ordinated?	On the border: Jesenice na Dolenjskem
	Who are the main actors in this respect?	Agency for environment
	What kind of data is exchanged at what interval?	Bilateral commission SLO-CRO (at least twice a year)
	Is there a clear transboundary communication of the interpreted data? E.g. joint report	Yes: monitoring data is validated by Slovenia and Croatia; minutes of the meeting
Information Exchange	Is there an exchange of information between national governments and transboundary commissions, how does it work?	Yes – on bilateral level
	Is there an integration of information management at the local level with information management at the transboundary level?	In the procces of strategic environmental assessment
Public Information	Is information regularly disseminated to the general/organised public?	Yes: information to local administrative offices, water management offices
Other		

C. Topics of Measures (Task 3)

Non-exclusive list of types of Measures (WFD) which can be chosen (i.e. are available) to address Key Transboundary Issues

Types of Measure to address KTI	Explanation
Legislative instruments (e.g. the Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC), the Nitrates Directive (91/676/EEC), the Urban Waste-water Treatment Directive (91/271/EEC)	All directives transposed into national legislation
administrative instruments	Water director nominated, at minstry of Envrionment and Physical planning: Directorate for environment - water division
economic or fiscal instruments	Water pricing, water taxes, concessions
negotiated environmental agreements	Sava Commission; Bilateral SLO-CRO commission for water management
emission controls	Yes: by monitoring and data exchange
codes of good practice	Yes: BAT, Environmentally Friendly Agricultural good practices
abstraction controls	Yes: by monitoring and water taxation
demand management measures	By water pricing
Changes in land use	-
efficiency and re-use measures, inter alia, promotion of water-efficient technologies in industry and water-saving	Yes: Water technological Platform established through promotion is initiated and technologies knowhow transferred
irrigation techniques	Reserach activities, application of water effficiency use techniques (on project level)
construction projects (e.g. dams, treatment plants)	Treatment plants is all agglomeration over 10000, hydropower plants Boštanj, Blanca
desalination plants	Not applicable
rehabilitation projects (e.g. renaturation)	Through Life Nature programme, Nature 2000 management plans, pilot projects
artificial recharge of aquifers	Not applicable
educational projects (e.g. training, advisory services)	Krka project, seminars, conferences (promoted through tehnological platform, NGO, Ministry, Institute for Water)
research, development and demonstration projects	National research project – flood management, public services in waste water collection, treatment, river corridor maintenance; environmental standards; Nature protection projects;
other relevant measures	See appendix: case study of the Krka river

Appendix:

Summary of the programme of measures - Krka RIVER basin, a case study (October 2006)

To improve the status of water resources in the Krka River sub-basin in line with the environmental objectives of the WFD, different measures and projects are proposed. The results of the analysis of pressures and impacts and feedback from stakeholders have stressed that measures are required for:

- Reversing the increasing trend in nitrate concentrations in the Krsko kotlina aquifer, and at the same time stabilising pesticide concentrations;
- Reducing nitrate and phosphorous loads to surface water in the entire Krka River sub-basin to tackle problems of eutrophication (in particular during low flow periods during the summer);
- Enhancing the ecological functioning of the river ecosystem;
- Improving the monitoring of water in the Krka Rievr sub-basin and thus improve the understanding of pressures, impacts and risks;
- Raising awareness of stakeholders and the wider public in water problems, and building activities for information, consultation and participation of the main stakeholders and the public in water management discussions.

Proposed measures for nutrient reduction in groundwater

Two different water quality improvement objectives were investigated for identifying the most appropriate programme of measures aimed at restauring good water quality for groundwater.

The first scenario aims at a reduction in concentration by 10 mg/l, i.e. thus ensuring that in the longer term the average nitrate concentration in the aquifer is just below the 50 mg/l threshold. Indeed, this is clearly the minimum required;

The second scenario aims at reducing nitrate concentration by 22,5 mg/l, i.e. ensuring groundwater reaches the trend-reversal threshold of 75% of 50 mg/l equal to 37,5 mg/l. Such a scenario would provide some safety with regards to the quality of the aquifer, ensuring that short term variability in concentration that might occur as a result of climatic variability or variability in nutrient use do not threaten the quality of the aquifer that would always be drinkable.

<u>A wide range of measures were considered for the analysis.</u>

- Measure 1: WPA I – This measure applies to the first level of water protection areas (Water Protection Areas I or WPAI, defined with a transportation time of water to the abstraction well of less than 50 days) already defined in existing legislation for the abstraction wells of Brege and Drnovo. Today, these areas are entirely under arable land – although the exact crops and manure management of this land is unknown. The measure requires the abandonment of mineral fertiliser and use of organic fertilisation restricted to compost. A decrease of nitrogen surplus from approximately 120 kg/ha to less than 5 kg/ha is expected. The maximum coverage of the measure is 70 ha. And it is assumed that no hectare is currently managed today under this measure. The costs of this measure represent the end of of farm production in arable fields and the installation of (quasinatural) meadows.

- Measure 2: WPA II & III - In other water protection areas (second and third circles of the Brege and Drnovo abstraction wells), it is anticipated to reduce fertiliser input from 188 kg/ha to 170 kg/ha (in line with the requirements of Good Managament Practices). There are about 2 163 ha of such areas. We assume that this measure is carried out today already on 1 431 ha, thus leaving 732 ha for additional implementation. The main costs of the measure are costs of extension for raising awareness on balancing input of nutrients, protective means of rural economies, education for executing effective supervision, development of more efficient monitoring and obligatory preparation of fertilization plan.

Measure 3: Good Farming Practices - With the introduction of good farming practice, we can assume the same decrease in nitrate pollution for the rest of agricultural areas (i.e. 4 800 ha). In practice, measures of good farming practice consider arrangement of manure pits for preventing leakages of liquid manure into the groundwater, decrease of input to minimal standard for light soil and vulnerable area, prohibition of fertilization during different time periods of the year, development of fertilisation plans with monitoring of nutrient leaching to the ground and efficient control of carrying out fertilization and other measures. It is assumed that all manure pits are improved today and that time restrictions for fertilization are already taken into account by farmers of the area. It is assumed that 50% of agricultural areas are already carrying out the package of protection measures of Good Farming Practices today, thus leaving 2 400 left for additional implementation. The average decrase in total nitrogen is estimated at 9,91 kg/ha. The main costs of this measure are costs for extension for raising awareness on balancing input of nutrients, protective means of rural economies, education for executing effective supervision, development of more efficient monitoring and obligatory preparation of fertilization plans.

- Measure 4: winter green cover – This measure aims at growing winter crops to capture remaining nitrates and limit leaching during the winter. There is no data about today's application of winter green cover. We estimate that that the measure is implemented today already for 696 ha (progressive farmers). It is estimated that the nitrogen leaching to the groundwater will decrase by 21 kg/ha as a result of winter green cover. It is assumed that potential areas for that kind of measure do not exceed 40% of total agricultural areas, i.e. around 2 088 ha, thus leaving a total of 1 392 ha as remaining area where this measure can be implemented.
- Measure 5: buffer zones – Buffer zones are grass or forest areas installed along water courses (5 m wide on each side) for limiting runoff and nitrate leacing to mainly surface water. It also impact on groundwater and it is assumed that the total nitrate reduction will become equal to practically 0 (from 188 kg/ha) as a result of the implementation of this measure, 80% of this reduction benefiting directly groundwater (the rest being relevant to surface water). It is assumed that such buffer zones are already practices today along the Sava River and the Krka River. The potential additional areas for buffer zones estimated according to the length of remaining water courses is then equivalent to 99 ha. The cost of the measure is the related reduction in farm profit results from the abandonment of production for the areas under buffer zones.
- Measure 6: ecological farming - Ecological farming implies that mineral fertilisers and chemical products are not used anymore and replaced by alternative ecological ways of cultivating crops. A reduction by 30% to 50% in nitrate surplus leaching to the groundwater can be expected. And the conservative value of 30% reduction has been used in the context of this analysis. Today, there are 5 to 10% of total farms involved in ecological farming. And it is expected that up to 15% of total farms could do ecological farming. We assume that 5% (384 ha) of the total area is today under ecological farming, out of a total of 1 044 ha. This leaves an area of 696 ha for further implementation of this measure.

- Measure 7: WPAII & III, supplementary Brege – This measure is proposed only for the water protection areas II & III linked to the Brege abstraction well. With this measure, fertilization should be prohibited, leading to a reduction in nitrate surplus from approximately 110,1 kg/ha to less than 5 kg/ha. The area of implementation of this measure is the surface of today's second water protection areas for both wells reduced for the share of protected areas of the first circle for the abstraction point of Drnovo. The area where this measure can thus be applied is approximately 497 ha.
- Measure 8: WPAII & III, supplementary Drnovo – This measure is similar to the measure before for the water protection areas of the abstraction well of Drnovo. With this measure, fertilization is essentially more restricted than by measures for the first water protection area, that is with a reduction of nitrogen input from 170 kg/ha to a maximum of 120 kg/ha. It is estimated that the surplus will be decreasing proportionally to the decrease in nitrate input, that is reduction of 32,4 kg/ha (110,1 kg/ha time (1-120/170)). The estimated area for this measure represents an additional 50 ha. The cost of the measure represents the loss in farm production resulting from the drastic reduction in fertilisation.
- Measure 9: Septic tanks - Septic tanks have three treatment stages and need r egular sludge transportation to waste water treatment plants. It is estimated that today this basic measure will be implemented for 25% of the population, thus for 7 646 PE. The expected reduction in nitrogen input will be 1,7 kg/PE (from 4,7 kg/PE to 3 kg/PE).
- Measure 10: small wastewater treatment plans for individual houses (<50 PE) - The measure foresees the installation of small waste water treatment plants with secondary treatment for individual houses or for a group of houses. This measure would capture 297 PE by total implementation. It is assumed that the outflows from the waste water treatment plants would lead directly or indirectly to the ground. This represents an additional reduction of nitrogen input as compared to measure 9 from 3 kg/PE to 1,18 kg/PE.
- Measure 11: wastewater treatment plans for 50 to 2000 PE -The measure foresees the construction of wastewater treatment plants for smaller settlements. It is assumed that the outflows from the waste water treatment plants will flow to surface waters and that there is around 1% of loss that will go to the groundwater. The settlements between 50 and 2000 PE represents around 1 019 PE. The reduction of nitrogen input is from 3 kg/PE to 1% of loss before the treatment, i.e. 0,047 kg/PE.
- Measure 12: wastewater treatment plans > 2000 PE – This measures represents the construction of wastewater treatment plants for agglomeration of more than 2000 PE. The effect of this measure is equal to the effect of measure 11, the only (significant) difference being the total costs of the measure. The measure treats waste water treatment plants for larger settlements. The reduction of nitrogen input is from 3 kg/PE to around 1% of losses before the treatment plant, i.e. 0,047 kg/PE. The effects are estimated from the shares of nitrogen in total yearly nitrogen from dispersed sources of pollution, urbanisation and agriculture. If the proposed measures would be fully implemented, there would be 763 PE left with primary treatment.
- Measure 13: WPAI extended to WPAII & III areas – This measure is the same measure as WPAI but applied to the less strict protection areas of both water abstraction wells. It has thus the same costs and effectiveness. Using the cost and effectiveness information for potential measures, cost-effectiveness ratios have been computed and used fo ranking measures from the most cost-effectiven (1) to the least cost-effective (12). Different package of measures were then developed based on the cost-effectiveness ranking of measures. For the first scenario, two packages were identified: (i) the first package following only the ranking of the cost-effectiveness analysis, and (ii) the second package where basic measures are selected first then complemented with additional

measures based on their cost-effectiveness ratio. The results are displayed in the table below.

Proposed measures for nutrient reduction in surface water

The analysis of pressures and impacts stressed that agriculture, mainly concentrated in areas close to the Krka River, is the largest contributor to the total yearly balance for nitrogen and phosphorous. The second largest contributors are discharges from wastewater, either from wastewater treatment plants or from individual treatment. Similar to agriculture, people are mainly concentrated close to the Krka River (60% are living close to the River). In the upper part of the sub-basin (karstic area), agriculture drains less then half of the amount of nitrogen per hectare then the lower part of the sub-basin. It is estimated that the upper part drains 7.70 kg N/ha/year while the lower part drains 26.0 kg N/ha/year. For phosphorous, the difference is even greater: 0.08 kg P/ha/year for the upper part versus 2.30 kg P/ha/year for the lower part. The main pressure of agriculture is concentrated around the around the Krka River from Novo Mesto to the confluence with the Sava River.

In the summer period, agriculture is not the largest contributor to the total mass balance. Instead, wastewater treatment plants and private houses are the most important pollution source in the summer for phosphorous and also for nitrogen. And the absolute contribution of the area of Novo Mesto is larger than at the end of the KrkaRiver. This is explained by the concentration of activities (industry in particular, inhabitants) in the area around Novo Mesto. The only area of the Krka sub-basin where agriculture remains the largest contributor is the most downstream part of the sub-basin. At present, the concentration for nitrogen and phosphorous are in Class III and Class IV with regards to eutrophication at the Krka River sub-basic scale. Thus, measures are required to reduce the concentration of N & P and thus eutrophication. A wide range of measures relevant to the agriculture and household/sewage & wastewater treatment sectors were considered and analysed in terms of costs and potential impacts.

- Installation of/renovation manure storage - This measure deals with the repairing or construction of manure pits for reducing/eliminating leakages. As the existing number of leaking manure pits is unknown, it is estimated that around 5% of all livestock units are not connected to properly functioning manure pit. The reduction in pollution load to surface water is considered as similar to the production of manure per livestock unit (LSU), i.e. 100 kg N/LSU/year and 16 kg P/LSU/year. The maximum coverage for this measure is 5% of the total livestock (i.e. 2340 LSU).
- Constructed wetland is a measure complementary to the treatment of waste water from animal husbandry farms. It should be combined with anaerobic mixing of effluents for complete recovery and represents an alternative to treating liquid manure. This measure has a synergy with organic farming. The reduction in pollution load to surface water is estimated at 0.02 kg N/LSU/year and 0.20 kg P/LSU/year.
- Buffer strips - Buffer strips help capturing nutrients from runoff. It is an effective measures in areas with many streams and ditches where direct nutrient losses occur during the spreading of manure and fertilizers. The measure consists of putting under grass, bushes and/or tress a part of the land along rivers and streams. The width of the zone depends on the size of the water stream. The application of fertilizers, chemical plant protection substances or the storage of manure and silage are forbidden in this area. In this zone due to uptake of nutrients by plants, and buffering surface runoff (erosion), less N and P is running off to the surface water. It is estimated that the runoff from agricultural land will be reduced by 20% for nitrogen and by 25% for phosphorous when buffer strips are applied. Buffer strips are applied to a maximum of 30% of the total agricultural land in the downstream part of the Krka basin (i.e. on 11 541 ha) and to a maxium of 5% of the agricultural land in the upstream part (i.e. 1 352 ha only) as

natural buffer areas (mainly forests) already exist in the upstream part.. The reduction in terms of nutrient load to the surface water is estimated at 1.90 kg N/ha/year and 0.02 kg P/ha/year in the upstream part, and 6.50 kg N/ha/year and 0.50 kg P/ha/year in the downstream part. The difference in reduction kg N/ha between the upstream part and the downstream part is explained by difference in runoff.

- Shifting agricultural land to meadows – Shifting agricultural land to grassland is expected to lead to a 75 % and 60% runoff reduction per hectare of agricultural land (compared to agricultural land) for N & P, respectively. A maxium of 20% of total agricultural land is relevant to this measure, i.e. 5 408 ha in the upstream part and 7 694 ha in the downstream part. The reduction in nutrient load is estimated at 5.80 kg N/ha/year and 0.05 kg P/ha/year for the upstream part, and 19.5 kg N/ha/year and 1.40 kg P/ha/year for the downstream part.
- Organic farming - The effects of organic (ecological) farming are difficult to predict. Studies from other European countries (the Netherlands) show that organic farming can lead to a reduction in nutrient load of 6 kg N/ha/year and 0.80 kg P/ha/year for the downstream part and 50% of this load reduction for the upstream part. As organic farming requires structural changes in farming, it is estimated that it can be applied only for 10% of the total agricultural area, i.e. up to 2 704 ha for the upstream part and up to 3 847 ha for the downstream part.
- Good Management practices - This measure is already described for the groundwater case study. The resulting nutrient load reduction is estimated at 8.60 kg N/ha/year and 0.50 kg P/ha/year for the downstream part, and 50% of this reduction for the upstream part. It is expected that this measure can be implemented in 40% of total agricultural land in the downstream part of the basin (i.e. up to 15 388 ha) and 30% in the upstream part (i.e. up to 8 113 ha).
- Winter green cover - The change of agricultural land into winter green cover aims to cover the fallow land with nutrient catch crops for capturing nutrients left from the previous crop. The land is then sowed between July and October, immediately after the harvest of the main crop. This measure can be implemented in synergy with organic farming and therefore has a similar coverage (10% of the total agricultural land are). The expected reduction in nutrient load is estimated at 5 % N and 60% P runoff reduction per hectare of agricultural land, i.e. 5.80 kg N/ha/year and 0.05 kg P/ha/year for the upstream part, and 19.5 kg N/ha/year and 1.40 kg P/ha/year for the downstream part.
- Connection to new public sewerage (with existing wastewater treatment plant) - This measure connects households connected to a basic sceptic tank to a new sewerage system that is then connected to an existing wastewater treatment plant (WWTP). This measure has a maximum coverage of 15 686 PE, which is the difference between the design capacity of all existing WWTPs and the present connection rate. The effect of this measure is a shift of nutrient load reduction from the reduction of a sceptic tank to the reduction of a WWTP (i.e. 85% reduction). This implies an improvement of 1.66 kg N/PE/year and 0.26 kg P/PE/year.
- Connection to new public sewerage and WWTP - This measure is similar to the previous one but with the construction of a new WWTP. This measure is proposed for the following villages: Dolenja Vas (2000 PE), Brezice (4500 PE) and Sentjernej (3000 PE). The resulting reduction in nutrient load is on average 1.66 kg N/PE/year and 0.26 kg P/PE/year.
- Expansion and modernisation of existing WWTP - The WWTP that can be expanded and modernised are Ribnica (2000 PE extra), Grosuplje (additional 5000 PE), Dolenjske Toplice (additional 2000 PE) and Novo Mesto (additional 10000 PE). The reduction in

nutrient load is on average 1.66 kg N/PE/year and 0.26 kg P/PE/year, as more PE from various sceptic tanks can be connected.

- Additional treatment for existing WWTP - This additional measure means the construction of an additional treatment stage on top of the 85% nutrient reduction reached for a WWTP. The concentration in the effluent will reach 2 mg/l N and 1 mg/l P (as compared to a normal reduction to 15 mg/l N and 2 mg/l P). The reduction will then be 0.77 kg N/PE/year and 0.05 kg P/PE/year. This measure can be considered for large WWTPs or treatment plants in vulnerable areas. Only Novo Mesto WWTP is considered for this measure, thus for a maximum coverage of 55 000 PE.
- Treatment of small settlements - Wastewater of small settlements can be treated with small waste water treatment plants instead of sceptic tanks. Technical alternatives include biological filters, rotating biological contactors, natural lagoons, aerated lagoons or macrophyte lagoons. The number of PEs that can be targeted by this measure are PEs in smaller settlements larger then 50 PE i.e. 41 145 PE. Average nutrient reduction expected from this measure is 1.66 kg N/PE/year and 0.26 kg P/PE/year.
- Reduction in the effects of stormwater overflow - The effect of stormwater overflow systems can be reduced by the construction of retention tanks or natural lagoons. The maximum reduction in N and P loads that can be expected is 50%. As the number and distribution of stormwater overflow structures is unknown, the reduction is expressed as a reduction per percentage of placement of retention tanks. Therefore, it is estimated at 100 kg N/%/year and 25 kg P/%/year.
- Advanced sceptic tanks with controlled sewage disposal - This measure is pplied for settlements smaller then 50 PE. Houses receive advanced sceptic tanks with controlled sewage disposal. The maximum coverage for this measure is 2000 PE, with PE shifting from individual treatment with not-functioning cesspools (5% reduction) to closed cesspools where the content is transported to a WWTP (75% reduction). This implies a nutrient reduction of 3.42 kg N/PE/year and 0.54 kg P/PE/year.
- Small WWTP for dispersed houses- This measure can also be applied to settlements smaller than 50 PE with a maximum coverage of 10 000 PE. Nutrient reduction is estimated at 1.66 kg N/PE/year and 0.26 kg P/PE/year.
- Use of advanced technologies for industry - This measure represents the application of Best Available Techniques (BAT) for Krka chemicals, leading to a reduction by 25% of the current nutrient load.

Other measures for the Krka River sub-basin

- The increase of the water storage capacity of the river via the restructuring of the river bed to limit rising of river bottom. This natural phenomenon might be problematic especially in the lower parts of the river as it can result in floods. If this becomes a significant problem, the river bed could be deepened by excavations. However, it is important to stress that other solutions should be found first as this measure if not implemented with care might lead to significant negative impacts on the aquatic ecosystems contrary to the environmental objectives of the WFD. Such measures should be implemented very locally after studies are done, in consultation with relevant authorities to account for river bed conditions and nature protection.
- The creation of passages for upstream and downstream migration of site specific organisms (e.g. fish path) might be considered also very locally, although it is not seen today as a necessary measures because of the absence of significant horizontal structures that could hinder fish migration.

- The restoration of wetlands connected to the surface water system. Wetlands in the Krka river sub-basin have to be protected as they are retainers of water, matter and energy, help restoring aquifers, have an impact on local (or in same cases also on regional) climate and protect against pollution which means that they protect the water quality. It is similar with flooded meadows and forests (like Krakovo forest). Preliminary to the protection of these ecosystems, an inventory of the current status and importance of wetlands in the Krka River sub-basin should be initiated. This would help identifying priorities for restoring those ecosystems considered as essential and of great value for the aquatic ecosystem of the Krka River.
- With regards to the Krakovo forest, one of the possible solutions to compensate for the decreasing groundwater level and for protecting the forest could be the diversion of water from the Krka river or from its tributaries to the area of Krakovo forest.
- Some measures that account for the ecological status of the river might be proposed for flood protection. The restoration of wetlands is a measure that might play a role also for flood protection. More generally, restoring floodplains that have been disconnected from the river system by dykes aimed at protecting economic activities (e.g. agriculture) might be a means for combining flood protection and ecology. In these floodplains, shifting agriculture land to meadows as proposed for water protection areas in the groundwater case study might be a well-adapted alternative.
- Enhanced fishery management to better account to the specifities of the area and the protection of native fish species and their habitat, e.g. adapting stocking in terms of timing, quantities and fish types (stocking with the native borwn fish trout instead of with the rainbow trout).

ANNEX IV SARAJEVO WORKSHOP AGENDA AND LIST OF PARTICIPANTS

UNDP | GEF
DANUBE
REGIONAL
PROJECT

UNDP/GEF Danube Regional Project

Component 1.1-9

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

RER/03/G31/A/1G/31

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Regional Workshop

13-14 November 2006 in Sarajevo

Task 2 Support to the Description of Key Transboundary Issues

Task 3 Development of Topics for a Programme of Measures

2nd Meeting of GEF Sava Working Group

HYDRO INGENIEURE

umweltbundesamt

10 YEARS eco logic

AGENDA

Sunday 12 November 2006

Individual arrival of participants at hotel Grand, Sarajevo

Monday 13 November 2006

09:00 – 10:15

Opening Session
• Welcome by Bosnian hosts, ICPDR and DRP Sava Consortium; introduction of participants • Short introduction of the current state of the DRP/GEF Component "Development of Sava River Basin Management Plan – Pilot Project" in relation to the WFD implementation (*Vogel/ICPDR*) • Overview of the DRP Sava Component and of the results of TASK 1 – Sava basin countries' Gap Analysis, Vienna working session and electronic follow-up (*Zinke and Konecny*) • Introduction into the Regional Workshop (TASKS 2 and 3) on *Sava Key Transboundary Issues* and *Topics for a Sava Programme of Measures (Zinke)* • General expectations for the working sessions by Sava countries' participants and Sava WG

10:30 – 11:00

- Coffee break

11:00 – 12:00

• Presentation of the **Discussion Paper** on national responses on KTI and ToM templates : Findings and suggestions by International Consultants (*Kranz & Konecny*) • Discussion

12:00 - 13:30

- Lunch

13:30 – 15:00

• Examples of ongoing transboundary river basin cooperation (e.g. Rhine, Morava,…) (*Kranz & Konecny*) • Discussion

15:00 – 15:30

- Coffee break

15:30 – 17:30

• **Sava Key Transboundary Issues:** Discussion aiming at a prioritisation • Conclusions on draft Sava KTI by ICPDR, Beneficiaries and Sava Commission

19:00 Joint Dinner at restaurant "Park Princeva"

Tuesday 14 November 2006

09:00 – 10:30

- Selection of cost efficient measures – approaches in EU countries (*Kranz*)
- Discussion

- Developing and implementing measures in transboundary River Basins: Experiences from Rhine, Morava,… (*Kranz & Konecny*)
- Discussion

10:30 – 11:00

- Coffee break

11:00 – 13:30

- **Sava Topics for Programme of Measures**: Discussion leading towards a prioritisation
- Conclusions on draft Sava ToM by Beneficiaries and Sava Commission
- **Sava Workshop conclusions** and follow-up (*ICPDR, DRP Consultants and Sava WG)*

- Lunch

End of Workshop and departure

19:00 Joint dinner for participants staying overnight

Note

According to the DRP Sava Component Inception Report (February 2006), the **Sava WG** is the main steering body supervising the execution of this assignment. It includes representatives from the following bodies:

- The Beneficiary countries (HR, BA, CS and SI)
- The Sava Commission Secretariat
- The ICPDR
- The GEF-DRP

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APPENDIX 3

DEVELOPMENT OF SAVA RIVER BASIN MANAGEMENT PLAN – PILOT PROJECT

Bosnia & Herzegovina, Croatia, Serbia & Montenegro, Slovenia

Report on TASK 4: Structure of the Sava River Basin Management Plan

February 2007

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Table of Contents

1 Introduction

This Paper is prepared within Phase 2 of the Sava component of the Danube Regional Project (**DRP**), supporting and complementing the activities of the International Commission for the Protection of the Danube River (**ICPDR**) to provide and sustain a regional approach to the development of national water management policies and legislation in the Danube Basin.

This Paper constitutes the output of Task 4, which has the objective to initiate and support the agreement on the **structure of the future Sava RBM Plan**. Task 4 constitutes the final part of the DRP Component and follows up on the previously addressed Task 1 (Gap analysis for the completion of the Danube RR and assistance to current WFD activities), Task 2 (Key Transboundary Issues) and Task 3 (Development of Topics for a Programme of Measures).

Within Task 4, the International Consultants also prepared a **draft "Road Map"** for the Sava RBM Plan, tuned with the new Danube RBMP Road Map. Even though this was not foreseen in the ToR, it was found useful by the Beneficiaries and the Sava Commission during the Inception Phase to have such a document available for further discussions.

Further a review of the Public Participation strategy of the REC (2005) and of the ICPDR (2003) was executed, resulting in a **Sava Basin Public Information and Consultation Plan** which is attached to the draft Sava Road Map. The plan aims to ensure public participation when implementing the EU Water Framework Directive on the basin-wide level.

On the base of a previously disseminated and commented Discussion Paper, these three deliverables where discussed at a regional workshop held on 24-25 January 2007 in Zagreb. The views and the results of the discussion are also presented in this Report.

2 Methodology

For the preparation of the Sava RBM Plan (**SRBMP**) *Structure* and *Road Map*, the following documents were considered:

- WFD, particularly the requirements as defined in Annex VII
- Road Map for the DRB Management Plan (in draft-8 from 2nd October 2006)
- Reporting Sheets for the reporting under the WFD under development within the CIS Process
- Available documents such as ICPDR Issue Papers
- The draft Report on Task 2 and Task 3 of this DRP Component
- The CIS-Workshop on River Basin Management Plans on 8 and 9 May 2006 at Bonn

The first draft of the SRBMP Structure, the Road Map and the Public Information and Consultation Plan was prepared in December 2006 in co-ordination with the ICPDR Permanent Secretariat and the DRP office.

In their approach, the International Consultants took the following documents and aspects into account:

- Legal requirements as set in the WFD
- The current (different) statutes/levels of WFD implementation which the countries have reached so far (as EU Member, Accession or Non-member States)
- The approach taken by the ICPDR so far
- The anticipated resources which each country can make available for the further work.

In a second step a draft Discussion Paper with the draft RBMP Structure and Road Map was sent for comments to the Beneficiaries and the members of the Sava Commission's Permanent Expert Group RBM (PEG RBM). Comments received from Beneficiaries (BiH, SC Secretariat and HR) by mid January 2007 have been taken into account in the preparation (circulation of a revised Discussion Paper) and execution of the DRP Sava Component's regional workshop on 24-25 January 2007 in Zagreb: On request of the Sava Commission, this workshop was relocated and directly connected to the 2nd Sava PEG RBM Meeting (25-26 January 2007) in Zagreb. This allowed PEG members to be closely connected to the workshop discussions and be prepared for the follow-up work at PEG level.

During the regional workshop, the review of the Public Participation strategies and the needed Sava Commission steps to meet the WFD (draft Sava Public Information and Consultation Plan) were presented, and there was opportunity for clarification and further comments on all Task 4 issues. Following this workshop, this Task 4 Report is summarising all results.

3 Regional Workshop 24-25 January 2007 in Zagreb

3.1 Minutes of the Workshop

The workshop held at the premises of Hrvatske Vode was organised by the International Consultants. 29 experts from Bosnia & Herzegovina, Croatia, Serbia and Slovenia, representatives from international bodies and NGOs as well as Local and International Consultants attended (the Agenda is given in Annex 6, the List of Participants in Annex 7).

In the **Opening Session** (24 January afternoon), welcome words were expressed by the Croatians host, Ms. Karmen Cerar (Federal Ministry of Agriculture, Water Management and Forestry), the representatives from the UNDP-GEF DRP (Mr. Ivan Zavadsky), the Secretariats of ICPDR (Ms Birgit Vogel) and the Sava Commission (Mr Dejan Komatina). Mr Komatina stressed the importance of this activity as it provides a sound basis for future joint Sava basin management. After a short tour of the table, the workshop chair, Mr Zavadsky, introduced the workshop objectives and Ms Vogel gave an update of WFD implementation and ICPDR's support to the SC.

The specific results of TASK 1 (Sava countries' Gap Analysis) and of TASKS 2 and 3 (Key Transboundary Issues and Topics of Measures) were presented by Mr Robert Konecny (UBA).

While the report on TASK 1 has been finalised, the Report on TASK 2 and 3 is still open for comments (Deadline 31 January 2007). In the following discussion it was made clear that both reports do not constitute an official position of the Sava countries but are a good technical base for the future work.

In the following Mr. Arnulf Schönbauer (UBA) presented the **draft structure** of the **future Sava RBM Plan.** It was made clear that the document is a living document and has to be updated regularly (e.g. to follow the updates of the EU-Commission's WFD reporting sheets). The participants of the benefiting countries agreed on and accepted the structure.

Some specific comments were made after the presentation and directly included into the final version of the Sava RBM Plan structure, as attached to this report (see Annex 1). The more general discussion concentrated on two main issues, namely

a) the timing of deadlines, and

b) the availability of resources on the national level to provide the outputs needed.

The Beneficiaries stressed several times that the deadlines set in the draft structure and the Road Map are difficult to meet due to lack of human resources and financial means. Further, some countries have already agreed on their internal deadlines for the WFD implementation which do not always meet the set deadlines. The Beneficiaries asked the International Consultants for more details regarding the expected work load to carry out the Sava basins analyses and subsequent steps. The International Consultants clearly outlined that any such estimation would be a guess as they are not sufficiently familiar with national conditions. On the other hand, the current drafting of the Tisza Basin Analysis can provide a good guess for the Sava Analysis, in particular the related experience of Serbia. Slovenia provided some figures on their human resources inputs. At the end of the discussion, some recommendations were made in order to overcome the resource problems, i.a. the need to gain the support of political decision-makers and to profit from other EU experience (e.g. the Bonn workshop 2006[1]), that focus should be on available data and information but not on gaps and a postponing of deadlines, and that the work can only be achieved when national authorities will have enough capacities.

Further, Slovenia stressed the issue of developments in the field of inland navigation and flood management. Both issues should be addressed in the structure of the Sava RBM Plan. Ms Vogel agreed and referred to the related ongoing efforts to develop a clear guidance at EU level (For further details on this issue see Annex 5).

At the end of the first day, Mr. Alexander Zinke (for Hydro-Ingenieure) presented the **Review of the Public Participation Strategy** and the **Sava RBMP Public Information and Consultation Plan**. Both documents were welcomed and accepted by all Beneficia-ries (the final version can be found in Annex 4).

The related discussion clearly indicated that PP is still not addressed by the SC, and there is an urgent need to adopt the PP strategy and the related Sava Plan by the Sava Commission as well as to clarify how to implement them when resources are limited. The International Consultants recommended making use of resources outside the "official" contact points, e.g. by involving

[1] For further details see http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/implementation_conventio/workshop_management&vm=detailed&sb=Title

additional partners such as NGOs for executing parts of the work. Such an approach was chosen in Germany for the WFD public participation process and could be used as a blueprint for the Sava. Ms Irma Popovic (Green Action) informed that recently her NGO was granted SC Observer status and a new "Sava NGO Committee" was established. Mr Dragan Zeljko (SC Secretariat) informed that soon a Strategy on the Monitoring of the FASRB will be approved which will also deal with public participation.

The **second half day** (25 January morning) started with a short summary of the first day presented by Mr. Ivan Zavadsky (chair) and Mr. Thomas Dworak. The latter further presented the **draft Sava Road Map,** focusing on the most urgent steps to be taken in 2007. He particularly stressed two important issues: First, the Road Map has to be seen as a living document that needs a regular update, and secondly, the first and most important step is the clarification of responsibilities and share of work. This step must soon be agreed at the SC level.

Comments and remarks on the Road Map made during the presentation were included directly into the document (for the agreed and finalised document see Annex 2)

The Workshop was closed by Mr Zavadsky thanking all participants for their attendance and the Consultants for the preparation of the meeting. Mr Zinke informed that the Task 4 Report will be circulated for comments in February, the final documents of the DRP Sava Component will be ready in March 2007 and soon after also available on the DRP webpage.

The DRP Office will send the Final Report to the ICPDR, SC and the Beneficiary countries.

3.2 Workshop Conclusions

An agreement was reached on the draft outline of the RBMP and its correlating Road Map as well as on the Public Participation Plan, even if it will be necessary to discuss their deadlines and resources in more details at the SC. The workshop results were presented by some participants at the subsequent PEG RBM meeting.

The focus of the upcoming SC work should be on the Sava Basin Analysis and on its organisation of work and clarification of responsibilities. All the available resources should be used for this, such as the Sava CARDS project for template evaluation and the water quality part of the Sava Basin analysis. The writing of the Analysis until the end of 2007 could be organised as a joint task: Each Sava country should sign up for a specific chapter and thus take responsibility for writing it. Existing data, reports and maps should be used as a starting point.

Montenegro, having a share of 6000 km² of the Sava basin, must be involved into the SC (by adopting the FASRB) and into this WFD reporting process.

The process of developing the Sava RBMP has already started. However, there is no doubt that additional resources at country level are needed in order to finalise the work within the proposed time-frame. Possible external resources should thus be investigated.

In order to gain experiences from outside the Sava Basin and to find answers to common questions when implementing the WFD, a close exchange with other international River Basins, such as the Danube, Tisza, Rhine or the Odra, should be envisaged. Such networking "across Europe" would not only be beneficial for people implementing the WFD in the Sava Basin; it would also allow integrating the experiences gained into the EU.

Annex 1 Draft Structure of the Sava River Basin Management Plan

The basic outline of the future SRBMP is suggested in Table 1 and the detailed structure in Table 2 (including EC Reporting Sheets and the relevant EC and Sava deadlines).

Table 1: Basic outline for the SRBMP 2009 (based on Annex VII WFD) and basic availability of national data and information

No.	Chapter title	WFD Danube Roof Report 2004 (SAVA countries 4000 km²) (level already achieved by)	WFD Sava Roof Report 2007 (SAVA countries 1000 km²): level to be achieved by all countries, and already achieved by	Less than 1000 km² (level already achieved by)
1.	Characteristics of the Sava River Basin	BA	SRB, HR	SI
2.	Significant pressures and impacts from human activity	BA	SRB, HR	SI
3.	Identification and mapping of protected areas	BA	SRB, HR	SI
4.	Monitoring networks and monitoring results	-		
5.	Environmental objectives and exemptions	-		
6.	Economic analysis of water use	BA, HR & SRB: see Gap Analysis SI: see Article 5 Report		
7.	Programme of Measures	-		
8.	Register of more detailed programmes or management plans	-		
9.	Public information and consultation measures	SI		
10.	Competent authorities and international coordination arrangements	SI, BA, SRB, HR		
11.	Contact points for obtaining background documentation	SI, BA, SRB, HR		

Legend: SI: Slovenia BA: Bosnia Herzegovina
SRB: Serbia HR: Croatia
Grey areas: Information not related to size of catchment (level of detail)
Yellow areas: level to be achieved by each country for Sava RBM Plan

Note: This table does not give any information on the quality of information available

Table 2 Specific outline for the SRBMP 2009 (based on Annex VII WFD and the draft Outline for Reporting Sheets for 2010 Reporting Requirements – River Basin Management Plan)

Note: In case that WFD deadlines have expired already, the new Sava deadlines are set for the year 2007, and in case that WFD deadlines have not expired yet, the actual deadlines are set exactly as stipulated by WFD.

Reporting Sheet Code	Reporting Sheet Title	WFD Reference	Actual deadline for the Sava Basin	First Reporting deadline according to WFD
0. Summary of river basin management plan				
RBMP 1	Summary description of river basin management plan	Article 13	2009/10	2009/2010
1. General description of the characteristics of the river basin		Annex II		
1.1 Governance of the Sava Basin (transboundary co-operation)				
1.2 Surface water (rivers, lakes, transitional and coastal waters)		Annex II 1		
SWB 1	Mapping of ecoregions and Typology of surface water bodies	Annex II 1.1, 1.2	2007	2004/2005
SWB 2	Location and boundaries of surface water bodies	Annex II 1.1	2007	2004/2005
SWB 3	Identification of artificial and heavily modified water bodies	Annex II 1.1	2007	2004/2005
SWB 4	Type-specific reference conditions, maximum ecological potential and reference network	Annex II 1.3(i)-(vi)	2009/2010	2009/2010
	1.2 Groundwater	Annex II 2		
GWB 1	Location and boundaries of groundwater bodies	Annex II 2.1	2007	2004/2005
2. Summary of the significant pressures and impact of human activity		Art 5; Annex II		
2.1 Surface water (rivers, lakes, transitional and coastal waters)		Annex II 1		
SWPI 1	Summary of significant pressures on surface waters in the river basin district	Annex II 1.4	2007	2004/2005
SWPI 3	Estimation of Significant point source pollution on surface waters	Annex II 1.4	2007	2004/2005
SWPI 4	Estimation of Significant diffuse source pollution on surface waters, including a summary of land use	Annex II 1.4	2007	2004/2005
SWPI 5	Estimation of pressures on quantitative status of water including Significant water abstractions from surface water	Annex II 1.4	2007	2004/2005
SWPI 6	Significant water flow regulations and morphological alterations (e.g. hydropower, navigation, flood protection, etc.)	Annex II 1.4	2007	2004/2005
SWPI 7	Assessment of the impact of the significant pressures on surface water bodies	Annex II 1.5	2007	2004/2005

Reporting Sheet Code	Reporting Sheet Title	WFD Reference	Actual deadline for the Sava Basin	First Reporting deadline according to WFD
SWPI 8	Uncertainties and data gaps		2007	2004/2005
SWPI 9	Analysis of other impacts of human activity on the status of water		2007	2004/2005
	2.2 Groundwater			
GWPI 1	Initial characterisation - Summary of pressures on groundwaters in the river basin district		2007	2004/2005
GWPI 3	Estimation of Significant Diffuse source pollution in groundwaters	Annex II 2.1	2007	2004/2005
GWPI 4	Estimation of Significant Point source pollution to groundwaters	Annex II 2.1	2007	2004/2005
GWPI 5	Estimation of pressures on quantitative status of water including Significant Groundwater abstraction	Annex II 2.1	2007	2004/2005
GWPI 6	Significant Artificial groundwater recharge	Annex II 2.1	2007	2004/2005
GWPI 7	Significant Saltwater intrusion (e.g. alterations to flow direction from level changes)	Annex II 2.1	2007	2004/2005
GWPI 8	Review of the other impact of human activity on groundwater	Annex II 2.3	2007	2004/2005
GWPI 10	Uncertainties and data gaps		2007	2004/2005
3. Protected Areas		Annex VI		
RPA 1	Register of Protected Areas	Article 6; Annex IV(i)	2007/2009	2005/2009
4. Monitoring Networks		Article 8, Annex V		
SWM 1	**Summary of the surface water monitoring programmes (surveillance and operational)**	Annex V 1.3	2007	2006/2007
SWM 2	Surface water investigative monitoring programme	Annex V 1.3.3, 1.3.4, 1.3.5 and 1.3.6	2007	2006/2007
SWM 3	**Results of surface water monitoring programmes (status of surface water bodies)**	Annex V 1.4	2009/2010	2009/2010
GWM 1	**Summary of Monitoring Programme for Groundwater (Quantitative and Chemical Status)**	Annex V 2.2	2007	2006/2007
GWM 2	Results of groundwater monitoring programmes (status of groundwater bodies)	Annex V 2.4	2009/2010	2009/2010
RPA 1	Protected areas (inventory with a map)		2004/2007	2004/2005

Reporting Sheet Code	Reporting Sheet Title	WFD Reference	Actual deadline for the Sava Basin	First Reporting deadline according to WFD
5. Environmental Objectives				
Please note: Under the Water Framework Directive, the stated goal is the achievement of environmental objectives by 2015. Article 4 of the WFD determinates how to set the environmental objectives within river basin plans for surface waters, ground water and protected areas. This includes the ability to set alternative objectives to that of achieving 'good status' by 2015 for individual water bodies by using a process of exemptions and/or the setting of less stringent objectives. This chapter of the RBMP should include sufficient information which and how environmental objectives have been set for each water body (please see detailed information in the rows below).				
SWO1	Environmental objectives established for surface waters	Article 4	to be discussed by SC	2009/2010
SWO2	Use of Article 4(4) in surface waters	Article 4	to be discussed by SC	2009/2010
SWO3	Use of Article 4(5) in surface waters	Article 4	to be discussed by SC	2009/2010
SWO4	Use of Article 4(6) in surface waters	Article 4	to be discussed by SC	2009/2010
SWO5	Use of Article 4(7) in surface waters	Article 4	to be discussed by SC	2009/2010
SWPI 2[2]	Identification of surface water bodies at risk	Annex II 1.5	to be discussed by SC	2004/2005
GWO1	Environmental objectives established for groundwaters	Article 4	to be discussed by SC	2009/2010
GWO2	Use of Article 4(4) in groundwaters	Article 4	to be discussed by SC	2009/2010
GWO3	Use of Article 4(5) in groundwaters	Article 4	to be discussed by SC	2009/2010
GWO4	Use of Article 4(6) in groundwaters	Article 4	to be discussed by SC	2009/2010
GWO5	Use of Article 4(7) in groundwaters	Article 4	to be discussed by SC	2009/2010
GWPI 2[2]	Identification of groundwater bodies at risk	Annex II 2.2	2007	2004/2005
GWPI 9[2]	Further characterisation of groundwater bodies at risk	Annex II 2.2	2007	2004/2005
6. Economic Analysis of Water Use		Article 5, Annex III		
ECON1	Summary of economic analysis of water use	Article 5, Annex III	2007	2004/2005
7. Programme of Measures with respect to the Key Issues		Article 11		

[2] This sheet was previously developed as part of the 2005 Reporting Guidance. It may need to be re-numbered.

Reporting Sheet Code	Reporting Sheet Title	WFD Reference	Actual deadline for the Sava Basin	First Reporting deadline according to WFD
Please note:				
POM1	Summary of measures required to implement Community legislation for the protection of water	Article 11	2009/2010	2009/2010
POM2	Summary of steps and measures taken to apply the principle of recovery of costs of water use	Article 9; Article 11	2009/2010	2009/2010
POM3	Summary of measures taken to meet the requirements of Article 7 (protection of waters used for the abstraction of drinking water)	Article 7; Article 11	2009/2010	2009/2010
POM4	Summary of controls on abstraction and impoundment of water	Article 11	2009/2010	2009/2010
POM5	Summary of controls adopted for point source discharges and other activities	Article 11	2009/2010	2009/2010
POM6	Summary of authorisation of direct discharges to groundwater	Article 11	2009/2010	2009/2010
POM7	Measures taken in accordance with Article 16 on priority substances	Article 11; Article 16	2009/2010	2009/2010
POM8	Measures taken to prevent or reduce the impact of accidental pollution incidents	Article 11	2009/2010	2009/2010
POM9	Summary of measures taken for those water bodies at risk of failing to meet the objectives	Article 11	2009/2010	2009/2010
POM10	Supplementary measures	Article 11; Annex VI	2009/2010	2009/2010

Reporting Sheet Code	Reporting Sheet Title	WFD Reference	Actual deadline for the Sava Basin	First Reporting deadline according to WFD
POM11	Summary of measures taken to avoid the pollution of marine waters	Article 11	2009/2010	2009/2010
8. Detailed programmes and management plans		Article 11		2009/2010
PROG1	Register of more detailed programmes and management plans for the RB, including sub-units defined for the Sava River Basin Management Plan, sectors, issues or water types		2009/2010	2009/2010
9. Public information and consultation		Article 14		
PP1	Summary of public information and consultation		2009/2010	2009/2010
10. Competent Authorities				
CA1	List of competent authorities	Article 3; Annex I	2004/2007	2004/2005
11. Contact Points				
CA2	Contact points and procedures for obtaining background and more detailed information	Article 3	2004/2007	2004 (partial)
Annexes	Maps • RBD overview with competent Authorities • Surface water bodies • Surface water bodies type and ecoregions • Groundwater bodies • Monitoring networks for Surface water bodies • Monitoring networks for Groundwater water bodies: 2007 • Ecological status and ecological potential of surface water bodies: 2009 • Chemical status of surface waters: 2009 • Groundwater status: 2009 • Status of Protected Areas Further maps: • Risk maps on four issues: Organic, Hazardous and Nutrient Pollution, Hydromorphology, HMWB • Major hydraulic structures, (longitudinal interruptions) • Contaminated sites • Accidental Risk spots.		2004/2007	2004/2005

Annex 2: Draft Road Map for the Development of the Sava Basin Management Plan 2007 to 2010

Work Plan for Producing the Sava River Basin Management Plan

Tasks 2007 to 2010

Note: The different national laws of the countries in the Sava basin are not always matching the deadlines specified by the EU WFD. Still, it is recommended to meet the WFD deadlines as good as possible.

Issues related to SRB MP (WFD)	Operational Task	Start of Operational Task	End	Remarks
0. Clarification of responsibilities				
General task and requirement	• Clarification of responsibilities and framework (e.g. layout, coordination, communication) for the implementation of the Sava Road Map,taking into account the experiences from the EC CARDS Sava pilot and other projects • Delegation of work among different groups to be involved in drafting the Sava Basin River Management Plan.	2007	ongoing	
1. Analysis of the characteristics of the Sava river basin				
1.1 Surface water • Typology (definition of relevant types) within the Sava Basin • Type-specific reference conditions/Maximum ecological potential • Identification of surface water bodies • Identification of artificial and heavily modified water bodies	• Updating and extension of previous information (Danube Roof Report and other reports) in accordance with Art. 5 WFD, considering existing typologies, ref. conditions etc.	Beginning 2007	End 2007	Secure link to the operational tasks on monitoring Secure ongoing link to ICPDR RBM EG and COM For BiH only preliminary typology based on abiotic parameters for rivers is available, typology for lakes should be developed (in 2007/2008). BiH is at early beginning of defining Ref. Conditions and Max. Ecol. Potential (results expected in 2009)

Issues related to SRB MP (WFD)	Operational Task	Start of Operational Task	End	Remarks
1.2 Groundwater • Identification and characterisation of groundwater bodies	• Updating and extension of previous information (Danube roof report and others) in accordance with Art. 5 WFD.	Beginning 2007	End 2007	
2. Pressures & impact Assessment				
2.1 Surface water • Summary of significant pressures on surface waters in the river basin district • Significant point source pollution on surface waters • Significant diffuse source pollution on surface waters • Significant water abstractions from surface water • Significant water flow regulations and morphological alterations • Assessment of the impact of the significant pressures on surface water bodies • Uncertainties and data gaps	• Updating and extension of previous information (Danube Roof report and others) in accordance with Art. 5 WFD. • Assess identified preliminary Key Water Management Issues on the basis of the DRP Sava Project and value their significance	Beginning 2007	End 2007	See Report on DRP-Sava component Task 2 and 3 Key Water Management Issues, December 2006
	• Identify final Significant Water Management Issues for the Sava Basin		04/2008	
2.2 Groundwater • Initial characterisation - Summary of pressures on groundwaters in the river basin district • Significant Diffuse source pollution in groundwaters • Significant Point source pollution to groundwaters • Significant Groundwater abstraction • Significant Artificial groundwater recharge • Significant Saltwater intrusion • Review of the impact of human activity from pressures on groundwater • Uncertainties and data gaps	• Updating and extension of previous information (Danube roof report and others) in accordance with Art. 5 WFD. • Assess identified preliminary Key Water Management Issues on the basis of the DRP Sava Project and value their significance.	Beginning 2007	End 2007	For BiH only preliminary characterisation of GW has been completed.
	• Identify final Significant Water Management Issues for the Sava Basin		04/2008	

Issues related to SRB MP (WFD)	Operational Task	Start of Operational Task	End	Remarks
3. Protected Areas				
Register of Protected Areas (water, biodiversity and others according WFD)	• Update Danube Roof Report inventory • Produce a map	Beginning 2007	End 2007	
4. Monitoring Networks and Programs				
Monitoring networks and programmes	• Map of monitoring stations and list of parameters measures	Beginning of 2007	End of 2007	Templates will be distributed within the Sava Basin Analysis Data collection. Templates will be discussed in the 2nd PEG RBM meeting
	• Intercalibration of existing monitoring programmes	Beginning of 2007	To be discussed by SC and its relevant technical bodies	
	• Discussion of the transboundary Sava basin wide network and program	Beginning 2008	To be discussed	
5 Environmental Objectives and Exemptions				
General requirement and task	• Definition of environmental objectives for Sava Basin • Link to ICPDR basin wide approach. • Find an approach for exemptions	Beginning 2007	End 2007	Link to characterisation and Monitoring activity
6. Economic Analyses				
General requirement and task	• Organise joint Sava/ICPDR workshop to follow up on the Gap Analysis	First half 2008		See Report on Task 1 Report on WFD Gap Analysis, December 2006 Strong link to ICPDR activities
	• More detailed baseline scenario on basin wide level.	Beginning 2007	to be discussed	Definition of scale within Cost-effectiveness analysis.
	• Update of economic data.	2007	End 2007	BiH has started with economic analysis in 2007

Issues related to SRB MP (WFD)	Operational Task	Start of Operational Task	End of Operational Task	Remarks
	• Cost-recovery	2006	to be discussed	
7 Programs of Measures				
7.1 Preparation of fundamentals to create the PoM according to WFD				WFD Article 14(1.a), as there is a deadline with 31/12/2009
7.1.1 IDENTIFICATION AND ENDORSEMENT OF KEY MANAGEMENT ISSUES ON SAVA BASIN WIDE SCALE: This step is the basis for creating the PoM and focuses on the main identified significant pressures and impacts which put water bodies at risk or possibly at risk of failing the WFD objectives. Therefore, available information is analysed in such a way that the start of a PoM Is enabled.				
7.1.1.1. Identification of Key Water Management Issues and future pressures on Sava basin wide scale based on the information provided by the ***Sava Basin Analysis 2007, national reports or other sources*** in order to enable the PoM.	• Define and endorse criteria for determining KWMIs • Identify and rank Sava KWMIs according to the Sava Basin Analysis 2007, taking into account the DRB Analysis 2004. • KWMIs are based on identified significant pressures which put water bodies at risk or possibly at risk or possibly at risk to fail the WFD environmental objectives. • Investigate possible future water management issues and assess their relevance on basin wide scale.	08/2006	04/2008	The following four key management issues identified for the Danube Basin Analysis 2004 should also be valid for the Sava Basin: ○ organic pollution ○ nutrient pollution ○ hazardous pollution and ○ hydromorphological alterations. Several Key Issues to be considered (beside the four issues mentioned above) have been preliminarily identified in the course of the Sava DRP Comp. Task 2 (2006).
7.1.1.2 Identification of further management issues on Sava basin wide scale based on the information provided by the ***results of the first cycle of the WFD compliant monitoring network*** in order to enable the PoM.	• Evaluation of first monitoring results for development of Programme of Measures.	To be discussed	To be discussed	These steps refine the information achieved from the points above and/or deliver further as well as new information on pressures and their impacts. The PoM can also be refined based on this information.
	• Update of ecological and chemical status according to the results of the first monitoring program.			
	• Comparison of acquired data of the first monitoring year with Sava Basin Analysis 2007.			
	• Input of new information on water body status and pressures for the creation of PoM.			

Issues related to SRB MP (WFD)	Operational Task	Start of Operational Task	End of Operational Task	Remarks
7.1.1.3 Endorsement of Sava Key Water Management Issues		To be discussed	To be discussed	
7.1.1.4 Publication of overview of significant Water Management Issues (WFD Art. 14).		To be discussed	To be discussed	
7.1.2. PREPARATION OF PROGRAM OF MEASURES				
	• Decision scheme to define the priority needs of Measures at basin wide scale for the identified Key Water Management Issues • Definition of criteria for the selection and prioritising of selected measures	04/2008	12/2009	On basin wide scale three options are available to decide on need for Measures: 1. Need for Measure is obvious and has to be set. 2. Need for Measures has to be debated (e.g. gaps for clear decision are still present) 3. No need for Measure on the basin wide
	• Development of **Issue Papers** and execution of **Workshops** to assess significance of issues and needs of Measures at Sava Basin level.			Consider relevant ICPDR Issue papers and Workshop results Consider implication of local contributions (measures) to address Sava Key Issues.
	• Development of a "Catalogue of possible Measures" for the Sava Basin			Assess information provided by EU Member States and DRP Sava Comp. Task 3
	• Estimation of the possible costs and effects of measures for each Key Water Management Issue.			To select relevant Measures, scenarios should be performed to estimate the costs and effects of specific measures for each Key Issue. Task group(s) can be established. The assessment of costs should include: financial cost, cost to the wider economy and society, environmental cost, resources cost. Indicate which Measures can be performed immediately.
	• Select most suitable measures to address Key Issues			

Issues related to SRB MP (WFD)	Operational Task	Start of Operational Task	End of Operational Task	Remarks
	• Develop an Operational Plan for implementing PoM			
7.1.3. AGREEMENT OF DRAFT PROGRAM OF MEASURES				
	• A draft Sava Program of Measures and the draft Operational Plan are discussed at a Workshop.	To be discussed	To be discussed	
	• Publication of draft PoM including the Operational Plan (WFD Art. 14).			This step is part of the public participation and consultation process. Linked to Operational Plan
7.1.4 AGREEMENT OF FINAL PROGRAMME OF MEASURES to be integrated into the River Basin Management Plan by 12/2009 All requirements of WFD Annex VII (7.1 – 7.6) have to be fulfilled.				
7.2 Development of Program of Measures (PoM) according to WFD Article 11	• The **draft PoM** (as a response to Significant Water Management Issues and as part of the Draft Sava Basin Management Plan) will be based on information from the Sava Basin Analysis 2007. 6 months of public consultation of this draft shall be allowed. • As part of the River Basin Management Plan the **final PoM** is developed on basin wide level.. • Reporting of the Sava Program of Measures (PoM)	To be discussed	To be discussed	If specific knowledge on the need for measures is already available from the Sava Analysis Report 2007 the development of the PoM can already start before the first monitoring results. For the development of other measures the monitoring results have to be available.
8. Compilation of all parts of the River basin Management Plan				
8. 1.Establishment of a strategy and work programme for the RBM Plan within the Sava RB.		2007	Mid 2007	Development of a Road Map/Work Plan/ Operational Plan to define frame for Sava RBM planning between 2007 and 2010.
8.2.Draft of the Sava River Basin Management Plan	• Compilation of all existing parts in one RBM Plan • Publication and consultation on drafts of RBM Plan (at least 6 months)		12/2008	This step is part of the public participation and consultation process.
8.3. Final Draft of the Sava River Basin Management Plan	• Agreement on the developed Sava RBM Plan at the Sava Commission and ICPDR's Ordinary Meetings	12/2008	12/2009	
8.4. Final Sava Basin Management Plan	• Publication of RBM Plan and report to EC and ICPDR	12/2009	03/2010	All required parts of the RBM plan are reported to EC including all maps.

SAVA Basin Public Information and Consultation Plan (2007-2010)

to ensure public participation in implementing the EU Water Framework Directive on the basin-wide level

Background

The public participation process for the WFD implementation in the Sava basin is proposed to follow the process at ICPDR level. Relevant document is the **ICPDR Operational Plan (2006-2010) to ensure Public Participation in implementing the EU Water Framework Directive on a basin-wide level** (short Operational Plan), which is based on the "Danube River Basin Strategy for Public Participation in River Basin Management Planning", but goes further beyond in the sense that it brings the strategic approach into practical activities ready for implementation.

The Operational Plan follows the timeframe of the WFD and is directly linked to the **"Sava Road Map for producing the SRBMP 2007 to 2010"**. Despite the efforts to finalise the Operational Plan, there should be the possibility to amend and complement the document whenever needed to ensure the successful implementation of the EU Water Framework Directive regarding public participation activities. This document is developed under the guidance and in close consultation with the Sava PEG RBM and the ICPDR RMB EG.

The activities described in the Operational Plan should not duplicate ongoing and well-functioning Sava Commission processes, but make best use of the existing SC structures and mechanisms. Proposed activities with policy or financial implications for the SC must be approved in advance by the SC.

It is recommended to make use of the "**Guidelines for Participants with Consultative Status and for Observers to the ICPDR (ICWD 110**)".

Based on these guidelines the ICPDR invites stakeholders to be actively involved in the implementation of the EU Water Framework Directive on the basin wide level by participating in the ICPDR expert bodies (Expert Working Groups as well as Task Groups).

Similar to the work of the ICPDR, the SC is encouraged to further actively contact stakeholder and facilitate their participation in the relevant expert bodies.

The SC also has new rules on granting observer status. The new document "Permanent monitoring of the implementation of the FASRB", which should include a chapter on public participation, should be adopted at the next meeting of the Parties in 2007.

Activities

Activity on behalf of the Sava Commission	Type of PP	Tentative timeframe
(a) Active invitation of stakeholders to participate as accredited observer at the work of the SC expert bodies (as requested by the respective expert body).	Active participation	Ongoing
(b) Sava Stakeholder Conference to discuss the findings of the **Sava Analysis Report 2007**, encourage written feedback on the findings.	Consultation	April 2008
(c – ad 7.1.1 of Road Map[3]**) Reflect the feedback received by the stakeholder on the findings of the Sava Analysis Report 2007**. Provide written feedback to the stakeholders.	Consultation	2008 (on the Sava Comm website as soon as endorsed)
(d – ad 8.1 of the Road Map) **Publish the Road Map** for Producing the Sava River Basin Management Plan 2007 to 2010	Information	09/2008 (to be discussed.)
(e) Publish the summary version the Sava Analysis Report 2007 in Sava languages as required; on SC website, and as printed documents.	Information	09/2008 (to be discussed)
(f) Organise the basin-wide **Sava Day 2006** (1 June) to specially promote the joint efforts of the Sava Countries to develop sustainable water manage-ment; outreach programme (cooperation with interest groups, such as Sava NGO Committee, WWF,GWP)	Information	1 June every year
(g– ad 4. of Road Map) **Publish the revised monitoring network / programme** (surface, groundwater and protected areas)	Information	Mid 2008
(h – ad 7. of Road Map**) Regular *information to and at a later stage also consultation with* the public community on the work status towards the Programme of Measures** and encourage feedback (using the SC website)	Information, and at later stage Consultation	From 2007 onwards

[3] The numbers refer to the activities explained in detail in the "Road map for Producing the Sava River Basin Management Plan 2007 to 2010"

Activity on behalf of the Sava Commission	Type of PP	Tentative timeframe
(i – ad 7.1.1.4 of Road map) Publish the **timetable** and **interim overview of significant Water Management Issues**; encourage feedback	Consultation	To be discussed
(j – ad 7.2 Road map) **Publish the draft River Basin Management Plan (incl. the Programme of Measures),** encourage feedback	Consultation	12/2008
(k – ad 7.2/8.2 of Road map) 2nd Sava River Basin Stakeholder Conference to discuss the **draft River Basin Management Plan (incl. the Programme of Measures)**	Consultation	Beginning 2009
(l – ad 7.2/8.4 Road map) **Publish the final River Basin Management Plan (incl. the Programme of measures)**	Information	22.03.2010

Annex 3: Sava Road Map - Responsible and cooperating bodies for Producing the Sava River Basin Management Plan

Issues related to SRB MP (WFD)	Operational Task	Natl. authority designated by the Parties responsible for impl. of FASRB	Competent national authorities responsible for SRB district	Responsible at Sava Commission *[to be defined]*	Co-operating intl. organisa-tion, espec. ICPDR body
0. Clarification of responsibilities					
General task and requirement	• Clarification of responsibilities and framework (e.g. layout, coordination, communication) for the implementation of the Sava Road Map, taking into account the experiences from the EC CARDS Sava pilot and other projects • Delegation of work among different groups to be involved in drafting the Sava Basin River Management Plan.				RBM-EG
1. ANALYSIS OF THE CHARACTERISTICS OF THE SAVA RIVER BASIN					
1.1 Surface water • Typology (definition of relevant types) within the Sava Basin • Type-specific reference conditions/Maximum ecological potential • Identification of surface water bodies • Identification of artificial and heavily modified water bodies	• Updating and extension of previous information (Danube Roof Report and other reports) in accordance with Art. 5 WFD, considering existing typologies, ref. conditions etc..				RBM-EG

Issues related to SRB MP (WFD)	**Operational Task**	**Natl. authority designated by the Parties responsible for impl. of FASRB**	**Competent national authorities responsible for SRB district**	**Responsible at Sava Commission *[to be defined]***	**Co-operating intl. organisa-tion, espec. ICPDR body**
1.2 Groundwater • Identification and characterisa-tion of groundwater bodies	• Updating and extension of previous information (Danube roof report and others) in accordance with Art. 5 WFD.				RBM-EG
2. Pressures & impact Assessment					
2.1 Surface water • Summary of significant pressures on surface waters in the river basin district • Significant point source pollution on surface waters • Significant diffuse source pollution on surface waters • Significant water abstractions from surface water • Significant water flow regulations and morphological alterations • Assessment of the impact of the significant pressures on surface water bodies • Uncertainties and data gaps	• Updating and extension of previous information (Danube Roof report and others) in accordance with Art. 5 WFD. • Assess identified preliminary Key Water Management Issues on the basis of the DRP Sava Project and value their significance				RBM-EG and other ICPDR EGs
	• Identify final Significant Water Management Issues for the Sava Basin				
2.2 Groundwater • Initial characterisation - Summary of pressures on groundwaters in the river basin district • Significant Diffuse source	• Updating and extension of previous information (Danube roof report and others) in accordance with Art. 5 WFD. • Assess identified preliminary Key Water Management Issues on the basis of the DRP Sava Project and value their significance.				RBM-EG and other ICPDR EGs

Issues related to SRB MP (WFD)	**Operational Task**	**Natl. authority designated by the Parties responsible for impl. of FASRB**	**Competent national authorities responsible for SRB district**	**Responsible at Sava Commission *[to be defined]***	**Co-operating intl. organisa-tion, espec. ICPDR body**
pollution in groundwaters • Significant Point source pollution to groundwaters • Significant Groundwater abstraction • Significant Artificial groundwater recharge • Significant Saltwater intrusion • Review of the impact of human activity on groundwater • Uncertainties and data gaps	• Identify final Significant Water Management Issues for the Sava Basin				
3. Protected Areas					
Register of Protected Areas	• Update Danube Roof Report inventory • Produce a map				RBM-EG and MA EG
4. Monitoring Networks and Programs					
Monitoring networks and programmes	• Map of monitoring stations and list of parameters measures				MA EG
	• Intercalibration of existing monitoring programmes				MA EG
	• Discussion of the transboundary Sava basin wide network and program				MA EG
5. Environmental Objectives and Exemptions					
General requirement and task	• Definition of environmental objectives for Sava Basin • Link to ICPDR basin wide approach. • Find an approach for exemptions				RBM-EG and MA EG
6 Economic Analyses					
General requirement and task	• Organise joint Sava/ICPDR workshop to follow up on the Gap Analysis				RBM EG, Economics

Issues related to SRB MP (WFD)	**Operational Task**	**Natl. authority designated by the Parties responsible for impl. of FASRB**	**Competent national authorities responsible for SRB district**	**Responsible at Sava Commission *[to be defined]***	**Co-operating intl. organisa-tion, espec. ICPDR body**
	• More detailed baseline scenario on basin wide level.				Task **Group**
	• Update of economic data.				
	• Cost-recovery				
7 Programs of Measures					
7.1 Preparation of fundamentals to create the PoM according to WFD					RBM-EG and other ICPDR EGs
7.1.1 IDENTIFICATION AND ENDORSEMENT OF KEY MANAGEMENT ISSUES ON SAVA BASIN WIDE SCALE: This step is the basis for creating the PoM and focuses on the main identified significant pressures and impacts which put water bodies at risk or possibly at risk of failing the WFD objectives. Therefore, available information is analysed in such a way that he start of a PoM Is enabled.					
7.1.1.1. Identification of Key Water Management Issues and future pressures on Sava basin wide scale based on the information provided by the ***Sava Basin Analysis 2007, national reports or other sources*** in order to enable the PoM.	• Define and endorse criteria for determining KWMIs • Identify and rank Sava KWMIs according to the Sava Basin Analysis 2007, taking into account the DRB Analysis 2004. • KWMIs are based on identified significant pressures which put water bodies at risk or possibly at risk or possibly at risk to fail the WFD environmental objectives. • Investigate possible future water management issues and assess their relevance on basin wide scale.				RBM-EG
7.1.1.2 Identification of further management issues on Sava basin wide scale based on the information provided by the ***results of the first cycle of the WFD compliant monitoring network*** in order to	• Evaluation of first monitoring results for development of Programme of Measures.				RBM-EG
	• Update of ecological and chemical status according to the results of the first monitoring program.				RBM-EG

Issues related to SRB MP (WFD)	**Operational Task**	**Natl. authority designated by the Parties responsible for impl. of FASRB**	**Competent national authorities responsible for SRB district**	**Responsible at Sava Commission *[to be defined]***	**Co-operating intl. organisa-tion, espec. ICPDR body**
enable the PoM.	• Comparison of acquired data of the first monitoring year with Sava Basin Analysis 2007.				RBM-EG
	• Input of new information on water body status and pressures for the creation of PoM.				RBM-EG
7.1.1.3 Endorsement of Sava Key Water Management Issues				Sava Com	RBM-EG
7.1.1.4 Publication of overview of significant Water Management Issues (WFD Art. 14).					RBM-EG
7.1.2. PREPARATION OF PROGRAM OF MEASURES					
	• Decision scheme to define the priority needs of Measures at basin wide scale for the identified Key Water Management Issues • Definition of criteria for the selection and prioritising of selected measures				RBM-EG
	• Development of **Issue Papers** and execution of **Workshops** to assess significance of issues and needs of Measures at Sava Basin level.				RBM-EG, PM EG, MA EG
	• Development of a "Catalogue of possible Measures" for the Sava Basin				RBM-EG, PM EG
	• Estimation of the possible costs and effects of measures for each Key Water Management Issue.				RBM-EG, Economics Task Group
	• Select most suitable measures to address Key Issues				RBM-EG

Issues related to SRB MP (WFD)	**Operational Task**	**Natl. authority designated by the Parties responsible for impl. of FASRB**	**Competent national authorities responsible for SRB district**	**Responsible at Sava Commission *[to be defined]***	**Co-operating intl. organisa-tion, espec. ICPDR body**
	• Develop an Operational Plan for implementing PoM				RBM-EG
7.1.3. AGREEMENT OF DRAFT PROGRAM OF MEASURES					
	• A draft Sava Program of Measures and the draft Operational Plan are discussed at a Workshop.				RBM-EG
	• Publication of draft PoM including the Operational Plan (WFD Art. 14).				RBM-EG
7.1.4 AGREEMENT OF FINAL PROGRAMME OF MEASURES to be integrated into the River Basin Management Plan by 12/2009 All requirements of WFD Annex VII (7.1 – 7.6) have to be fulfilled.					
7.2 Development of Program of Measures (PoM) according to WFD Article 11	• The **draft PoM** (as a response to Significant Water Management Issues and as part of the Draft Sava Basin Management Plan) will be based on information from the Sava Basin Analysis 2007. 6 months of public consultation of this draft shall be allowed. • As part of the River Basin Management Plan the **final PoM** is developed on basin wide level. • Reporting of the Sava Program of Measures (PoM)				
8 Compilation of all parts of the River basin Management Plan					
8. 1.Establishment of a strategy and work programme for the RBM Plan within the Sava RB.					RBM-EG

Issues related to SRB MP (WFD)	**Operational Task**	**Natl. authority designated by the Parties responsible for impl. of FASRB**	**Competent national authorities responsible for SRB district**	**Responsible at Sava Commission *[to be defined]***	**Co-operating intl. organisa-tion, espec. ICPDR body**
8.2.Draft of the Sava River Basin Management Plan	• Compilation of all existing parts in one RBM Plan • Publication and consultation on drafts of RBM Plan (at least 6 months)				RBM-EG
8.3. Final Draft of the Sava River Basin Management Plan	• Agreement on the developed Sava RBM Plan at the Sava Commission and ICPDR's Ordinary Meetings				OM
8.4. Final Sava Basin Management Plan	• Publication of RBM Plan and report to EC and ICPDR				

Annex 4: Review of Public Participation in the Sava Basin

Task 4 of the DRP Sava Component asks that a

- *General PP strategy for the Sava basin prepared by the REC will be reviewed, taking into account that strategy already developed for the Danube basin*.

1. Review of Key Documents referring to Public Participation in the Sava Basin

Public Participation is still to be developed in the Sava basin countries. In this section, relevant information is quoted (in excerpts) from key documents that were recently produced and shall serve as guidance for the next steps of PP in the Sava basin.

The Regional Environmental Center (REC) executed a project (2003-2005) on "*Sava River Commission – Technical, Legal, Stakeholder, and Secretariat Support*". One of the outputs was the

Public Communication and Stakeholder Involvement Strategy

for the implementation of the Framework Agreement of the Sava River Basin

Final Draft as Submitted to the Sava Commission (June 2005).

The *Objective* of this document is to assist the Parties of the FASRB to carry out a Public Communication and Stakeholder Involvement Strategy in line with the requirements of the national legislation, EU directives and relevant international legal instruments in order to:

- make the decision-making under this Agreement more transparent,
- gain public support for the implementation of this Agreement,
- raise awareness about the issues related to the Sava Agreement,
- mobilize the public and the key stakeholders to assist in carrying out and achieving the goals of the Agreement with success.

The *Specific Objectives* refer to

- Rules and procedures for public access to information and public /stakeholder involvement
- Concrete mechanisms to ensure public access to information and facilitate public/stakeholder involvement at the level of the Sava Agreement (Commission) as well as at the national level
- Regular information about the meetings of the Commission, activities of the Working Groups and Expert Groups established under the Agreement, and the Secretariat
- Regular information and guidance about the all forms of public/stakeholder involvement
- The discussion of the Stategy before adoption
- Information of the public and key stakeholders at the national level about the Sava Agreement and related issues and their involvement in the decision-making related to the implementation of the Agreement.

The REC document stresses that the approach should be similar to the EU Water Framework Directive and the Aarhus Convention. The WFD requires public participation in river basin management planning in different forms, including "active involvement of all interested parties" or "stakeholders" in the implementation of the directive, and in particular, "information and consultation with the public, including water users" in the production, review and updating of river basin management plans.

The REC Strategy underlines that it would be difficult to involve the general "public" directly in the Sava Agreement at the sub-regional level, but it is possible and necessary to inform them at this level about the developments of the process and what information they can find where, when are there opportunities to participate. For the level of Sava Agreement, focus needs to be on the so called "concerned public" or otherwise "key stakeholders", "interested parties" and those need to be defined.

For this stakeholder identification, reference is given to the REC "*Issue Paper on Developing a Draft Stakeholder Involvement Strategy of Key Stakeholders in the process of negotiation and implementation of the Framework Agreement of the Sava River Basin*", annexed to this Strategy (page 13-15).

Reports on Stakeholder analysis and proposals for the involvement of key stakeholders in the process of implementation of the FASRB in BA, HR, S&M and SI were prepared in the project "*Sava River Basin – Support to Public Participation*" funded by USEPA, during 2003. Another short stakeholder assessment was done during the **Phase 1 of the DRP Sava Component** (*Water Management Indicators of the SRB – Summary of National Analysis,* Nov. 2003), listing 49 stakeholders (20 for BiH, 8 for HR, 21 for S&M).

At the level of the Sava Agreement, the REC states that the main form of participation will be the participation of representatives of key stakeholders in the meetings of the Sava Commission, its Working Groups and its Expert Groups as observers. A clear concept shall define of who can obtain this status, what rights observers have, and what the difference is between the permanent and ad hoc observer status, as proposed by the current draft Rules of Procedure.

In this regard, states the REC, the experiences of the ICPDR could serve as a useful example regarding its model for observers, the well developed information system providing to access to information to the general public and key stakeholders, the cooperation and support to NGOS and key stakeholders as well as the first Stakeholder Consultation Conference held on June 28-29, 2005 in Budapest, Hungary.

In order to achieve the general and specific objectives of the REC Public Communication and Stakeholder Involvement Strategy the following steps were proposed:

- The Sava Commission will approve this Strategy as well as an Implementation Plan;
- An Ad hoc Expert Group or Working Group will be established to finalize the proposed draft Strategy and to develop a draft Implementation Plan. This group will include representatives of the Parties as well as observers and key stakeholders;
- The Sava Commission will take measures to implement the Strategy (political support, human and financial resources);
- Guidance and criteria will be prepared clarifying the status and rights of observers;

- Information will be provided actively by the Secretariat to potential observers. A Stakeholder Analysis will be developed for the Sava Agreement and the Secretariat will develop database of observers.
- A Communication and Stakeholder Strategy Implementation Plan will be prepared and approved for regular communication and dissemination of information
- The Commission will hire an Information and Public Participation Officer who will be in charge for carrying out in practice the proposed Strategy and Implementation Plan
- The Parties will nominate Public Participation Focal Points who will participate in the work of the Ad hoc Expert Group or Working Group and implement the Strategy.
- The Parties at national level will take measure to establish the necessary conditions for informing and involving the public/key stakeholders at the national and local level issues related to the Sava Agreement including developing and implementing an action plan (tasks, responsibilities and resources).

The REC also provides a Draft Implementation Plan for the Strategy but without specific timing.

According to information provided by the SC Secretariat from January 2007, it seems that all the listed steps have yet not been implemented.

The second relevant document for this review is the

ICPDR Danube River Basin Strategy for Public Participation

in River Basin Management Planning 2003-2009 (IC WD 167, October 2003)

This document provides background and guidance for the public participation activities in the Danube Basin in River Basin Management Planning, and thus also for PP in the Sava basin.

It first stresses that public participation is a core principle in sustainable water management as required by the EU Water Framework Directive (2000/60/EC). Recognising this, the ICPDR Expert Group on River Basin Management (RBM EG), defined a DRB Strategy for Public Participation.

The Strategy's objectives are:

- To ensure public participation (PP) in WFD implementation in the Danube River Basin (DRB), especially concerning the development of the Danube RBMP.
- To facilitate the establishment of effective structures and mechanisms for PP in the DRB that will continue operating beyond the first cycle of RBM planning.
- To provide guidance to national governments on how to comply with their obligations under the WFD by providing them with practical support and guidance in addressing PP in RBM planning.
- To inform other key stakeholders about appropriate PP activities and structures at the different levels.

The ICPDR Strategy is based on the implementation timetable of the WFD and the activities are based on the requirements of this Directive. It is intended to compliment and assist national actions by providing a coherent framework with links to the international levels on one hand, and by offering a strategic approach to organising actions – with possible implications for securing funding – on the other hand.

Based on the Strategy, an Operational Plan for all activities at the Danube basin (roof) level has been developed under the guidance of the RBM EG. The Operational Plan provides details on the activities at the roof level, including a timetable and a workplan (covering a 12-18 months period). The Operational Plan is a planning document, which is regularly updated.

The ICPDR Strategy then quotes Article 14 WFD and stresses the three "depths" of participation (information – consultation – active involvement) and refers to the WFD CIS "Horizontal Guidance Document on Public Participation" (EU Horizontal Guidance Document; final version from January 2003).

According to both the ICPDR Issues Paper and the EC Horizontal Guidance Document, PP is required at several geographical levels in order to secure meaningful inputs into river basin management planning. In the case of the Danube, these levels can be translated as the following –

- International: Danube River Basin (or "roof") Level
- National Level (the key "implementing" and management level)
- **Sub-Basin Level** (transboundary or/and national) – *relevant for the Sava basin!*
- Local Level (where the WFD actually gets "implemented")

All four levels are needed, therefore co-ordination between the levels is necessary, and the linkages between the levels need careful planning.

Different governments, organizations, and other key stakeholders shall be responsible for implementation, and external assistance may be needed for some specific activities.

The activities which will form the Strategy will all require additional capacity to be built, sometimes in central governments responsible for WFD implementation, often in local or regional government, often in NGOs and other stakeholders, and also within ICPDR as well.

Importantly, almost always a combination of these actors will be involved, by working in partnership in order to ensure that those who are influenced by decision-making are involved in reaching those decisions.

Some suggestions are made for capacity-building activities required to enable public participation to 'happen'. In addition to governmental capacities, a range of international organisations and networks can assist in many of the tasks of the Strategy, including UNDP/GEF, Danube Environment Forum (DEF), Global Water Partnership (GWP), Regional Environment Centre (REC), and WWF.

A new project component (3.4) has been developed in the frame of the UNDP/GEF Danube Regional Project, where technical as well as financial assistance for public participation are provided to **Croatia**, Bulgaria, Romania, **Serbia–Montenegro and Bosnia-Herzegovina** (for further information please see: www.icpdr.org/undp-gef).

The ICPDR document then provides outlines for implementation plans at the Danube basin, national, sub-basin (pages 20-22) and local levels: As such a sub-basin plan does yet not exist, a "pilot" approach is required in order to test, demonstrate, and then disseminate the benefits of PP in other sub-basins. This plan's structure (table) links the needed Activities and Outputs with the required Capacities, Responsibilities, Involvement and Time. The writing of such plans is recommended at all levels.

2. Conclusions for the PP Process in the Sava Basin

The review has shown that the start of PP process in the Sava basin is more than urgent in order to still allow meeting the WFD Objectives and to secure overall appropriate stakeholder information and involvement.

The steps recommended by the REC and ICPDR Strategies are essential, complementary and urgently needed for realising the PP process in the Sava basin.

In the course of proposing a *Road Map for the Sava RBM Plan*, the DRP Consultants have also worked out a proposal for a Public Information and Consultation Plan for the Sava Basin. This evidently starts in 2007 and indicates that several WFD deadlines are already difficult to achieve. This Sava PP Plan is also given here in Annex 2 (on page 30, Sava RBMP Road Map) and should be seen as a starting point for writing a more detailed implementation plan, also for the national and local levels.

This proposal and these constraints were discussed both at the Zagreb workshop of the DRP Sava Component and should be further assessed in the meetings of the Sava Commission (incl. PEG RBM).

Annex 5: Future socio-economic development in River Basin Management - The issues of flood management and inland waterway transport

The Water Framework Directive (WFD) risk assessments, carried out in 2005, showed that hydro-morphological pressures and impacts are one of the most important risks of failing to achieve WFD objectives. The three main hydro-morphological driving forces identified in the risk are: hydropower, navigation and flood protection. The Policy Paper "**WFD and Hydro-morphological pressures**" produced under the Common Implementation Strategy for the Water Framework Directive deals with the integration of water, energy, transport and flood management policies. The paper aims to create synergies and avoid potential inconsistencies and mitigate possible conflicts between water users and environmentalists. In addition a paper on **good practice** and **case studies** was produced[4].

Further, even if the WFD aims for the good water status the WFD sets out circumstances in which failure to achieve certain objectives is permitted (Article 4.7). Article 4.7 can be used in the following circumstances:

1) When failure to achieve good groundwater status, good ecological status or, where relevant, good ecological potential or to prevent deterioration in the status of a body of surface water or groundwater is the result of new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater, or
2) When failure to prevent deterioration from high status to good status of a body of surface water is the result of new sustainable human development activities.

Future flood protection and inland shipping are both issues that can be covered under this article if a set of conditions is met. The conditions are not defined in the Directive, thus, a common understanding of key concepts is needed. This key concept is further discussed in the paper "**Exemptions to the Environmental Objectives under the Water Framework Directive allowed for new modifications or new sustainable human development activities (WFD Article 4.7**)" produced by the drafting group on Environmental Objectives and Exemptions[5].

[4] All three papers can be downloaded at http://forum.europa.eu.int/Members/irc/env/wfd/library?l=/water_directors/documents_november1/meeting_documents&vm=detailed&sb=Title

[5] available at http://forum.europa.eu.int/Members/irc/env/wfd/library?l=/water_directors/documents_november1/meeting_documents&vm=detailed&sb=Title

Annex 6: Agenda of the Regional Workshop

24-25 January 2006 in Zagreb
Task 4 Structure and Road Map for the Sava RBM Plan

3rd Meeting of GEF Sava Working Group

Wednesday 24 January 2007

Individual arrival of participants in Zagreb (at *Hrvatske Vode, Ulica grada Vukovara 220*)

13:00 – 14:30

Opening Session
• Welcome by Croatian hosts, DRP, ICPDR and SC Secretariats, and Sava Consortium • Short update of the WFD implementation and RBM planning in the Danube River Basin (ICPDR) • Wrap up of Task 1 (WFD Gap Analysis and capacity building) and Tasks 2 & 3 activities (Key Water Management Issues and Topics of Measures) (UBA)

14:30 – 15:00

- *Coffee Break*

15:00 – 17:00

• Presentation and discussion of draft RBMP structure (part 1 of the Discussion Paper) (UBA) • Comments by Beneficiaries and Sava Commission and discussion

17:00 – 18:00

• Proposals for a Sava Public Participation Strategy –(Zinke) • Conclusions of Day 1

19:30 *Joint Dinner*

Thursday 25 January 2007

09:00 – 10:30

- Presentation of draft Sava RBMP Road Map (part 2 of Discussion Paper) (Ecologic)
- First comments by Beneficiaries and Sava Commission

10:30 – 11:00

- *Coffee Break*

11:00 – 11:45

- Continued discussion of draft RBMP Road Map

11:45 - 12:30

- Conclusions of workshop (incl. follow up steps by Consultants, Sava Commission/ PEG RBM and CARDS Sava project).

End of Workshop

Note

According to the DRP Sava Component Inception Report (February 2006), the **Sava WG** is the main steering body supervising the execution of this assignment. It includes representatives from the following bodies:

- The Beneficiary countries (HR, BA, CS and SI)
- The Secretariats of Sava Commission and the ICPDR
- The GEF-DRP

Annex 7:List of Participants at the Regional Workshop from 24-25 January 2007 in Zagreb

	Country/ Institution	Name	Competence	Address	Phone	E-mail
1	BIH	Aleksandra Šućur-Pločo	Expert for water issues	State Ministry of Foreign Trade and Economic Relations, Sarajevo	+387 33663713	vetcon@bih.net.ba asucur@bih.net.ba
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5	CRO	Karmen Cerar	Head of Sector for international projects	MAFWM Ul. Grada Vukovara 220, Zagreb	+38516307300	krerar@voda.hr
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12	SRB	Milica Pavlovic	Protected Areas	Ministry of Agricul-ture, Forestry and Water Mgmt, Direc-torate f. Water; Bule-var umetnosti 2a, 11070 Novi Beograd	+381 11 201 33 67	milica.pavlovic@minpolj.sr.gov.yu

	Country/ Institution	Name	Competence	Address	Phone	E-mail
13	Sava Commission	Dejan Komatina	Secretary	Intl. Sava Basin Commission Secre-tariat; Nova Ves 11, 10000 Zagreb	+385 1 48869 60	dkomatinamission.org
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15	Sava Commission	Samo Groselj	Deputy Secretary for protection of waters and aqua-ic ecosystems	Intl. Sava Basin Commission Secre-tariat; Nova Ves 11, 10000 Zagreb	+385 1 48869 67	sgroselj@savacommission.org
16	ICPDR	Birgit Vogel	Technical Expert River Basin Management	ICPDR Permanent Secretariat, Vienna Intl. Centre, Wagramer Str. 5, 1210 Vienna, Austria	+431 260 60 5738	birgit.vogel@unvienna.org
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18	EC CARDS Sava Project	Senad Ploco	Team Leader	Grbavicka 4/IV BA-71000 Sarajevo	+ 387 61 90 59 22	sploco@bih.net.ba
19	Green Action / NGO Sava Committee	Irma Popovic	Coordinator of freshwater prog-ram, monitoring of WFD implementa-tion in Croatia	Frankopanska 1, post box. 952, HR-10000 Zagreb, Croatia	+ 385 1 4818 480	irma@zelena-akcija.hr
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